Uterine Leiomyoma Beadchip Gene Expressions

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This is to re-examine the UL and non-UL samples from the Gene Expression Omnibus online data repository (GEO) for genotypes in the ULs compared to those samples without tumor tissue in them. The accession IDs for the Series is GSE95101 and for the platform is GPL13376

```
library(dplyr)
library(tidyr)

UL1a <- read.csv('UL1a.csv', sep=',',
                 header=T, na.strings=c('',' '))
UL1b <- read.csv('UL1b.csv', sep=',',
                 header=T, na.strings=c('',' '))
UL1c <- read.csv('UL1c.csv', sep=',',
                 header=T, na.strings=c('',' '))
UL1d <- read.csv('UL1d.csv', sep=',',
                 header=T, na.strings=c('',' '))

UL1 <- rbind(UL1a,UL1b,UL1c,UL1d)
rm(UL1a,UL1b,UL1c,UL1d)
str(UL1)
```

```
## 'data.frame':    48701 obs. of  51 variables:
##  $ X                    : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ ID                   : Factor w/ 48701 levels "ILMN_1343289",..: 1 2 3
4 5 6 7 8 9 10 ...
##  $ Species              : Factor w/ 1 level "Homo sapiens": 1 1 1 1 1 1 1
1 1 1 ...
##  $ Source               : Factor w/ 3 levels "ILMN_Controls",..: 1 1 2 1 1
2 2 2 2 2 ...
##  $ Search_Key           : Factor w/ 46721 levels
"ILMN_10001","ILMN_10014",..: 11664 11664 11664 11664 11664 11664 11664 9848
11306 1417 ...
##  $ Transcript           : Factor w/ 46724 levels
"ILMN_10001","ILMN_10014",..: 2290 2291 1377 2292 2293 4903 1218 9858 11314
1421 ...
##  $ ILMN_Gene            : Factor w/ 43186 levels "1-Dec","1-Mar",..: 8904
10174 2074 10143 10156 88 2713 4872 9250 2029 ...
##  $ Source_Reference_ID  : Factor w/ 46721 levels "NM_000015.1",..: 776
4636 1225 1123 1827 1130 1438 9379 7158 10894 ...
##  $ RefSeq_ID            : Factor w/ 28570 levels "NM_000015.1",..: 776
4636 1225 1123 1827 1130 1438 9379 7158 10894 ...
##  $ Unigene_ID           : Factor w/ 18153 levels "NA","Hs.100554",..: 1 1
```

```
1 1 1 1 1 1 1 1 ...
##  $ Entrez_Gene_ID       : Factor w/ 16063 levels "10","10000","10001",..:
10744 10744 1487 10744 10744 5871 2331 6516 10718 5545 ...
##  $ GI                   : int  14141192 20149305 25453469 4507728 4507744
5016088 7669491 88954077 33469136 89070645 ...
##  $ Accession            : Factor w/ 46721 levels "NM_000015.1",..: 776
4636 1225 1123 1827 1130 1438 9379 7158 10894 ...
##  $ Symbol               : Factor w/ 25036 levels "1-Dec","1-Mar",..: 8904
10174 2074 10143 10156 88 2713 4872 9250 2029 ...
##  $ Protein_Product      : Factor w/ 28173 levels "NA","NP_000006.1",..: 1
1 1224 1 1 1129 1437 9300 7155 10815 ...
##  $ Probe_Id             : Factor w/ 48701 levels "ILMN_1343289",..: 1 2 3
4 5 6 7 8 9 10 ...
##  $ Array_Address_Id     : int  2140735 6550370 2690379 4590356 4260048
5860528 1770601 50270 3310274 7040079 ...
##  $ Probe_Type           : Factor w/ 3 levels "A","I","S": 3 3 3 3 3 3 3 3
3 2 ...
##  $ Probe_Start          : int  416 1856 1293 1408 72 1725 930 1 1103 2975
...
##  $ SEQUENCE             : Factor w/ 48701 levels
"AAAAAACAGGAATAGCTCTAGGAGTCCTTACACAGGTCCGAGGGACCAGC",..: 9453 9026 11512 4877
6702 9532 5532 1967 10077 11476 ...
##  $ Chromosome           : Factor w/ 56 levels "1","10","11",..: 27 27 22
27 27 23 4 14 1 27 ...
##  $ Probe_Chr_Orientation: Factor w/ 3 levels "-","+","NA": 3 3 1 3 3 1 2 2
1 3 ...
##  $ Probe_Coordinates    : Factor w/ 41351 levels "100000925-100000974",..:
10161 10161 8915 10161 10161 7449 8192 4231 2830 10161 ...
##  $ Cytoband             : Factor w/ 3676 levels "10p11.1d","10p11.21a",..:
2501 2501 2039 2501 2501 2165 288 1490 1036 2033 ...
##  $ Definition           : Factor w/ 46614 levels "Homo sapiens 1-
acylglycerol-3-phosphate O-acyltransferase 1 (lysophosphatidic acid
acyltransferase, alpha) (AGP"| __truncated__,..: 5692 7144 2221 7047 6692 98
2786 8195 6195 7895 ...
##  $ Ontology_Component   : Factor w/ 7849 levels "A 20S multiprotein
assembly of total mass about 1.2 MDa that activates dynein-based activity in
vivo. A large s"| __truncated__,..: 2614 1893 1304 1321 1266 2112 1468 1893
1763 269 ...
##  $ Ontology_Process     : Factor w/ 8950 levels "[goid 6069] [pmid
1755855] [evidence IDA]; A change in state or activity of a cell or an
organism (in terms of "| __truncated__,..: 2067 2257 3716 1085 547 417 1784
1091 1091 962 ...
##  $ Ontology_Function    : Factor w/ 9453 levels "[goid 16505] [pmid
10426319] [evidence NAS]",..: 3847 2486 1975 1911 2750 2514 95 3637 3637 828
...
##  $ Synonyms             : Factor w/ 16472 levels "0610037N12Rik; RPP20;
RPP2",..: 4591 4591 5325 4591 4591 5300 2402 4591 3649 4591 ...
##  $ Obsolete_Probe_Id    : Factor w/ 16878 levels "0610037N12Rik; RPP20;
RPP2",..: 4784 4784 645 6450 1251 5508 2490 4784 3785 4784 ...
##  $ GB_ACC               : Factor w/ 46717 levels "NA","NM_000015.1",..:
```

```
777 4635 1225 1123 1827 1130 1438 9377 7156 10892 ...
##  $ GSM2496185           : num  13942 23759 27434 3092 6857 ...
##  $ GSM2496186           : num  12934 15091 26473 4269 7799 ...
##  $ GSM2496187           : num  11909 22609 23964 3455 7954 ...
##  $ GSM2496188           : num  12147 18225 27823 4258 7380 ...
##  $ GSM2496189           : num  14142 20728 24486 3333 6445 ...
##  $ GSM2496190           : num  11650 19582 26225 4545 9215 ...
##  $ GSM2496191           : num  12786 19105 28200 3413 10031 ...
##  $ GSM2496192           : num  9383 10008 27997 3191 7428 ...
##  $ GSM2496193           : num  11481 10575 23172 3597 7712 ...
##  $ GSM2496203           : num  4136 1028 16324 4994 6466 ...
##  $ GSM2496204           : num  11458 17921 26664 3095 7471 ...
##  $ GSM2496205           : num  15445 18186 25687 3138 7047 ...
##  $ GSM2496206           : num  11098 8905 22094 2473 6307 ...
##  $ GSM2496207           : num  11510 9721 21161 4353 4826 ...
##  $ GSM2496208           : num  11446 11451 26427 3863 7069 ...
##  $ GSM2496209           : num  9945 16387 27837 3027 6462 ...
##  $ GSM2496217           : num  12707 18456 28792 3251 8407 ...
##  $ GSM2496218           : num  12261 19342 25018 2322 6925 ...
##  $ GSM2496219           : num  11087 9198 27179 4554 9100 ...
##  $ GSM2496220           : num  11746 21023 29030 4131 7771 ...
```

```
nonUL1a <- read.csv('nonUL1a.csv', sep=',',
                header=T, na.strings=c('',' '))
nonUL1b <- read.csv('nonUL1b.csv', sep=',',
                header=T, na.strings=c('',' '))
nonUL1c <- read.csv('nonUL1c.csv', sep=',',
                header=T, na.strings=c('',' '))
nonUL1d <- read.csv('nonUL1d.csv', sep=',',
                header=T, na.strings=c('',' '))

nonUL1 <- rbind(nonUL1a,nonUL1b,nonUL1c,nonUL1d)

rm(nonUL1a,nonUL1b,nonUL1c,nonUL1d)
str(nonUL1)
```

```
## 'data.frame':    48701 obs. of  49 variables:
##  $ X                    : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ ID                   : Factor w/ 48701 levels "ILMN_1343289",..: 1 2 3
4 5 6 7 8 9 10 ...
##  $ Species              : Factor w/ 1 level "Homo sapiens": 1 1 1 1 1 1 1
1 1 1 ...
##  $ Source               : Factor w/ 3 levels "ILMN_Controls",..: 1 1 2 1 1
2 2 2 2 2 ...
##  $ Search_Key           : Factor w/ 46721 levels
"ILMN_10001","ILMN_10014",..: 11664 11664 11664 11664 11664 11664 11664 9848
11306 1417 ...
##  $ Transcript           : Factor w/ 46724 levels
"ILMN_10001","ILMN_10014",..: 2290 2291 1377 2292 2293 4903 1218 9858 11314
1421 ...
```

```
##  $ ILMN_Gene            : Factor w/ 43186 levels "1-Dec","1-Mar",..: 8904
10174 2074 10143 10156 88 2713 4872 9250 2029 ...
##  $ Source_Reference_ID  : Factor w/ 46721 levels "NM_000015.1",..: 776
4636 1225 1123 1827 1130 1438 9379 7158 10894 ...
##  $ RefSeq_ID            : Factor w/ 28570 levels "NM_000015.1",..: 776
4636 1225 1123 1827 1130 1438 9379 7158 10894 ...
##  $ Unigene_ID           : Factor w/ 18153 levels "NA","Hs.100554",..: 1 1
1 1 1 1 1 1 1 1 ...
##  $ Entrez_Gene_ID       : Factor w/ 16063 levels "10","10000","10001",..:
10744 10744 1487 10744 10744 5871 2331 6516 10718 5545 ...
##  $ GI                   : int  14141192 20149305 25453469 4507728 4507744
5016088 7669491 88954077 33469136 89070645 ...
##  $ Accession            : Factor w/ 46721 levels "NM_000015.1",..: 776
4636 1225 1123 1827 1130 1438 9379 7158 10894 ...
##  $ Symbol               : Factor w/ 25036 levels "1-Dec","1-Mar",..: 8904
10174 2074 10143 10156 88 2713 4872 9250 2029 ...
##  $ Protein_Product      : Factor w/ 28173 levels "NA","NP_000006.1",..: 1
1 1224 1 1 1129 1437 9300 7155 10815 ...
##  $ Probe_Id             : Factor w/ 48701 levels "ILMN_1343289",..: 1 2 3
4 5 6 7 8 9 10 ...
##  $ Array_Address_Id     : int  2140735 6550370 2690379 4590356 4260048
5860528 1770601 50270 3310274 7040079 ...
##  $ Probe_Type           : Factor w/ 3 levels "A","I","S": 3 3 3 3 3 3 3 3
3 2 ...
##  $ Probe_Start          : int  416 1856 1293 1408 72 1725 930 1 1103 2975
...
##  $ SEQUENCE             : Factor w/ 48701 levels
"AAAAAACAGGAATAGCTCTAGGAGTCCTTACACAGGTCCGAGGGACCAGC",..: 9453 9026 11512 4877
6702 9532 5532 1967 10077 11476 ...
##  $ Chromosome           : Factor w/ 56 levels "1","10","11",..: 27 27 22
27 27 23 4 14 1 27 ...
##  $ Probe_Chr_Orientation: Factor w/ 3 levels "-","+","NA": 3 3 1 3 3 1 2 2
1 3 ...
##  $ Probe_Coordinates    : Factor w/ 41351 levels "100000925-100000974",..:
10161 10161 8915 10161 10161 7449 8192 4231 2830 10161 ...
##  $ Cytoband             : Factor w/ 3676 levels "10p11.1d","10p11.21a",..:
2501 2501 2039 2501 2501 2165 288 1490 1036 2033 ...
##  $ Definition           : Factor w/ 46614 levels "Homo sapiens 1-
acylglycerol-3-phosphate O-acyltransferase 1 (lysophosphatidic acid
acyltransferase, alpha) (AGP"| __truncated__,..: 5692 7144 2221 7047 6692 98
2786 8195 6195 7895 ...
##  $ Ontology_Component   : Factor w/ 7849 levels "A 20S multiprotein
assembly of total mass about 1.2 MDa that activates dynein-based activity in
vivo. A large s"| __truncated__,..: 2614 1893 1304 1321 1266 2112 1468 1893
1763 269 ...
##  $ Ontology_Process     : Factor w/ 8950 levels "[goid 6069] [pmid
1755855] [evidence IDA]; A change in state or activity of a cell or an
organism (in terms of "| __truncated__,..: 2067 2257 3716 1085 547 417 1784
1091 1091 962 ...
##  $ Ontology_Function    : Factor w/ 9453 levels "[goid 16505] [pmid
```

```
10426319] [evidence NAS]",..: 3847 2486 1975 1911 2750 2514 95 3637 3637 828
...
##  $ Synonyms             : Factor w/ 16472 levels "0610037N12Rik; RPP20;
RPP2",..: 4591 4591 5325 4591 4591 5300 2402 4591 3649 4591 ...
##  $ Obsolete_Probe_Id    : Factor w/ 16878 levels "0610037N12Rik; RPP20;
RPP2",..: 4784 4784 645 6450 1251 5508 2490 4784 3785 4784 ...
##  $ GB_ACC               : Factor w/ 46717 levels "NA","NM_000015.1",..:
777 4635 1225 1123 1827 1130 1438 9377 7156 10892 ...
##  $ GSM2496194           : num  9823 18157 27796 3428 7706 ...
##  $ GSM2496195           : num  11265 20893 24042 4279 9407 ...
##  $ GSM2496196           : num  13016 20943 24368 3049 9110 ...
##  $ GSM2496197           : num  11698 18242 24179 3574 7935 ...
##  $ GSM2496198           : num  11448 20998 25276 2178 7307 ...
##  $ GSM2496199           : num  11454 21756 26935 3768 8928 ...
##  $ GSM2496200           : num  11514 21849 26969 3170 9457 ...
##  $ GSM2496201           : num  10621 10200 24231 2292 7765 ...
##  $ GSM2496202           : num  11066 9349 22945 4513 8454 ...
##  $ GSM2496210           : num  10189 21816 29280 4816 8773 ...
##  $ GSM2496211           : num  9998 18435 26231 4683 8579 ...
##  $ GSM2496212           : num  11407 23942 27389 3589 7977 ...
##  $ GSM2496213           : num  9476 10440 23432 5444 8126 ...
##  $ GSM2496214           : num  11708 9478 22640 4533 8418 ...
##  $ GSM2496215           : num  11457 11803 24008 5839 8549 ...
##  $ GSM2496216           : num  12900 20375 28086 4044 7252 ...
##  $ GSM2496221           : num  10020 16842 25324 2469 7225 ...
##  $ GSM2496222           : num  13409 9030 22273 3315 7844 ...

UL <- UL1[,-c(1:13,15:19,21,29:31)]
nonUL <- nonUL1[,-c(1:13,15:19,21,29:31)]

write.csv(UL,'UL.csv', row.names=FALSE)
write.csv(nonUL, 'nonUL.csv', row.names=FALSE)

fibroid <- read.csv('UL.csv', sep=',', header=T, na.strings=c('',' '))
nonFibroid <- read.csv('nonUL.csv', sep=',', header=T, na.strings=c('',' '))

fibroid_gene_n <- fibroid %>% group_by(Symbol) %>% count(n())
narm <- grep('^NA$',fibroid_gene_n$Symbol)

fibroid1 <- fibroid_gene_n[-narm,-2]
colnames(fibroid1)[2] <- 'gene_count'

NONfibroid_gene_n <- nonFibroid %>% group_by(Symbol) %>% count(n())
narm1 <- grep('^NA$',NONfibroid_gene_n$Symbol)

nonFibroid1 <- NONfibroid_gene_n[-narm1,-2]
colnames(nonFibroid1)[2] <- 'gene_count'

GeneCopyNumberVariants <-
```

```
fibroid1[order(fibroid1$gene_count,decreasing=TRUE)[1:10],]
GeneCopyNumberVariants
```

```
## # A tibble: 10 x 2
## # Groups:   Symbol [10]
##    Symbol    gene_count
##    <fct>          <int>
##  1 DDX12             10
##  2 KIAA0692           9
##  3 LOC23117           8
##  4 PLEC1              8
##  5 BDNF               7
##  6 CTNNB1             7
##  7 DMD                7
##  8 LOC202134          7
##  9 LOC339047          7
## 10 LOC653086          7
```

Combine the gene counts with the tables of samples for each type of UL or nonUL.

```
Fibroid_count <- merge(fibroid1, fibroid, by.x='Symbol', by.y='Symbol')
nonFibroid_count <- merge(nonFibroid1, nonFibroid, by.x='Symbol',
by.y='Symbol')
Fibroid_count[order(Fibroid_count$gene_count, decreasing=TRUE)[1:20],1:3]
```

```
##         Symbol gene_count
SEQUENCE
## 5646     DDX12         10
CCAGTCCCTGACTACAGAGGATTTCCCCAAAGTCCCTGGCTGTGAGGTTC
## 5647     DDX12         10
TTACTGGGGATGGTATTTAGGAGCCAGGAAAGCCGGTGCATTCCTAGTGA
## 5648     DDX12         10
TCTCCTGCCCCCTCCGGAAGCTTGGATGCCCCTCCACACCCTCTTGATCT
## 5649     DDX12         10
CAGACTTCTCGCTTCCTTTCTGCTGGGCCTCTGAGGGGTCATGGGGCCAT
## 5650     DDX12         10
ACATGTGCTGTCACTGGAACTTGCTCTTTTCACTCAGCAGCCAGAGGGTC
## 5651     DDX12         10
AAACGTTACAGTGTTCCGATGAGACACAGTAGGCAGTACTTGGGAGGGTC
## 5652     DDX12         10
CAGGGCAGGAACCACGTCTTTACAGTTTGATGTTCCCAGAGCTGACCCAG
## 5653     DDX12         10
GCAGGGGAGATTGGGTTTAGGGGCTTTCCTGGTCTGCATTCTGCTACAGC
## 5654     DDX12         10
CCGCCGGGCTGCTTTTTCCTTGGATGCCCATCAGGACGCCTCAGTTCTCT
## 5655     DDX12         10
CGTTGCTACAAGCTGTTTTTTGAATGTCTCTACACAGTCCAGGCAGGAAG
## 10983 KIAA0692          9
AAGTGGTGCCTGGCTGTCCCTATACTGTGCTGCTGGGTGTTCCAGCCTGT
## 10984 KIAA0692          9
TAAGTGCAGTGAGCTCTGGCGGAAACCACCCTCTGCCCCGTCTGTTGGAT
```

```
## 10985 KIAA0692          9
CATTGTAATGATAAGGAAATGTTGCGATCAAATAAGATTTAGACACACTT
## 10986 KIAA0692          9
GATCACAGGCACAGGGAAGCCACAAGGAGCTCTGTATGAGTTGTGTTTGC
## 10987 KIAA0692          9
CAGGCGACTGGGTAGCAGATGTGGAAGCTGATGGTTAGGCCCAGGGCATG
## 10988 KIAA0692          9
GTTGTTCTGGACGATCTTCGGGATCCTCTGGGGCACTGTGACACTCGGAG
## 10989 KIAA0692          9
GAGTGCTGGGAAGGTTAATGTTAAATGGGTTGTGTGTCGGGGAGGGTACA
## 10990 KIAA0692          9
AGCTCCACCTTGACCCAGCCTCACAACAAAAAGTTTGTGTATGACCAGGC
## 10991 KIAA0692          9
GCAAATGTAACTCAGGGGTTTGGGGCCAGAGGAAGAGGGAGAAGGTGGCC
## 12174 LOC23117          8
CTGGCCTTCCCTCATCAGCCGTAAATGATGATTTACTGCTGTTACCATCA
```

Add a mean, median, min, and max column to these tables.

```
Fibroid_count$Fibroid_Mean <- rowMeans(Fibroid_count[11:30])
nonFibroid_count$nonFibroid_Mean <- rowMeans(nonFibroid_count[11:28])
```

Use the tidyr package to group by sample ID by gathering those columns into one.

```
UL_3 <- gather(Fibroid_count, 'UL_Sample_ID','Value',11:30)
nonUL_3 <- gather(nonFibroid_count, 'nonUL_Sample_ID', 'Value',11:28)
```

Create the stat tables then combine for the UL and nonUL sample sets using the dplyr package.

```
UL_median <- UL_3 %>% group_by(SEQUENCE) %>% summarise_at(vars(Value),
median)
colnames(UL_median)[2] <- 'Fibroid_Median'

nonUL_median <- nonUL_3 %>% group_by(SEQUENCE) %>% summarise_at(vars(Value),
median)
colnames(nonUL_median)[2] <- 'nonFibroid_Median'

UL_max <- UL_3 %>% group_by(SEQUENCE) %>% summarise_at(vars(Value), max)
colnames(UL_max)[2] <- 'Fibroid_max'

nonUL_max <- nonUL_3 %>% group_by(SEQUENCE) %>% summarise_at(vars(Value),
max)
colnames(nonUL_max)[2] <- 'nonFibroid_max'

UL_min <- UL_3 %>% group_by(SEQUENCE) %>% summarise_at(vars(Value), min)
colnames(UL_min)[2] <- 'Fibroid_min'

nonUL_min <- nonUL_3 %>% group_by(SEQUENCE) %>% summarise_at(vars(Value),
min)
colnames(nonUL_min)[2] <- 'nonFibroid_min'
```

```
UL_sd <- UL_3 %>% group_by(SEQUENCE) %>% summarise_at(vars(Value), sd)
colnames(UL_sd)[2] <- 'Fibroid_stdError'

nonUL_sd <- nonUL_3 %>% group_by(SEQUENCE) %>% summarise_at(vars(Value), sd)
colnames(nonUL_sd)[2] <- 'nonFibroid_stdError'
```

Combine these four tables together.

```
Fibroid_stats <- merge(UL_median, UL_max, by.x='SEQUENCE', by.y='SEQUENCE')
Fibroid_stats1 <- merge(Fibroid_stats, UL_min, by.x='SEQUENCE',
by.y='SEQUENCE')
Fibroid_stats2 <- merge(Fibroid_count, Fibroid_stats1, by.x='SEQUENCE',
by.y='SEQUENCE')
Fibroid_stats3 <- merge(Fibroid_stats2, UL_sd, by.x='SEQUENCE',
by.y='SEQUENCE')
colnames(Fibroid_stats3)[11:30] <- paste('UL_',
colnames(Fibroid_stats3)[11:30], sep='')

nonFibroid_stats <- merge(nonUL_median, nonUL_max, by.x='SEQUENCE',
by.y='SEQUENCE')
nonFibroid_stats1 <- merge(nonFibroid_stats, nonUL_min, by.x='SEQUENCE',
by.y='SEQUENCE')
nonFibroid_stats2 <- merge(nonFibroid_count, nonFibroid_stats1,
by.x='SEQUENCE', by.y='SEQUENCE')
nonFibroid_stats3 <- merge(nonFibroid_stats2, nonUL_sd, by.x='SEQUENCE',
by.y='SEQUENCE')
colnames(nonFibroid_stats3)[11:28] <- paste('nonUL_',
colnames(nonFibroid_stats3)[11:28], sep='')


nonfibroid <- nonFibroid_stats3[,c(1,11:33)]
all <- merge(Fibroid_stats3, nonfibroid, by.x='SEQUENCE', by.y='SEQUENCE')
str(all)
```

```
## 'data.frame':    30549 obs. of  58 variables:
##  $ SEQUENCE             : Factor w/ 48701 levels
"AAAAAACAAAACCGCGCAGCGGAGAACCGGTGCCTGAGTCTCCCAGGGAC",..: 1 4 5 7 8 10 12 13
15 18 ...
##  $ Symbol               : Factor w/ 25036 levels "1-Dec","1-Mar",..: 12031
11383 13002 14397 15611 12721 12474 10953 24822 18000 ...
##  $ gene_count           : int  1 1 1 1 1 1 1 1 1 1 ...
##  $ Probe_Chr_Orientation: Factor w/ 3 levels "-","+","NA": 2 1 2 3 3 2 2 3
1 2 ...
##  $ Probe_Coordinates    : Factor w/ 41351 levels "100000925-100000974",..:
33600 3552 19430 41351 41351 36542 28872 41351 31503 41119 ...
##  $ Cytoband             : Factor w/ 3676 levels "10p11.1d","10p11.21a",..:
3472 3472 3472 3472 3472 293 3472 3472 1261 2180 ...
##  $ Definition           : Factor w/ 46614 levels "{3 region, probe S2}
[human, 76N, mammary epithelial cells, mRNA Partial, 339 nt]",..: 33743 33388
```

```
39229 37744 38664 34103 33968 35730 29449 21454 ...
##  $ Ontology_Component   : Factor w/ 7849 levels "A 20S multiprotein
assembly of total mass about 1.2 MDa that activates dynein-based activity in
vivo. A large s"| __truncated__,..: 4150 4150 4150 4150 4150 4150 4150 4150
5434 6267 ...
##  $ Ontology_Process     : Factor w/ 8950 levels "[goid 19642] [evidence
IEA]; The chemical reactions and pathways involving carbohydrates, any of a
group of org"| __truncated__,..: 2492 2492 2492 2492 2492 2492 2492 2492 8502
3316 ...
##  $ Ontology_Function    : Factor w/ 9453 levels "[goid 15280] [evidence
IEA]; Interacting selectively with sodium ions (Na+) [goid 31402] [evidence
IEA]",..: 8111 8111 8111 8111 8111 8111 8111 8111 7071 2705 ...
