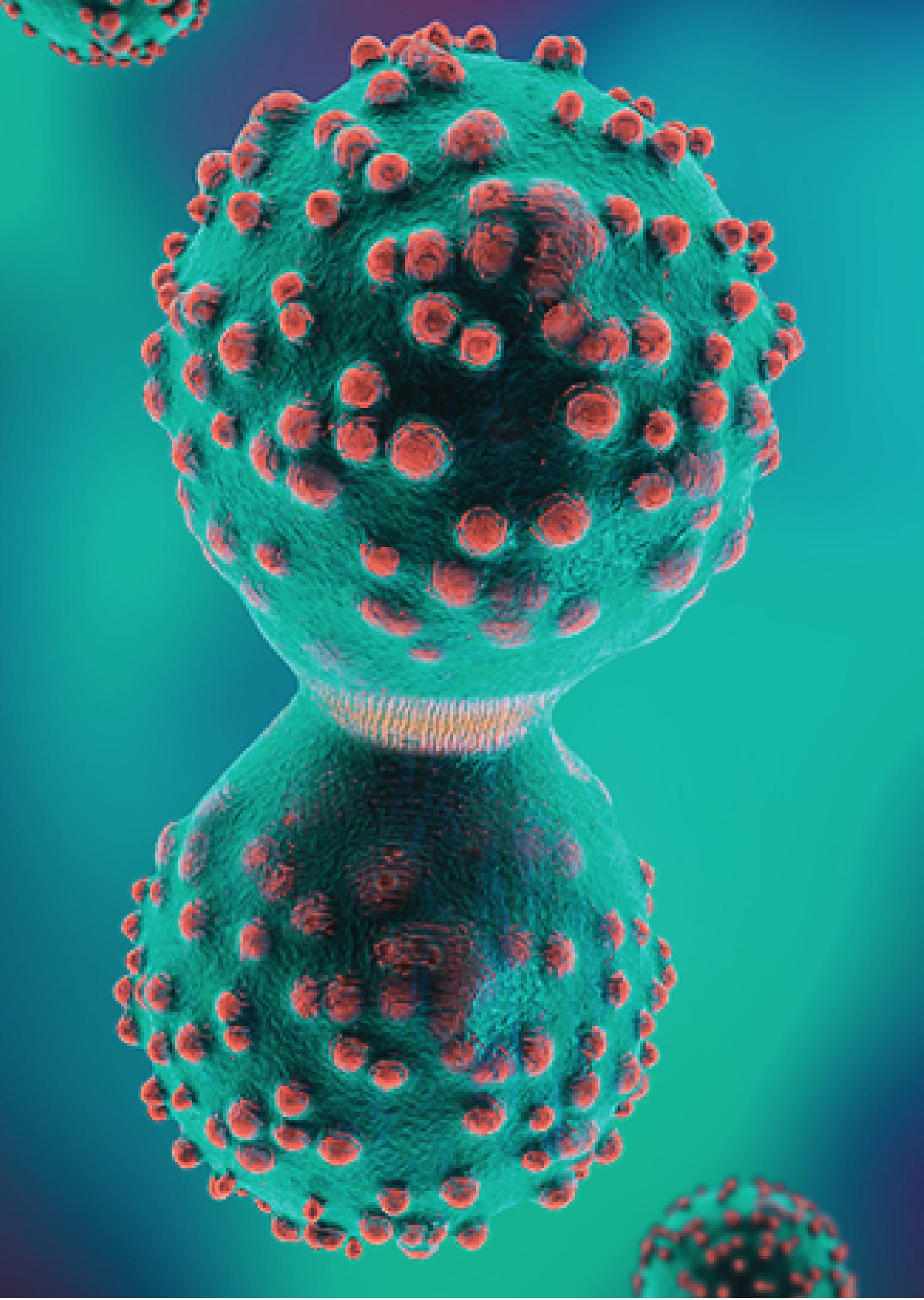


Prostate Cancer

Prof. Dr. Taysir Hassan Abdel Hamid
Scientific data management



Team Members



- ندى محمود عيد
- علياء محمد عبدالحليم
- منار عبدالحافظ محمود
- منار ماهر فتح الله
- محمد سالمان محمد
- احمد يحييا حسين



DATA DESCRIPTION

DataSet Title:

Adipocyte-driven unfolded protein response is a shared transcriptomic signature of metastatic prostate carcinoma cells

DataSet Link:

<https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSE180239>

Organism:

Homo sapiens

Accession Key:

GSE180239



DATA DESCRIPTION

Experiment type:

Number of Records:

Number of Column:

Samples:

Expression profiling by high throughput sequencing.

27470

14 col

4 Sample: control

ARCaP1
ARCaP2
ARCaP3
ARCaP4

4 Sample: Treat

ARCaP tw1
ARCaP tw2
ARCaP tw3
ARCaP tw4



DATA DESCRIPTION

Last update date:

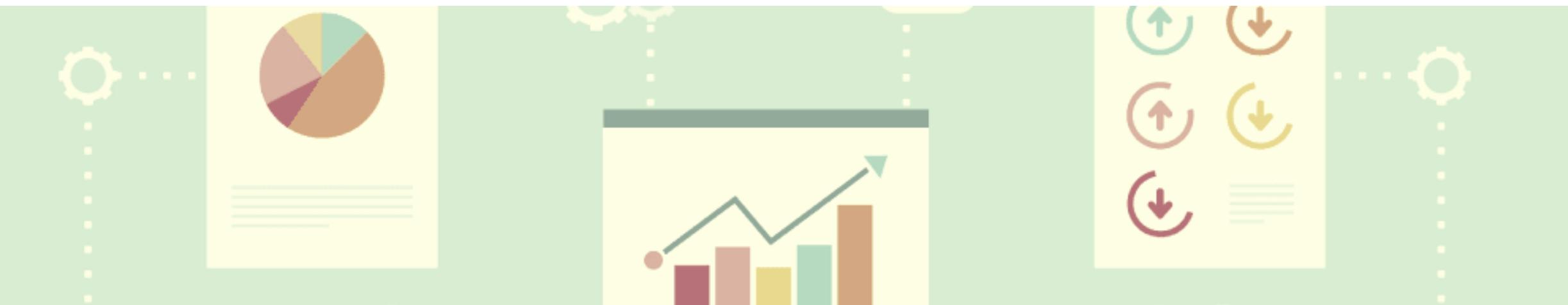
Oct 16, 2021

Submission date:

Jul 16, 2021

Last Access Date:

Dem 26, 2021 3:09PM



Before

The Number Of Records In
The Data Before Cleaning Is
27470 Records.

B

 **OpenRefine** GSE180239 ARCaP DifferentialExpression.xlsx [Permalink](#)

Facet / Filter Undo / Redo 0 / 0

27470 rows

Show as: rows records Show: 5 10 25 50 100 500 1000 rows

Using facets and filters 

Use facets and filters to select subsets of your data to act on. Choose facet and filter methods from the menus at the top of each data column.

Not sure how to get started?
[Watch these screencasts](#)

		All	Column	log2FC	logCPM	LR
1.	SEL1L	1.54862457032063	7.68573167980687	66.6728215974		
2.	DDIT3	3.23630483844543	6.30106555663568	66.348100153850		
3.	GDF15	2.71264269692306	8.11873216400235	63.696653350313		
4.	TRIB3	1.48380248542322	6.95873675904147	54.492435142988		
5.	SESN2	2.78326308383769	7.33970188348518	52.698014757361		
6.	ESRP1	6.51117737392071	3.15954886715353	50.436632051802		
7.	SLC7A11	1.84058915534676	6.60662837609425	49.979165094397		
8.	KRT19	1.29605838467414	8.48534318060947	47.732112454850		
9.	LURAP1L	3.71445505916033	3.54795082200636	46.939125141897		
10.	HERPUD1	2.55387230592427	8.13858143954269	45.414030559381		
11.	CDH15	3.87405066889264	4.51877304071296	44.942049313688		
12.	HSPA5	1.7622197389343	9.32911794672786	44.661547403080		
13.	ADM2	3.00668829984239	3.67823139053288	44.168155403800		
14.	TSPAN1	1.59062647742134	3.40504035589248	44.141325998570		
15.	CLGN	3.79157299528006	6.61834811629481	43.201430116258		
16.	BBC3	1.44385070509083	5.53604166974524	42.556764034199		
17.	CHAC1	2.55315453671217	5.99712655010299	41.674480811893		
...
48.	SLC45A2	2.0574004000000007	5.0774004000000007	40.000740040000007		

After

The Number Of Records
After Cleaning Is 27443
Records.

A

 **OpenRefine** GSE180239 ARCaP DifferentialExpression.xlsx [Permalink](#)

Facet / Filter Undo / Redo 7 / 7

27443 rows

Show as: rows records Show: 5 10 25 50 100 500 1000 rows

Using facets and filters 

Use facets and filters to select subsets of your data to act on. Choose facet and filter methods from the menus at the top of each data column.

Not sure how to get started?
[Watch these screencasts](#)

		All	Column	ARCaP 1	ARCaP 2	ARCaP 3	ARCaP 4
1.	SEL1L	648	850	741			
2.	DDIT3	89	149	173			
3.	GDF15	198	205	227			
4.	TRIB3	246	271	246			
5.	SESN2	404	580	419			
6.	ESRP1	0	0	0			
7.	SLC7A11	331	447	365			
8.	KRT19	95	63	84			
9.	LURAP1L	2	17	10			
10.	HERPUD1	611	741	703			
11.	CDH15	4	0	0			
12.	HSPA5	2458	2795	2522			
13.	ADM2	33	40	30			
14.	TSPAN1	47	47	40			
15.	CLGN	0	2	0			
16.	BBC3	510	528	590			

0 rows

Rows: rows records Show: 5 10 25 50 100 500 1000 rows

Rows: rows records Show: 5 10 25 50 100 500 1000 rows

< first < previous

	Column	log2FC	logCPM	ARCaP 1	ARCaP 2	ARCaP 3	ARCaP 4	Column	log2FC	ARCaP 1	ARCaP 2	ARCaP 3	ARCaP 4	ARCaP tw 1	ARCaP tw 2
1.	SEL1L	1.54862457032063	Facet ►	648	850	741	841	1.	SEL1L	1.54862457032063	648	850	741	841	2379
2.	DDIT3	3.23630483844543	Text filter	89	149	173	154	2.	DDIT3	3.23630483844543	89	149	173	154	1500
3.	GDF15	2.71264269692306	Edit cells ►	198	205	227	248	3.	GDF15	2.71264269692306	198	205	227	248	1412
4.	TRIB3	1.48380248542322	Edit column ►	246	271	246	415	4.	TRIB3	1.48380248542322	246	271	246	415	836
5.	SESN2	2.78326308383769	Transpose ►	Split into several columns...				5.	SESN2	2.78326308383769	404	580	419	600	3728
6.	ESRP1	6.51117737392071	Sort... ►	Join columns...				6.	ESRP1	6.51117737392071	0	0	0	0	3
7.	SLC7A11	1.84058915534676	View ►	Add column based on this column...				7.	SLC7A11	1.84058915534676	331	447	365	547	1686
8.	KRT19	1.29605838467414	Reconcile ►	Add column by fetching URLs...				8.	KRT19	1.29605838467414	95	63	84	85	213
9.	LURAP1L	3.71445505916033	Add columns from reconciled values...				9.	LURAP1L	3.71445505916033	2	17	10	7	119	
10.	HERPUD1	2.55387230592427	Rename this column				10.	HERPUD1	2.55387230592427	611	741	703	1321	5148	
11.	CDH15	3.87405066889264	Remove this column				11.	CDH15	3.87405066889264	4	0	0	0	21	
12.	HSPA5	1.7622197389343	Move column to beginning				12.	HSPA5	1.7622197389343	2458	2795	edit	2522	2986	9401
13.	ADM2	3.00668829984239	Move column to end				13.	ADM2	3.00668829984239	33	40	30	26	289	
14.	TSPAN1	1.59062647742134	Move column left				14.	TSPAN1	1.59062647742134	47	47	40	85	184	
15.	CLGN	3.79157299528006	Move column right				15.	CLGN	3.79157299528006	0	2	0	1	13	
16.	BBC3	1.44385070509083	153	224	212	116.	BBC3	1.44385070509083	510	528	590	673	1672		
17.	CHAC1	2.55315453671217	5.99712655010299	1	0	0	17.	CHAC1	2.55315453671217	106	186	77	260	1003	
18.	SLFN5	2.05971016228227	5.87719942361129	153	224	212	18.	SLFN5	2.05971016228227	153	224	212	250	887	
19.	SPOCD1	5.84721122029456	2.69178812222148	020.	PRR15	2.68488625728793	2	1	11	5	0	0	14	24	

	Column	log2FC	ARCaP 1	ARCaP 2	ARCaP 3	ARCaP 4	Column	log2FC	ARCaP 1	ARCaP 2	ARCaP 3	ARCaP 4	ARCaP tw 1	ARCaP tw 2		
1.	SEL1L	1.54862457032063	648	850	741	841	1.	SEL1L	1.54862457032063	648	850	741	841	2379		
2.	DDIT3	3.23630483844543	89	149	173	154	2.	DDIT3	3.23630483844543	89	149	173	154	1500		
3.	GDF15	2.71264269692306	198	205	227	248	3.	GDF15	2.71264269692306	198	205	227	248	1412		
4.	TRIB3	1.48380248542322	246	271	246	415	4.	TRIB3	1.48380248542322	246	271	246	415	836		
5.	SESN2	2.78326308383769	600	600	600	600	5.	SESN2	2.78326308383769	404	580	419	600	3728		
6.	ESRP1	6.51117737392071	0	0	0	0	6.	ESRP1	6.51117737392071	0	0	0	0	3		
7.	SLC7A11	1.84058915534676	547	547	547	547	7.	SLC7A11	1.84058915534676	331	447	365	547	1686		
8.	KRT19	1.29605838467414	85	85	85	85	8.	KRT19	1.29605838467414	95	63	84	85	213		
9.	LURAP1L	3.71445505916033	1321	1321	1321	1321	9.	LURAP1L	3.71445505916033	2	17	10	7	119		
10.	HERPUD1	2.55387230592427	11.	CDH15	3.87405066889264	4	10.	HERPUD1	2.55387230592427	611	741	703	1321	5148		
11.	CDH15	3.87405066889264	0	12.	HSPA5	1.7622197389343	2458	12.	HSPA5	1.7622197389343	2458	2795	edit	2522	2986	9401
12.	HSPA5	1.7622197389343	2986	13.	ADM2	3.00668829984239	33	13.	ADM2	3.00668829984239	33	40	30	26	289	
13.	ADM2	3.00668829984239	26.	14.	TSPAN1	1.59062647742134	47	14.	TSPAN1	1.59062647742134	47	47	40	85	184	
14.	TSPAN1	1.59062647742134	85	15.	CLGN	3.79157299528006	0	15.	CLGN	3.79157299528006	0	2	0	1	13	
15.	CLGN	3.79157299528006	116.	BBC3	1.44385070509083	510	116.	BBC3	1.44385070509083	510	528	590	673	1672		
16.	BBC3	1.44385070509083	673.	17.	CHAC1	2.55315453671217	106	17.	CHAC1	2.55315453671217	106	186	77	260	1003	
17.	CHAC1	2.55315453671217	260.	18.	SLFN5	2.05971016228227	153	260.	SLFN5	2.05971016228227	153	224	212	250	887	
18.	SLFN5	2.05971016228227	250.	19.	SPOCD1	5.84721122029456	1	250.	SPOCD1	5.84721122029456	1	0	0	0	14	
19.	SPOCD1	5.84721122029456	020.	PRR15	2.68488625728793	2	020.	PRR15	2.68488625728793	2	1	11	5	24		