##  $ UL_GSM2496185        : num  49.5 51.2 59.9 312.3 52.3 ...
##  $ UL_GSM2496186        : num  51.5 52.3 64.5 333.3 53.7 ...
##  $ UL_GSM2496187        : num  46.9 49 50.3 331.8 56.4 ...
##  $ UL_GSM2496188        : num  50.1 48.4 52 360.9 51.8 ...
##  $ UL_GSM2496189        : num  54 49.8 52.8 339 52.6 ...
##  $ UL_GSM2496190        : num  50.1 48.6 52 411.7 51.9 ...
##  $ UL_GSM2496191        : num  49.5 46 54.7 424.3 54.8 ...
##  $ UL_GSM2496192        : num  46.5 50.6 50.2 517.3 53.6 ...
##  $ UL_GSM2496193        : num  48 46.7 52.9 631.7 54.1 ...
##  $ UL_GSM2496203        : num  48.1 51.5 55.1 576.7 55 ...
##  $ UL_GSM2496204        : num  51.7 50.8 51.6 300.4 52.3 ...
##  $ UL_GSM2496205        : num  46.9 47.5 52.3 348.9 53.2 ...
##  $ UL_GSM2496206        : num  50.5 43.9 54.9 722.6 56.1 ...
##  $ UL_GSM2496207        : num  44 46.5 56.5 1218 55.9 ...
##  $ UL_GSM2496208        : num  51.1 46 51.9 535.5 55.5 ...
##  $ UL_GSM2496209        : num  55.2 46.9 50.6 669 53.3 ...
##  $ UL_GSM2496217        : num  48.9 45.8 49.6 361.9 49.8 ...
##  $ UL_GSM2496218        : num  50 49.9 53.9 377.2 53.6 ...
##  $ UL_GSM2496219        : num  48.3 49.5 50.4 544.1 58.1 ...
##  $ UL_GSM2496220        : num  47.7 46.7 51.7 406.1 56.3 ...
##  $ Fibroid_Mean         : num  49.4 48.4 53.4 486.1 54 ...
##  $ Fibroid_Median       : num  49.5 48.5 52.1 408.9 53.7 ...
##  $ Fibroid_max          : num  55.2 52.3 64.5 1218 58.1 ...
##  $ Fibroid_min          : num  44 43.9 49.6 300.4 49.8 ...
##  $ Fibroid_stdError     : num  2.59 2.3 3.61 214.26 2 ...
##  $ nonUL_GSM2496194     : num  42.7 42.7 56.6 442 57 ...
##  $ nonUL_GSM2496195     : num  49.1 45.3 56 505.4 55.3 ...
##  $ nonUL_GSM2496196     : num  51.1 45.3 55.1 416.5 57.4 ...
##  $ nonUL_GSM2496197     : num  46 52.6 56.2 475.3 54.6 ...
##  $ nonUL_GSM2496198     : num  49.1 54.1 53.7 408.1 50.8 ...
##  $ nonUL_GSM2496199     : num  52.6 47.9 51.1 510.7 52.5 ...
##  $ nonUL_GSM2496200     : num  46 47.1 52.5 681.9 50.3 ...
##  $ nonUL_GSM2496201     : num  45.9 46.8 48.3 689.3 56.7 ...
##  $ nonUL_GSM2496202     : num  50.6 45.3 56.5 735.2 48.7 ...
##  $ nonUL_GSM2496210     : num  48.3 49.3 56.3 426.9 52.5 ...
##  $ nonUL_GSM2496211     : num  46.8 46 54.6 567.3 47.4 ...
##  $ nonUL_GSM2496212     : num  50.6 48.7 54.3 493.8 51.5 ...
##  $ nonUL_GSM2496213     : num  49.1 49.5 56.7 792.8 48.8 ...
```

```
##  $ nonUL_GSM2496214     : num  48.8 49.9 54 710.5 50.6 ...
##  $ nonUL_GSM2496215     : num  48 47.1 52.9 795.4 53.1 ...
##  $ nonUL_GSM2496216     : num  47.9 49.2 48 574.5 51.1 ...
##  $ nonUL_GSM2496221     : num  48.8 48.2 50.6 507.4 54.7 ...
##  $ nonUL_GSM2496222     : num  44.6 49.5 50.4 590 56 ...
##  $ nonFibroid_Mean      : num  48.1 48 53.5 573.5 52.7 ...
##  $ nonFibroid_Median    : num  48.5 48.1 54.1 539 52.5 ...
##  $ nonFibroid_max       : num  52.6 54.1 56.7 795.4 57.4 ...
##  $ nonFibroid_min       : num  42.7 42.7 48 408.1 47.4 ...
##  $ nonFibroid_stdError  : num  2.46 2.75 2.85 130.03 3.07 ...
```

Lets change the 'fibroid' in the column names to 'UL' for uterine leiomyoma.

```
colnames(all) <- gsub('Fibroid', 'UL', colnames(all))
```

Reorder the table so that the stats are at the end of the columns.

```
All <- all[,c(1:10,11:30, 36:53,31:35,54:58)]
str(All)
```

```
## 'data.frame':    30549 obs. of  58 variables:
##  $ SEQUENCE             : Factor w/ 48701 levels
"AAAAAACAAAACCGCGCAGCGGAGAACCGGTGCCTGAGTCTCCCAGGGAC",..: 1 4 5 7 8 10 12 13
15 18 ...
##  $ Symbol               : Factor w/ 25036 levels "1-Dec","1-Mar",..: 12031
11383 13002 14397 15611 12721 12474 10953 24822 18000 ...
##  $ gene_count           : int  1 1 1 1 1 1 1 1 1 1 ...
##  $ Probe_Chr_Orientation: Factor w/ 3 levels "-","+","NA": 2 1 2 3 3 2 2 3
1 2 ...
##  $ Probe_Coordinates    : Factor w/ 41351 levels "100000925-100000974",..:
33600 3552 19430 41351 41351 36542 28872 41351 31503 41119 ...
##  $ Cytoband             : Factor w/ 3676 levels "10p11.1d","10p11.21a",..:
3472 3472 3472 3472 3472 293 3472 3472 1261 2180 ...
##  $ Definition           : Factor w/ 46614 levels "{3 region, probe S2}
[human, 76N, mammary epithelial cells, mRNA Partial, 339 nt]",..: 33743 33388
39229 37744 38664 34103 33968 35730 29449 21454 ...
##  $ Ontology_Component   : Factor w/ 7849 levels "A 20S multiprotein
assembly of total mass about 1.2 MDa that activates dynein-based activity in
vivo. A large s"| __truncated__,..: 4150 4150 4150 4150 4150 4150 4150 4150
5434 6267 ...
##  $ Ontology_Process     : Factor w/ 8950 levels "[goid 19642] [evidence
IEA]; The chemical reactions and pathways involving carbohydrates, any of a
group of org"| __truncated__,..: 2492 2492 2492 2492 2492 2492 2492 2492 8502
3316 ...
##  $ Ontology_Function    : Factor w/ 9453 levels "[goid 15280] [evidence
IEA]; Interacting selectively with sodium ions (Na+) [goid 31402] [evidence
IEA]",..: 8111 8111 8111 8111 8111 8111 8111 8111 7071 2705 ...
##  $ UL_GSM2496185        : num  49.5 51.2 59.9 312.3 52.3 ...
##  $ UL_GSM2496186        : num  51.5 52.3 64.5 333.3 53.7 ...
##  $ UL_GSM2496187        : num  46.9 49 50.3 331.8 56.4 ...
##  $ UL_GSM2496188        : num  50.1 48.4 52 360.9 51.8 ...
```

```
##  $ UL_GSM2496189        : num  54 49.8 52.8 339 52.6 ...
##  $ UL_GSM2496190        : num  50.1 48.6 52 411.7 51.9 ...
##  $ UL_GSM2496191        : num  49.5 46 54.7 424.3 54.8 ...
##  $ UL_GSM2496192        : num  46.5 50.6 50.2 517.3 53.6 ...
##  $ UL_GSM2496193        : num  48 46.7 52.9 631.7 54.1 ...
##  $ UL_GSM2496203        : num  48.1 51.5 55.1 576.7 55 ...
##  $ UL_GSM2496204        : num  51.7 50.8 51.6 300.4 52.3 ...
##  $ UL_GSM2496205        : num  46.9 47.5 52.3 348.9 53.2 ...
##  $ UL_GSM2496206        : num  50.5 43.9 54.9 722.6 56.1 ...
##  $ UL_GSM2496207        : num  44 46.5 56.5 1218 55.9 ...
##  $ UL_GSM2496208        : num  51.1 46 51.9 535.5 55.5 ...
##  $ UL_GSM2496209        : num  55.2 46.9 50.6 669 53.3 ...
##  $ UL_GSM2496217        : num  48.9 45.8 49.6 361.9 49.8 ...
##  $ UL_GSM2496218        : num  50 49.9 53.9 377.2 53.6 ...
##  $ UL_GSM2496219        : num  48.3 49.5 50.4 544.1 58.1 ...
##  $ UL_GSM2496220        : num  47.7 46.7 51.7 406.1 56.3 ...
##  $ nonUL_GSM2496194     : num  42.7 42.7 56.6 442 57 ...
##  $ nonUL_GSM2496195     : num  49.1 45.3 56 505.4 55.3 ...
##  $ nonUL_GSM2496196     : num  51.1 45.3 55.1 416.5 57.4 ...
##  $ nonUL_GSM2496197     : num  46 52.6 56.2 475.3 54.6 ...
##  $ nonUL_GSM2496198     : num  49.1 54.1 53.7 408.1 50.8 ...
##  $ nonUL_GSM2496199     : num  52.6 47.9 51.1 510.7 52.5 ...
##  $ nonUL_GSM2496200     : num  46 47.1 52.5 681.9 50.3 ...
##  $ nonUL_GSM2496201     : num  45.9 46.8 48.3 689.3 56.7 ...
##  $ nonUL_GSM2496202     : num  50.6 45.3 56.5 735.2 48.7 ...
##  $ nonUL_GSM2496210     : num  48.3 49.3 56.3 426.9 52.5 ...
##  $ nonUL_GSM2496211     : num  46.8 46 54.6 567.3 47.4 ...
##  $ nonUL_GSM2496212     : num  50.6 48.7 54.3 493.8 51.5 ...
##  $ nonUL_GSM2496213     : num  49.1 49.5 56.7 792.8 48.8 ...
##  $ nonUL_GSM2496214     : num  48.8 49.9 54 710.5 50.6 ...
##  $ nonUL_GSM2496215     : num  48 47.1 52.9 795.4 53.1 ...
##  $ nonUL_GSM2496216     : num  47.9 49.2 48 574.5 51.1 ...
##  $ nonUL_GSM2496221     : num  48.8 48.2 50.6 507.4 54.7 ...
##  $ nonUL_GSM2496222     : num  44.6 49.5 50.4 590 56 ...
##  $ UL_Mean              : num  49.4 48.4 53.4 486.1 54 ...
##  $ UL_Median            : num  49.5 48.5 52.1 408.9 53.7 ...
##  $ UL_max               : num  55.2 52.3 64.5 1218 58.1 ...
##  $ UL_min               : num  44 43.9 49.6 300.4 49.8 ...
##  $ UL_stdError          : num  2.59 2.3 3.61 214.26 2 ...
##  $ nonUL_Mean           : num  48.1 48 53.5 573.5 52.7 ...
##  $ nonUL_Median         : num  48.5 48.1 54.1 539 52.5 ...
##  $ nonUL_max            : num  52.6 54.1 56.7 795.4 57.4 ...
##  $ nonUL_min            : num  42.7 42.7 48 408.1 47.4 ...
##  $ nonUL_stdError       : num  2.46 2.75 2.85 130.03 3.07 ...

All_stats_only <- All[,c(1,2,3,49:58)]
stats_all <- All_stats_only[!duplicated(All_stats_only),]

stats_all$foldChange_UL_to_nonUL <- stats_all$UL_Mean/stats_all$nonUL_Mean
```

```
FoldChangeGenes <- stats_all[order(stats_all$foldChange_UL_to_nonUL,
decreasing=TRUE)[c(1:5,30545:30549)],]

FoldChangeGenes

##                                                SEQUENCE   Symbol
gene_count
## 16709 GCAACGCTCCTCTGAAATGCTTGTCTTTTTTCTGTTGCCGAAATAGCTGG KIAA1199
1
## 17948 GCCCCAGCAAGCCTCCCTCCATCCTCCAGTGGGAAACTGTTGATGGTGTT     PENK
1
## 22790 GGTATTGCTGATCGTATGCAGAAGGAAATCACTGCTCTGGCTCCTAGCAC     ACTC
1
## 28162 TGCGAGACCTGGGTGTCCAACCTGCGCTACAACCACATGCTGCGGAAGAA     DLK1
2
## 3569  AGGCCCTGGAGGCTGCAACATACCTCAATCCTGTCCCAGGCCGGATCCTC    MMP11
1
## 17565 GCCAACCTCCTCTCACAGCCTCTGTATCTCTGCAGGCCATACTGGTTCCA    ABCA8
1
## 6582  CAGATGTTTTCCCTTGTGGCAGTCTTCAGCCTCCTCTACCCTACATGATC    ADH1A
1
## 8958  CCCAGTGACACTTCAGAGAGCTGGTAGTTAGTAGCATGTTGAGCCAGGCC      FOS
1
## 27542 TGACTGTCCCTGCCAATGCTCCAGCTGTCGTCTGACTCTGGGTTCGTTGG     FOSB
1
## 6881  CAGCTGGGCGATGTGCGAGCTGATAGTGAGCGGCAGAATCAGGAGTACCA    KRT19
1
##         UL_Mean UL_Median     UL_max   UL_min UL_stdError nonUL_Mean
## 16709 3029.4710 2566.7096  6548.8160 156.8375  1948.88193  167.75283
## 17948 1798.4359  237.7790 26134.7105  48.2000  5783.33114  120.28719
## 22790 4693.5182 4880.4535 13992.2647 110.2923  3328.78611  392.30767
## 28162  946.4365  249.4440  5799.7170  54.7250  1542.06289   87.41913
## 3569  4767.6862 3652.1430 15286.3475 235.9674  4029.71487  442.19991
## 17565  143.2650   99.0957   628.2257  56.0500   126.17477  724.33959
## 6582   608.7258  545.4995  1947.6415  54.3500   476.16852 3102.90066
## 8958  1287.1220  805.1551  7335.1691 220.6810  1573.12379 6916.73077
## 27542  205.9075   70.8273  2290.1261  53.1000   493.97933 1142.67872
## 6881   130.4870   85.6123   311.2020  45.6000    90.60451  815.61118
##       nonUL_Median  nonUL_max nonUL_min nonUL_stdError
foldChange_UL_to_nonUL
## 16709    116.83410   514.9222   63.1000      127.90943
18.0591346
## 17948     71.88335   431.7050   54.2000       98.67055
14.9511840
## 22790    332.26735   830.2335  169.4130      197.47324
11.9638706
## 28162     52.70835   669.4027   47.3000      145.29680
10.8264232
## 3569     308.24915  1683.5592   75.9750      430.96362
10.7817440
```

```
## 17565    643.88430  1493.2380  125.9636      317.38002
0.1977871
## 6582    2961.70150  7727.8238  275.2883     1833.54639
0.1961796
## 8958    6722.92010 17362.0317 2406.0706     3676.04993
0.1860882
## 27542    595.09105  7604.0221   92.4250     1864.52510
0.1801972
## 6881     738.20585  2049.6529   57.4000      498.12489
0.1599868
```

```
str(stats_all)
```

```
## 'data.frame':    30549 obs. of  14 variables:
##  $ SEQUENCE              : Factor w/ 48701 levels
"AAAAAACAAAACCGCGCAGCGGAGAACCGGTGCCTGAGTCTCCCAGGGAC",..: 1 4 5 7 8 10 12 13
15 18 ...
##  $ Symbol                : Factor w/ 25036 levels "1-Dec","1-Mar",..:
12031 11383 13002 14397 15611 12721 12474 10953 24822 18000 ...
##  $ gene_count            : int  1 1 1 1 1 1 1 1 1 1 ...
##  $ UL_Mean               : num  49.4 48.4 53.4 486.1 54 ...
##  $ UL_Median             : num  49.5 48.5 52.1 408.9 53.7 ...
##  $ UL_max                : num  55.2 52.3 64.5 1218 58.1 ...
##  $ UL_min                : num  44 43.9 49.6 300.4 49.8 ...
##  $ UL_stdError           : num  2.59 2.3 3.61 214.26 2 ...
##  $ nonUL_Mean            : num  48.1 48 53.5 573.5 52.7 ...
##  $ nonUL_Median          : num  48.5 48.1 54.1 539 52.5 ...
##  $ nonUL_max             : num  52.6 54.1 56.7 795.4 57.4 ...
##  $ nonUL_min             : num  42.7 42.7 48 408.1 47.4 ...
##  $ nonUL_stdError        : num  2.46 2.75 2.85 130.03 3.07 ...
##  $ foldChange_UL_to_nonUL: num  1.027 1.007 0.997 0.848 1.024 ...
```

```
write.csv(stats_all, 'stats_only_UL_nonUL.csv', row.names=FALSE)
```

Combine the table of top and bottom five genes in fold change values of the ratio of UL to non-UL sample means, FoldChangeGenes, with the table of the ten genes having the highest number of copy number variations or genotypes, GeneCopyNumberVariants.

```
ontology <- nonFibroid[,c(1,6:9)]
gnc <- as.data.frame(GeneCopyNumberVariants)[1]

keyGenes1 <- merge(gnc, stats_all, by.x='Symbol', by.y='Symbol')

keyGenes1a <- merge(keyGenes1, ontology, by.x='Symbol', by.y='Symbol')

keyGenes2 <- merge(FoldChangeGenes, ontology, by.x='Symbol', by.y='Symbol')
keyGenes2a <- keyGenes2[,c(1:3,15:18,4:14)]
keyGenes1b <- keyGenes1a[,c(1:3,15:18,4:14)]

KeyGenes <- rbind(keyGenes2a, keyGenes1b)
```

```
KG <- KeyGenes[!duplicated(KeyGenes$SEQUENCE),]
KG1 <- KG[order(KG$foldChange_UL_to_nonUL, decreasing=TRUE),]
write.csv(KG1,'keyGenes_UL_FCs_CNVs.csv', row.names=FALSE)
KG1
```

```
##        Symbol                                                SEQUENCE
gene_count
## 8    KIAA1199 GCAACGCTCCTCTGAAATGCTTGTCTTTTTTCTGTTGCCGAAATAGCTGG
1
## 11       PENK GCCCCAGCAAGCCTCCCTCCATCCTCCAGTGGGAAACTGTTGATGGTGTT
1
## 2        ACTC GGTATTGCTGATCGTATGCAGAAGGAAATCACTGCTCTGGCTCCTAGCAC
1
## 4        DLK1 TGCGAGACCTGGGTGTCCAACCTGCGCTACAACCACATGCTGCGGAAGAA
2
## 10      MMP11 AGGCCCTGGAGGCTGCAACATACCTCAATCCTGTCCCAGGCCGGATCCTC
1
## 68     CTNNB1 AGCTGCAGGGGTCCTCTGTGAACTTGCTCAGGACAAGGAAGCTGCAGAAG
7
## 89     CTNNB1 CTGCAGGGGTCCTCTGTGAACTTGCTCAGGACAAGGAAGCTGCAGAAGCT
7
## 82     CTNNB1 AGTCTCTCGTAGTGTTAAGTTATAGTGAATACTGCTACAGCAATTTCTAA
7
## 231       DMD CAGTGTTGGGATCACTCACTTTCCCCCTACAGGACTCAGATCTGGGAGGC
7
## 210       DMD CTCCTCTCAGCTGAACACCCTCCTTTCACTCCCAAATGCAAACAGTCTCT
7
## 96     CTNNB1 GCCTCTTGCACTCTGAATTGGGAATGTTTGCACCACAGTGGGGGGCTTGC
7
## 140     DDX12 CCGCCGGGCTGCTTTTTCCTTGGATGCCCATCAGGACGCCTCAGTTCTCT
10
## 397  LOC23117 TCAACCACATCCTTCAAAAGGACTATGCCTGTTTATAAGCCCAGCTGTTT
8
## 361 LOC202134 GCCAAAGGAATGGGCTCCAGACACCCCCTCTTCCAGAGCAAGGATGAAGG
7
## 286  KIAA0692 TAAGTGCAGTGAGCTCTGGCGGAAACCACCCTCTGCCCCGTCTGTTGGAT
9
## 61     CTNNB1 CAAACTTTACAGAGGAGAATGCCCTGTTTGTTAACCATGTTTCTTTTGGC
7
## 516 LOC653086 TGATGTGTCACGCCACTGTACTCCAGCCTGACGGCAGAGCGAGACTCCAT
7
## 33       BDNF CCCTCCACCTCCTGCTCGGGGGGCTTTAATGAGACACCCACCGCTGCTGT
7
## 551     PLEC1 CCCGACGAGCAGGACTTCATCCAGGCCTACGAGGAGGTGCGCGAGAAGTA
8
## 445  LOC23117 TGTCGTTTCCTCCATTCTTCACCAAAACATCAGCGTACATAGGCACATGG
8
## 474 LOC339047 ACTGCCTGTGTGGCTCCTTGAGTGCGCGGAGGCCAAAGCTGAGATGACTT
7
## 331  KIAA0692 CATTGTAATGATAAGGAAATGTTGCGATCAAATAAGATTTAGACACACTT
```

```
9
## 559     PLEC1 CCCTCGGGCAGCCTGTTTCCCTCCCTGGTGGTTGTGGGTCACGTTGTCAC
8
## 530 LOC653086 GGTGTGCTCTGGTATGTAATGACAATATGTGAACAAACCTGTGGAATTAA
7
## 259  KIAA0692 GAGTGCTGGGAAGGTTAATGTTAAATGGGTTGTGTGTCGGGGAGGGTACA
9
## 429  LOC23117 GGCTCCTCTTTGGGCTCCTACTGGAATTTATCAGCCATCAGTGCATCTCT
8
## 252       DMD TCTATCAACAGAGCTGAATGAGTGCCAGGAAGCTGCGAAATCTGTCTTAC
7
## 268  KIAA0692 GCAAATGTAACTCAGGGGTTTGGGGCCAGAGGAAGAGGGAGAAGGTGGCC
9
## 19       BDNF AATAATAGAGTGTGGGAGTTTTGGGGCCGAAGTCTTTCCCGGAGCAGCTG
7
## 340 LOC202134 CAAACCCTTGAAGACATTTCAGGGCCATGCTCACTTGGGAGGGTTTGAGG
7
## 405  LOC23117 AAAGCAGTGGTTTTCAGCTGCCAGAGGCCTGAGAGAGTTTGGGCATACTC
8
## 245       DMD CCATTCAGAAGAATGATAAATGCCACAAGCATTTGGAAACAGGCTTCCCT
7
## 322  KIAA0692 AGCTCCACCTTGACCCAGCCTCACAACAAAAAGTTTGTGTATGACCAGGC
9
## 375 LOC202134 AGTGGGCAGAATGATGAGGGAAGTGGGCACGTGCCCATGTTCTTCTTGGC
7
## 382 LOC202134 TTCATCCAGGCCTGCGCCGGTGTTCACAGTGGTCCTCATCTAAGCCAGCC
7
## 591     PLEC1 CCGGGCCTTCTCGTGGTACCCTGCCTGCTGCCTTTGCCCCCGCACTGACT
8
## 47       BDNF GCTCGCTGAAGTTGGCTTCCTAGCGGTGTAGGCTGGAATAGACTCTTGGC
7
## 575     PLEC1 GGCGCAGACATGGACCCCTCGCGAGCCATCCAGAACGAGATCAGCTCCCT
8
## 313  KIAA0692 GATCACAGGCACAGGGAAGCCACAAGGAGCTCTGTATGAGTTGTGTTTGC
9
## 495 LOC339047 TTTCAGGCCCATGGCAGAGGGTGGGCTCAGGAGGGCCATCGTGGGTGTCC
7
## 170     DDX12 GCAGGGGAGATTGGGTTTAGGGGCTTTCCTGGTCTGCATTCTGCTACAGC
10
## 460 LOC339047 AGTGCCCACATCACACAGCATCTAGCACGTAACTGCACCCCGGGAGTCGT
7
## 437  LOC23117 GGCTCTGTTGGAATCCGCATAGTGTGGAAATGAGTTTGCCCTGGAAAGGG
8
## 502 LOC653086 AGTGTTGGGACTACAGGTGTGTGTTACTGCTCCCAGCTGGGAGGCAGGCT
7
## 509 LOC653086 GTGAGCCTGTTTCATCATCTGTAAACTTTGAATAATGATACCTACCCCGC
7
## 467 LOC339047 CGCCCTGAAAGGACCAGGACATGCGGGTGCGGTGGCTGCTCTTTTGGCTC
7
## 150     DDX12 CAGGGCAGGAACCACGTCTTTACAGTTTGATGTTCCCAGAGCTGACCCAG
```

```
10
## 75     CTNNB1 CAGGAATCTAGTCTGGATGACTGCTTCTGGAGCCTGGATGCAGTACCATT
7
## 295  KIAA0692 GTTGTTCTGGACGATCTTCGGGATCCTCTGGGGCACTGTGACACTCGGAG
9
## 180     DDX12 TCTCCTGCCCCCTCCGGAAGCTTGGATGCCCCTCCACACCCTCTTGATCT
10
## 389  LOC23117 CTGGCCTTCCCTCATCAGCCGTAAATGATGATTTACTGCTGTTACCATCA
8
## 103    CTNNB1 GCAATTTGCCAAGTTTCTTTAGCATTTGGCCCTGGATTACGCTGGACCCC
7
## 413  LOC23117 CCCTTCCTACATTCTTGTTTTCATTTTTTCGGAGGAAGAGGAGTTGCTAG
8
## 523 LOC653086 AGCAGCACATCGTCATTTTACAATTGAGAAACATGGAGACTCCAAATGGA
7
## 421  LOC23117 GGGAAGTACATGGGGCAGATGGAAGAACCTGAGATAATCGCAAGGATGGC
8
## 40       BDNF TCAGACCCCTCAGGCCACTGCTGTTCCTGTCACACATTCCTGCAAAGGAC
7
## 607     PLEC1 CTCCGTCTGCCCCGTGGGCTCCTGCCACCGTCCCCGATGAAGATCGTGCC
8
## 453 LOC339047 TTTCCTGAAATGGAGCTTTGCTCTTGTTGCCCAGGCCGTAGTGCAATGGC
7
## 599     PLEC1 GCCTTTGCCTCGCCGAGGGAGGTCTTGCTGGAGCGGCCGTGCTGGCTGGA
8
## 12       BDNF ATGTACGTGGGGGATTCTTGACTCGGGTTAGTCTCTGGGGATGCAGAGCC
7
## 583     PLEC1 CAGCCCTGGGGACACACTGCCCTGGAACCTTGGGAAAACGCAGCGGAGCC
8
## 190     DDX12 CGTTGCTACAAGCTGTTTTTTGAATGTCTCTACACAGTCCAGGCAGGAAG
10
## 481 LOC339047 TCTGTATGGACCCTGCCAAGCTCTGCCCCTCTGCCCCTGCATTGGGGCGC
7
## 54       BDNF TGGGGAGACGAGATTTTAAGACACTTGAGTCTCCAGGACAGCAAAGGCAC
7
## 160     DDX12 CAGACTTCTCGCTTCCTTTCTGCTGGGCCTCTGAGGGGTCATGGGGCCAT
10
## 304  KIAA0692 AAGTGGTGCCTGGCTGTCCCTATACTGTGCTGCTGGGTGTTCCAGCCTGT
9
## 224       DMD GCAGCCAACTTATTGGCATGATGGAGTGACAGGAAAAACAGCTGGCATGG
7
## 200     DDX12 TTACTGGGGATGGTATTTAGGAGCCAGGAAAGCCGGTGCATTCCTAGTGA
10
## 544 LOC653086 TACCTGGCCTATCTTTCATAGGTTATATAAATTCCTTGGTTCCCAGTTTT
7
## 217       DMD GGGTTTTCTCAGGATTGCTATGCAACAGGATCAGTGCTGTAGTGCCCGGT
7
## 120     DDX12 ACATGTGCTGTCACTGGAACTTGCTCTTTTCACTCAGCAGCCAGAGGGTC
10
## 110     DDX12 CCAGTCCCTGACTACAGAGGATTTCCCCAAAGTCCCTGGCTGTGAGGTTC
```

```
10
## 130     DDX12 AAACGTTACAGTGTTCCGATGAGACACAGTAGGCAGTACTTGGGAGGGTC
10
## 368 LOC202134 GACCAAAGCAGGACAATTGCTTGATCCCAGGAGTTTAAGACCAGCCGGGG
7
## 537 LOC653086 AAGGACTCAGATGCAGGGTCTTCTCTGCTCCCCGTCACACAGAGGGTGGC
7
## 277  KIAA0692 CAGGCGACTGGGTAGCAGATGTGGAAGCTGATGGTTAGGCCCAGGGCATG
9
## 488 LOC339047 GACCTGTAGCTAAACCTTCCACCAGCGCTTGAGAACTTAATTTGAACCGG
7
## 238       DMD GCACTCCGACTACATCAGGAGAAGATGTTCGAGACTTTGCCAAGGTACTA
7
## 354 LOC202134 CCACGCCGGCAAAGAAATTGGAAGACTCCACCATTACAGGCAGCCACCAG
7
## 26       BDNF CTTGCTGTGGTCTCTTTGTGGCAGAAGTGTTTCATGCATGGCAGCAGGCC
7
## 567     PLEC1 AGCCTCTGTTCCCCTAGTAAGTGCCTTCCATGTCGGCCTCTAACCCCAGG
8
## 347 LOC202134 CCTGTTTGGATCACATGGTCTTGTCCTGATAACTTGGAAGAGGTTGCTTC
7
## 1       ABCA8 GCCAACCTCCTCTCACAGCCTCTGTATCTCTGCAGGCCATACTGGTTCCA
1
## 3       ADH1A CAGATGTTTTCCCTTGTGGCAGTCTTCAGCCTCCTCTACCCTACATGATC
1
## 6         FOS CCCAGTGACACTTCAGAGAGCTGGTAGTTAGTAGCATGTTGAGCCAGGCC
1
## 7        FOSB TGACTGTCCCTGCCAATGCTCCAGCTGTCGTCTGACTCTGGGTTCGTTGG
1
## 9       KRT19 CAGCTGGGCGATGTGCGAGCTGATAGTGAGCGGCAGAATCAGGAGTACCA
1
##
Definition
## 8
Homo sapiens KIAA1199 (KIAA1199), mRNA.