Clean with OpenRefine

27470 rows

Show as: rows records Show: 5 10 25 50 100 500 1000 rows

All	Column	log2FC	ARCaP 1	ARCaP 2	ARCaP 3	ARCaP 4	A
1.	SEL1L	Facet	648	850	741	841	
2.	DDIT3	Text filter	89	149	173	154	
3.	GDF15	Edit cells	198	205	227	248	
4.	TRIB3	Edit column	246	271	246	415	
5.	SESN2	Split into several columns...					
6.	ESRP1	Transpose	Join columns...				
7.	SLC7A11	Sort...	Add column based on this column...				
8.	KRT19	View	Add column by fetching URLs...				
9.	LURAP1L	Reconcile	Add columns from reconciled values...				
10.	HERPUD1	3.87405066889264	Rename this column				
11.	CDH15	1.7622197389343	Remove this column				
12.	HSPA5	3.00668829984239	Move column to beginning				
13.	ADM2	1.59062647742134	Move column to end				
14.	TSPAN1	3.79157299528006	Move column left				
15.	CLGN	1.44385070509083	Move column right				
16.	BBC3	2.55315453671217					
17.	CHAC1	2.05971016228227					
18.	SLFN5	5.84721122029456					
19.	SPOCD1	2.68488625728793					
20.	PRR15	1.28922969656362					
21.	DNAJB11	1.34476952114714					
22.	IFDN1						

27470 rows

Show as: rows records Show: 5 10 25 50 100 500 1000 rows

All	Column	ARCaP 1	ARCaP 2	ARCaP 3	ARCaP 4	ARCaP tw 1	ARCaP tw 2	A
1.	SEL1L	648	850	741	841	2379	1055	
2.	DDIT3	89	149	173	154	1500	213	
3.	GDF15	198	205	227	248	1412	258	
4.	TRIB3	246	271	246	415	836	376	
5.	SESN2	600	404	580	419	600	3728	519
6.	ESRP1	0	0	0	0	3	15	
7.	SLC7A11	547	331	447	365	547	1686	511
8.	KRT19	85	95	63	84	85	213	122
9.	LURAP1L	7	2	17	10	7	119	13
10.	HERPUD1	1321	611	741	703	1321	5148	884
11.	CDH15	0	4	0	0	0	21	8
12.	HSPA5	2986	2458	2795	edit 2522	2986	9401	2607
13.	ADM2	26	33	40	30	26	289	73
14.	TSPAN1	85	47	47	40	85	184	114
15.	CLGN	1	0	2	0	1	13	5
16.	BBC3	673	510	528	590	673	1672	766
17.	CHAC1	260	106	186	77	260	1003	162
18.	SLFN5	250	153	224	212	250	887	179
19.	SPOCD1	0	1	0	0	0	14	0
20.	PRR15	5	2	1	11	5	24	8
21.	DNAJB11	1374	921	1274	1127	1374	2295	1249

Clean with OpenRefine

27470 rows

27470 rows

		Show as: rows records Show: 5 10 25 50 100 500 1000 rows							
		All	Column	log2FC	ARCaP 1	ARCaP 2	ARCaP 3	ARCaP 4	A
1.	SEL1L	Facet			648	850	741	841	
2.	DDIT3	Text filter			89	149	173	154	
3.	GDF15	Edit cells			198	205	227	248	
4.	TRIB3	Edit column			246	271	246	415	
5.	SESN2	Transpose			Split into several columns...				
6.	ESRP1	Join columns...							
7.	SLC7A11	Sort...			Add column based on this column...				
8.	KRT19	View			Add column by fetching URLs...				
9.	LURAP1L	Reconcile			Add columns from reconciled values...				
10.	HERPUD1	3.87405066889264			Rename this column				
11.	CDH15	1.7622197389343			Remove this column				
12.	HSPA5	3.00668829984239			Move column to beginning				
13.	ADM2	1.59062647742134			Move column to end				
14.	TSPAN1	3.79157299528006			Move column left				
15.	CLGN	1.44385070509083			Move column right				
16.	BBC3	2.55315453671217							
17.	CHAC1	2.05971016228227							
18.	SLFN5	5.84721122029456							
19.	SPOCD1	2.68488625728793							
20.	PRR15	1.28922969656362							
21.	DNAJB11	1.34476952114714							
22.	IFDN1								

		Show as: rows records Show: 5 10 25 50 100 500 1000 rows							
		All	Column	log2FC	ARCaP 1	ARCaP 2	ARCaP 3	ARCaP 4	A
1.	SEL1L	648			850	741	841		2379
2.	DDIT3	89			149	173	154		1500
3.	GDF15	198			205	227	248		1412
4.	TRIB3	246			271	246	415		836
5.	SESN2	600			404	580	419	600	3728
6.	ESRP1	0			0	0	0	0	3
7.	SLC7A11	547			331	447	365	547	1686
8.	KRT19	85			95	63	84	85	213
9.	LURAP1L	7			2	17	10	7	119
10.	HERPUD1	1321			611	741	703	1321	5148
11.	CDH15	0			4	0	0	0	21
12.	HSPA5	2986			2458	2795	edit	2522	2986
13.	ADM2	26			33	40	30	26	289
14.	TSPAN1	85			47	47	40	85	184
15.	CLGN	1			0	2	0	1	13
16.	BBC3	673			510	528	590	673	1672
17.	CHAC1	260			106	186	77	260	1003
18.	SLFN5	250			153	224	212	250	887
19.	SPOCD1	0			1	0	0	0	14
20.	PRR15	2			2	1	11	5	24
21.	DNAJB11	921			1274	1127	1374		2295
22.	IFDN1	316			404	305	532		1249

Clean with OpenRefine

Facet / Filter Undo / Redo 6 / 9

Refresh Reset All Remove All

Column invert reset

2019

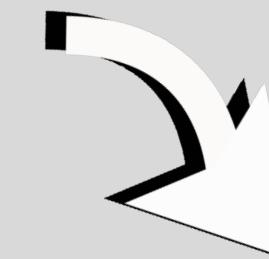
case sensitive regular expression

27 matching rows (27470 total)

Show as: rows records Show: 5 10 25 50 100

All Column ARCaP 1 ARCaP 2

		-03-	53	67
Transform		0:00:00Z		
Edit all columns	▶	-03-	122	138
Facet	▶	0:00:00Z		
		-09-	1532	1732
Edit rows	▶	Star rows		
Edit columns	▶	Unstar rows		
View	▶	Flag rows		
		Unflag rows		
		Remove matching rows		
		3843.	2019	
			05T2	
		4374.	2019	
			28T2	
		5197.	2019-09-	1191 1107



OpenRefine GSE180239 ARCaP DifferentialExpression.xlsx Permalink Remove 27 rows Undo Open... Export Help

Facet / Filter Undo / Redo 7 / 7

Refresh Reset All Remove All

Column invert reset

2019

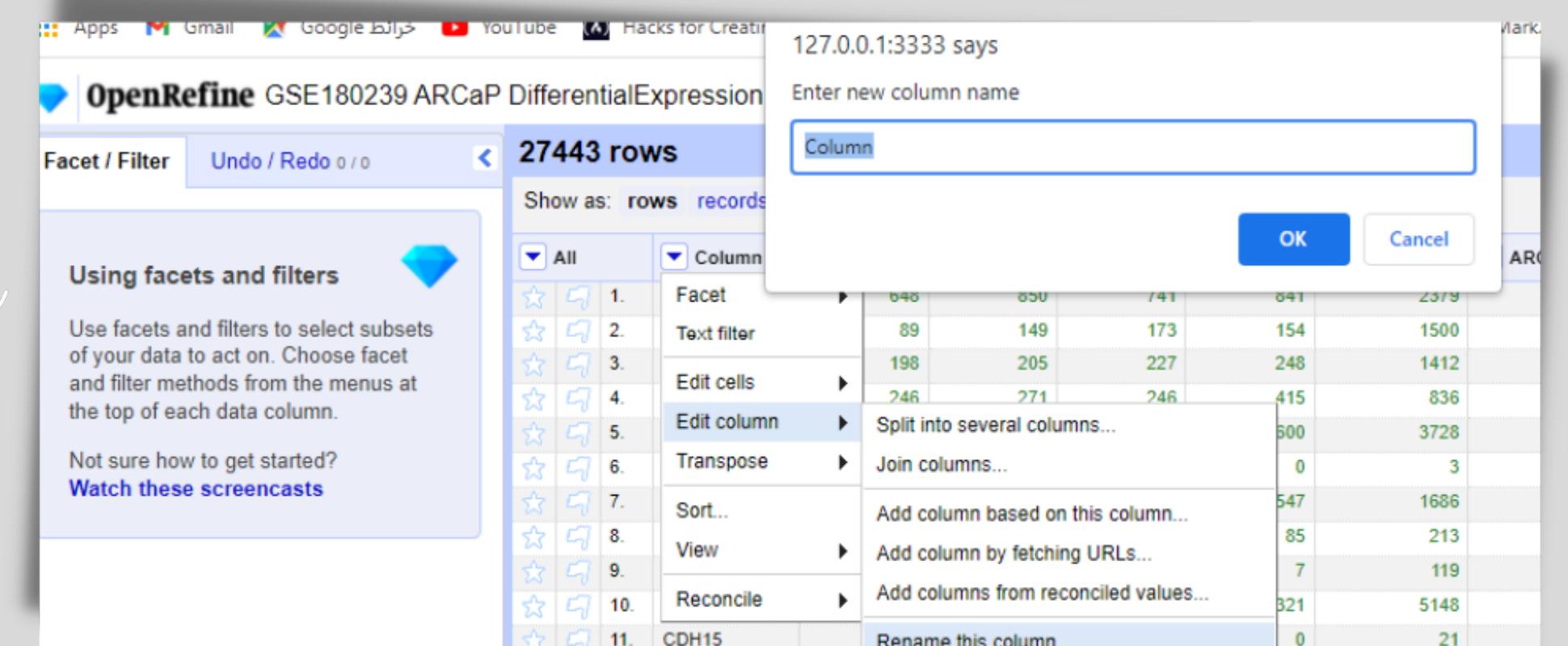
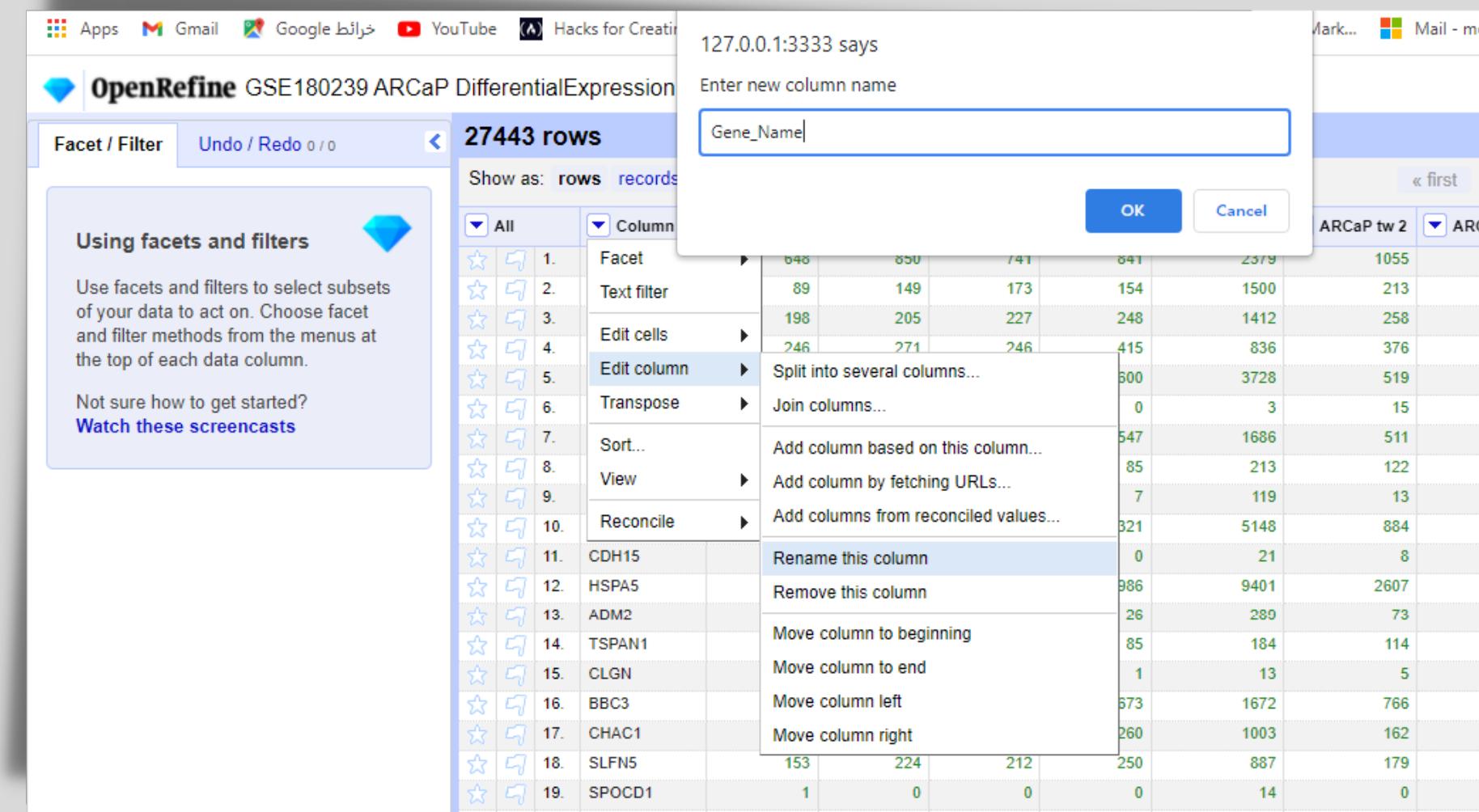
case sensitive regular expression

0 matching rows (27443 total)

Show as: rows records Show: 5 10 25 50 100 500 1000 rows

« first < previous 1 of 0 pages next > last »