## 11
Homo sapiens proenkephalin (PENK), mRNA.
## 2
Homo sapiens actin, alpha, cardiac muscle (ACTC), mRNA.
## 4
Homo sapiens delta-like 1 homolog (Drosophila) (DLK1), mRNA.
## 10
Homo sapiens matrix metallopeptidase 11 (stromelysin 3) (MMP11), mRNA.
## 68                                          PREDICTED: Homo sapiens catenin
(cadherin-associated protein), beta 1, 88kDa, transcript variant 9 (CTNNB1),
mRNA.
## 89                                          PREDICTED: Homo sapiens catenin
(cadherin-associated protein), beta 1, 88kDa, transcript variant 9 (CTNNB1),
mRNA.
## 82                                          PREDICTED: Homo sapiens catenin
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(cadherin-associated protein), beta 1, 88kDa, transcript variant 9 (CTNNB1),
mRNA.
231 Homo sapiens dystrophin
(muscular dystrophy, Duchenne and Becker types) (DMD), transcript variant
Dp40, mRNA.
210 Homo sapiens dystrophin
(muscular dystrophy, Duchenne and Becker types) (DMD), transcript variant
Dp40, mRNA.
96 PREDICTED: Homo sapiens catenin
(cadherin-associated protein), beta 1, 88kDa, transcript variant 9 (CTNNB1),
mRNA.
140 PREDICTED: Homo sapiens DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide
12 (CHL1-like helicase homolog, S. cerevisiae), transcript variant 14
(DDX12), mRNA.
397
PREDICTED: Homo sapiens KIAA0220-like protein, transcript variant 10
(LOC23117), mRNA.
361 PREDICTED:
Homo sapiens hypothetical protein LOC202134, transcript variant 3
(LOC202134), mRNA.
286
PREDICTED: Homo sapiens KIAA0692 protein, transcript variant 7 (KIAA0692),
mRNA.
61 PREDICTED: Homo sapiens catenin
(cadherin-associated protein), beta 1, 88kDa, transcript variant 9 (CTNNB1),
mRNA.
516 PREDICTED: Homo sapiens similar
to RAN-binding protein 2-like 1 isoform 2, transcript variant 3 (LOC653086),
mRNA.
33
Homo sapiens brain-derived neurotrophic factor (BDNF), transcript variant 3,
mRNA.
551 Homo sapiens plectin
1, intermediate filament binding protein 500kDa (PLEC1), transcript variant
1, mRNA.
445
PREDICTED: Homo sapiens KIAA0220-like protein, transcript variant 10
(LOC23117), mRNA.
474 PREDICTED:
Homo sapiens hypothetical protein LOC339047, transcript variant 27
(LOC339047), mRNA.
331
PREDICTED: Homo sapiens KIAA0692 protein, transcript variant 7 (KIAA0692),
mRNA.
559 Homo sapiens plectin
1, intermediate filament binding protein 500kDa (PLEC1), transcript variant
1, mRNA.
530 PREDICTED: Homo sapiens similar
to RAN-binding protein 2-like 1 isoform 2, transcript variant 3 (LOC653086),
mRNA.

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## 259
PREDICTED: Homo sapiens KIAA0692 protein, transcript variant 7 (KIAA0692),
mRNA.
## 429
PREDICTED: Homo sapiens KIAA0220-like protein, transcript variant 10
(LOC23117), mRNA.
## 252                                                  Homo sapiens dystrophin
(muscular dystrophy, Duchenne and Becker types) (DMD), transcript variant
Dp40, mRNA.
## 268
PREDICTED: Homo sapiens KIAA0692 protein, transcript variant 7 (KIAA0692),
mRNA.
## 19
Homo sapiens brain-derived neurotrophic factor (BDNF), transcript variant 3,
mRNA.
## 340                                                                PREDICTED:
Homo sapiens hypothetical protein LOC202134, transcript variant 3
(LOC202134), mRNA.
## 405
PREDICTED: Homo sapiens KIAA0220-like protein, transcript variant 10
(LOC23117), mRNA.
## 245                                                  Homo sapiens dystrophin
(muscular dystrophy, Duchenne and Becker types) (DMD), transcript variant
Dp40, mRNA.
## 322
PREDICTED: Homo sapiens KIAA0692 protein, transcript variant 7 (KIAA0692),
mRNA.
## 375                                                                PREDICTED:
Homo sapiens hypothetical protein LOC202134, transcript variant 3
(LOC202134), mRNA.
## 382                                                                PREDICTED:
Homo sapiens hypothetical protein LOC202134, transcript variant 3
(LOC202134), mRNA.
## 591                                                  Homo sapiens plectin
1, intermediate filament binding protein 500kDa (PLEC1), transcript variant
1, mRNA.
## 47
Homo sapiens brain-derived neurotrophic factor (BDNF), transcript variant 3,
mRNA.
## 575                                                  Homo sapiens plectin
1, intermediate filament binding protein 500kDa (PLEC1), transcript variant
1, mRNA.
## 313
PREDICTED: Homo sapiens KIAA0692 protein, transcript variant 7 (KIAA0692),
mRNA.
## 495                                                               PREDICTED:
Homo sapiens hypothetical protein LOC339047, transcript variant 27
(LOC339047), mRNA.
## 170 PREDICTED: Homo sapiens DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide
12 (CHL1-like helicase homolog, S. cerevisiae), transcript variant 14
```

(DDX12), mRNA.
460 PREDICTED:
Homo sapiens hypothetical protein LOC339047, transcript variant 27
(LOC339047), mRNA.
437
PREDICTED: Homo sapiens KIAA0220-like protein, transcript variant 10
(LOC23117), mRNA.
502 PREDICTED: Homo sapiens similar
to RAN-binding protein 2-like 1 isoform 2, transcript variant 3 (LOC653086),
mRNA.
509 PREDICTED: Homo sapiens similar
to RAN-binding protein 2-like 1 isoform 2, transcript variant 3 (LOC653086),
mRNA.
467 PREDICTED:
Homo sapiens hypothetical protein LOC339047, transcript variant 27
(LOC339047), mRNA.
150 PREDICTED: Homo sapiens DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide
12 (CHL1-like helicase homolog, S. cerevisiae), transcript variant 14
(DDX12), mRNA.
75 PREDICTED: Homo sapiens catenin
(cadherin-associated protein), beta 1, 88kDa, transcript variant 9 (CTNNB1),
mRNA.
295
PREDICTED: Homo sapiens KIAA0692 protein, transcript variant 7 (KIAA0692),
mRNA.
180 PREDICTED: Homo sapiens DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide
12 (CHL1-like helicase homolog, S. cerevisiae), transcript variant 14
(DDX12), mRNA.
389
PREDICTED: Homo sapiens KIAA0220-like protein, transcript variant 10
(LOC23117), mRNA.
103 PREDICTED: Homo sapiens catenin
(cadherin-associated protein), beta 1, 88kDa, transcript variant 9 (CTNNB1),
mRNA.
413
PREDICTED: Homo sapiens KIAA0220-like protein, transcript variant 10
(LOC23117), mRNA.
523 PREDICTED: Homo sapiens similar
to RAN-binding protein 2-like 1 isoform 2, transcript variant 3 (LOC653086),
mRNA.
421
PREDICTED: Homo sapiens KIAA0220-like protein, transcript variant 10
(LOC23117), mRNA.
40
Homo sapiens brain-derived neurotrophic factor (BDNF), transcript variant 3,
mRNA.
607 Homo sapiens plectin
1, intermediate filament binding protein 500kDa (PLEC1), transcript variant
1, mRNA.
453 PREDICTED:

```
Homo sapiens hypothetical protein LOC339047, transcript variant 27
(LOC339047), mRNA.
## 599                                                  Homo sapiens plectin
1, intermediate filament binding protein 500kDa (PLEC1), transcript variant
1, mRNA.
## 12
Homo sapiens brain-derived neurotrophic factor (BDNF), transcript variant 3,
mRNA.
## 583                                                  Homo sapiens plectin
1, intermediate filament binding protein 500kDa (PLEC1), transcript variant
1, mRNA.
## 190 PREDICTED: Homo sapiens DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide
12 (CHL1-like helicase homolog, S. cerevisiae), transcript variant 14
(DDX12), mRNA.
## 481                                                            PREDICTED:
Homo sapiens hypothetical protein LOC339047, transcript variant 27
(LOC339047), mRNA.
## 54
Homo sapiens brain-derived neurotrophic factor (BDNF), transcript variant 3,
mRNA.
## 160 PREDICTED: Homo sapiens DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide
12 (CHL1-like helicase homolog, S. cerevisiae), transcript variant 14
(DDX12), mRNA.
## 304
PREDICTED: Homo sapiens KIAA0692 protein, transcript variant 7 (KIAA0692),
mRNA.
## 224                                              Homo sapiens dystrophin
(muscular dystrophy, Duchenne and Becker types) (DMD), transcript variant
Dp40, mRNA.
## 200 PREDICTED: Homo sapiens DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide
12 (CHL1-like helicase homolog, S. cerevisiae), transcript variant 14
(DDX12), mRNA.
## 544                                        PREDICTED: Homo sapiens similar
to RAN-binding protein 2-like 1 isoform 2, transcript variant 3 (LOC653086),
mRNA.
## 217                                              Homo sapiens dystrophin
(muscular dystrophy, Duchenne and Becker types) (DMD), transcript variant
Dp40, mRNA.
## 120 PREDICTED: Homo sapiens DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide
12 (CHL1-like helicase homolog, S. cerevisiae), transcript variant 14
(DDX12), mRNA.
## 110 PREDICTED: Homo sapiens DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide
12 (CHL1-like helicase homolog, S. cerevisiae), transcript variant 14
(DDX12), mRNA.
## 130 PREDICTED: Homo sapiens DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide
12 (CHL1-like helicase homolog, S. cerevisiae), transcript variant 14
(DDX12), mRNA.
## 368                                                             PREDICTED:
Homo sapiens hypothetical protein LOC202134, transcript variant 3
(LOC202134), mRNA.
```

```
## 537                                          PREDICTED: Homo sapiens similar
to RAN-binding protein 2-like 1 isoform 2, transcript variant 3 (LOC653086),
mRNA.
## 277
PREDICTED: Homo sapiens KIAA0692 protein, transcript variant 7 (KIAA0692),
mRNA.
## 488                                                        PREDICTED:
Homo sapiens hypothetical protein LOC339047, transcript variant 27
(LOC339047), mRNA.
## 238                                              Homo sapiens dystrophin
(muscular dystrophy, Duchenne and Becker types) (DMD), transcript variant
Dp40, mRNA.
## 354                                                         PREDICTED:
Homo sapiens hypothetical protein LOC202134, transcript variant 3
(LOC202134), mRNA.
## 26
Homo sapiens brain-derived neurotrophic factor (BDNF), transcript variant 3,
mRNA.
## 567                                                 Homo sapiens plectin
1, intermediate filament binding protein 500kDa (PLEC1), transcript variant
1, mRNA.
## 347                                                         PREDICTED:
Homo sapiens hypothetical protein LOC202134, transcript variant 3
(LOC202134), mRNA.
## 1
Homo sapiens ATP-binding cassette, sub-family A (ABC1), member 8 (ABCA8),
mRNA.
## 3
Homo sapiens alcohol dehydrogenase 1A (class I), alpha polypeptide (ADH1A),
mRNA.
## 6
Homo sapiens v-fos FBJ murine osteosarcoma viral oncogene homolog (FOS),
mRNA.
## 7
Homo sapiens FBJ murine osteosarcoma viral oncogene homolog B (FOSB), mRNA.
## 9
Homo sapiens keratin 19 (KRT19), mRNA.
##
Ontology_Component
## 8
NA
## 11
The space external to the outermost structure of a cell. For cells without
external protective or external encapsulating structures this refers to space
outside of the plasma membrane. This term covers the host cell environment
outside an intracellular parasite [goid 5576] [evidence IEA]
## 2
NA
## 4
That part of a multicellular organism outside the cells proper, usually taken
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to be outside the plasma membranes, and occupied by fluid [goid 5615] [pmid 7925474] [evidence TAS]; That fraction of cells, prepared by disruptive biochemical methods, that is soluble in water [goid 5625] [pmid 7925474] [evidence TAS]; Double layer of lipid molecules that encloses all cells, and, in eukaryotes, many organelles; may be a single or double lipid bilayer; also includes associated proteins [goid 16020] [evidence IEA]; Penetrating at least one phospholipid bilayer of a membrane. May also refer to the state of being buried in the bilayer with no exposure outside the bilayer. When used to describe a protein, indicates that all or part of the peptide sequence is embedded in the membrane [goid 16021] [pmid 8095043] [evidence TAS]
10
A layer consisting mainly of proteins (especially collagen) and glycosaminoglycans (mostly as proteoglycans) that forms a sheet underlying or overlying cells such as endothelial and epithelial cells. The proteins are secreted by cells in the vicinity [goid 5578] [evidence IEA]; The space external to the outermost structure of a cell. For cells without external protective or external encapsulating structures this refers to space outside of the plasma membrane. This term covers the host cell environment outside an intracellular parasite [goid 5576] [evidence IEA]; A layer consisting mainly of proteins (especially collagen) and glycosaminoglycans (mostly as proteoglycans) that forms a sheet underlying or overlying cells such as endothelial and epithelial cells. The proteins are secreted by cells in the vicinity [goid 5578] [pmid 1701851] [evidence TAS]
68
That fraction of cells, prepared by disruptive biochemical methods, that includes the plasma and other membranes [goid 5624] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 9065401] [evidence TAS]; Any complex, distinct from RNA polymerase, including one or more polypeptides capable of binding DNA at promoters or at cis-acting regulatory sequences, and regulating transcription [goid 5667] [evidence IEA]; All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 16753179] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 11955436] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 12000790] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 15327769] [evidence EXP]; That part of the cytoplasm that does not contain membranous or

particulate subcellular components [goid 5829] [pmid 12820959] [evidence EXP]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [pmid 7806582] [evidence TAS]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 10837025] [evidence TAS]; An electron dense junctional complex, at the end to end contacts of cardiac muscle cells, that contains gap junctions and desmosomes. Most of the disc is formed of a convoluted fascia adherens type of junction into which the actin filaments of the terminal sarcomeres insert (or in the case of muscle cells, myofibrils), desmosomes are also present. The lateral portion of the stepped disc contains gap junctions that couple the cells electrically and thus coordinate the contraction [goid 5916] [evidence IEA]; The region of the plasma membrane that includes the basal end and sides of the cell. Often used in reference to animal polarized epithelial membranes, where the basal membrane is the part attached to the extracellular matrix, or in plant cells, where the basal membrane is defined with respect to the zygotic axis [goid 16323] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [pmid 12072559] [evidence IDA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A thin sheetlike process extended by the leading edge of a crawling fibroblast; contains a dense meshwork of actin filaments [goid 30027] [evidence IEA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 16188939] [evidence IDA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 9601641] [evidence IDA]; The portion of the plasma membrane surrounding a microvillus [goid 31528] [evidence IEA]; A functional unit located near the cell apex at the points of contact between epithelial cells, which in vertebrates is composed of the tight junction, the zonula adherens, and desmosomes and in invertebrates is composed of the subapical complex (SAC), the zonula adherens and the septate junction. Functions in the regulation of cell polarity, tissue integrity and intercellular adhesion and permeability [goid 43296] [evidence IEA]; The region of a polarized cell that forms a tip or is distal

to a base. For example, in a polarized epithelial cell, the apical region has an exposed surface and lies opposite to the basal lamina that separates the epithelium from other tissue [goid 45177] [evidence IEA]
89
That fraction of cells, prepared by disruptive biochemical methods, that includes the plasma and other membranes [goid 5624] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 9065401] [evidence TAS]; Any complex, distinct from RNA polymerase, including one or more polypeptides capable of binding DNA at promoters or at cis-acting regulatory sequences, and regulating transcription [goid 5667] [evidence IEA]; All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 16753179] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 11955436] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 12000790] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 15327769] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 12820959] [evidence EXP]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [pmid 7806582] [evidence TAS]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 10837025] [evidence TAS]; An electron dense junctional complex, at the end to end contacts of cardiac muscle cells, that contains gap junctions and desmosomes. Most of the disc is formed of a convoluted fascia adherens type of junction into which the actin filaments of the terminal sarcomeres insert (or in the case of muscle cells, myofibrils),

desmosomes are also present. The lateral portion of the stepped disc contains gap junctions that couple the cells electrically and thus coordinate the contraction [goid 5916] [evidence IEA]; The region of the plasma membrane that includes the basal end and sides of the cell. Often used in reference to animal polarized epithelial membranes, where the basal membrane is the part attached to the extracellular matrix, or in plant cells, where the basal membrane is defined with respect to the zygotic axis [goid 16323] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [pmid 12072559] [evidence IDA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A thin sheetlike process extended by the leading edge of a crawling fibroblast; contains a dense meshwork of actin filaments [goid 30027] [evidence IEA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 16188939] [evidence IDA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 9601641] [evidence IDA]; The portion of the plasma membrane surrounding a microvillus [goid 31528] [evidence IEA]; A functional unit located near the cell apex at the points of contact between epithelial cells, which in vertebrates is composed of the tight junction, the zonula adherens, and desmosomes and in invertebrates is composed of the subapical complex (SAC), the zonula adherens and the septate junction. Functions in the regulation of cell polarity, tissue integrity and intercellular adhesion and permeability [goid 43296] [evidence IEA]; The region of a polarized cell that forms a tip or is distal to a base. For example, in a polarized epithelial cell, the apical region has an exposed surface and lies opposite to the basal lamina that separates the epithelium from other tissue [goid 45177] [evidence IEA]
82
That fraction of cells, prepared by disruptive biochemical methods, that includes the plasma and other membranes [goid 5624] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 9065401] [evidence TAS]; Any complex, distinct from RNA polymerase, including one or more polypeptides capable of binding DNA at promoters or at cis-acting regulatory sequences, and regulating transcription [goid 5667] [evidence IEA]; All of the contents of a cell excluding the plasma membrane and

nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 16753179] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 11955436] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 12000790] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 15327769] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 12820959] [evidence EXP]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [pmid 7806582] [evidence TAS]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 10837025] [evidence TAS]; An electron dense junctional complex, at the end to end contacts of cardiac muscle cells, that contains gap junctions and desmosomes. Most of the disc is formed of a convoluted fascia adherens type of junction into which the actin filaments of the terminal sarcomeres insert (or in the case of muscle cells, myofibrils), desmosomes are also present. The lateral portion of the stepped disc contains gap junctions that couple the cells electrically and thus coordinate the contraction [goid 5916] [evidence IEA]; The region of the plasma membrane that includes the basal end and sides of the cell. Often used in reference to animal polarized epithelial membranes, where the basal membrane is the part attached to the extracellular matrix, or in plant cells, where the basal membrane is defined with respect to the zygotic axis [goid 16323] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [pmid 12072559] [evidence IDA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A thin sheetlike process extended by the leading edge of a crawling fibroblast; contains a dense meshwork of actin filaments [goid 30027] [evidence IEA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 16188939] [evidence IDA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and

the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 9601641] [evidence IDA]; The portion of the plasma membrane surrounding a microvillus [goid 31528] [evidence IEA]; A functional unit located near the cell apex at the points of contact between epithelial cells, which in vertebrates is composed of the tight junction, the zonula adherens, and desmosomes and in invertebrates is composed of the subapical complex (SAC), the zonula adherens and the septate junction. Functions in the regulation of cell polarity, tissue integrity and intercellular adhesion and permeability [goid 43296] [evidence IEA]; The region of a polarized cell that forms a tip or is distal to a base. For example, in a polarized epithelial cell, the apical region has an exposed surface and lies opposite to the basal lamina that separates the epithelium from other tissue [goid 45177] [evidence IEA]
231 A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 18029348] [evidence IDA]; All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [pmid 18029348] [evidence IDA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [pmid 2261642] [evidence ISS]; That fraction of cells, prepared by disruptive biochemical methods, that is not soluble in water [goid 5626] [evidence IEA]; Any of the small, heterogeneous, artifactual, vesicular particles, 50-150 nm in diameter, that are formed when some eukaryotic cells are homogenized and that sediment on centrifugation at 100000 g [goid 5792] [evidence IEA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [evidence IEA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A specialized region of connection between a cell and the extracellular matrix [goid 30055] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic

vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]; That fraction of cells, prepared by disruptive biochemical methods, that is not soluble in water [goid 5626] [evidence IEA]; Any of the small, heterogeneous, artifactual, vesicular particles, 50-150 nm in diameter, that are formed when some eukaryotic cells are homogenized and that sediment on centrifugation at 100000 g [goid 5792] [evidence IEA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [evidence IEA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A specialized region of connection between a cell and the extracellular matrix [goid 30055] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]; That fraction of cells, prepared by disruptive biochemical methods, that is not soluble in water [goid 5626] [evidence IEA]; Any of the small, heterogeneous, artifactual, vesicular particles, 50-150 nm in diameter, that are formed when some eukaryotic cells are homogenized and that sediment on centrifugation at 100000 g [goid 5792] [evidence IEA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [evidence IEA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A specialized region of connection between a cell and the extracellular matrix [goid 30055] [evidence

IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]; That fraction of cells, prepared by disruptive biochemical methods, that is not soluble in water [goid 5626] [evidence IEA]; Any of the small, heterogeneous, artifactual, vesicular particles, 50-150 nm in diameter, that are formed when some eukaryotic cells are homogenized and that sediment on centrifugation at 100000 g [goid 5792] [evidence IEA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [evidence IEA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A specialized region of connection between a cell and the extracellular matrix [goid 30055] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]; That fraction of cells, prepared by disruptive biochemical methods, that is

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fibers [goid 42383] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [pmid 7545544] [evidence IDA]; Regular periodic sub membranous arrays of vinculin in skeletal and cardiac muscle cells, these arrays link Z-discs to the sarcolemma and are associated with links to extracellular matrix [goid 43034] [pmid 16000376] [evidence IDA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]
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filaments are attached [goid 30018] [evidence IEA]; A specialized region of connection between a cell and the extracellular matrix [goid 30055] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]; That fraction of cells, prepared by disruptive biochemical methods, that is not soluble in water [goid 5626] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 18029348] [evidence IDA]; All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; Any of the small, heterogeneous, artifactual, vesicular particles, 50-150 nm in diameter, that are formed when some eukaryotic cells are homogenized and that sediment on centrifugation at 100000 g [goid 5792] [evidence IEA]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [pmid 3282674] [evidence TAS]; The external part of the cell wall and/or plasma membrane [goid 9986] [pmid 10867799] [evidence IDA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [evidence IEA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is

composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [pmid 8282811] [evidence TAS]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A specialized region of connection between a cell and the extracellular matrix [goid 30055] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [pmid 7545544] [evidence IDA]; Regular periodic sub membranous arrays of vinculin in skeletal and cardiac muscle cells, these arrays link Z-discs to the sarcolemma and are associated with links to extracellular matrix [goid 43034] [pmid 16000376] [evidence IDA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]
96
That fraction of cells, prepared by disruptive biochemical methods, that includes the plasma and other membranes [goid 5624] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 9065401] [evidence TAS]; Any complex, distinct from RNA polymerase, including one or more polypeptides capable of binding DNA at promoters or at cis-acting regulatory sequences, and regulating transcription [goid 5667] [evidence IEA]; All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; That part of the cytoplasm that does not contain membranous or

particulate subcellular components [goid 5829] [pmid 16753179] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 11955436] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 12000790] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 15327769] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 12820959] [evidence EXP]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [pmid 7806582] [evidence TAS]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 10837025] [evidence TAS]; An electron dense junctional complex, at the end to end contacts of cardiac muscle cells, that contains gap junctions and desmosomes. Most of the disc is formed of a convoluted fascia adherens type of junction into which the actin filaments of the terminal sarcomeres insert (or in the case of muscle cells, myofibrils), desmosomes are also present. The lateral portion of the stepped disc contains gap junctions that couple the cells electrically and thus coordinate the contraction [goid 5916] [evidence IEA]; The region of the plasma membrane that includes the basal end and sides of the cell. Often used in reference to animal polarized epithelial membranes, where the basal membrane is the part attached to the extracellular matrix, or in plant cells, where the basal membrane is defined with respect to the zygotic axis [goid 16323] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [pmid 12072559] [evidence IDA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A thin sheetlike process extended by the leading edge of a crawling fibroblast; contains a dense meshwork of actin filaments [goid 30027] [evidence IEA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 16188939] [evidence IDA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 9601641]

[evidence IDA]; The portion of the plasma membrane surrounding a microvillus [goid 31528] [evidence IEA]; A functional unit located near the cell apex at the points of contact between epithelial cells, which in vertebrates is composed of the tight junction, the zonula adherens, and desmosomes and in invertebrates is composed of the subapical complex (SAC), the zonula adherens and the septate junction. Functions in the regulation of cell polarity, tissue integrity and intercellular adhesion and permeability [goid 43296] [evidence IEA]; The region of a polarized cell that forms a tip or is distal to a base. For example, in a polarized epithelial cell, the apical region has an exposed surface and lies opposite to the basal lamina that separates the epithelium from other tissue [goid 45177] [evidence IEA]
140
A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [evidence IEA]
397
NA
361
NA
286
NA
61
That fraction of cells, prepared by disruptive biochemical methods, that includes the plasma and other membranes [goid 5624] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 9065401] [evidence TAS]; Any complex, distinct from RNA polymerase, including one or more polypeptides capable of binding DNA at promoters or at cis-acting regulatory sequences, and regulating transcription [goid 5667] [evidence IEA]; All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 16753179] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 11955436] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 12000790] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 15327769] [evidence EXP]; That part of the cytoplasm that does not contain membranous or

particulate subcellular components [goid 5829] [pmid 12820959] [evidence EXP]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [pmid 7806582] [evidence TAS]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 10837025] [evidence TAS]; An electron dense junctional complex, at the end to end contacts of cardiac muscle cells, that contains gap junctions and desmosomes. Most of the disc is formed of a convoluted fascia adherens type of junction into which the actin filaments of the terminal sarcomeres insert (or in the case of muscle cells, myofibrils), desmosomes are also present. The lateral portion of the stepped disc contains gap junctions that couple the cells electrically and thus coordinate the contraction [goid 5916] [evidence IEA]; The region of the plasma membrane that includes the basal end and sides of the cell. Often used in reference to animal polarized epithelial membranes, where the basal membrane is the part attached to the extracellular matrix, or in plant cells, where the basal membrane is defined with respect to the zygotic axis [goid 16323] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [pmid 12072559] [evidence IDA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A thin sheetlike process extended by the leading edge of a crawling fibroblast; contains a dense meshwork of actin filaments [goid 30027] [evidence IEA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 16188939] [evidence IDA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 9601641] [evidence IDA]; The portion of the plasma membrane surrounding a microvillus [goid 31528] [evidence IEA]; A functional unit located near the cell apex at the points of contact between epithelial cells, which in vertebrates is composed of the tight junction, the zonula adherens, and desmosomes and in invertebrates is composed of the subapical complex (SAC), the zonula adherens and the septate junction. Functions in the regulation of cell polarity, tissue integrity and intercellular adhesion and permeability [goid 43296] [evidence IEA]; The region of a polarized cell that forms a tip or is distal

to a base. For example, in a polarized epithelial cell, the apical region has an exposed surface and lies opposite to the basal lamina that separates the epithelium from other tissue [goid 45177] [evidence IEA]
516
NA
33
A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; The space external to the outermost structure of a cell. For cells without external protective or external encapsulating structures this refers to space outside of the plasma membrane. This term covers the host cell environment outside an intracellular parasite [goid 5576] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]
551
All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 8633055] [evidence NAS]
445
NA
474
NA
331
NA
559
All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated

proteins [goid 5886] [pmid 8633055] [evidence NAS]
530
NA
259
NA
429
NA
252 A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 18029348] [evidence IDA]; All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [pmid 18029348] [evidence IDA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [pmid 2261642] [evidence ISS]; That fraction of cells, prepared by disruptive biochemical methods, that is not soluble in water [goid 5626] [evidence IEA]; Any of the small, heterogeneous, artifactual, vesicular particles, 50-150 nm in diameter, that are formed when some eukaryotic cells are homogenized and that sediment on centrifugation at 100000 g [goid 5792] [evidence IEA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [evidence IEA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A specialized region of connection between a cell and the extracellular matrix [goid 30055] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane

[goid 45202] [evidence IEA]; That fraction of cells, prepared by disruptive biochemical methods, that is not soluble in water [goid 5626] [evidence IEA]; Any of the small, heterogeneous, artifactual, vesicular particles, 50-150 nm in diameter, that are formed when some eukaryotic cells are homogenized and that sediment on centrifugation at 100000 g [goid 5792] [evidence IEA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [evidence IEA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A specialized region of connection between a cell and the extracellular matrix [goid 30055] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]; That fraction of cells, prepared by disruptive biochemical methods, that is not soluble in water [goid 5626] [evidence IEA]; Any of the small, heterogeneous, artifactual, vesicular particles, 50-150 nm in diameter, that are formed when some eukaryotic cells are homogenized and that sediment on centrifugation at 100000 g [goid 5792] [evidence IEA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [evidence IEA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A specialized region of connection between a cell and the extracellular matrix [goid 30055] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes

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with links to extracellular matrix [goid 43034] [pmid 16000376] [evidence IDA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]
268
NA
19
A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; The space external to the outermost structure of a cell. For cells without external protective or external encapsulating structures this refers to space outside of the plasma membrane. This term covers the host cell environment outside an intracellular parasite [goid 5576] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]
340
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245 A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 18029348] [evidence IDA]; All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [pmid 18029348] [evidence IDA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [pmid 2261642] [evidence ISS]; That fraction of cells, prepared by disruptive biochemical methods, that is not soluble in water [goid 5626] [evidence IEA]; Any of the small, heterogeneous, artifactual, vesicular particles, 50-150 nm in diameter, that are formed when some eukaryotic cells are homogenized and that sediment on centrifugation at 100000 g [goid 5792] [evidence IEA]; A multiprotein complex that forms a

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IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]; That fraction of cells, prepared by disruptive biochemical methods, that is not soluble in water [goid 5626] [evidence IEA]; Any of the small, heterogeneous, artifactual, vesicular particles, 50-150 nm in diameter, that are formed when some eukaryotic cells are homogenized and that sediment on centrifugation at 100000 g [goid 5792] [evidence IEA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [evidence IEA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A specialized region of connection between a cell and the extracellular matrix [goid 30055] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]; That fraction of cells, prepared by disruptive biochemical methods, that is

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division, endocytosis, and movement of organelles [goid 5856] [pmid 3282674] [evidence TAS]; The external part of the cell wall and/or plasma membrane [goid 9986] [pmid 10867799] [evidence IDA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [evidence IEA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [pmid 8282811] [evidence TAS]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A specialized region of connection between a cell and the extracellular matrix [goid 30055] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [pmid 7545544] [evidence IDA]; Regular periodic sub membranous arrays of vinculin in skeletal and cardiac muscle cells, these arrays link Z-discs to the sarcolemma and are associated with links to extracellular matrix [goid 43034] [pmid 16000376] [evidence IDA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]
322
NA
375
NA
382
NA
591
All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; Any of the

various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 8633055] [evidence NAS]
47
A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; The space external to the outermost structure of a cell. For cells without external protective or external encapsulating structures this refers to space outside of the plasma membrane. This term covers the host cell environment outside an intracellular parasite [goid 5576] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]
575
All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 8633055] [evidence NAS]
313
NA
495
NA
170
A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [evidence IEA]
460
NA
437

NA
502
NA
509
NA
467
NA
150
A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [evidence IEA]
75
That fraction of cells, prepared by disruptive biochemical methods, that includes the plasma and other membranes [goid 5624] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 9065401] [evidence TAS]; Any complex, distinct from RNA polymerase, including one or more polypeptides capable of binding DNA at promoters or at cis-acting regulatory sequences, and regulating transcription [goid 5667] [evidence IEA]; All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 16753179] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 11955436] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 12000790] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 15327769] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 12820959] [evidence EXP]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles

[goid 5856] [pmid 7806582] [evidence TAS]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 10837025] [evidence TAS]; An electron dense junctional complex, at the end to end contacts of cardiac muscle cells, that contains gap junctions and desmosomes. Most of the disc is formed of a convoluted fascia adherens type of junction into which the actin filaments of the terminal sarcomeres insert (or in the case of muscle cells, myofibrils), desmosomes are also present. The lateral portion of the stepped disc contains gap junctions that couple the cells electrically and thus coordinate the contraction [goid 5916] [evidence IEA]; The region of the plasma membrane that includes the basal end and sides of the cell. Often used in reference to animal polarized epithelial membranes, where the basal membrane is the part attached to the extracellular matrix, or in plant cells, where the basal membrane is defined with respect to the zygotic axis [goid 16323] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [pmid 12072559] [evidence IDA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A thin sheetlike process extended by the leading edge of a crawling fibroblast; contains a dense meshwork of actin filaments [goid 30027] [evidence IEA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 16188939] [evidence IDA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 9601641] [evidence IDA]; The portion of the plasma membrane surrounding a microvillus [goid 31528] [evidence IEA]; A functional unit located near the cell apex at the points of contact between epithelial cells, which in vertebrates is composed of the tight junction, the zonula adherens, and desmosomes and in invertebrates is composed of the subapical complex (SAC), the zonula adherens and the septate junction. Functions in the regulation of cell polarity, tissue integrity and intercellular adhesion and permeability [goid 43296] [evidence IEA]; The region of a polarized cell that forms a tip or is distal to a base. For example, in a polarized epithelial cell, the apical region has an exposed surface and lies opposite to the basal lamina that separates the epithelium from other tissue [goid 45177] [evidence IEA]
295
NA
180
A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA

metabolism or DNA replication may be absent [goid 5634] [evidence IEA]
389
NA
103
That fraction of cells, prepared by disruptive biochemical methods, that includes the plasma and other membranes [goid 5624] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [evidence IEA]; A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 9065401] [evidence TAS]; Any complex, distinct from RNA polymerase, including one or more polypeptides capable of binding DNA at promoters or at cis-acting regulatory sequences, and regulating transcription [goid 5667] [evidence IEA]; All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 16753179] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 11955436] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 12000790] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 15327769] [evidence EXP]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 12820959] [evidence EXP]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [pmid 7806582] [evidence TAS]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 10837025] [evidence TAS]; An electron dense junctional complex, at the end to end contacts of cardiac muscle cells, that contains gap junctions and desmosomes. Most of the disc is formed of a convoluted fascia adherens type of junction into which the actin filaments of the terminal sarcomeres insert (or in the case of muscle cells, myofibrils),

desmosomes are also present. The lateral portion of the stepped disc contains gap junctions that couple the cells electrically and thus coordinate the contraction [goid 5916] [evidence IEA]; The region of the plasma membrane that includes the basal end and sides of the cell. Often used in reference to animal polarized epithelial membranes, where the basal membrane is the part attached to the extracellular matrix, or in plant cells, where the basal membrane is defined with respect to the zygotic axis [goid 16323] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [evidence IEA]; The membranes on the sides of epithelial cells which lie at the interface of adjacent cells [goid 16328] [pmid 12072559] [evidence IDA]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A thin sheetlike process extended by the leading edge of a crawling fibroblast; contains a dense meshwork of actin filaments [goid 30027] [evidence IEA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 16188939] [evidence IDA]; A cytoplasmic protein complex containing glycogen synthase kinase-3-beta (GSK-3-beta), the adenomatous polyposis coli protein (APC), and the scaffolding protein axin, among others; phosphorylates beta-catenin, targets it for degradation by the proteasome [goid 30877] [pmid 9601641] [evidence IDA]; The portion of the plasma membrane surrounding a microvillus [goid 31528] [evidence IEA]; A functional unit located near the cell apex at the points of contact between epithelial cells, which in vertebrates is composed of the tight junction, the zonula adherens, and desmosomes and in invertebrates is composed of the subapical complex (SAC), the zonula adherens and the septate junction. Functions in the regulation of cell polarity, tissue integrity and intercellular adhesion and permeability [goid 43296] [evidence IEA]; The region of a polarized cell that forms a tip or is distal to a base. For example, in a polarized epithelial cell, the apical region has an exposed surface and lies opposite to the basal lamina that separates the epithelium from other tissue [goid 45177] [evidence IEA]
413
NA
523
NA
421
NA
40
A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; The space external to the outermost structure of a cell. For cells without external protective or external encapsulating structures this refers to space outside of the plasma membrane. This term covers the host cell environment outside an intracellular parasite [goid 5576] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]
607

All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 8633055] [evidence NAS]
453
NA
599
All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 8633055] [evidence NAS]
12
A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; The space external to the outermost structure of a cell. For cells without external protective or external encapsulating structures this refers to space outside of the plasma membrane. This term covers the host cell environment outside an intracellular parasite [goid 5576] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]
583
All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements

of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 8633055] [evidence NAS]
190
A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [evidence IEA]
481
NA
54
A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; The space external to the outermost structure of a cell. For cells without external protective or external encapsulating structures this refers to space outside of the plasma membrane. This term covers the host cell environment outside an intracellular parasite [goid 5576] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]
160
A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [evidence IEA]
304
NA
224 A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 18029348] [evidence IDA]; All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [pmid 18029348] [evidence IDA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [pmid 2261642] [evidence ISS]; That fraction of cells, prepared by disruptive biochemical methods, that is not soluble in water [goid 5626] [evidence IEA]; Any of the small, heterogeneous, artifactual, vesicular particles, 50-150 nm in diameter, that are formed when some eukaryotic cells are homogenized and that sediment on centrifugation at 100000 g [goid 5792] [evidence IEA]; A multiprotein complex that forms a

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division, endocytosis, and movement of organelles [goid 5856] [pmid 3282674] [evidence TAS]; The external part of the cell wall and/or plasma membrane [goid 9986] [pmid 10867799] [evidence IDA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [evidence IEA]; A multiprotein complex that forms a strong mechanical link between the cytoskeleton and extracellular matrix; typical of, but not confined to, muscle cells. The complex is composed of transmembrane, cytoplasmic, and extracellular proteins, including dystrophin, sarcoglycans, dystroglycan, dystrobrevins, syntrophins, sarcospan, caveolin-3, and NO synthase [goid 16010] [pmid 8282811] [evidence TAS]; Platelike region of a muscle sarcomere to which the plus ends of actin filaments are attached [goid 30018] [evidence IEA]; A specialized region of connection between a cell and the extracellular matrix [goid 30055] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [evidence IEA]; The outer membrane of a muscle fiber, consisting of the plasma membrane, a covering basement membrane (about 100 nm thick and sometimes common to more than one fiber), and the associated loose network of collagen fibers [goid 42383] [pmid 7545544] [evidence IDA]; Regular periodic sub membranous arrays of vinculin in skeletal and cardiac muscle cells, these arrays link Z-discs to the sarcolemma and are associated with links to extracellular matrix [goid 43034] [pmid 16000376] [evidence IDA]; Any of the small (10-200 nm), heterogeneous, highly dynamic, sterol- and sphingolipid-enriched membrane domains that compartmentalize cellular processes. Small rafts can sometimes be stabilized to form larger platforms through protein-protein and protein-lipid interactions [goid 45121] [evidence IEA]; The junction between a nerve fiber of one neuron and another neuron or muscle fiber or glial cell; the site of interneuronal communication. As the nerve fiber approaches the synapse it enlarges into a specialized structure, the presynaptic nerve ending, which contains mitochondria and synaptic vesicles. At the tip of the nerve ending is the presynaptic membrane; facing it, and separated from it by a minute cleft (the synaptic cleft) is a specialized area of membrane on the receiving cell, known as the postsynaptic membrane. In response to the arrival of nerve impulses, the presynaptic nerve ending secretes molecules of neurotransmitters into the synaptic cleft. These diffuse across the cleft and transmit the signal to the postsynaptic membrane [goid 45202] [evidence IEA]
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120
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110
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368
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354
NA
26
A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]; The space external to the

outermost structure of a cell. For cells without external protective or external encapsulating structures this refers to space outside of the plasma membrane. This term covers the host cell environment outside an intracellular parasite [goid 5576] [evidence IEA]; A membrane-bounded vesicle found in the cytoplasm of the cell [goid 16023] [evidence IEA]
567
All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence IEA]; Any of the various filamentous elements that form the internal framework of cells, and typically remain after treatment of the cells with mild detergent to remove membrane constituents and soluble components of the cytoplasm. The term embraces intermediate filaments, microfilaments, microtubules, the microtrabecular lattice, and other structures characterized by a polymeric filamentous nature and long-range order within the cell. The various elements of the cytoskeleton not only serve in the maintenance of cellular shape but also have roles in other cellular functions, including cellular movement, cell division, endocytosis, and movement of organelles [goid 5856] [evidence IEA]; The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [pmid 8633055] [evidence NAS]
347
NA
1
The membrane surrounding a cell that separates the cell from its external environment. It consists of a phospholipid bilayer and associated proteins [goid 5886] [evidence IEA]; Penetrating at least one phospholipid bilayer of a membrane. May also refer to the state of being buried in the bilayer with no exposure outside the bilayer. When used to describe a protein, indicates that all or part of the peptide sequence is embedded in the membrane [goid 16021] [evidence IEA]
3
All of the contents of a cell excluding the plasma membrane and nucleus, but including other subcellular structures [goid 5737] [evidence NAS]; That part of the cytoplasm that does not contain membranous or particulate subcellular components [goid 5829] [pmid 9982] [evidence EXP]
6
A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, and is the site of RNA synthesis and processing. In some species, or in specialized cell types, RNA metabolism or DNA replication may be absent [goid 5634] [pmid 9443941] [evidence TAS]; Any complex, distinct from RNA polymerase, including one or more polypeptides capable of binding DNA at promoters or at cis-acting regulatory sequences, and regulating transcription [goid 5667] [evidence IEA]
7
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chromosomes except the organellar chromosomes, and is the site of RNA
synthesis and processing. In some species, or in specialized cell types, RNA
metabolism or DNA replication may be absent [goid 5634] [evidence IEA]
## 9
A cytoskeletal structure that forms a distinct elongated structure,
characteristically 10 nm in diameter, that occurs in the cytoplasm of
eukaryotic cells. Intermediate filaments form a fibrous system, composed of
chemically heterogeneous subunits and involved in mechanically integrating
the various components of the cytoplasmic space. Intermediate filaments may
be divided into five chemically distinct classes: Type I, acidic keratins;
Type II, basic keratins; Type III, including desmin, vimentin and others;
Type IV, neurofilaments and related filaments; and Type V, lamins [goid 5882]
[pmid 2448790] [evidence TAS]; Platelike region of a muscle sarcomere to
which the plus ends of actin filaments are attached [goid 30018] [evidence
IEA]; The outer membrane of a muscle fiber, consisting of the plasma
membrane, a covering basement membrane (about 100 nm thick and sometimes
common to more than one fiber), and the associated loose network of collagen
fibers [goid 42383] [evidence IEA]; Regular periodic sub membranous arrays of
vinculin in skeletal and cardiac muscle cells, these arrays link Z-discs to
the sarcolemma and are associated with links to extracellular matrix [goid
43034] [pmid 16000376] [evidence IDA]
##
Ontology_Process
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8
The series of events required for an organism to receive an auditory stimulus, convert it to a molecular signal, and recognize and characterize the signal. Sonic stimuli are detected in the form of vibrations and are processed to form a sound [goid 7605] [evidence IEA]
11
An acute behavioral change resulting from a perceived external threat [goid 1662] [evidence IEA]; The cascade of processes by which a signal interacts with a receptor, causing a change in the level or activity of a second messenger or other downstream target, and ultimately effecting a change in the functioning of the cell [goid 7165] [pmid 7057924] [evidence TAS]; The series of molecular signals generated as a consequence of a peptide neurotransmitter binding to a cell surface receptor [goid 7218] [evidence IEA]; The specific actions or reactions of an organism in response to external or internal stimuli. Patterned activity of a whole organism in a manner dependent upon some combination of that organism's internal state and external conditions [goid 7610] [evidence IEA]; The series of events required for an organism to receive a painful stimulus, convert it to a molecular signal, and recognize and characterize the signal. Pain is medically defined as the physical sensation of discomfort or distress caused by injury or illness, so can hence be described as a harmful stimulus which signals current (or impending) tissue damage. Pain may come from extremes of temperature, mechanical damage, electricity or from noxious chemical substances [goid 19233] [evidence IEA]
2
NA
4
The biological process whose specific outcome is the progression of a multicellular organism over time from an initial condition (e.g. a zygote or a young adult) to a later condition (e.g. a multicellular animal or an aged adult) [goid 7275] [pmid 8500166] [evidence TAS]
10
The hydrolysis of a peptide bond or bonds within a protein [goid 6508] [evidence IEA]; The hydrolysis of a peptide bond or bonds within a protein [goid 6508] [pmid 1701851] [evidence TAS]; The biological process whose specific outcome is the progression of a multicellular organism over time from an initial condition (e.g. a zygote or a young adult) to a later condition (e.g. a multicellular animal or an aged adult) [goid 7275] [pmid 7746327] [evidence TAS]; The proteolytic chemical reactions and pathways resulting in the breakdown of collagen in the extracellular matrix, usually carried out by proteases secreted by nearby cells [goid 30574] [evidence IEA]
68
Any process that stops, prevents or reduces the frequency, rate or extent of transcription from an RNA polymerase II promoter [goid 122] [evidence IEA]; The change in form (cell shape and size) that occurs when relatively unspecialized cells, e.g. embryonic or regenerative cells, acquire specialized structural and/or functional features that characterize the cells, tissues, or organs of the mature organism or some other relatively stable phase of the organism's life history [goid 904] [evidence IEA]; The process whose specific outcome is the progression of the skeleton over time,

from its formation to the mature structure. The skeleton is the bony framework of the body in vertebrates (endoskeleton) or the hard outer envelope of insects (exoskeleton or dermoskeleton) [goid 1501] [evidence IEA]; The process that regulates the coordinated growth and sprouting of blood vessels giving rise to the organized vascular system [goid 1569] [evidence IEA]; A complex and coordinated series of cellular movements that occurs at the end of cleavage during embryonic development of most animals. In Deuterostomes the initial blastopore becomes the anus and the mouth forms second [goid 1702] [evidence IEA]; The formation of the endoderm during gastrulation [goid 1706] [evidence IEA]; The process involved in the specification of cell identity. Once specification has taken place, a cell will be committed to differentiate down a specific pathway if left in its normal environment [goid 1708] [evidence IEA]; Process involved in cell fate commitment. Once determination has taken place, a cell becomes committed to differentiate down a particular pathway regardless of its environment [goid 1709] [evidence IEA]; The process by which a cell becomes committed to become part of the endoderm [goid 1711] [evidence IEA]; A transition where an epithelial cell loses apical/basolateral polarity, severs intercellular adhesive junctions, degrades basement membrane components and becomes a migratory mesenchymal cell [goid 1837] [pmid 14679171] [evidence TAS]; The synthesis of either RNA on a template of DNA or DNA on a template of RNA [goid 6350] [evidence IEA]; A form of programmed cell death induced by external or internal signals that trigger the activity of proteolytic caspases, whose actions dismantle the cell and result in cell death. Apoptosis begins internally with condensation and subsequent fragmentation of the cell nucleus (blebbing) while the plasma membrane remains intact. Other characteristics of apoptosis include DNA fragmentation and the exposure of phosphatidyl serine on the cell surface [goid 6915] [evidence IEA]; The attachment of a cell, either to another cell or to an underlying substrate such as the extracellular matrix, via cell adhesion molecules [goid 7155] [evidence IEA]; The binding of a cell to the extracellular matrix via adhesion molecules [goid 7160] [evidence IEA]; The process of communication from a neuron to a target (neuron, muscle, or secretory cell) across a synapse [goid 7268] [evidence IEA]; The process whose specific outcome is the progression of the ectoderm over time, from its formation to the mature structure. In animal embryos, the ectoderm is the outer germ layer of the embryo, formed during gastrulation [goid 7398] [evidence IEA]; The process whose specific outcome is the progression of the heart over time, from its formation to the mature structure. The heart is a hollow, muscular organ, which, by contracting rhythmically, keeps up the circulation of the blood [goid 7507] [evidence IEA]; The establishment, maintenance and elaboration of the dorsal/ventral axis [goid 9950] [evidence IEA]; The regionalization process by which specific areas of cell differentiation are determined along a proximal/distal axis [goid 9954] [evidence IEA]; The process by which the anatomical structures of embryonic epithelia are generated and organized. Morphogenesis pertains to the creation of form [goid 16331] [evidence IEA]; The attachment of one cell to another cell via adhesion molecules [goid 16337] [evidence IEA]; The process whose specific outcome is the progression of the myeloid and lymphoid derived organ/tissue systems of the blood and other parts of the body over time, from formation to the mature structure.