All Column ARCaP 1 ARCaP 2 ARCaP 3 ARCaP 4 ARCaP tw 1 ARCaP tw 2 ARCaP tw 3 ARCaP tw 4 Column 15 Column 16 Column 17



Rename column Column to Gene_Name Undo

EntExpression.xlsx

3 rows

Show: 5 10 25 50 100 500 1000 rows

« first < previous

	Gene_Name	ARCaP 1	ARCaP 2	ARCaP 3	ARCaP 4	ARCaP tw 1	ARCaP tw 2	ARCaP tw 3	
1.	SEL1L	648	850	741	841	2379	1055	1773	
2.	DDIT3	89	149	173	154	1500	213	1181	
3.	GDF15	198	205	227	248	1412	258	1400	
4.	TRIB3	246	271	246	415	edit	836	376	714

Project.R* ×

Source on Save | Run | Save | Close

```
1 install.packages("read_xlsx")
2 install.packages("readxl")
3 install.packages("xlsx")
4 library("xlsx")
5 library("readxl")
6 my_data <-readxl::read_xlsx("GSE180239-ARCaP-DifferentialExpression.xlsx")
7 data=data.frame(my_data)
8 control=data[,c(2,3,4,5)]
9 treatment=data[,c(6,7,8,9)]
10 index<-c() #use it for storing index of cells which pvalue<0.05
11 pvalues<-c() #use it for storing pvalues of cells
12 t<-c() #use it for storing t values of cells
13 i=1
14 counter=1
15 while(counter<=100) {
16   x<-t.test(control[i,],treatment[i,],var.equal = TRUE)
17   if(x$p.value<=0.05&!is.nan(x$p.value)){
18     index[counter]=i
19     pvalues[counter]=x$p.value
20     t[counter]=x$statistic
21     counter=counter+1}
22   i=i+1}
23 rownames=c(1:100)
24 colnames=c("gene name", "P-value","t")
25 output<-matrix(c(data$Gene_Name[index],pvalues,t),nrow = 100,byrow = FALSE,dimnames =list(rownames,colnames))
26 output # show t and p-value of first 100 gene which p-value <0.05
27 boxplot(data[index,2:9],boxwex=0.7, xlab = "Number of Samples",ylab = "Number of Genes",
28         main="Boxplot of gene Expression",ylim=c(0,10000),
29         col= c("blue","blue","blue","blue","green","green","green","green"),las=2)
30 
31 hist( data[index,3],main="Histogram for comparing between 2 groups ", xlab = "sample(control) ",col="black")
32 hist( data[index,7],main="Histogram for one Sample (treatment) ", xlab = "sample(treatment) ",
33       col = "green")
34 
35 hist( data[index,7],add=T,col = "green")
```

THE

WHOLE

CODE

```
> output # show t and p-value of first 100 gene which p-value <0.05
```

	gene name	P-value	t
1	"SEL1L"	"0.0213968221421847"	"-3.08967164546013"
2	"DDIT3"	"0.0255335672137666"	"-2.95239296208916"
3	"GDF15"	"0.0313574432333503"	"-2.79530380269965"
4	"TRIB3"	"0.0196561030055053"	"-3.15633645621881"
5	"SESN2"	"0.0418111469571174"	"-2.57925791056999"
6	"ESRP1"	"0.00976807350146104"	"-3.72727272727273"
7	"SLC7A11"	"0.0397777973793353"	"-2.61639750381386"
8	"KRT19"	"0.0145656224186218"	"-3.39610566872672"
9	"HERPUD1"	"0.0426778174519512"	"-2.56400719865791"
10	"CDH15"	"0.0223110847947093"	"-3.05698514839493"
11	"HSPA5"	"0.0494244081472092"	"-2.45543966170678"
12	"ADM2"	"0.0131527607977894"	"-3.47935997291996"
13	"TSPAN1"	"0.00360132551307068"	"-4.62371164472094"
14	"BBC3"	"0.0434929610252837"	"-2.54995996966749"
15	"CHAC1"	"0.0282371461582628"	"-2.87512499739034"
16	"PRR15"	"0.0274307844742055"	"-2.89730404925016"
17	"DNAJB11"	"0.0445420582785055"	"-2.53228602223248"
18	"IFRD1"	"0.0314432736895286"	"-2.79323062669268"
19	"SEL1L3"	"0.042517434049863"	"-2.56680453248065"
20	"LMTK3"	"0.00687431035562127"	"-4.03076563975186"
21	"FSTL3"	"0.0273764393253973"	"-2.89882405456899"
22	"ZNF606"	"0.0434155687741747"	"-2.55128161927974"
23	"IFT46"	"0.0146799630742322"	"-3.3897608531099"
24	"NFAT5"	"0.0383008356052431"	"-2.64466366082216"
25	"AREG"	"0.0453160690671971"	"-2.51952653989452"
26	"ABCC3"	"0.0487331796273595"	"-2.46581996268826"
27	"ATF3"	"0.0295969088040546"	"-2.83922846730122"
28	"FLNB"	"0.0410544286520272"	"-2.59285073490742"
29	"SDF2L1"	"0.0336988612622062"	"-2.74082438668366"
30	"HEY1"	"0.0404591061561318"	"-2.60373281768237"
31	"STEAP2"	"0.0305397365574235"	"-2.81536628164816"
32	"PWAR6"	"0.0281885656996571"	"-2.87644175027041"
33	"ASNS"	"0.038718803026627"	"-2.63654839048357"
34	"NOG"	"0.0403719869893424"	"-2.60533955817955"
35	"MOSPD2"	"0.0372249087245144"	"-2.66599597154012"
36	"MFSD3"	"0.0293263095735572"	"-2.84622847138997"
37	"KDM7A"	"0.0302821618474966"	"-2.82180573507717"
38	"CCDC163"	"0.0088614725448028"	"-3.80782360589544"
39	"CCPG1"	"0.0304540828411275"	"-2.81750114830504"
40	"DIABLO"	"0.00148510540221753"	"5.52131562535288"
41	"ARHGEF2"	"0.0207992399810768"	"-3.11186891911926"
42	"ANXA1"	"0.0454933687637926"	"-2.51663621869984"
43	"SPATA17"	"0.023339291685747"	"-3.02192163262935"
44	"IGFBP4"	"0.0385764466099735"	"2.63930186321985"
45	"ZNF467"	"0.0345228699724932"	"-2.72261145689261"
46	"DNAJB9"	"0.0343802209187591"	"-2.7257308698044"
47	"MIS18BP1"	"0.0172409610634751"	"3.26036310601674"
48	"SECTM1"	"0.0209586351453164"	"-3.10588087210776"
49	"PPM1F"	"0.00363156410483388"	"4.61573167602565"
50	"FLNA"	"0.0344973208657746"	"-2.72316914277829"
51	"SCN9A"	"0.047500876869079"	"-2.48471640498472"
52	"FZD8"	"0.0278359461550559"	"2.8860733599492"
53	"MCM5"	"0.00545823243260525"	"4.23692832887718"