The site of hemopoiesis is variable during development, but occurs primarily in bone marrow or kidney in many adult vertebrates [goid 30097] [evidence IEA]; The process whose specific outcome is the progression of the lung over time, from its formation to the mature structure. In all air-breathing vertebrates the lungs are developed from the ventral wall of the oesophagus as a pouch which divides into two sacs. In amphibians and many reptiles the lungs retain very nearly this primitive sac-like character, but in the higher forms the connection with the oesophagus becomes elongated into the windpipe and the inner walls of the sacs become more and more divided, until, in the mammals, the air spaces become minutely divided into tubes ending in small air cells, in the walls of which the blood circulates in a fine network of capillaries. In mammals the lungs are more or less divided into lobes, and each lung occupies a separate cavity in the thorax [goid 30324] [evidence IEA]; Any series of molecular signals generated as a consequence of an androgen binding to its receptor [goid 30521] [pmid 15572661] [evidence NAS]; Any process that activates or increases the frequency, rate or extent of epithelial cell differentiation [goid 30858] [evidence IEA]; The process whose specific outcome is the progression of the forebrain over time, from its formation to the mature structure. The forebrain is the anterior of the three primary divisions of the developing chordate brain or the corresponding part of the adult brain (in vertebrates, includes especially the cerebral hemispheres, the thalamus, and the hypothalamus and especially in higher vertebrates is the main control center for sensory and associative information processing, visceral functions, and voluntary motor functions) [goid 30900] [evidence IEA]; The process whose specific outcome is the progression of the pancreas over time, from its formation to the mature structure. The pancreas is an endoderm derived structure that produces precursors of digestive enzymes and blood glucose regulating enzymes [goid 31016] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of chondrocyte differentiation [goid 32331] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the hindlimbs are generated and organized. Morphogenesis pertains to the creation of form. The hindlimbs are the posterior limbs of an animal [goid 35116] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the arm are generated and organized. Morphogenesis pertains to the creation of form. In humans, the arms are the two upper limbs of the body from the shoulder to the hand [goid 35117] [evidence IEA]; Any process that modulates the frequency, rate or extent of cell proliferation [goid 42127] [evidence IEA]; The process whose specific outcome is the progression of a dentine-containing tooth over time, from its formation to the mature structure. A dentine-containing tooth is a hard, bony organ borne on the jaw or other bone of a vertebrate, and are composed mainly of dentine, a dense calcified substance, covered by a layer of enamel [goid 42475] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the digit are generated and organized. Morphogenesis pertains to the creation of form. A digit is one of the terminal divisions of an appendage. For example a finger or toe [goid 42733] [evidence IEA]; The process by which specialized cells known as osteoclasts degrade the organic and inorganic portions of bone, and endocytose and transport the degradation products [goid 45453] [evidence IEA]; Any process that activates or increases

the frequency, rate or extent of osteoblast differentiation [goid 45669] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of osteoclast differentiation [goid 45671] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of DNA-dependent transcription [goid 45893] [pmid 15572661] [evidence NAS]; Any process that activates or increases the frequency, rate or extent of transcription from the RNA polymerase II promoter [goid 45944] [evidence IEA]; A developmental process, independent of morphogenetic (shape) change, that is required for a cell to attain its fully functional state [goid 48469] [evidence IEA]; The directed movement of substances in synaptic membrane-bounded vesicles within the neuron along the cytoskeleton either toward or away from the neuronal cell body [goid 48489] [evidence IEA]; The process by which the anatomical structures of the eye are generated and organized. Morphogenesis pertains to the creation of form. The camera-type eye is an organ of sight that receives light through an aperture and focuses it through a lens, projecting it on a photoreceptor field [goid 48593] [evidence IEA]; A process that is carried out at the cellular level which results in the formation, arrangement of constituent parts, or disassembly of a synapse, the junction between a neuron and a target (neuron, muscle, or secretory cell) [goid 50808] [evidence IEA]; The series of molecular signals initiated by binding of Wnt protein to a frizzled family receptor on the surface of the target cell and ending with a change in transcription of target genes [goid 60070] [evidence IEA]; The series of molecular signals initiated by binding of Wnt protein to a frizzled family receptor on the surface of the target cell and ending with a change in transcription of target genes [goid 60070] [pmid 9601641] [evidence IC]
89
Any process that stops, prevents or reduces the frequency, rate or extent of transcription from an RNA polymerase II promoter [goid 122] [evidence IEA]; The change in form (cell shape and size) that occurs when relatively unspecialized cells, e.g. embryonic or regenerative cells, acquire specialized structural and/or functional features that characterize the cells, tissues, or organs of the mature organism or some other relatively stable phase of the organism's life history [goid 904] [evidence IEA]; The process whose specific outcome is the progression of the skeleton over time, from its formation to the mature structure. The skeleton is the bony framework of the body in vertebrates (endoskeleton) or the hard outer envelope of insects (exoskeleton or dermoskeleton) [goid 1501] [evidence IEA]; The process that regulates the coordinated growth and sprouting of blood vessels giving rise to the organized vascular system [goid 1569] [evidence IEA]; A complex and coordinated series of cellular movements that occurs at the end of cleavage during embryonic development of most animals. In Deuterostomes the initial blastopore becomes the anus and the mouth forms second [goid 1702] [evidence IEA]; The formation of the endoderm during gastrulation [goid 1706] [evidence IEA]; The process involved in the specification of cell identity. Once specification has taken place, a cell will be committed to differentiate down a specific pathway if left in its normal environment [goid 1708] [evidence IEA]; Process involved in cell fate commitment. Once determination has taken place, a cell becomes committed to differentiate down a particular pathway regardless of its environment [goid

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Any process that activates or increases the frequency, rate or extent of epithelial cell differentiation [goid 30858] [evidence IEA]; The process whose specific outcome is the progression of the forebrain over time, from its formation to the mature structure. The forebrain is the anterior of the three primary divisions of the developing chordate brain or the corresponding part of the adult brain (in vertebrates, includes especially the cerebral hemispheres, the thalamus, and the hypothalamus and especially in higher vertebrates is the main control center for sensory and associative information processing, visceral functions, and voluntary motor functions) [goid 30900] [evidence IEA]; The process whose specific outcome is the progression of the pancreas over time, from its formation to the mature structure. The pancreas is an endoderm derived structure that produces precursors of digestive enzymes and blood glucose regulating enzymes [goid 31016] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of chondrocyte differentiation [goid 32331] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the hindlimbs are generated and organized. Morphogenesis pertains to the creation of form. The hindlimbs are the posterior limbs of an animal [goid 35116] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the arm are generated and organized. Morphogenesis pertains to the creation of form. In humans, the arms are the two upper limbs of the body from the shoulder to the hand [goid 35117] [evidence IEA]; Any process that modulates the frequency, rate or extent of cell proliferation [goid 42127] [evidence IEA]; The process whose specific outcome is the progression of a dentine-containing tooth over time, from its formation to the mature structure. A dentine-containing tooth is a hard, bony organ borne on the jaw or other bone of a vertebrate, and are composed mainly of dentine, a dense calcified substance, covered by a layer of enamel [goid 42475] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the digit are generated and organized. Morphogenesis pertains to the creation of form. A digit is one of the terminal divisions of an appendage. For example a finger or toe [goid 42733] [evidence IEA]; The process by which specialized cells known as osteoclasts degrade the organic and inorganic portions of bone, and endocytose and transport the degradation products [goid 45453] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of osteoblast differentiation [goid 45669] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of osteoclast differentiation [goid 45671] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of DNA-dependent transcription [goid 45893] [pmid 15572661] [evidence NAS]; Any process that activates or increases the frequency, rate or extent of transcription from the RNA polymerase II promoter [goid 45944] [evidence IEA]; A developmental process, independent of morphogenetic (shape) change, that is required for a cell to attain its fully functional state [goid 48469] [evidence IEA]; The directed movement of substances in synaptic membrane-bounded vesicles within the neuron along the cytoskeleton either toward or away from the neuronal cell body [goid 48489] [evidence IEA]; The process by which the anatomical structures of the eye are generated and organized. Morphogenesis pertains to the creation of form. The camera-type eye is an organ of sight that receives light through an aperture and focuses it through

a lens, projecting it on a photoreceptor field [goid 48593] [evidence IEA]; A process that is carried out at the cellular level which results in the formation, arrangement of constituent parts, or disassembly of a synapse, the junction between a neuron and a target (neuron, muscle, or secretory cell) [goid 50808] [evidence IEA]; The series of molecular signals initiated by binding of Wnt protein to a frizzled family receptor on the surface of the target cell and ending with a change in transcription of target genes [goid 60070] [evidence IEA]; The series of molecular signals initiated by binding of Wnt protein to a frizzled family receptor on the surface of the target cell and ending with a change in transcription of target genes [goid 60070] [pmid 9601641] [evidence IC]
82
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231
Process by which cytoskeletal filaments are directly or indirectly linked to the plasma membrane [goid 7016] [pmid 2261642] [evidence ISS]; The developmental sequence of events leading to the formation of adult muscle

that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes

that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The process whose specific outcome is the progression of the muscle over time, from its formation to the mature structure. The muscle is an organ consisting of a tissue made up of various elongated cells that are specialized to contract and thus to produce movement and mechanical work [goid 7517] [pmid 1824797] [evidence NAS]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways resulting in the formation of peptides, compounds of 2 or more (but usually less than 100) amino acids where the alpha carboxyl group of one is bound to the alpha amino group of another. This may include the translation of a precursor protein and its subsequent processing into a functional peptide [goid 43043] [pmid 16000376] [evidence IDA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]
210
Process by which cytoskeletal filaments are directly or indirectly linked to the plasma membrane [goid 7016] [pmid 2261642] [evidence ISS]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to

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or more (but usually less than 100) amino acids where the alpha carboxyl group of one is bound to the alpha amino group of another. This may include the translation of a precursor protein and its subsequent processing into a functional peptide [goid 43043] [pmid 16000376] [evidence IDA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]
96
Any process that stops, prevents or reduces the frequency, rate or extent of transcription from an RNA polymerase II promoter [goid 122] [evidence IEA]; The change in form (cell shape and size) that occurs when relatively unspecialized cells, e.g. embryonic or regenerative cells, acquire specialized structural and/or functional features that characterize the cells, tissues, or organs of the mature organism or some other relatively stable phase of the organism's life history [goid 904] [evidence IEA]; The process whose specific outcome is the progression of the skeleton over time, from its formation to the mature structure. The skeleton is the bony framework of the body in vertebrates (endoskeleton) or the hard outer envelope of insects (exoskeleton or dermoskeleton) [goid 1501] [evidence IEA]; The process that regulates the coordinated growth and sprouting of blood vessels giving rise to the organized vascular system [goid 1569] [evidence IEA]; A complex and coordinated series of cellular movements that occurs at the end of cleavage during embryonic development of most animals. In Deuterostomes the initial blastopore becomes the anus and the mouth forms second [goid 1702] [evidence IEA]; The formation of the endoderm during gastrulation [goid 1706] [evidence IEA]; The process involved in the specification of cell identity. Once specification has taken place, a cell will be committed to differentiate down a specific pathway if left in its normal environment [goid 1708] [evidence IEA]; Process involved in cell fate commitment. Once determination has taken place, a cell becomes committed to differentiate down a particular pathway regardless of its environment [goid 1709] [evidence IEA]; The process by which a cell becomes committed to become part of the endoderm [goid 1711] [evidence IEA]; A transition where an epithelial cell loses apical/basolateral polarity, severs intercellular adhesive junctions, degrades basement membrane components and becomes a migratory mesenchymal cell [goid 1837] [pmid 14679171] [evidence TAS]; The synthesis of either RNA on a template of DNA or DNA on a template of RNA [goid 6350] [evidence IEA]; A form of programmed cell death induced by external or internal signals that trigger the activity of proteolytic caspases, whose actions dismantle the cell and result in cell death. Apoptosis begins internally with condensation and subsequent fragmentation of the cell nucleus (blebbing) while the plasma membrane remains intact. Other characteristics of apoptosis include DNA fragmentation and the exposure of phosphatidyl serine on the cell surface [goid 6915] [evidence IEA]; The attachment of a cell, either to another cell or to an underlying substrate such as the extracellular matrix, via cell adhesion molecules [goid 7155] [evidence IEA]; The binding of a cell to the extracellular matrix via adhesion molecules [goid 7160] [evidence IEA]; The process of communication from a neuron to a target (neuron, muscle, or secretory cell) across a

synapse [goid 7268] [evidence IEA]; The process whose specific outcome is the progression of the ectoderm over time, from its formation to the mature structure. In animal embryos, the ectoderm is the outer germ layer of the embryo, formed during gastrulation [goid 7398] [evidence IEA]; The process whose specific outcome is the progression of the heart over time, from its formation to the mature structure. The heart is a hollow, muscular organ, which, by contracting rhythmically, keeps up the circulation of the blood [goid 7507] [evidence IEA]; The establishment, maintenance and elaboration of the dorsal/ventral axis [goid 9950] [evidence IEA]; The regionalization process by which specific areas of cell differentiation are determined along a proximal/distal axis [goid 9954] [evidence IEA]; The process by which the anatomical structures of embryonic epithelia are generated and organized. Morphogenesis pertains to the creation of form [goid 16331] [evidence IEA]; The attachment of one cell to another cell via adhesion molecules [goid 16337] [evidence IEA]; The process whose specific outcome is the progression of the myeloid and lymphoid derived organ/tissue systems of the blood and other parts of the body over time, from formation to the mature structure. The site of hemopoiesis is variable during development, but occurs primarily in bone marrow or kidney in many adult vertebrates [goid 30097] [evidence IEA]; The process whose specific outcome is the progression of the lung over time, from its formation to the mature structure. In all air-breathing vertebrates the lungs are developed from the ventral wall of the oesophagus as a pouch which divides into two sacs. In amphibians and many reptiles the lungs retain very nearly this primitive sac-like character, but in the higher forms the connection with the oesophagus becomes elongated into the windpipe and the inner walls of the sacs become more and more divided, until, in the mammals, the air spaces become minutely divided into tubes ending in small air cells, in the walls of which the blood circulates in a fine network of capillaries. In mammals the lungs are more or less divided into lobes, and each lung occupies a separate cavity in the thorax [goid 30324] [evidence IEA]; Any series of molecular signals generated as a consequence of an androgen binding to its receptor [goid 30521] [pmid 15572661] [evidence NAS]; Any process that activates or increases the frequency, rate or extent of epithelial cell differentiation [goid 30858] [evidence IEA]; The process whose specific outcome is the progression of the forebrain over time, from its formation to the mature structure. The forebrain is the anterior of the three primary divisions of the developing chordate brain or the corresponding part of the adult brain (in vertebrates, includes especially the cerebral hemispheres, the thalamus, and the hypothalamus and especially in higher vertebrates is the main control center for sensory and associative information processing, visceral functions, and voluntary motor functions) [goid 30900] [evidence IEA]; The process whose specific outcome is the progression of the pancreas over time, from its formation to the mature structure. The pancreas is an endoderm derived structure that produces precursors of digestive enzymes and blood glucose regulating enzymes [goid 31016] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of chondrocyte differentiation [goid 32331] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the hindlimbs are generated and organized. Morphogenesis pertains to the creation of form. The hindlimbs are the posterior limbs of an

animal [goid 35116] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the arm are generated and organized. Morphogenesis pertains to the creation of form. In humans, the arms are the two upper limbs of the body from the shoulder to the hand [goid 35117] [evidence IEA]; Any process that modulates the frequency, rate or extent of cell proliferation [goid 42127] [evidence IEA]; The process whose specific outcome is the progression of a dentine-containing tooth over time, from its formation to the mature structure. A dentine-containing tooth is a hard, bony organ borne on the jaw or other bone of a vertebrate, and are composed mainly of dentine, a dense calcified substance, covered by a layer of enamel [goid 42475] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the digit are generated and organized. Morphogenesis pertains to the creation of form. A digit is one of the terminal divisions of an appendage. For example a finger or toe [goid 42733] [evidence IEA]; The process by which specialized cells known as osteoclasts degrade the organic and inorganic portions of bone, and endocytose and transport the degradation products [goid 45453] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of osteoblast differentiation [goid 45669] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of osteoclast differentiation [goid 45671] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of DNA-dependent transcription [goid 45893] [pmid 15572661] [evidence NAS]; Any process that activates or increases the frequency, rate or extent of transcription from the RNA polymerase II promoter [goid 45944] [evidence IEA]; A developmental process, independent of morphogenetic (shape) change, that is required for a cell to attain its fully functional state [goid 48469] [evidence IEA]; The directed movement of substances in synaptic membrane-bounded vesicles within the neuron along the cytoskeleton either toward or away from the neuronal cell body [goid 48489] [evidence IEA]; The process by which the anatomical structures of the eye are generated and organized. Morphogenesis pertains to the creation of form. The camera-type eye is an organ of sight that receives light through an aperture and focuses it through a lens, projecting it on a photoreceptor field [goid 48593] [evidence IEA]; A process that is carried out at the cellular level which results in the formation, arrangement of constituent parts, or disassembly of a synapse, the junction between a neuron and a target (neuron, muscle, or secretory cell) [goid 50808] [evidence IEA]; The series of molecular signals initiated by binding of Wnt protein to a frizzled family receptor on the surface of the target cell and ending with a change in transcription of target genes [goid 60070] [evidence IEA]; The series of molecular signals initiated by binding of Wnt protein to a frizzled family receptor on the surface of the target cell and ending with a change in transcription of target genes [goid 60070] [pmid 9601641] [evidence IC]
140
The chemical reactions and pathways involving nucleobases, nucleosides, nucleotides and nucleic acids [goid 6139] [evidence IEA]; The progression of biochemical and morphological phases and events that occur in a cell during successive cell replication or nuclear replication events. Canonically, the cell cycle comprises the replication and segregation of genetic material followed by the division of the cell, but in endocycles or syncytial cells

nuclear replication or nuclear division may not be followed by cell division [goid 7049] [evidence IEA]
397
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361
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286
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61
Any process that stops, prevents or reduces the frequency, rate or extent of transcription from an RNA polymerase II promoter [goid 122] [evidence IEA]; The change in form (cell shape and size) that occurs when relatively unspecialized cells, e.g. embryonic or regenerative cells, acquire specialized structural and/or functional features that characterize the cells, tissues, or organs of the mature organism or some other relatively stable phase of the organism's life history [goid 904] [evidence IEA]; The process whose specific outcome is the progression of the skeleton over time, from its formation to the mature structure. The skeleton is the bony framework of the body in vertebrates (endoskeleton) or the hard outer envelope of insects (exoskeleton or dermoskeleton) [goid 1501] [evidence IEA]; The process that regulates the coordinated growth and sprouting of blood vessels giving rise to the organized vascular system [goid 1569] [evidence IEA]; A complex and coordinated series of cellular movements that occurs at the end of cleavage during embryonic development of most animals. In Deuterostomes the initial blastopore becomes the anus and the mouth forms second [goid 1702] [evidence IEA]; The formation of the endoderm during gastrulation [goid 1706] [evidence IEA]; The process involved in the specification of cell identity. Once specification has taken place, a cell will be committed to differentiate down a specific pathway if left in its normal environment [goid 1708] [evidence IEA]; Process involved in cell fate commitment. Once determination has taken place, a cell becomes committed to differentiate down a particular pathway regardless of its environment [goid 1709] [evidence IEA]; The process by which a cell becomes committed to become part of the endoderm [goid 1711] [evidence IEA]; A transition where an epithelial cell loses apical/basolateral polarity, severs intercellular adhesive junctions, degrades basement membrane components and becomes a migratory mesenchymal cell [goid 1837] [pmid 14679171] [evidence TAS]; The synthesis of either RNA on a template of DNA or DNA on a template of RNA [goid 6350] [evidence IEA]; A form of programmed cell death induced by external or internal signals that trigger the activity of proteolytic caspases, whose actions dismantle the cell and result in cell death. Apoptosis begins internally with condensation and subsequent fragmentation of the cell nucleus (blebbing) while the plasma membrane remains intact. Other characteristics of apoptosis include DNA fragmentation and the exposure of phosphatidyl serine on the cell surface [goid 6915] [evidence IEA]; The attachment of a cell, either to another cell or to an underlying substrate such as the extracellular matrix, via cell adhesion molecules [goid 7155] [evidence IEA]; The binding of a cell to the extracellular matrix via adhesion molecules [goid 7160] [evidence IEA]; The process of communication from a neuron to a target (neuron, muscle, or secretory cell) across a

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516
NA
33 The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation

of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with the intake of food [goid 7631] [evidence IEA]; The process by which a neuronal cell in a multicellular organism interprets its surroundings [goid 8038] [evidence IEA]; The regulated release of glutamate by a cell or group of cells. The glutamate is the most abundant excitatory neurotransmitter in the nervous system [goid 14047] [evidence IEA]; The process whose specific outcome is the progression of the dendrite over time, from its formation to the mature structure. A dendrite is a freely branching protoplasmic process of a nerve cell [goid 16358] [evidence IEA]; Any process that modulates the frequency, rate or extent of the chemical reactions and pathways within a cell or an organism [goid 19222] [evidence IEA]; The process whose specific outcome is the progression of a nerve over time, from its formation to the mature structure [goid 21675] [evidence IEA]; The process whereby a relatively unspecialized cell acquires specialized features of a mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of cell death by apoptosis in neurons [goid 43524] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of neuron differentiation [goid 45666] [evidence IEA]; Any process that modulates the frequency, rate or extent of programmed cell death that occurs in the retina [goid 46668] [evidence IEA]; A process that modulates synaptic plasticity, the ability of synapses to change as circumstances require. They may alter function, such as increasing or decreasing their sensitivity, or they may increase or decrease in actual numbers [goid 48167] [evidence IEA]; The process whose specific outcome is the progression of the inner ear over time, from its formation to the mature structure [goid 48839] [evidence IEA]; The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with

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that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of cell death by apoptosis in neurons [goid 43524] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of neuron differentiation [goid 45666] [evidence IEA]; Any process that modulates the frequency, rate or extent of programmed cell death that occurs in the retina [goid 46668] [evidence IEA]; A process that modulates synaptic plasticity, the ability of synapses to change as circumstances require. They may alter function, such as increasing or decreasing their sensitivity, or they may increase or decrease in actual numbers [goid 48167] [evidence IEA]; The process whose specific outcome is the progression of the inner ear over time, from its formation to the mature structure [goid 48839] [evidence IEA]
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Process by which cytoskeletal filaments are directly or indirectly linked to the plasma membrane [goid 7016] [pmid 2261642] [evidence ISS]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the

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47 The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with the intake of food [goid 7631] [evidence IEA]; The process by which a neuronal cell in a multicellular organism interprets its surroundings [goid 8038] [evidence IEA]; The regulated release of glutamate by a cell or group of cells. The glutamate is the most abundant excitatory neurotransmitter in the nervous system [goid 14047] [evidence IEA]; The process whose specific outcome is the progression of the dendrite over time, from its formation to the mature structure. A dendrite is a freely branching protoplasmic process

of a nerve cell [goid 16358] [evidence IEA]; Any process that modulates the frequency, rate or extent of the chemical reactions and pathways within a cell or an organism [goid 19222] [evidence IEA]; The process whose specific outcome is the progression of a nerve over time, from its formation to the mature structure [goid 21675] [evidence IEA]; The process whereby a relatively unspecialized cell acquires specialized features of a mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of cell death by apoptosis in neurons [goid 43524] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of neuron differentiation [goid 45666] [evidence IEA]; Any process that modulates the frequency, rate or extent of programmed cell death that occurs in the retina [goid 46668] [evidence IEA]; A process that modulates synaptic plasticity, the ability of synapses to change as circumstances require. They may alter function, such as increasing or decreasing their sensitivity, or they may increase or decrease in actual numbers [goid 48167] [evidence IEA]; The process whose specific outcome is the progression of the inner ear over time, from its formation to the mature structure [goid 48839] [evidence IEA]; The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with the intake of food [goid 7631] [evidence IEA]; The process by which a neuronal cell in a multicellular organism interprets its surroundings [goid 8038] [evidence IEA]; The regulated release of glutamate by a cell or group of cells. The glutamate is the most abundant excitatory neurotransmitter in the nervous system [goid 14047] [evidence IEA]; The process whose specific outcome is the progression of the dendrite over time, from its formation to the mature structure. A dendrite is a freely branching protoplasmic process of a nerve cell [goid 16358] [evidence IEA]; Any process that modulates the frequency, rate or extent of the chemical reactions and pathways within a cell or an organism [goid 19222] [evidence IEA]; The process whose specific outcome is the progression of a nerve over time, from its formation to the mature structure [goid 21675] [evidence IEA]; The process whereby a relatively unspecialized cell acquires specialized features of a mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay

that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of cell death by apoptosis in neurons [goid 43524] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of neuron differentiation [goid 45666] [evidence IEA]; Any process that modulates the frequency, rate or extent of programmed cell death that occurs in the retina [goid 46668] [evidence IEA]; A process that modulates synaptic plasticity, the ability of synapses to change as circumstances require. They may alter function, such as increasing or decreasing their sensitivity, or they may increase or decrease in actual numbers [goid 48167] [evidence IEA]; The process whose specific outcome is the progression of the inner ear over time, from its formation to the mature structure [goid 48839] [evidence IEA]; The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with the intake of food [goid 7631] [evidence IEA]; The process by which a neuronal cell in a multicellular organism interprets its surroundings [goid 8038] [evidence IEA]; The regulated release of glutamate by a cell or group of cells. The glutamate is the most abundant excitatory neurotransmitter in the nervous system [goid 14047] [evidence IEA]; The process whose specific outcome is the progression of the dendrite over time, from its formation to the mature structure. A dendrite is a freely branching protoplasmic process of a nerve cell [goid 16358] [evidence IEA]; Any process that modulates the frequency, rate or extent of the chemical reactions and pathways within a cell or an organism [goid 19222] [evidence IEA]; The process whose specific outcome is the progression of a nerve over time, from its formation to the mature structure [goid 21675] [evidence IEA]; The process whereby a relatively unspecialized cell acquires specialized features of a mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of cell

death by apoptosis in neurons [goid 43524] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of neuron differentiation [goid 45666] [evidence IEA]; Any process that modulates the frequency, rate or extent of programmed cell death that occurs in the retina [goid 46668] [evidence IEA]; A process that modulates synaptic plasticity, the ability of synapses to change as circumstances require. They may alter function, such as increasing or decreasing their sensitivity, or they may increase or decrease in actual numbers [goid 48167] [evidence IEA]; The process whose specific outcome is the progression of the inner ear over time, from its formation to the mature structure [goid 48839] [evidence IEA]; The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with the intake of food [goid 7631] [evidence IEA]; The process by which a neuronal cell in a multicellular organism interprets its surroundings [goid 8038] [evidence IEA]; The regulated release of glutamate by a cell or group of cells. The glutamate is the most abundant excitatory neurotransmitter in the nervous system [goid 14047] [evidence IEA]; The process whose specific outcome is the progression of the dendrite over time, from its formation to the mature structure. A dendrite is a freely branching protoplasmic process of a nerve cell [goid 16358] [evidence IEA]; Any process that modulates the frequency, rate or extent of the chemical reactions and pathways within a cell or an organism [goid 19222] [evidence IEA]; The process whose specific outcome is the progression of a nerve over time, from its formation to the mature structure [goid 21675] [evidence IEA]; The process whereby a relatively unspecialized cell acquires specialized features of a mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of cell death by apoptosis in neurons [goid 43524] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of neuron differentiation [goid 45666] [evidence IEA]; Any process that modulates the frequency, rate or extent of programmed cell death that occurs in the retina [goid 46668] [evidence IEA]; A process that modulates synaptic plasticity, the ability of synapses to change as circumstances require. They may alter function, such as increasing or decreasing their sensitivity, or they may

increase or decrease in actual numbers [goid 48167] [evidence IEA]; The process whose specific outcome is the progression of the inner ear over time, from its formation to the mature structure [goid 48839] [evidence IEA]
575
NA
313
NA
495
NA
170
The chemical reactions and pathways involving nucleobases, nucleosides, nucleotides and nucleic acids [goid 6139] [evidence IEA]; The progression of biochemical and morphological phases and events that occur in a cell during successive cell replication or nuclear replication events. Canonically, the cell cycle comprises the replication and segregation of genetic material followed by the division of the cell, but in endocycles or syncytial cells nuclear replication or nuclear division may not be followed by cell division [goid 7049] [evidence IEA]
460
NA
437
NA
502
NA
509
NA
467
NA
150
The chemical reactions and pathways involving nucleobases, nucleosides, nucleotides and nucleic acids [goid 6139] [evidence IEA]; The progression of biochemical and morphological phases and events that occur in a cell during successive cell replication or nuclear replication events. Canonically, the cell cycle comprises the replication and segregation of genetic material followed by the division of the cell, but in endocycles or syncytial cells nuclear replication or nuclear division may not be followed by cell division [goid 7049] [evidence IEA]
75
Any process that stops, prevents or reduces the frequency, rate or extent of transcription from an RNA polymerase II promoter [goid 122] [evidence IEA]; The change in form (cell shape and size) that occurs when relatively unspecialized cells, e.g. embryonic or regenerative cells, acquire specialized structural and/or functional features that characterize the cells, tissues, or organs of the mature organism or some other relatively stable phase of the organism's life history [goid 904] [evidence IEA]; The process whose specific outcome is the progression of the skeleton over time, from its formation to the mature structure. The skeleton is the bony framework of the body in vertebrates (endoskeleton) or the hard outer envelope of insects (exoskeleton or dermoskeleton) [goid 1501] [evidence IEA]; The process that regulates the coordinated growth and sprouting of

blood vessels giving rise to the organized vascular system [goid 1569] [evidence IEA]; A complex and coordinated series of cellular movements that occurs at the end of cleavage during embryonic development of most animals. In Deuterostomes the initial blastopore becomes the anus and the mouth forms second [goid 1702] [evidence IEA]; The formation of the endoderm during gastrulation [goid 1706] [evidence IEA]; The process involved in the specification of cell identity. Once specification has taken place, a cell will be committed to differentiate down a specific pathway if left in its normal environment [goid 1708] [evidence IEA]; Process involved in cell fate commitment. Once determination has taken place, a cell becomes committed to differentiate down a particular pathway regardless of its environment [goid 1709] [evidence IEA]; The process by which a cell becomes committed to become part of the endoderm [goid 1711] [evidence IEA]; A transition where an epithelial cell loses apical/basolateral polarity, severs intercellular adhesive junctions, degrades basement membrane components and becomes a migratory mesenchymal cell [goid 1837] [pmid 14679171] [evidence TAS]; The synthesis of either RNA on a template of DNA or DNA on a template of RNA [goid 6350] [evidence IEA]; A form of programmed cell death induced by external or internal signals that trigger the activity of proteolytic caspases, whose actions dismantle the cell and result in cell death. Apoptosis begins internally with condensation and subsequent fragmentation of the cell nucleus (blebbing) while the plasma membrane remains intact. Other characteristics of apoptosis include DNA fragmentation and the exposure of phosphatidyl serine on the cell surface [goid 6915] [evidence IEA]; The attachment of a cell, either to another cell or to an underlying substrate such as the extracellular matrix, via cell adhesion molecules [goid 7155] [evidence IEA]; The binding of a cell to the extracellular matrix via adhesion molecules [goid 7160] [evidence IEA]; The process of communication from a neuron to a target (neuron, muscle, or secretory cell) across a synapse [goid 7268] [evidence IEA]; The process whose specific outcome is the progression of the ectoderm over time, from its formation to the mature structure. In animal embryos, the ectoderm is the outer germ layer of the embryo, formed during gastrulation [goid 7398] [evidence IEA]; The process whose specific outcome is the progression of the heart over time, from its formation to the mature structure. The heart is a hollow, muscular organ, which, by contracting rhythmically, keeps up the circulation of the blood [goid 7507] [evidence IEA]; The establishment, maintenance and elaboration of the dorsal/ventral axis [goid 9950] [evidence IEA]; The regionalization process by which specific areas of cell differentiation are determined along a proximal/distal axis [goid 9954] [evidence IEA]; The process by which the anatomical structures of embryonic epithelia are generated and organized. Morphogenesis pertains to the creation of form [goid 16331] [evidence IEA]; The attachment of one cell to another cell via adhesion molecules [goid 16337] [evidence IEA]; The process whose specific outcome is the progression of the myeloid and lymphoid derived organ/tissue systems of the blood and other parts of the body over time, from formation to the mature structure. The site of hemopoiesis is variable during development, but occurs primarily in bone marrow or kidney in many adult vertebrates [goid 30097] [evidence IEA]; The process whose specific outcome is the progression of the lung over time, from its formation to the mature structure. In all air-breathing

vertebrates the lungs are developed from the ventral wall of the oesophagus as a pouch which divides into two sacs. In amphibians and many reptiles the lungs retain very nearly this primitive sac-like character, but in the higher forms the connection with the oesophagus becomes elongated into the windpipe and the inner walls of the sacs become more and more divided, until, in the mammals, the air spaces become minutely divided into tubes ending in small air cells, in the walls of which the blood circulates in a fine network of capillaries. In mammals the lungs are more or less divided into lobes, and each lung occupies a separate cavity in the thorax [goid 30324] [evidence IEA]; Any series of molecular signals generated as a consequence of an androgen binding to its receptor [goid 30521] [pmid 15572661] [evidence NAS]; Any process that activates or increases the frequency, rate or extent of epithelial cell differentiation [goid 30858] [evidence IEA]; The process whose specific outcome is the progression of the forebrain over time, from its formation to the mature structure. The forebrain is the anterior of the three primary divisions of the developing chordate brain or the corresponding part of the adult brain (in vertebrates, includes especially the cerebral hemispheres, the thalamus, and the hypothalamus and especially in higher vertebrates is the main control center for sensory and associative information processing, visceral functions, and voluntary motor functions) [goid 30900] [evidence IEA]; The process whose specific outcome is the progression of the pancreas over time, from its formation to the mature structure. The pancreas is an endoderm derived structure that produces precursors of digestive enzymes and blood glucose regulating enzymes [goid 31016] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of chondrocyte differentiation [goid 32331] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the hindlimbs are generated and organized. Morphogenesis pertains to the creation of form. The hindlimbs are the posterior limbs of an animal [goid 35116] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the arm are generated and organized. Morphogenesis pertains to the creation of form. In humans, the arms are the two upper limbs of the body from the shoulder to the hand [goid 35117] [evidence IEA]; Any process that modulates the frequency, rate or extent of cell proliferation [goid 42127] [evidence IEA]; The process whose specific outcome is the progression of a dentine-containing tooth over time, from its formation to the mature structure. A dentine-containing tooth is a hard, bony organ borne on the jaw or other bone of a vertebrate, and are composed mainly of dentine, a dense calcified substance, covered by a layer of enamel [goid 42475] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the digit are generated and organized. Morphogenesis pertains to the creation of form. A digit is one of the terminal divisions of an appendage. For example a finger or toe [goid 42733] [evidence IEA]; The process by which specialized cells known as osteoclasts degrade the organic and inorganic portions of bone, and endocytose and transport the degradation products [goid 45453] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of osteoblast differentiation [goid 45669] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of osteoclast differentiation [goid 45671] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of DNA-

dependent transcription [goid 45893] [pmid 15572661] [evidence NAS]; Any process that activates or increases the frequency, rate or extent of transcription from the RNA polymerase II promoter [goid 45944] [evidence IEA]; A developmental process, independent of morphogenetic (shape) change, that is required for a cell to attain its fully functional state [goid 48469] [evidence IEA]; The directed movement of substances in synaptic membrane-bounded vesicles within the neuron along the cytoskeleton either toward or away from the neuronal cell body [goid 48489] [evidence IEA]; The process by which the anatomical structures of the eye are generated and organized. Morphogenesis pertains to the creation of form. The camera-type eye is an organ of sight that receives light through an aperture and focuses it through a lens, projecting it on a photoreceptor field [goid 48593] [evidence IEA]; A process that is carried out at the cellular level which results in the formation, arrangement of constituent parts, or disassembly of a synapse, the junction between a neuron and a target (neuron, muscle, or secretory cell) [goid 50808] [evidence IEA]; The series of molecular signals initiated by binding of Wnt protein to a frizzled family receptor on the surface of the target cell and ending with a change in transcription of target genes [goid 60070] [evidence IEA]; The series of molecular signals initiated by binding of Wnt protein to a frizzled family receptor on the surface of the target cell and ending with a change in transcription of target genes [goid 60070] [pmid 9601641] [evidence IC]
295
NA
180
The chemical reactions and pathways involving nucleobases, nucleosides, nucleotides and nucleic acids [goid 6139] [evidence IEA]; The progression of biochemical and morphological phases and events that occur in a cell during successive cell replication or nuclear replication events. Canonically, the cell cycle comprises the replication and segregation of genetic material followed by the division of the cell, but in endocycles or syncytial cells nuclear replication or nuclear division may not be followed by cell division [goid 7049] [evidence IEA]
389
NA
103
Any process that stops, prevents or reduces the frequency, rate or extent of transcription from an RNA polymerase II promoter [goid 122] [evidence IEA]; The change in form (cell shape and size) that occurs when relatively unspecialized cells, e.g. embryonic or regenerative cells, acquire specialized structural and/or functional features that characterize the cells, tissues, or organs of the mature organism or some other relatively stable phase of the organism's life history [goid 904] [evidence IEA]; The process whose specific outcome is the progression of the skeleton over time, from its formation to the mature structure. The skeleton is the bony framework of the body in vertebrates (endoskeleton) or the hard outer envelope of insects (exoskeleton or dermoskeleton) [goid 1501] [evidence IEA]; The process that regulates the coordinated growth and sprouting of blood vessels giving rise to the organized vascular system [goid 1569] [evidence IEA]; A complex and coordinated series of cellular movements that

occurs at the end of cleavage during embryonic development of most animals. In Deuterostomes the initial blastopore becomes the anus and the mouth forms second [goid 1702] [evidence IEA]; The formation of the endoderm during gastrulation [goid 1706] [evidence IEA]; The process involved in the specification of cell identity. Once specification has taken place, a cell will be committed to differentiate down a specific pathway if left in its normal environment [goid 1708] [evidence IEA]; Process involved in cell fate commitment. Once determination has taken place, a cell becomes committed to differentiate down a particular pathway regardless of its environment [goid 1709] [evidence IEA]; The process by which a cell becomes committed to become part of the endoderm [goid 1711] [evidence IEA]; A transition where an epithelial cell loses apical/basolateral polarity, severs intercellular adhesive junctions, degrades basement membrane components and becomes a migratory mesenchymal cell [goid 1837] [pmid 14679171] [evidence TAS]; The synthesis of either RNA on a template of DNA or DNA on a template of RNA [goid 6350] [evidence IEA]; A form of programmed cell death induced by external or internal signals that trigger the activity of proteolytic caspases, whose actions dismantle the cell and result in cell death. Apoptosis begins internally with condensation and subsequent fragmentation of the cell nucleus (blebbing) while the plasma membrane remains intact. Other characteristics of apoptosis include DNA fragmentation and the exposure of phosphatidyl serine on the cell surface [goid 6915] [evidence IEA]; The attachment of a cell, either to another cell or to an underlying substrate such as the extracellular matrix, via cell adhesion molecules [goid 7155] [evidence IEA]; The binding of a cell to the extracellular matrix via adhesion molecules [goid 7160] [evidence IEA]; The process of communication from a neuron to a target (neuron, muscle, or secretory cell) across a synapse [goid 7268] [evidence IEA]; The process whose specific outcome is the progression of the ectoderm over time, from its formation to the mature structure. In animal embryos, the ectoderm is the outer germ layer of the embryo, formed during gastrulation [goid 7398] [evidence IEA]; The process whose specific outcome is the progression of the heart over time, from its formation to the mature structure. The heart is a hollow, muscular organ, which, by contracting rhythmically, keeps up the circulation of the blood [goid 7507] [evidence IEA]; The establishment, maintenance and elaboration of the dorsal/ventral axis [goid 9950] [evidence IEA]; The regionalization process by which specific areas of cell differentiation are determined along a proximal/distal axis [goid 9954] [evidence IEA]; The process by which the anatomical structures of embryonic epithelia are generated and organized. Morphogenesis pertains to the creation of form [goid 16331] [evidence IEA]; The attachment of one cell to another cell via adhesion molecules [goid 16337] [evidence IEA]; The process whose specific outcome is the progression of the myeloid and lymphoid derived organ/tissue systems of the blood and other parts of the body over time, from formation to the mature structure. The site of hemopoiesis is variable during development, but occurs primarily in bone marrow or kidney in many adult vertebrates [goid 30097] [evidence IEA]; The process whose specific outcome is the progression of the lung over time, from its formation to the mature structure. In all air-breathing vertebrates the lungs are developed from the ventral wall of the oesophagus as a pouch which divides into two sacs. In amphibians and many reptiles the

lungs retain very nearly this primitive sac-like character, but in the higher forms the connection with the oesophagus becomes elongated into the windpipe and the inner walls of the sacs become more and more divided, until, in the mammals, the air spaces become minutely divided into tubes ending in small air cells, in the walls of which the blood circulates in a fine network of capillaries. In mammals the lungs are more or less divided into lobes, and each lung occupies a separate cavity in the thorax [goid 30324] [evidence IEA]; Any series of molecular signals generated as a consequence of an androgen binding to its receptor [goid 30521] [pmid 15572661] [evidence NAS]; Any process that activates or increases the frequency, rate or extent of epithelial cell differentiation [goid 30858] [evidence IEA]; The process whose specific outcome is the progression of the forebrain over time, from its formation to the mature structure. The forebrain is the anterior of the three primary divisions of the developing chordate brain or the corresponding part of the adult brain (in vertebrates, includes especially the cerebral hemispheres, the thalamus, and the hypothalamus and especially in higher vertebrates is the main control center for sensory and associative information processing, visceral functions, and voluntary motor functions) [goid 30900] [evidence IEA]; The process whose specific outcome is the progression of the pancreas over time, from its formation to the mature structure. The pancreas is an endoderm derived structure that produces precursors of digestive enzymes and blood glucose regulating enzymes [goid 31016] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of chondrocyte differentiation [goid 32331] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the hindlimbs are generated and organized. Morphogenesis pertains to the creation of form. The hindlimbs are the posterior limbs of an animal [goid 35116] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the arm are generated and organized. Morphogenesis pertains to the creation of form. In humans, the arms are the two upper limbs of the body from the shoulder to the hand [goid 35117] [evidence IEA]; Any process that modulates the frequency, rate or extent of cell proliferation [goid 42127] [evidence IEA]; The process whose specific outcome is the progression of a dentine-containing tooth over time, from its formation to the mature structure. A dentine-containing tooth is a hard, bony organ borne on the jaw or other bone of a vertebrate, and are composed mainly of dentine, a dense calcified substance, covered by a layer of enamel [goid 42475] [evidence IEA]; The process, occurring in the embryo, by which the anatomical structures of the digit are generated and organized. Morphogenesis pertains to the creation of form. A digit is one of the terminal divisions of an appendage. For example a finger or toe [goid 42733] [evidence IEA]; The process by which specialized cells known as osteoclasts degrade the organic and inorganic portions of bone, and endocytose and transport the degradation products [goid 45453] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of osteoblast differentiation [goid 45669] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of osteoclast differentiation [goid 45671] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of DNA-dependent transcription [goid 45893] [pmid 15572661] [evidence NAS]; Any process that activates or increases the frequency, rate or extent of

transcription from the RNA polymerase II promoter [goid 45944] [evidence IEA]; A developmental process, independent of morphogenetic (shape) change, that is required for a cell to attain its fully functional state [goid 48469] [evidence IEA]; The directed movement of substances in synaptic membrane-bounded vesicles within the neuron along the cytoskeleton either toward or away from the neuronal cell body [goid 48489] [evidence IEA]; The process by which the anatomical structures of the eye are generated and organized. Morphogenesis pertains to the creation of form. The camera-type eye is an organ of sight that receives light through an aperture and focuses it through a lens, projecting it on a photoreceptor field [goid 48593] [evidence IEA]; A process that is carried out at the cellular level which results in the formation, arrangement of constituent parts, or disassembly of a synapse, the junction between a neuron and a target (neuron, muscle, or secretory cell) [goid 50808] [evidence IEA]; The series of molecular signals initiated by binding of Wnt protein to a frizzled family receptor on the surface of the target cell and ending with a change in transcription of target genes [goid 60070] [evidence IEA]; The series of molecular signals initiated by binding of Wnt protein to a frizzled family receptor on the surface of the target cell and ending with a change in transcription of target genes [goid 60070] [pmid 9601641] [evidence IC]
413
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523
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421
NA
40 The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with the intake of food [goid 7631] [evidence IEA]; The process by which a neuronal cell in a multicellular organism interprets its surroundings [goid 8038] [evidence IEA]; The regulated release of glutamate by a cell or group of cells. The glutamate is the most abundant excitatory neurotransmitter in the nervous system [goid 14047] [evidence IEA]; The process whose specific outcome is the progression of the dendrite over time, from its formation to the mature structure. A dendrite is a freely branching protoplasmic process of a nerve cell [goid 16358] [evidence IEA]; Any process that modulates the frequency, rate or extent of the chemical reactions and pathways within a cell or an organism [goid 19222] [evidence IEA]; The process whose specific outcome is the progression of a nerve over time, from its formation to the mature structure [goid 21675] [evidence IEA]; The process whereby a

relatively unspecialized cell acquires specialized features of a mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of cell death by apoptosis in neurons [goid 43524] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of neuron differentiation [goid 45666] [evidence IEA]; Any process that modulates the frequency, rate or extent of programmed cell death that occurs in the retina [goid 46668] [evidence IEA]; A process that modulates synaptic plasticity, the ability of synapses to change as circumstances require. They may alter function, such as increasing or decreasing their sensitivity, or they may increase or decrease in actual numbers [goid 48167] [evidence IEA]; The process whose specific outcome is the progression of the inner ear over time, from its formation to the mature structure [goid 48839] [evidence IEA]; The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with the intake of food [goid 7631] [evidence IEA]; The process by which a neuronal cell in a multicellular organism interprets its surroundings [goid 8038] [evidence IEA]; The regulated release of glutamate by a cell or group of cells. The glutamate is the most abundant excitatory neurotransmitter in the nervous system [goid 14047] [evidence IEA]; The process whose specific outcome is the progression of the dendrite over time, from its formation to the mature structure. A dendrite is a freely branching protoplasmic process of a nerve cell [goid 16358] [evidence IEA]; Any process that modulates the frequency, rate or extent of the chemical reactions and pathways within a cell or an organism [goid 19222] [evidence IEA]; The process whose specific outcome is the progression of a nerve over time, from its formation to the mature structure [goid 21675] [evidence IEA]; The process whereby a relatively unspecialized cell acquires specialized features of a mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an

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NA

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## 453
NA
## 599
NA
## 12  The process whose specific outcome is the progression of the ureteric
bud over time, from its formation to the mature structure [goid 1657]
[evidence IEA]; A process which directly inhibits any of the steps required
for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that
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of an axon growth cone is directed to a specific target site in response to a
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process by which an axon recognizes and binds to a set of cells with which it
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neuronal cell in a multicellular organism interprets its surroundings [goid
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outcome is the progression of a nerve over time, from its formation to the
mature structure [goid 21675] [evidence IEA]; The process whereby a
relatively unspecialized cell acquires specialized features of a
mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay
that information centrally in the nervous system [goid 42490] [evidence IEA];
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differentiation [goid 45666] [evidence IEA]; Any process that modulates the
frequency, rate or extent of programmed cell death that occurs in the retina
[goid 46668] [evidence IEA]; A process that modulates synaptic plasticity,
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583
NA
190
The chemical reactions and pathways involving nucleobases, nucleosides, nucleotides and nucleic acids [goid 6139] [evidence IEA]; The progression of biochemical and morphological phases and events that occur in a cell during successive cell replication or nuclear replication events. Canonically, the cell cycle comprises the replication and segregation of genetic material followed by the division of the cell, but in endocycles or syncytial cells nuclear replication or nuclear division may not be followed by cell division [goid 7049] [evidence IEA]
481
NA
54 The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this

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mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of cell death by apoptosis in neurons [goid 43524] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of neuron differentiation [goid 45666] [evidence IEA]; Any process that modulates the frequency, rate or extent of programmed cell death that occurs in the retina [goid 46668] [evidence IEA]; A process that modulates synaptic plasticity, the ability of synapses to change as circumstances require. They may alter function, such as increasing or decreasing their sensitivity, or they may increase or decrease in actual numbers [goid 48167] [evidence IEA]; The process whose specific outcome is the progression of the inner ear over time, from its formation to the mature structure [goid 48839] [evidence IEA]; The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with the intake of food [goid 7631] [evidence IEA]; The process by which a neuronal cell in a multicellular organism interprets its surroundings [goid 8038] [evidence IEA]; The regulated release of glutamate by a cell or group of cells. The glutamate is the most abundant excitatory neurotransmitter in the nervous system [goid 14047] [evidence IEA]; The process whose specific outcome is the progression of the dendrite over time, from its formation to the mature structure. A dendrite is a freely branching protoplasmic process of a nerve cell [goid 16358] [evidence IEA]; Any process that modulates the frequency, rate or extent of the chemical reactions and pathways within a cell or an organism [goid 19222] [evidence IEA]; The process whose specific outcome is the progression of a nerve over time, from its formation to the mature structure [goid 21675] [evidence IEA]; The process whereby a relatively unspecialized cell acquires specialized features of a mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any

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160
The chemical reactions and pathways involving nucleobases, nucleosides, nucleotides and nucleic acids [goid 6139] [evidence IEA]; The progression of biochemical and morphological phases and events that occur in a cell during successive cell replication or nuclear replication events. Canonically, the cell cycle comprises the replication and segregation of genetic material followed by the division of the cell, but in endocycles or syncytial cells nuclear replication or nuclear division may not be followed by cell division [goid 7049] [evidence IEA]
304
NA
224
Process by which cytoskeletal filaments are directly or indirectly linked to the plasma membrane [goid 7016] [pmid 2261642] [evidence ISS]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be

regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The process whose specific outcome is the progression of the muscle over time, from its formation to the mature structure. The muscle is an organ consisting of a tissue made up of various elongated cells that are specialized to contract and thus to produce movement and mechanical work [goid 7517] [pmid 1824797] [evidence NAS]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways resulting in the formation of peptides, compounds of 2 or more (but usually less than 100) amino acids where the alpha carboxyl group of one is bound to the alpha amino group of another. This may include the translation of a precursor protein and its subsequent processing into a functional peptide [goid 43043] [pmid 16000376] [evidence IDA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213]