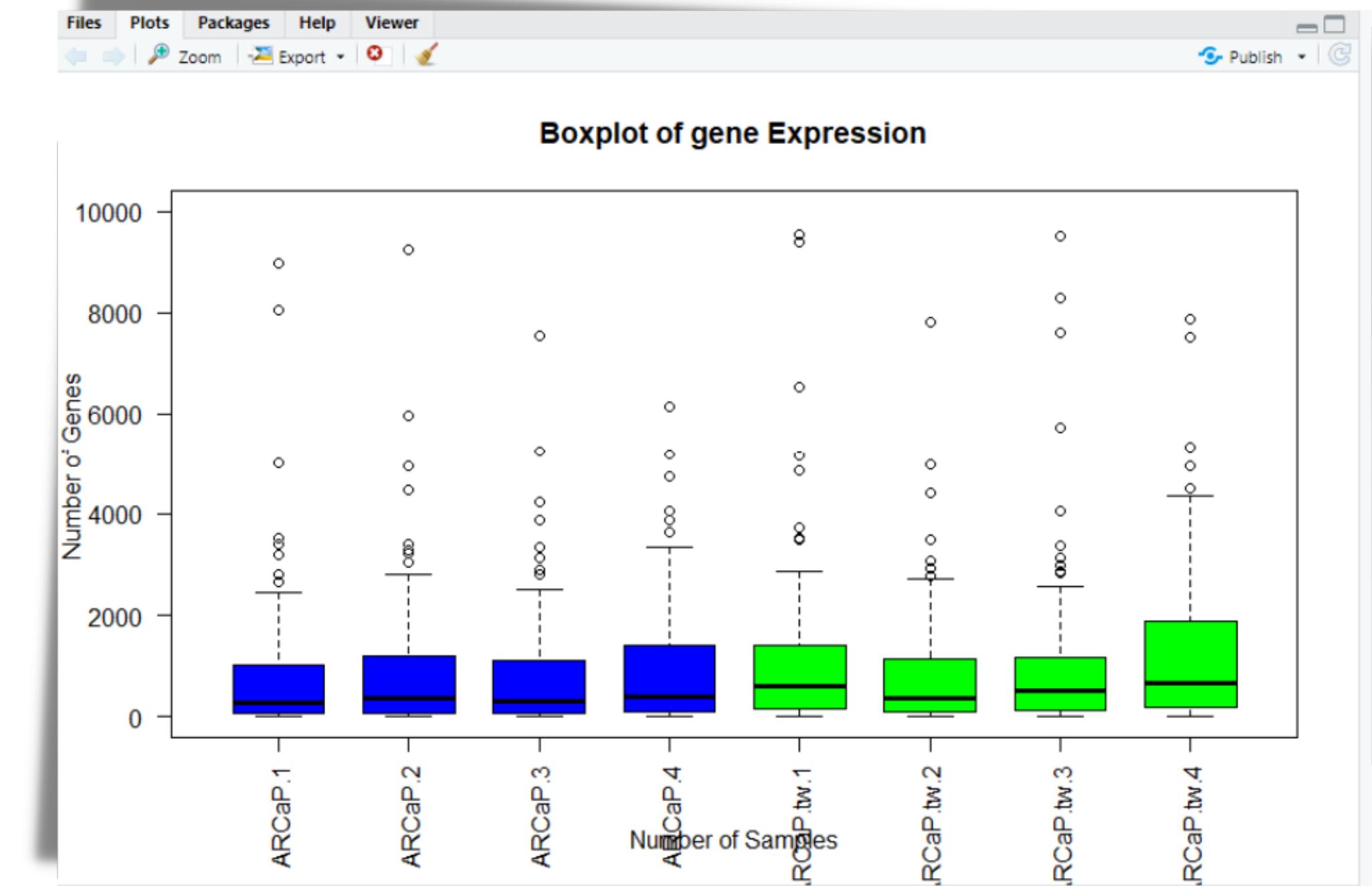
The Output unpaired T-Test

"VLDLR"	"0.00435463989766379"	"-4.44452539677858"
"UPK3B"	"0.0235454902172689"	"-3.01509205858981"
"ARL3"	"0.0134952048780655"	"3.45830570038571"
"ZKSCAN1"	"0.0489271798875439"	"-2.46289105134871"
"HSP90AA1"	"0.0109312848329875"	"3.63258755689139"
"DNAJ1A1"	"0.0112920118698799"	"3.60547887333469"
"NASP"	"0.00958806118237256"	"3.74303958018631"
"MSH6"	"0.0115604259536768"	"3.58592246770596"
"CTF1"	"0.00311894579044187"	"-4.76231801846432"
"F12"	"0.0367689026623436"	"-2.6752364091531"
"ATF4"	"0.0497935677816869"	"-2.44995835701069"
"HKDC1"	"0.0413262502233139"	"-2.58793764840986"
"CTBS"	"0.017359120408041"	"-3.25491171743118"
"CCNB1IP1"	"0.0107938575023765"	"-3.64317698988496"
"CENPW"	"0.0130463582228412"	"3.48602522246586"
"ASB9"	"0.00195366516889061"	"5.23186523078562"
"WDHD1"	"0.0100778343043201"	"3.70088244628164"
"LOXL4"	"0.0146864798641092"	"-3.38940087294377"
"MCM3"	"0.0186843004680495"	"3.19641863447031"
"HAUS8"	"0.00344249053534192"	"4.66690919522376"
"ZNF165"	"0.0338981820390601"	"-2.7363754414906"
"TNIP1"	"0.0144226855225982"	"3.404114842822"
"TBX19"	"0.0473460864068047"	"-2.48712647790792"
"GINS2"	"0.0102142417994832"	"3.68954529289397"
"MCM7"	"0.0171796289279076"	"3.2632088818723"
"PSMD1"	"0.0108907973048542"	"3.63569191662537"
"CERK"	"0.00876135317260652"	"3.81993672727187"
"PCP4"	"0.0315131704594335"	"-2.79154680462544"
"EIF4EBP2"	"0.01519333542814"	"3.36192841150975"
"HDGF"	"0.0176905723159439"	"3.23983417502839"
"BUB1B"	"0.0115231092734461"	"3.58861107372336"
"NFKBIL1"	"0.0321509628419872"	"-2.7763651010582"
"BIRC5"	"0.0156511112073116"	"3.33796859578916"
"FBXL17"	"0.0197279414174721"	"-3.1534598123774"
"LAMA3"	"0.0110787560400836"	"-3.62138703178574"
"NANS"	"0.0134484762935546"	"3.46114374882642"
"TAZ"	"0.0194145659627898"	"-3.16609323733115"
"HSD17B14"	"0.0282604133822166"	"-2.87449521429279"
"SAFB"	"0.0160076813362592"	"3.31983322727162"
"PTP4A3"	"0.0344880181876949"	"-2.72337231142709"
"JMY"	"0.0447939303100603"	"-2.52810836508585"
"CDR2L"	"0.0159554791401895"	"3.32246038536602"
"TOLLIP-AS1"	"0.0180126747829154"	"-3.22547539769905"
"BMP4"	"0.044426543128927"	"-2.53421037449976"
"MSMP"	"0.00471414287696614"	"4.37095677831464"

```
28 boxplot(data[index,2:9],boxwex=0.7, xlab = "Number of Samples",ylab = "Number of Genes ",  
29 main="Boxplot of gene Expression",ylim=c(0,10000),  
30 col= c("blue","blue","blue","blue","green","green","green","green"),las=2)
```

Why we Use Boxplot?