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[evidence IEA]; The cellular homeostatic process by which a muscle fiber is
preserved in a stable functional or structural state [goid 46716] [evidence
IEA]
## 200
The chemical reactions and pathways involving nucleobases, nucleosides,
nucleotides and nucleic acids [goid 6139] [evidence IEA]; The progression of
biochemical and morphological phases and events that occur in a cell during
successive cell replication or nuclear replication events. Canonically, the
cell cycle comprises the replication and segregation of genetic material
followed by the division of the cell, but in endocycles or syncytial cells
nuclear replication or nuclear division may not be followed by cell division
[goid 7049] [evidence IEA]
## 544
NA
## 217
Process by which cytoskeletal filaments are directly or indirectly linked to
the plasma membrane [goid 7016] [pmid 2261642] [evidence ISS]; The
developmental sequence of events leading to the formation of adult muscle
that occurs in the anima. In vertebrate skeletal muscle the main events are:
the fusion of myoblasts to form myotubes that increase in size by further
fusion to them of myoblasts, the formation of myofibrils within their
cytoplasm and the establishment of functional neuromuscular junctions with
motor neurons. At this stage they can be regarded as mature muscle fibers
[goid 7519] [evidence IEA]; The chemical reactions and pathways involving
neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular
homeostatic process by which a muscle fiber is preserved in a stable
functional or structural state [goid 46716] [evidence IEA]; The developmental
sequence of events leading to the formation of adult muscle that occurs in
the anima. In vertebrate skeletal muscle the main events are: the fusion of
myoblasts to form myotubes that increase in size by further fusion to them of
myoblasts, the formation of myofibrils within their cytoplasm and the
establishment of functional neuromuscular junctions with motor neurons. At
this stage they can be regarded as mature muscle fibers [goid 7519] [evidence
IEA]; The chemical reactions and pathways involving neurotransmitter
receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by
which a muscle fiber is preserved in a stable functional or structural state
[goid 46716] [evidence IEA]; The developmental sequence of events leading to
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preserved in a stable functional or structural state [goid 46716] [evidence
IEA]; The developmental sequence of events leading to the formation of adult
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120
The chemical reactions and pathways involving nucleobases, nucleosides, nucleotides and nucleic acids [goid 6139] [evidence IEA]; The progression of biochemical and morphological phases and events that occur in a cell during successive cell replication or nuclear replication events. Canonically, the

cell cycle comprises the replication and segregation of genetic material followed by the division of the cell, but in endocycles or syncytial cells nuclear replication or nuclear division may not be followed by cell division [goid 7049] [evidence IEA]
110
The chemical reactions and pathways involving nucleobases, nucleosides, nucleotides and nucleic acids [goid 6139] [evidence IEA]; The progression of biochemical and morphological phases and events that occur in a cell during successive cell replication or nuclear replication events. Canonically, the cell cycle comprises the replication and segregation of genetic material followed by the division of the cell, but in endocycles or syncytial cells nuclear replication or nuclear division may not be followed by cell division [goid 7049] [evidence IEA]
130
The chemical reactions and pathways involving nucleobases, nucleosides, nucleotides and nucleic acids [goid 6139] [evidence IEA]; The progression of biochemical and morphological phases and events that occur in a cell during successive cell replication or nuclear replication events. Canonically, the cell cycle comprises the replication and segregation of genetic material followed by the division of the cell, but in endocycles or syncytial cells nuclear replication or nuclear division may not be followed by cell division [goid 7049] [evidence IEA]
368
NA
537
NA
277
NA
488
NA
238
Process by which cytoskeletal filaments are directly or indirectly linked to the plasma membrane [goid 7016] [pmid 2261642] [evidence ISS]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter receptors [goid 45213] [evidence IEA]; The cellular homeostatic process by which a muscle fiber is preserved in a stable functional or structural state [goid 46716] [evidence IEA]; The developmental sequence of events leading to the formation of adult muscle that occurs in the anima. In vertebrate skeletal muscle the main events are: the fusion of myoblasts to form myotubes that increase in size by further fusion to them of myoblasts, the formation of myofibrils within their cytoplasm and the establishment of functional neuromuscular junctions with motor neurons. At this stage they can be regarded as mature muscle fibers [goid 7519] [evidence IEA]; The chemical reactions and pathways involving neurotransmitter

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354
NA
26 The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with the intake of food [goid 7631] [evidence IEA]; The process by which a neuronal cell in a multicellular organism interprets its surroundings [goid 8038] [evidence IEA]; The regulated release of glutamate by a cell or group of cells. The glutamate is the most abundant excitatory neurotransmitter in the nervous system [goid 14047] [evidence IEA]; The process whose specific outcome is the progression of the dendrite over time, from its formation to the mature structure. A dendrite is a freely branching protoplasmic process of a nerve cell [goid 16358] [evidence IEA]; Any process that modulates the frequency, rate or extent of the chemical reactions and pathways within a cell or an organism [goid 19222] [evidence IEA]; The process whose specific outcome is the progression of a nerve over time, from its formation to the mature structure [goid 21675] [evidence IEA]; The process whereby a relatively unspecialized cell acquires specialized features of a mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of cell death by apoptosis in neurons [goid 43524] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of neuron differentiation [goid 45666] [evidence IEA]; Any process that modulates the frequency, rate or extent of programmed cell death that occurs in the retina

[goid 46668] [evidence IEA]; A process that modulates synaptic plasticity, the ability of synapses to change as circumstances require. They may alter function, such as increasing or decreasing their sensitivity, or they may increase or decrease in actual numbers [goid 48167] [evidence IEA]; The process whose specific outcome is the progression of the inner ear over time, from its formation to the mature structure [goid 48839] [evidence IEA]; The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with the intake of food [goid 7631] [evidence IEA]; The process by which a neuronal cell in a multicellular organism interprets its surroundings [goid 8038] [evidence IEA]; The regulated release of glutamate by a cell or group of cells. The glutamate is the most abundant excitatory neurotransmitter in the nervous system [goid 14047] [evidence IEA]; The process whose specific outcome is the progression of the dendrite over time, from its formation to the mature structure. A dendrite is a freely branching protoplasmic process of a nerve cell [goid 16358] [evidence IEA]; Any process that modulates the frequency, rate or extent of the chemical reactions and pathways within a cell or an organism [goid 19222] [evidence IEA]; The process whose specific outcome is the progression of a nerve over time, from its formation to the mature structure [goid 21675] [evidence IEA]; The process whereby a relatively unspecialized cell acquires specialized features of a mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of cell death by apoptosis in neurons [goid 43524] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of neuron differentiation [goid 45666] [evidence IEA]; Any process that modulates the frequency, rate or extent of programmed cell death that occurs in the retina [goid 46668] [evidence IEA]; A process that modulates synaptic plasticity, the ability of synapses to change as circumstances require. They may alter function, such as increasing or decreasing their sensitivity, or they may increase or decrease in actual numbers [goid 48167] [evidence IEA]; The process whose specific outcome is the progression of the inner ear over time, from its formation to the mature structure [goid 48839] [evidence IEA]; The process whose specific outcome is the progression of the ureteric bud over

time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with the intake of food [goid 7631] [evidence IEA]; The process by which a neuronal cell in a multicellular organism interprets its surroundings [goid 8038] [evidence IEA]; The regulated release of glutamate by a cell or group of cells. The glutamate is the most abundant excitatory neurotransmitter in the nervous system [goid 14047] [evidence IEA]; The process whose specific outcome is the progression of the dendrite over time, from its formation to the mature structure. A dendrite is a freely branching protoplasmic process of a nerve cell [goid 16358] [evidence IEA]; Any process that modulates the frequency, rate or extent of the chemical reactions and pathways within a cell or an organism [goid 19222] [evidence IEA]; The process whose specific outcome is the progression of a nerve over time, from its formation to the mature structure [goid 21675] [evidence IEA]; The process whereby a relatively unspecialized cell acquires specialized features of a mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of cell death by apoptosis in neurons [goid 43524] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of neuron differentiation [goid 45666] [evidence IEA]; Any process that modulates the frequency, rate or extent of programmed cell death that occurs in the retina [goid 46668] [evidence IEA]; A process that modulates synaptic plasticity, the ability of synapses to change as circumstances require. They may alter function, such as increasing or decreasing their sensitivity, or they may increase or decrease in actual numbers [goid 48167] [evidence IEA]; The process whose specific outcome is the progression of the inner ear over time, from its formation to the mature structure [goid 48839] [evidence IEA]; The process whose specific outcome is the progression of the ureteric bud over time, from its formation to the mature structure [goid 1657] [evidence IEA]; A process which directly inhibits any of the steps required for cell death by apoptosis [goid 6916] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of the proliferation of neuroblasts [goid 7406] [evidence IEA]; The process by which the migration of an axon growth cone is directed to a specific target site in response to a combination of attractive and repulsive cues [goid 7411] [evidence IEA]; The

process by which an axon recognizes and binds to a set of cells with which it may form stable connections [goid 7412] [evidence IEA]; The acquisition and processing of information and/or the storage and retrieval of this information over time [goid 7611] [evidence IEA]; Behavior associated with the intake of food [goid 7631] [evidence IEA]; The process by which a neuronal cell in a multicellular organism interprets its surroundings [goid 8038] [evidence IEA]; The regulated release of glutamate by a cell or group of cells. The glutamate is the most abundant excitatory neurotransmitter in the nervous system [goid 14047] [evidence IEA]; The process whose specific outcome is the progression of the dendrite over time, from its formation to the mature structure. A dendrite is a freely branching protoplasmic process of a nerve cell [goid 16358] [evidence IEA]; Any process that modulates the frequency, rate or extent of the chemical reactions and pathways within a cell or an organism [goid 19222] [evidence IEA]; The process whose specific outcome is the progression of a nerve over time, from its formation to the mature structure [goid 21675] [evidence IEA]; The process whereby a relatively unspecialized cell acquires specialized features of a mechanoreceptor, a cell specialized to transduce mechanical stimuli and relay that information centrally in the nervous system [goid 42490] [evidence IEA]; A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a drug stimulus. A drug is a substance used in the diagnosis, treatment or prevention of a disease [goid 42493] [evidence IEA]; The response of an organism to a perceived external threat [goid 42596] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of cell death by apoptosis in neurons [goid 43524] [evidence IEA]; Any process that activates or increases the frequency, rate or extent of neuron differentiation [goid 45666] [evidence IEA]; Any process that modulates the frequency, rate or extent of programmed cell death that occurs in the retina [goid 46668] [evidence IEA]; A process that modulates synaptic plasticity, the ability of synapses to change as circumstances require. They may alter function, such as increasing or decreasing their sensitivity, or they may increase or decrease in actual numbers [goid 48167] [evidence IEA]; The process whose specific outcome is the progression of the inner ear over time, from its formation to the mature structure [goid 48839] [evidence IEA]
567
NA
347
NA
1
The directed movement of substances (such as macromolecules, small molecules, ions) into, out of, within or between cells, or within a multicellular organism [goid 6810] [pmid 12379217] [evidence IDA]
3
The chemical reactions and pathways involving alcohols, any of a class of compounds containing one or more hydroxyl groups attached to a saturated carbon atom, as carried out by individual cells [goid 6066] [pmid 2347582] [evidence NAS]; The process of removal or addition of one or more electrons with or without the concomitant removal or addition of a proton or protons [goid 55114] [evidence IEA]

6
The covalent transfer of a methyl group to either N-6 of adenine or C-5 or N-4 of cytosine [goid 6306] [pmid 9888853] [evidence TAS]; Any process that modulates the frequency, rate or extent of transcription from an RNA polymerase II promoter [goid 6357] [pmid 10918580] [evidence TAS]; The immediate defensive reaction (by vertebrate tissue) to infection or injury caused by chemical or physical agents. The process is characterized by local vasodilation, extravasation of plasma into intercellular spaces and accumulation of white blood cells and macrophages [goid 6954] [pmid 9443941] [evidence TAS]; The process whose specific outcome is the progression of nervous tissue over time, from its formation to its mature state [goid 7399] [evidence IEA]; A change in state or activity of a cell (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a reactive oxygen species stimulus. Reactive oxygen species include singlet oxygen, superoxide, and oxygen free radicals [goid 34614] [pmid 17217916] [evidence IDA]
7
Any process that modulates the frequency, rate or extent of DNA-dependent transcription [goid 6355] [evidence IEA]; The hydrolysis of a peptide bond or bonds within a protein [goid 6508] [evidence IEA]; The hydrolysis of a peptide bond or bonds within a protein [goid 6508] [evidence IEA]; The hydrolysis of a peptide bond or bonds within a protein [goid 6508] [evidence IEA]; Any process that modulates the frequency, rate or extent of DNA-dependent transcription [goid 6355] [evidence IEA]; The hydrolysis of a peptide bond or bonds within a protein [goid 6508] [evidence IEA]; Any process that stops, prevents or reduces the frequency, rate or extent of transcription from an RNA polymerase II promoter [goid 122] [pmid 1900040] [evidence TAS]; Any process that modulates the frequency, rate or extent of DNA-dependent transcription [goid 6355] [evidence IEA]; The hydrolysis of a peptide bond or bonds within a protein [goid 6508] [evidence IEA]; The biological process whose specific outcome is the progression of a multicellular organism over time from an initial condition (e.g. a zygote or a young adult) to a later condition (e.g. a multicellular animal or an aged adult) [goid 7275] [pmid 8706134] [evidence TAS]; The specific actions or reactions of an organism in response to external or internal stimuli. Patterned activity of a whole organism in a manner dependent upon some combination of that organism's internal state and external conditions [goid 7610] [pmid 8706134] [evidence TAS]
9
A change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of stimulus by an estrogen, C18 steroid hormones that can stimulate the development of female sexual characteristics [goid 43627] [pmid 10037815] [evidence IEP]; Any process by which an organism has an effect on an organism of a different species [goid 44419] [evidence IEA]; The myofibril assembly process by which the muscle actomyosin is organized into sarcomeres. The sarcomere is the repeating unit of a myofibril in a muscle cell, composed of an array of overlapping thick and thin filaments between two adjacent Z discs [goid 45214] [pmid 16000376] [evidence IDA]
##

Ontology_Function
8
NA
11
Naturally occurring peptide that is an opioid (any non-alkaloid having an opiate-like effect that can be reversed by naloxone or other recognized morphine antagonist). These include Leu- and Met-enkephalin, dynorphin and neoendorphin, alpha, beta, gamma and delta endorphins formed from beta-lipotropin, various pronase-resistant peptides such as beta casamorphin, and other peptides whose opiate-like action seems to be indirect [goid 1515] [evidence IEA]; The action characteristic of a neuropeptide hormone, any peptide hormone that acts in the central nervous system. A neuropeptide is any of several types of molecules found in brain tissue, composed of short chains of amino acids; they include endorphins, enkephalins, vasopressin, and others. They are often localized in axon terminals at synapses and are classified as putative neurotransmitters, although some are also hormones [goid 5184] [pmid 7057924] [evidence TAS]
2
NA
4
Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Elemental activities, such as catalysis or binding, describing the actions of a gene product at the molecular level. A given gene product may exhibit one or more molecular functions [goid 3674] [evidence ND]
10
Catalysis of a biochemical reaction at physiological temperatures. In biologically catalyzed reactions, the reactants are known as substrates, and the catalysts are naturally occurring macromolecular substances known as enzymes. Enzymes possess specific binding sites for substrates, and are usually composed wholly or largely of protein, but RNA that has catalytic activity (ribozyme) is often also regarded as enzymatic [goid 3824] [evidence IEA]; Catalysis of the hydrolysis of internal, alpha-peptide bonds in a polypeptide chain by a mechanism in which water acts as a nucleophile, one or two metal ions hold the water molecule in place, and charged amino acid side chains are ligands for the metal ions [goid 4222] [evidence IEA]; Interacting selectively with any metal ion [goid 46872] [evidence IEA]; Catalysis of the hydrolysis of internal, alpha-peptide bonds in a polypeptide chain by a mechanism in which water acts as a nucleophile, one or two metal ions hold the water molecule in place, and charged amino acid side chains are ligands for the metal ions [goid 4222] [pmid 7746327] [evidence TAS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Catalysis of the hydrolysis of a peptide bond. A peptide bond is a covalent bond formed when the carbon atom from the carboxyl group of one amino acid shares electrons with the nitrogen atom from the amino group of a second amino acid [goid 8233] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]
68
Interacting selectively with chromatin, the network of fibers of DNA and protein that make up the chromosomes of the eukaryotic nucleus during interphase [goid 3682] [evidence IEA]; Interacting selectively with double-

stranded DNA [goid 3690] [evidence IEA]; The function of binding to a specific DNA sequence in order to modulate transcription. The transcription factor may or may not also interact selectively with a protein or macromolecular complex [goid 3700] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II promoter; does not bind DNA itself [goid 3713] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II promoter; does not bind DNA itself [goid 3713] [pmid 15572661] [evidence NAS]; Mediates the transfer of a signal from the outside to the inside of a cell by means other than the introduction of the signal molecule itself into the cell [goid 4871] [pmid 10192393] [evidence NAS]; The action of a molecule that contributes to the structural integrity of a complex or assembly within or outside a cell [goid 5198] [evidence IEA]; Interacting selectively with a protein C-terminus, the end of any peptide chain at which the 1-carboxy function of a constituent amino acid is not attached in peptide linkage to another amino-acid residue [goid 8022] [pmid 10773885] [evidence IPI]; Interacting selectively with a transcription factor, any protein required to initiate or regulate transcription [goid 8134] [evidence IEA]; Interacting selectively with the alpha subunit of the catenin complex [goid 45294] [evidence IEA]; Interacting selectively with cadherin, a type I membrane protein involved in cell adhesion [goid 45296] [evidence IEA]; Interacting selectively with an androgen receptor [goid 50681] [pmid 15572661] [evidence NAS]
89
Interacting selectively with chromatin, the network of fibers of DNA and protein that make up the chromosomes of the eukaryotic nucleus during interphase [goid 3682] [evidence IEA]; Interacting selectively with double-stranded DNA [goid 3690] [evidence IEA]; The function of binding to a specific DNA sequence in order to modulate transcription. The transcription factor may or may not also interact selectively with a protein or macromolecular complex [goid 3700] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II promoter; does not bind DNA itself [goid 3713] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II promoter; does not bind DNA itself [goid 3713] [pmid 15572661] [evidence NAS]; Mediates the transfer of a signal from the outside to the inside of a cell by means other than the introduction of the signal molecule itself into the cell [goid 4871] [pmid 10192393] [evidence NAS]; The action of a molecule that contributes to the structural integrity of a complex or assembly within or outside a cell [goid 5198] [evidence IEA]; Interacting selectively with a protein C-terminus, the end of any peptide chain at which the 1-carboxy function of a constituent amino acid is not attached in peptide linkage to another amino-acid residue [goid 8022] [pmid 10773885] [evidence IPI]; Interacting selectively with a transcription factor, any protein required to initiate or regulate transcription [goid 8134] [evidence IEA]; Interacting selectively with the alpha subunit of the catenin complex [goid 45294] [evidence IEA]; Interacting selectively with cadherin, a type I membrane protein involved in cell adhesion [goid 45296] [evidence IEA]; Interacting selectively with an androgen receptor [goid 50681] [pmid 15572661] [evidence NAS]

82
Interacting selectively with chromatin, the network of fibers of DNA and protein that make up the chromosomes of the eukaryotic nucleus during interphase [goid 3682] [evidence IEA]; Interacting selectively with double-stranded DNA [goid 3690] [evidence IEA]; The function of binding to a specific DNA sequence in order to modulate transcription. The transcription factor may or may not also interact selectively with a protein or macromolecular complex [goid 3700] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II promoter; does not bind DNA itself [goid 3713] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II promoter; does not bind DNA itself [goid 3713] [pmid 15572661] [evidence NAS]; Mediates the transfer of a signal from the outside to the inside of a cell by means other than the introduction of the signal molecule itself into the cell [goid 4871] [pmid 10192393] [evidence NAS]; The action of a molecule that contributes to the structural integrity of a complex or assembly within or outside a cell [goid 5198] [evidence IEA]; Interacting selectively with a protein C-terminus, the end of any peptide chain at which the 1-carboxy function of a constituent amino acid is not attached in peptide linkage to another amino-acid residue [goid 8022] [pmid 10773885] [evidence IPI]; Interacting selectively with a transcription factor, any protein required to initiate or regulate transcription [goid 8134] [evidence IEA]; Interacting selectively with the alpha subunit of the catenin complex [goid 45294] [evidence IEA]; Interacting selectively with cadherin, a type I membrane protein involved in cell adhesion [goid 45296] [evidence IEA]; Interacting selectively with an androgen receptor [goid 50681] [pmid 15572661] [evidence NAS]
231
Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 2261642] [evidence ISS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 12376554] [evidence TAS]; The action of a molecule that contributes to the structural integrity of a cytoskeletal structure [goid 5200] [pmid 3282674] [evidence TAS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any

protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [pmid 16000376] [evidence IPI]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 16000376] [evidence IDA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 3287171] [evidence TAS]; Interacting selectively with the enzyme nitric-oxide synthase [goid 50998] [pmid 7545544] [evidence ISS]
210
Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 2261642] [evidence ISS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 12376554] [evidence TAS]; The action of a molecule that contributes to the structural integrity of a cytoskeletal structure [goid 5200] [pmid 3282674] [evidence TAS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [pmid 16000376] [evidence IPI]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 16000376] [evidence IDA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 3287171] [evidence TAS]; Interacting selectively with the enzyme nitric-oxide synthase [goid 50998] [pmid 7545544] [evidence ISS]
96
Interacting selectively with chromatin, the network of fibers of DNA and protein that make up the chromosomes of the eukaryotic nucleus during interphase [goid 3682] [evidence IEA]; Interacting selectively with double-stranded DNA [goid 3690] [evidence IEA]; The function of binding to a specific DNA sequence in order to modulate transcription. The transcription factor may or may not also interact selectively with a protein or macromolecular complex [goid 3700] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II promoter; does not bind DNA itself [goid 3713] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA

polymerase II promoter; does not bind DNA itself [goid 3713] [pmid 15572661] [evidence NAS]; Mediates the transfer of a signal from the outside to the inside of a cell by means other than the introduction of the signal molecule itself into the cell [goid 4871] [pmid 10192393] [evidence NAS]; The action of a molecule that contributes to the structural integrity of a complex or assembly within or outside a cell [goid 5198] [evidence IEA]; Interacting selectively with a protein C-terminus, the end of any peptide chain at which the 1-carboxy function of a constituent amino acid is not attached in peptide linkage to another amino-acid residue [goid 8022] [pmid 10773885] [evidence IPI]; Interacting selectively with a transcription factor, any protein required to initiate or regulate transcription [goid 8134] [evidence IEA]; Interacting selectively with the alpha subunit of the catenin complex [goid 45294] [evidence IEA]; Interacting selectively with cadherin, a type I membrane protein involved in cell adhesion [goid 45296] [evidence IEA]; Interacting selectively with an androgen receptor [goid 50681] [pmid 15572661] [evidence NAS]
140
Interacting selectively with a nucleotide, any compound consisting of a nucleoside that is esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose moiety [goid 166] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; Interacting selectively with an RNA molecule or a portion thereof [goid 3723] [evidence IEA]; Catalysis of the reaction: ATP + H2O = ADP + phosphate, driving the unwinding of the DNA helix [goid 4003] [evidence IEA]; Interacting selectively with ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator [goid 5524] [evidence IEA]; Catalysis of the hydrolysis of various bonds, e.g. C-O, C-N, C-C, phosphoric anhydride bonds, etc. Hydrolase is the systematic name for any enzyme of EC class 3 [goid 16787] [evidence IEA]; Catalysis of the hydrolysis of any acid anhydride which contains phosphorus [goid 16818] [evidence IEA]
397
NA
361
NA
286
NA
61
Interacting selectively with chromatin, the network of fibers of DNA and protein that make up the chromosomes of the eukaryotic nucleus during interphase [goid 3682] [evidence IEA]; Interacting selectively with double-stranded DNA [goid 3690] [evidence IEA]; The function of binding to a specific DNA sequence in order to modulate transcription. The transcription factor may or may not also interact selectively with a protein or macromolecular complex [goid 3700] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II promoter; does not bind DNA itself [goid 3713] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II promoter; does not bind DNA itself [goid 3713] [pmid 15572661] [evidence NAS]; Mediates the transfer of a signal from the outside to the inside of a cell by means other than the introduction of the signal molecule

itself into the cell [goid 4871] [pmid 10192393] [evidence NAS]; The action of a molecule that contributes to the structural integrity of a complex or assembly within or outside a cell [goid 5198] [evidence IEA]; Interacting selectively with a protein C-terminus, the end of any peptide chain at which the 1-carboxy function of a constituent amino acid is not attached in peptide linkage to another amino-acid residue [goid 8022] [pmid 10773885] [evidence IPI]; Interacting selectively with a transcription factor, any protein required to initiate or regulate transcription [goid 8134] [evidence IEA]; Interacting selectively with the alpha subunit of the catenin complex [goid 45294] [evidence IEA]; Interacting selectively with cadherin, a type I membrane protein involved in cell adhesion [goid 45296] [evidence IEA]; Interacting selectively with an androgen receptor [goid 50681] [pmid 15572661] [evidence NAS]
516
NA
33
The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [pmid 2236018] [evidence TAS]
551
Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 8696340] [evidence TAS]
445
NA
474
NA
331
NA
559
Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 8696340] [evidence TAS]
530
NA
259
NA
429
NA
252
Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA];

Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 2261642] [evidence ISS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 12376554] [evidence TAS]; The action of a molecule that contributes to the structural integrity of a cytoskeletal structure [goid 5200] [pmid 3282674] [evidence TAS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [pmid 16000376] [evidence IPI]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 16000376] [evidence IDA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 3287171] [evidence TAS]; Interacting selectively with the enzyme nitric-oxide synthase [goid 50998] [pmid 7545544] [evidence ISS]
268
NA
19
The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [pmid 2236018] [evidence TAS]
340
NA
405
NA
245
Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515]

[evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 2261642] [evidence ISS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 12376554] [evidence TAS]; The action of a molecule that contributes to the structural integrity of a cytoskeletal structure [goid 5200] [pmid 3282674] [evidence TAS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [pmid 16000376] [evidence IPI]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 16000376] [evidence IDA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 3287171] [evidence TAS]; Interacting selectively with the enzyme nitric-oxide synthase [goid 50998] [pmid 7545544] [evidence ISS]
322
NA
375
NA
382
NA
591
Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 8696340] [evidence TAS]
47