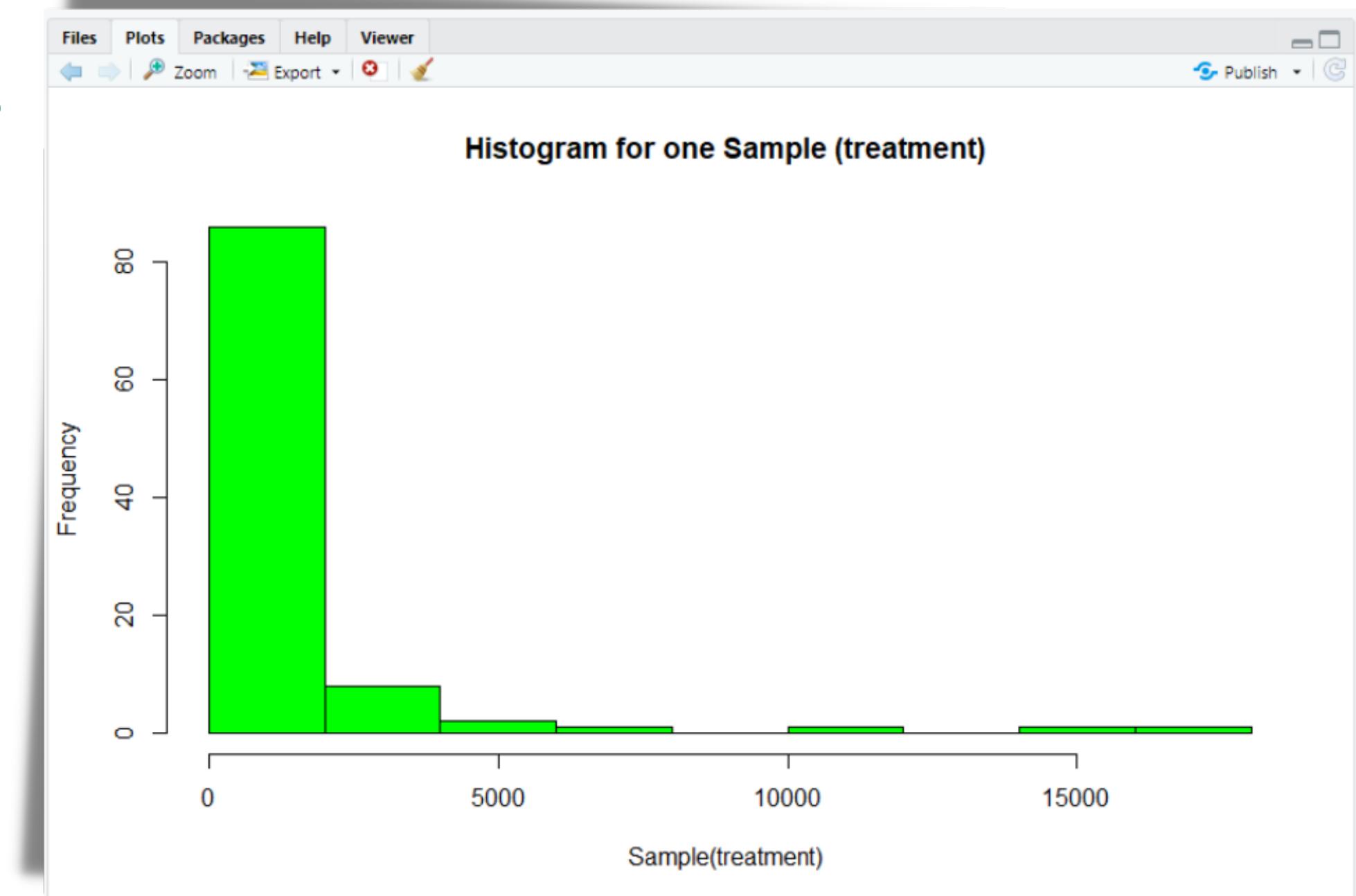
- **show distribution of numeric data value**
- **compare between multiple group**
- **provide high level information**
- **set limitations on the density of data that it can show**



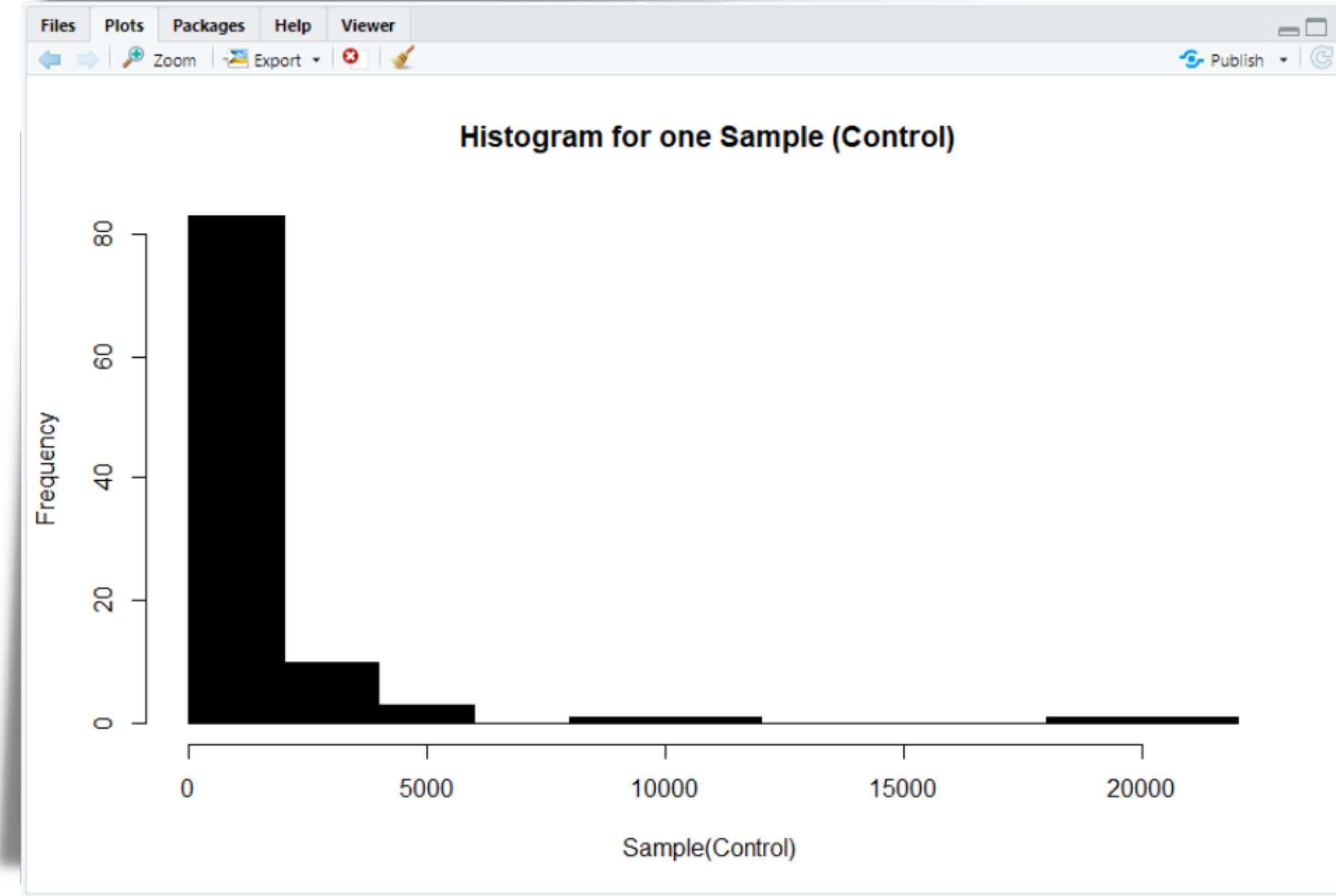
```
33 hist( data[index,7],main="Histogram for one Sample (treatment)", xlab = "Sample(treatment)",  
34   col = "green")
```

Why we Use Histogram?