The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [pmid 2236018] [evidence TAS]
575

Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 8696340] [evidence TAS]
313
NA
495
NA
170
Interacting selectively with a nucleotide, any compound consisting of a nucleoside that is esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose moiety [goid 166] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; Interacting selectively with an RNA molecule or a portion thereof [goid 3723] [evidence IEA]; Catalysis of the reaction: ATP + H2O = ADP + phosphate, driving the unwinding of the DNA helix [goid 4003] [evidence IEA]; Interacting selectively with ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator [goid 5524] [evidence IEA]; Catalysis of the hydrolysis of various bonds, e.g. C-O, C-N, C-C, phosphoric anhydride bonds, etc. Hydrolase is the systematic name for any enzyme of EC class 3 [goid 16787] [evidence IEA]; Catalysis of the hydrolysis of any acid anhydride which contains phosphorus [goid 16818] [evidence IEA]
460
NA
437
NA
502
NA
509
NA
467
NA
150
Interacting selectively with a nucleotide, any compound consisting of a nucleoside that is esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose moiety [goid 166] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; Interacting selectively with an RNA molecule or a portion thereof [goid 3723] [evidence IEA]; Catalysis of the reaction: ATP + H2O = ADP + phosphate, driving the unwinding of the DNA helix [goid 4003] [evidence IEA]; Interacting selectively with ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator [goid 5524] [evidence IEA]; Catalysis of the hydrolysis of various bonds, e.g. C-O, C-N, C-C, phosphoric anhydride bonds, etc. Hydrolase is the systematic name for any enzyme of EC class 3 [goid 16787] [evidence IEA]; Catalysis of the hydrolysis of any acid anhydride which contains phosphorus [goid 16818] [evidence IEA]
75
Interacting selectively with chromatin, the network of fibers of DNA and protein that make up the chromosomes of the eukaryotic nucleus during interphase [goid 3682] [evidence IEA]; Interacting selectively with double-

stranded DNA [goid 3690] [evidence IEA]; The function of binding to a specific DNA sequence in order to modulate transcription. The transcription factor may or may not also interact selectively with a protein or macromolecular complex [goid 3700] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II promoter; does not bind DNA itself [goid 3713] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II promoter; does not bind DNA itself [goid 3713] [pmid 15572661] [evidence NAS]; Mediates the transfer of a signal from the outside to the inside of a cell by means other than the introduction of the signal molecule itself into the cell [goid 4871] [pmid 10192393] [evidence NAS]; The action of a molecule that contributes to the structural integrity of a complex or assembly within or outside a cell [goid 5198] [evidence IEA]; Interacting selectively with a protein C-terminus, the end of any peptide chain at which the 1-carboxy function of a constituent amino acid is not attached in peptide linkage to another amino-acid residue [goid 8022] [pmid 10773885] [evidence IPI]; Interacting selectively with a transcription factor, any protein required to initiate or regulate transcription [goid 8134] [evidence IEA]; Interacting selectively with the alpha subunit of the catenin complex [goid 45294] [evidence IEA]; Interacting selectively with cadherin, a type I membrane protein involved in cell adhesion [goid 45296] [evidence IEA]; Interacting selectively with an androgen receptor [goid 50681] [pmid 15572661] [evidence NAS]
295
NA
180
Interacting selectively with a nucleotide, any compound consisting of a nucleoside that is esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose moiety [goid 166] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; Interacting selectively with an RNA molecule or a portion thereof [goid 3723] [evidence IEA]; Catalysis of the reaction: ATP + H2O = ADP + phosphate, driving the unwinding of the DNA helix [goid 4003] [evidence IEA]; Interacting selectively with ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator [goid 5524] [evidence IEA]; Catalysis of the hydrolysis of various bonds, e.g. C-O, C-N, C-C, phosphoric anhydride bonds, etc. Hydrolase is the systematic name for any enzyme of EC class 3 [goid 16787] [evidence IEA]; Catalysis of the hydrolysis of any acid anhydride which contains phosphorus [goid 16818] [evidence IEA]
389
NA
103
Interacting selectively with chromatin, the network of fibers of DNA and protein that make up the chromosomes of the eukaryotic nucleus during interphase [goid 3682] [evidence IEA]; Interacting selectively with double-stranded DNA [goid 3690] [evidence IEA]; The function of binding to a specific DNA sequence in order to modulate transcription. The transcription factor may or may not also interact selectively with a protein or macromolecular complex [goid 3700] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II

promoter; does not bind DNA itself [goid 3713] [evidence IEA]; The function of a transcription cofactor that activates transcription from a RNA polymerase II promoter; does not bind DNA itself [goid 3713] [pmid 15572661] [evidence NAS]; Mediates the transfer of a signal from the outside to the inside of a cell by means other than the introduction of the signal molecule itself into the cell [goid 4871] [pmid 10192393] [evidence NAS]; The action of a molecule that contributes to the structural integrity of a complex or assembly within or outside a cell [goid 5198] [evidence IEA]; Interacting selectively with a protein C-terminus, the end of any peptide chain at which the 1-carboxy function of a constituent amino acid is not attached in peptide linkage to another amino-acid residue [goid 8022] [pmid 10773885] [evidence IPI]; Interacting selectively with a transcription factor, any protein required to initiate or regulate transcription [goid 8134] [evidence IEA]; Interacting selectively with the alpha subunit of the catenin complex [goid 45294] [evidence IEA]; Interacting selectively with cadherin, a type I membrane protein involved in cell adhesion [goid 45296] [evidence IEA]; Interacting selectively with an androgen receptor [goid 50681] [pmid 15572661] [evidence NAS]
413
NA
523
NA
421
NA
40
The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [pmid 2236018] [evidence TAS]
607
Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 8696340] [evidence TAS]
453
NA
599
Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 8696340] [evidence TAS]
12
The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or

proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [pmid 2236018] [evidence TAS]
583
Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 8696340] [evidence TAS]
190
Interacting selectively with a nucleotide, any compound consisting of a nucleoside that is esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose moiety [goid 166] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; Interacting selectively with an RNA molecule or a portion thereof [goid 3723] [evidence IEA]; Catalysis of the reaction: ATP + H2O = ADP + phosphate, driving the unwinding of the DNA helix [goid 4003] [evidence IEA]; Interacting selectively with ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator [goid 5524] [evidence IEA]; Catalysis of the hydrolysis of various bonds, e.g. C-O, C-N, C-C, phosphoric anhydride bonds, etc. Hydrolase is the systematic name for any enzyme of EC class 3 [goid 16787] [evidence IEA]; Catalysis of the hydrolysis of any acid anhydride which contains phosphorus [goid 16818] [evidence IEA]
481
NA
54
The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [pmid 2236018] [evidence TAS]
160
Interacting selectively with a nucleotide, any compound consisting of a nucleoside that is esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose moiety [goid 166] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; Interacting selectively with an RNA molecule or a portion thereof [goid 3723] [evidence IEA]; Catalysis of the reaction: ATP + H2O = ADP + phosphate, driving the unwinding of the DNA helix [goid 4003] [evidence IEA]; Interacting selectively with ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator [goid 5524] [evidence

IEA]; Catalysis of the hydrolysis of various bonds, e.g. C-O, C-N, C-C, phosphoric anhydride bonds, etc. Hydrolase is the systematic name for any enzyme of EC class 3 [goid 16787] [evidence IEA]; Catalysis of the hydrolysis of any acid anhydride which contains phosphorus [goid 16818] [evidence IEA]
304
NA
224
Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 2261642] [evidence ISS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 12376554] [evidence TAS]; The action of a molecule that contributes to the structural integrity of a cytoskeletal structure [goid 5200] [pmid 3282674] [evidence TAS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [pmid 16000376] [evidence IPI]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 16000376] [evidence IDA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 3287171] [evidence TAS]; Interacting selectively with the enzyme nitric-oxide synthase [goid 50998] [pmid 7545544] [evidence ISS]
200
Interacting selectively with a nucleotide, any compound consisting of a nucleoside that is esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose moiety [goid 166] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; Interacting selectively with an RNA molecule or a portion thereof [goid 3723] [evidence IEA]; Catalysis of the reaction: ATP + H2O = ADP + phosphate, driving the unwinding of the DNA helix [goid 4003] [evidence IEA]; Interacting selectively with ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator [goid 5524] [evidence IEA]; Catalysis of the hydrolysis of various bonds, e.g. C-O, C-N, C-C, phosphoric anhydride bonds, etc. Hydrolase is the systematic name for any enzyme of EC class 3 [goid 16787] [evidence IEA]; Catalysis of the hydrolysis

of any acid anhydride which contains phosphorus [goid 16818] [evidence IEA]
544
NA
217
Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 2261642] [evidence ISS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 12376554] [evidence TAS]; The action of a molecule that contributes to the structural integrity of a cytoskeletal structure [goid 5200] [pmid 3282674] [evidence TAS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [pmid 16000376] [evidence IPI]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 16000376] [evidence IDA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 3287171] [evidence TAS]; Interacting selectively with the enzyme nitric-oxide synthase [goid 50998] [pmid 7545544] [evidence ISS]
120
Interacting selectively with a nucleotide, any compound consisting of a nucleoside that is esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose moiety [goid 166] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; Interacting selectively with an RNA molecule or a portion thereof [goid 3723] [evidence IEA]; Catalysis of the reaction: ATP + H2O = ADP + phosphate, driving the unwinding of the DNA helix [goid 4003] [evidence IEA]; Interacting selectively with ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator [goid 5524] [evidence IEA]; Catalysis of the hydrolysis of various bonds, e.g. C-O, C-N, C-C, phosphoric anhydride bonds, etc. Hydrolase is the systematic name for any enzyme of EC class 3 [goid 16787] [evidence IEA]; Catalysis of the hydrolysis of any acid anhydride which contains phosphorus [goid 16818] [evidence IEA]
110
Interacting selectively with a nucleotide, any compound consisting of a

nucleoside that is esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose moiety [goid 166] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; Interacting selectively with an RNA molecule or a portion thereof [goid 3723] [evidence IEA]; Catalysis of the reaction: ATP + H2O = ADP + phosphate, driving the unwinding of the DNA helix [goid 4003] [evidence IEA]; Interacting selectively with ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator [goid 5524] [evidence IEA]; Catalysis of the hydrolysis of various bonds, e.g. C-O, C-N, C-C, phosphoric anhydride bonds, etc. Hydrolase is the systematic name for any enzyme of EC class 3 [goid 16787] [evidence IEA]; Catalysis of the hydrolysis of any acid anhydride which contains phosphorus [goid 16818] [evidence IEA]
130
Interacting selectively with a nucleotide, any compound consisting of a nucleoside that is esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose moiety [goid 166] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; Interacting selectively with an RNA molecule or a portion thereof [goid 3723] [evidence IEA]; Catalysis of the reaction: ATP + H2O = ADP + phosphate, driving the unwinding of the DNA helix [goid 4003] [evidence IEA]; Interacting selectively with ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator [goid 5524] [evidence IEA]; Catalysis of the hydrolysis of various bonds, e.g. C-O, C-N, C-C, phosphoric anhydride bonds, etc. Hydrolase is the systematic name for any enzyme of EC class 3 [goid 16787] [evidence IEA]; Catalysis of the hydrolysis of any acid anhydride which contains phosphorus [goid 16818] [evidence IEA]
368
NA
537
NA
277
NA
488
NA
238
Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 2261642] [evidence ISS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA];

Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [pmid 12376554] [evidence TAS]; The action of a molecule that contributes to the structural integrity of a cytoskeletal structure [goid 5200] [pmid 3282674] [evidence TAS]; Interacting selectively with calcium ions (Ca2+) [goid 5509] [evidence IEA]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [pmid 16000376] [evidence IPI]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 16000376] [evidence IDA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 3287171] [evidence TAS]; Interacting selectively with the enzyme nitric-oxide synthase [goid 50998] [pmid 7545544] [evidence ISS]
354
NA
26
The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [evidence IEA]; The function that stimulates a cell to grow or proliferate. Most growth factors have other actions besides the induction of cell growth or proliferation [goid 8083] [pmid 2236018] [evidence TAS]
567
Interacting selectively with monomeric or multimeric forms of actin, including actin filaments [goid 3779] [evidence IEA]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 8696340] [evidence TAS]
347
NA
1
Interacting selectively with a nucleotide, any compound consisting of a nucleoside that is esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose moiety [goid 166] [evidence IEA]; Interacting selectively with ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator [goid 5524] [evidence IEA]; Catalysis of the reaction: ATP + H2O = ADP + phosphate. May or may not be coupled to another reaction [goid 16887] [evidence IEA]; Catalysis of the reaction: ATP + H2O = ADP + phosphate to directly drive the active transport of a substance across a membrane [goid 42626] [pmid 12379217] [evidence IDA]
3
Catalysis of the reaction: an alcohol + NAD+ = an aldehyde or ketone + NADH + H+ requiring the presence of zinc [goid 4024] [pmid 2935875] [evidence NAS]; Catalysis of the reaction: an alcohol + NAD+ = an aldehyde or ketone + NADH + H+ requiring the presence of zinc [goid 4024] [pmid 9982] [evidence EXP]; The

selective, often stoichiometric, interaction of a molecule with one or more specific sites on another molecule [goid 5488] [evidence IEA]; Interacting selectively with zinc (Zn) ions [goid 8270] [evidence IEA]; Catalysis of an oxidation-reduction (redox) reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate acts as a hydrogen or electron donor and becomes oxidized, while the other acts as hydrogen or electron acceptor and becomes reduced [goid 16491] [evidence IEA]; Interacting selectively with any metal ion [goid 46872] [evidence IEA]
6
The function of binding to a specific DNA sequence in order to modulate transcription. The transcription factor may or may not also interact selectively with a protein or macromolecular complex [goid 3700] [evidence IEA]; Functions to enable the transcription of specific, or specific sets, of genes by RNA polymerase II [goid 3704] [pmid 10918580] [evidence TAS]; Interacting selectively with DNA of a specific nucleotide composition, e.g. GC-rich DNA binding, or with a specific sequence motif or type of DNA e.g. promotor binding or rDNA binding [goid 43565] [evidence IEA]; The formation of a protein dimer, a macromolecular structure consists of two noncovalently associated identical or nonidentical subunits [goid 46983] [evidence IEA]
7 Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; The function of binding to a specific DNA sequence in order to modulate transcription. The transcription factor may or may not also interact selectively with a protein or macromolecular complex [goid 3700] [evidence IEA]; Catalysis of the hydrolysis of internal, alpha-peptide bonds in a polypeptide chain by a catalytic mechanism that involves a catalytic triad consisting of a serine nucleophile that is activated by a proton relay involving an acidic residue (e.g. aspartate or glutamate) and a basic residue (usually histidine) [goid 4252] [evidence IEA]; Interacting selectively with DNA of a specific nucleotide composition, e.g. GC-rich DNA binding, or with a specific sequence motif or type of DNA e.g. promotor binding or rDNA binding [goid 43565] [evidence IEA]; The formation of a protein dimer, a macromolecular structure consists of two noncovalently associated identical or nonidentical subunits [goid 46983] [evidence IEA]; Catalysis of the hydrolysis of internal, alpha-peptide bonds in a polypeptide chain by a catalytic mechanism that involves a catalytic triad consisting of a serine nucleophile that is activated by a proton relay involving an acidic residue (e.g. aspartate or glutamate) and a basic residue (usually histidine) [goid 4252] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; Catalysis of the hydrolysis of internal, alpha-peptide bonds in a polypeptide chain by a catalytic mechanism that involves a catalytic triad consisting of a serine nucleophile that is activated by a proton relay involving an acidic residue (e.g. aspartate or glutamate) and a basic residue (usually histidine) [goid 4252] [evidence IEA]; The function of binding to a specific DNA sequence in order to modulate transcription. The transcription factor may or may not also interact selectively with a protein or macromolecular complex [goid 3700] [evidence IEA]; Catalysis of the hydrolysis of internal, alpha-peptide bonds in a polypeptide chain by a catalytic mechanism that involves a catalytic triad consisting of a serine nucleophile that is activated by a proton relay

involving an acidic residue (e.g. aspartate or glutamate) and a basic residue (usually histidine) [goid 4252] [evidence IEA]; Interacting selectively with DNA of a specific nucleotide composition, e.g. GC-rich DNA binding, or with a specific sequence motif or type of DNA e.g. promotor binding or rDNA binding [goid 43565] [evidence IEA]; The formation of a protein dimer, a macromolecular structure consists of two noncovalently associated identical or nonidentical subunits [goid 46983] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; Interacting selectively with DNA (deoxyribonucleic acid) [goid 3677] [evidence IEA]; The function of binding to a specific DNA sequence in order to modulate transcription. The transcription factor may or may not also interact selectively with a protein or macromolecular complex [goid 3700] [evidence IEA]; Catalysis of the hydrolysis of internal, alpha-peptide bonds in a polypeptide chain by a catalytic mechanism that involves a catalytic triad consisting of a serine nucleophile that is activated by a proton relay involving an acidic residue (e.g. aspartate or glutamate) and a basic residue (usually histidine) [goid 4252] [evidence IEA]; Interacting selectively with a transcription factor, any protein required to initiate or regulate transcription [goid 8134] [pmid 1900040] [evidence TAS]; Interacting selectively with DNA of a specific nucleotide composition, e.g. GC-rich DNA binding, or with a specific sequence motif or type of DNA e.g. promotor binding or rDNA binding [goid 43565] [evidence IEA]; The formation of a protein dimer, a macromolecular structure consists of two noncovalently associated identical or nonidentical subunits [goid 46983] [evidence IEA]
9
The action of a molecule that contributes to the structural integrity of a cytoskeletal structure [goid 5200] [pmid 2448790] [evidence TAS]; Interacting selectively with any protein or protein complex (a complex of two or more proteins that may include other nonprotein molecules) [goid 5515] [pmid 16000376] [evidence IPI]; The action of a molecule that contributes to the structural integrity of a muscle fiber [goid 8307] [pmid 16000376] [evidence IDA]

	UL_Mean	UL_Median	UL_max	UL_min	UL_stdError	nonUL_Mean
8	3029.47099	2566.70960	6548.8160	156.8375	1948.881925	167.75283
11	1798.43589	237.77900	26134.7105	48.2000	5783.331140	120.28719
2	4693.51823	4880.45350	13992.2647	110.2923	3328.786114	392.30767
4	946.43653	249.44395	5799.7170	54.7250	1542.062890	87.41913
10	4767.68624	3652.14300	15286.3475	235.9674	4029.714871	442.19991
68	2837.66688	2748.51615	4742.3000	56.6000	1208.420540	1808.60279
89	2275.74086	2113.89070	4482.6000	70.6800	968.342631	1492.45321
82	74.98330	68.77500	171.9286	48.0000	29.192952	59.97223
231	496.82873	472.21140	1047.9697	143.9235	287.075366	414.79034
210	195.26896	191.62325	332.4777	66.7000	76.102492	172.31262
96	72.51520	70.39050	108.7714	54.1000	13.805423	65.33632
140	68.49114	61.18570	167.0652	53.7500	24.785042	61.83367
397	69.96363	65.63075	138.4923	53.0000	19.460702	63.76606
361	67.07152	59.65210	197.1143	53.1000	31.087042	62.24428
286	112.55259	109.89355	278.5458	55.1000	48.406572	104.58035
61	55.09052	53.58750	72.2000	48.4000	6.702562	51.29398
516	5600.10806	5647.71870	10322.8498	2220.1705	1907.742762	5243.14439

```
## 33    96.65178   88.19665   216.9526   76.2522   29.991848   92.47793
## 551   53.39750   53.50000    61.0000   47.4000    3.052631   51.17759
## 445   64.80976   63.20715    99.8444   55.6250    9.196416   62.81337
## 474   53.45508   52.51250    63.0000   48.9500    3.561771   51.94167
## 331   43.26944   43.39930    50.2000   37.7842    2.909360   42.21236
## 559   53.59325   53.20000    58.1000   49.8000    2.262894   52.31796
## 530   48.08322   47.80000    52.6000   44.2000    2.023506   46.96833
## 259   58.24149   58.08095    77.1000   49.5333    5.670628   57.02908
## 429   61.35489   61.22500    84.8529   49.5333    6.818899   60.12361
## 252   49.93158   49.83750    55.8500   45.9600    2.358168   48.94019
## 268   55.17789   55.38750    59.9250   49.3000    2.895990   54.35815
## 19    62.14353   61.41250    71.0000   51.5000    4.540241   61.30031
## 340   56.40121   55.67000    73.4125   49.4667    5.206750   55.66129
## 405   67.47304   65.40000    79.9091   60.7000    5.854482   66.74623
## 245   46.88287   47.47500    49.0000   43.7333    1.922848   46.41795
## 322   64.50078   65.12000    78.0545   49.7000    6.721143   63.87193
## 375   51.75516   51.52000    59.8000   47.5000    2.844548   51.27796
## 382   48.98375   49.25000    53.9000   45.2000    2.177753   48.54121
## 591   53.42019   53.80000    58.5889   46.7750    2.888729   53.03842
## 47    50.86091   50.71750    57.0000   46.5333    2.809128   50.51851
## 575   50.52191   49.23750    56.0000   46.5750    2.639068   50.30787
## 313   52.34083   52.40000    55.1000   49.4667    1.536173   52.13982
## 495   52.84333   52.67500    57.6500   48.5000    2.520176   52.65092
## 170   69.70767   66.95000    95.7375   58.6778   10.302655   69.57139
## 460   52.02750   52.45000    58.9000   44.4000    3.226369   52.00121
## 437   53.66792   53.92500    59.9250   47.4333    3.062409   53.67445
## 502   53.76566   54.26750    59.7000   48.7333    2.896536   53.81129
## 509   58.71589   58.63335    66.8000   52.3000    4.088107   58.82122
## 467   58.07492   57.68000    65.3000   52.0000    3.531079   58.18135
## 150   53.20708   52.65000    61.4000   48.1000    3.505811   53.31203
## 75    48.18238   47.93750    54.6000   43.8500    2.930155   48.29306
## 295   59.03216   57.58750    72.2600   54.9500    4.213190   59.16944
## 180   58.95318   57.95000    67.8000   54.6000    3.782996   59.16567
## 389   51.19490   51.12500    62.7714   43.5000    4.360474   51.51667
## 103   62.67426   61.58750    72.3125   57.5500    4.396588   63.11468
## 413   52.29933   51.93330    60.4250   46.5750    3.070970   52.67917
## 523   46.55006   46.41665    49.9000   43.1727    1.944349   46.90634
## 421   61.00845   60.73750    73.5545   55.7000    4.538682   61.49063
## 40    60.55615   60.53810    69.0500   52.5000    3.983882   61.09781
## 607   54.73633   54.53750    61.1000   48.4500    3.150015   55.46407
## 453   44.86078   44.58335    51.2000   41.3000    2.373286   45.46520
## 599   47.43136   47.80000    53.7500   40.5889    3.361526   48.10310
## 12    57.54948   57.04000    65.8000   51.5750    3.727915   58.59402
## 583   64.72897   63.95880    74.4636   59.1500    4.168145   65.93814
## 190   48.31075   48.50000    55.2000   41.0900    3.386435   49.32917
## 481   64.97817   65.65835    77.1000   56.8000    4.374740   66.36158
## 54    55.06237   54.57500    67.1000   46.5000    4.046009   56.37111
## 160   56.95685   58.13335    62.1333   47.4333    4.246677   58.34002
## 304   50.49900   50.55000    56.3750   44.7000    3.164492   51.85991
## 224   48.13375   48.48335    52.3000   42.3000    2.654931   49.44157
```

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## 200   60.23032   60.01665    70.4667   49.0000    5.836708   61.92870
## 544   52.44000   52.27500    60.4250   45.4800    3.552792   54.01190
## 217   44.01056   44.09445    47.1500   39.9429    2.107349   45.37224
## 120   48.54336   48.63335    55.2000   42.0724    3.260805   50.07352
## 110   47.02365   46.88750    52.6000   41.2629    2.757938   48.61713
## 130   45.84380   45.67000    51.3000   41.6757    2.660697   47.43316
## 368  289.37962  282.25600   431.4289  191.1000   65.063620  303.14563
## 537   49.27041   49.10000    56.8000   41.8600    3.429174   51.70408
## 277   71.80078   68.69445   101.6700   53.3000   12.784396   76.32903
## 488   60.70222   60.81250    65.6750   56.7600    2.717594   64.63102
## 238  145.29765  129.74480   302.9993   47.4333   67.438855  160.58719
## 354   51.98584   51.97500    57.0000   48.6000    2.021060   57.79109
## 26    67.60429   62.84050   129.1656   50.2000   19.025156   79.34167
## 567  308.98819  268.45535   777.6495   57.5000  172.575865  407.57965
## 347   94.02826   72.51865   186.8900   52.9000   42.533158  198.08489
## 1    143.26501   99.09570   628.2257   56.0500  126.174768  724.33959
## 3    608.72580  545.49945  1947.6415   54.3500  476.168519 3102.90066
## 6   1287.12204  805.15510  7335.1691  220.6810 1573.123791 6916.73077
## 7    205.90749   70.82730  2290.1261   53.1000  493.979332 1142.67872
## 9    130.48702   85.61230   311.2020   45.6000   90.604507  815.61118
##     nonUL_Median  nonUL_max nonUL_min nonUL_stdError
foldChange_UL_to_nonUL
## 8      116.83410   514.9222   63.1000     127.909429
18.0591346
## 11      71.88335   431.7050   54.2000      98.670547
14.9511840
## 2      332.26735   830.2335  169.4130     197.473243
11.9638706
## 4       52.70835   669.4027   47.3000     145.296800
10.8264232
## 10     308.24915  1683.5592   75.9750     430.963620
10.7817440
## 68    1745.71980  2641.8803 1300.1667     370.554205
1.5689829
## 89    1442.43415  1978.2444 1091.4076     261.380224
1.5248323
## 82      59.27665    79.3826   46.9400       9.767559
1.2503004
## 231    428.12710   881.0395  138.7846     209.629717
1.1977828
## 210    155.96500   291.7330   53.0000      71.551085
1.1332249
## 96      64.87220    76.3826   57.9000       5.236224
1.1098758
## 140     60.10950    89.0692   52.0000       8.569178
1.1076674
## 397     61.52500    87.5000   51.5000       9.981240
1.0971923
## 361     58.84520    96.9636   55.3000       9.953285
1.0775532
```

```
## 286    112.30925   134.7551   57.2000      25.835665
1.0762308
## 61      51.17500    55.4000   46.3667       2.514370
1.0740152
## 516   5422.96100  7141.3800 2427.0720    1446.493766
1.0680820
## 33      91.10020   115.1938   78.6000      10.131079
1.0451334
## 551     51.13335    56.1800   44.8000       2.747570
1.0433765
## 445     62.29520    69.6824   57.7000       3.544475
1.0317830
## 474     52.26250    56.0000   46.8500       2.390038
1.0291369
## 331     42.35000    46.2000   37.9286       2.437840
1.0250419
## 559     52.47500    58.0333   48.8000       2.695263
1.0243757
## 530     46.50000    51.5000   44.1000       2.314665
1.0237370
## 259     57.21665    70.0000   50.1000       4.315949
1.0212595
## 429     59.52000    70.5077   55.0250       3.640052
1.0204791
## 252     48.70000    53.1750   46.2000       2.142392
1.0202573
## 268     55.59500    60.0000   47.6000       3.765059
1.0150804
## 19      61.12980    78.3273   53.4000       6.111869
1.0137555
## 340     55.46250    64.1333   49.3250       3.865088
1.0132932
## 405     66.00535    86.3000   60.8000       5.853534
1.0108892
## 245     45.75000    51.3000   42.4000       2.494194
1.0100160
## 322     62.17710    77.1000   49.5000       7.160511
1.0098454
## 375     51.95000    54.8600   46.5750       2.388510
1.0093062
## 382     48.92500    54.6500   44.2000       2.360514
1.0091169
## 591     53.36665    58.9833   47.7000       2.620057
1.0071980
## 47      50.63330    54.2000   47.0000       1.806287
1.0067778
## 575     50.47500    54.7000   46.2000       2.474863
1.0042547
## 313     51.78750    58.2000   48.7000       2.498547
1.0038554
```

```
## 495     51.76665    61.0000   47.0000       3.387235
1.0036545
## 170     67.62855    95.4063   61.7333       7.313426
1.0019589
## 460     51.82500    58.2600   47.4333       3.166812
1.0005056
## 437     53.54000    59.9000   48.2000       2.531984
0.9998782
## 502     53.25000    62.7200   48.4000       3.384125
0.9991520
## 509     58.12665    67.0400   53.1000       3.781781
0.9982094
## 467     57.96665    67.3143   50.8500       3.263836
0.9981707
## 150     53.10000    60.3000   47.8000       3.308762
0.9980314
## 75      48.30000    52.2000   45.6667       1.840018
0.9977081
## 295     58.91665    67.3143   52.8250       4.440312
0.9976800
## 180     59.39165    66.3455   53.1000       3.962599
0.9964084
## 389     51.27500    64.8000   44.2000       4.476270
0.9937542
## 103     62.72855    72.5000   57.5500       3.401173
0.9930219
## 413     52.33750    58.3667   46.8000       2.866071
0.9927896
## 523     47.13750    50.8500   43.0000       2.251419
0.9924044
## 421     60.68095    70.6000   54.4000       4.263805
0.9921585
## 40      61.14765    68.0000   52.6000       4.341894
0.9911345
## 607     55.40000    59.6000   51.3500       2.319682
0.9868791
## 453     46.00000    51.2000   41.4126       2.891402
0.9867059
## 599     48.77085    52.6000   44.5500       2.320774
0.9860355
## 12      57.40000    70.1385   52.5000       4.688293
0.9821732
## 583     65.43890    78.2667   55.2500       5.457407
0.9816619
## 190     48.63335    57.8333   45.9000       2.883764
0.9793547
## 481     65.19390    78.0706   58.6000       5.384019
0.9791535
## 54      56.10000    60.8000   51.7250       2.113644
0.9767836
```

```
## 160     58.54000    64.2909   50.3500       3.152763
0.9762911
## 304     52.03335    54.9200   48.5000       1.967270
0.9737579
## 224     49.00000    56.1000   45.6400       2.543181
0.9735481
## 200     60.34375    78.9600   51.6000       6.703424
0.9725752
## 544     53.50415    61.7333   45.6000       4.846406
0.9708972
## 217     45.30000    48.4000   40.5321       2.053809
0.9699886
## 120     50.21250    52.9500   43.1400       2.198487
0.9694418
## 110     48.55000    54.0500   44.9000       2.498466
0.9672238
## 130     47.48750    56.0600   43.3286       3.143226
0.9664926
## 368    294.99890   441.7725  217.1313      59.464797
0.9545894
## 537     51.27915    54.8750   48.9000       1.575015
0.9529309
## 277     77.85000   100.0345   51.6500      13.331453
0.9406746
## 488     62.71670    77.1000   52.9667       6.617064
0.9392117
## 238    163.07360   308.8505   48.8000      71.264967
0.9047898
## 354     55.97500    95.4914   48.6000      10.073407
0.8995475
## 26      67.64355   234.7167   50.8000      42.036179
0.8520654
## 567    340.58915  1131.7058  164.6000     235.263152
0.7581050
## 347    181.38175   564.7217   87.3286     117.732885
0.4746867
## 1      643.88430  1493.2380  125.9636     317.380019
0.1977871
## 3     2961.70150  7727.8238  275.2883    1833.546395
0.1961796
## 6     6722.92010 17362.0317 2406.0706    3676.049929
0.1860882
## 7      595.09105  7604.0221   92.4250    1864.525102
0.1801972
## 9      738.20585  2049.6529   57.4000     498.124885
0.1599868
```