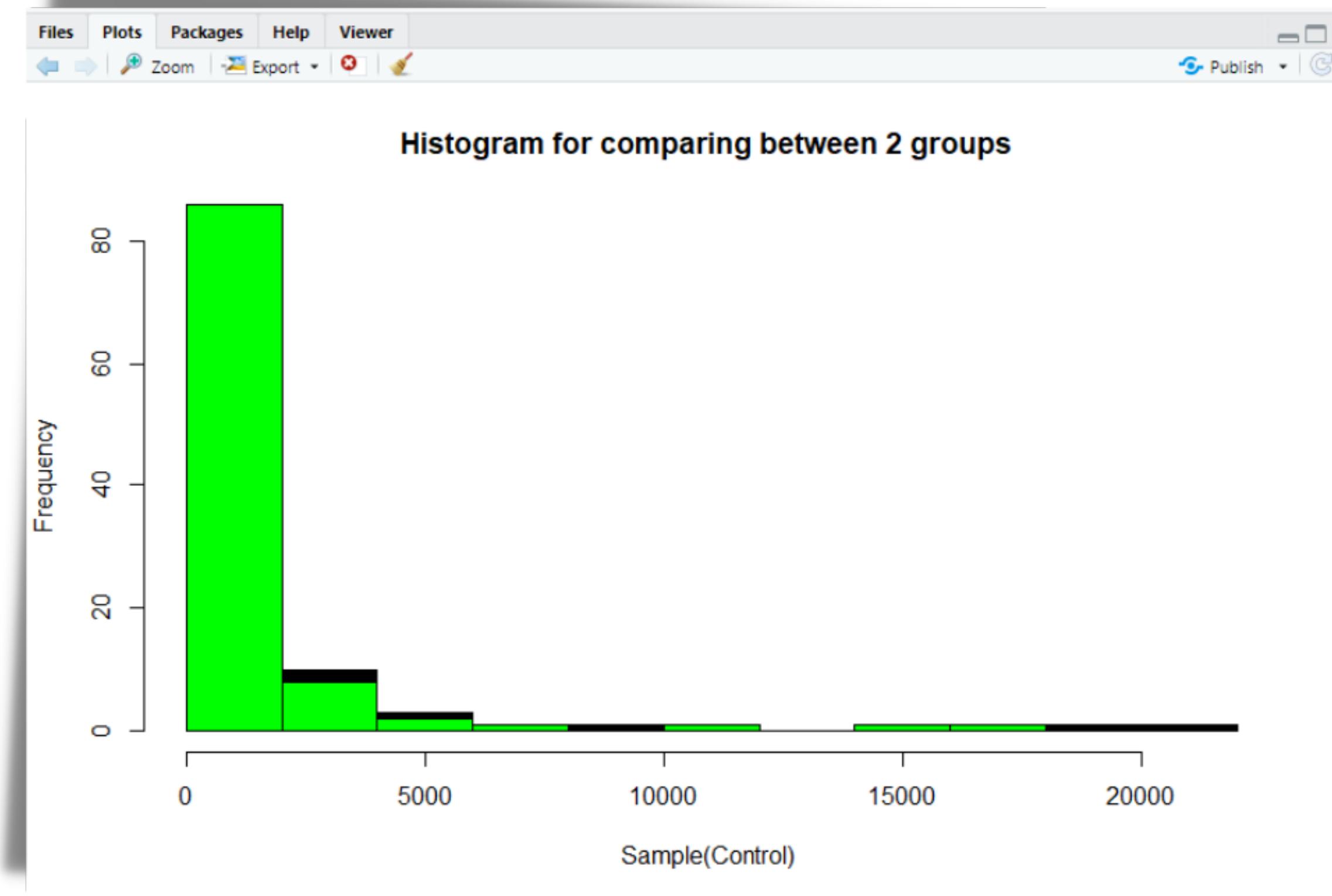
- Use a zero valued baseline
- Choose an appropriate number of bins
- Choose interpretable bin boundaries
- The data are numerical

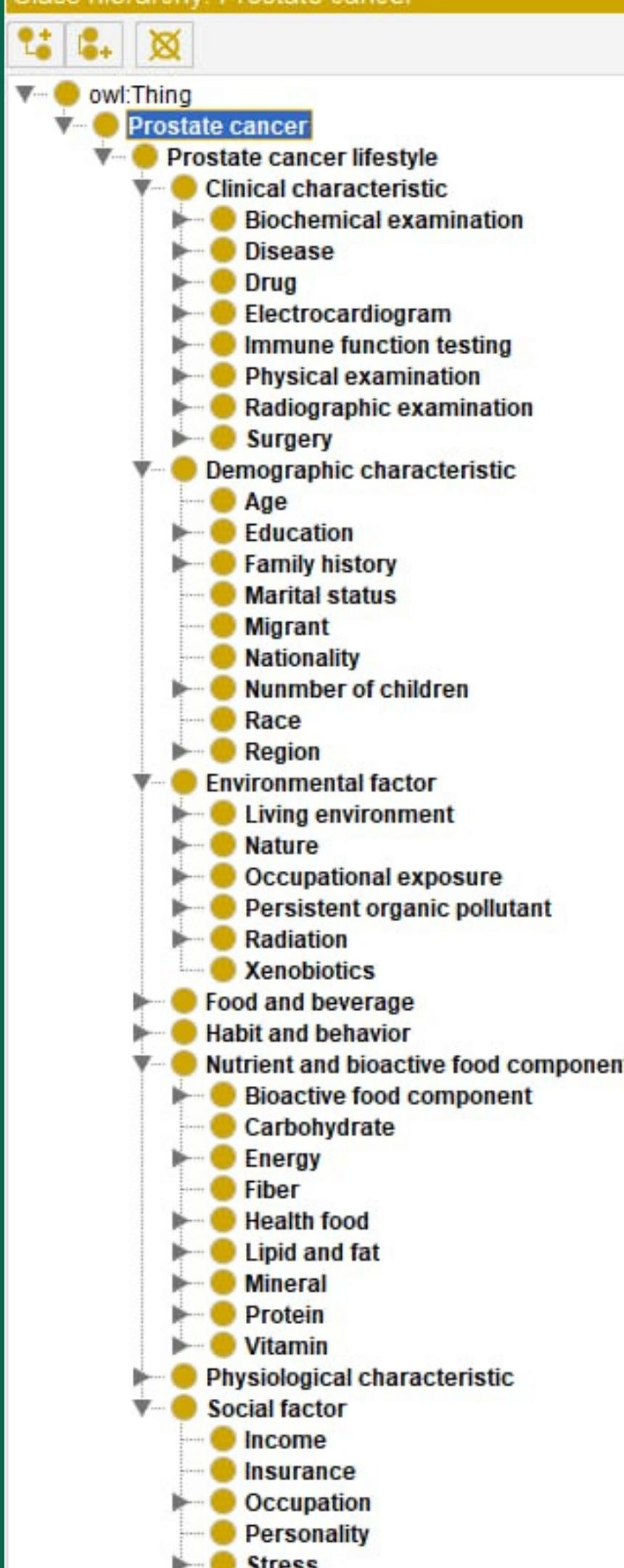


```
hist( data[index,3], main="Histogram for one Sample (control)", xlab = "sample(control)", col="black")
```



```
32 hist( data[index,3],main="Histogram for comparing between 2 groups ", xlab = "Sample(Control)",col="black")  
33 hist( data[index,7],add=T,col = "green")
```





Prostate Cancer Ontology

From: BioPortal

Last Uploaded Date : October 29,2020

What did we need exactly in the semantic data integration phase?

in the query making stage we need more data property and object property in individuals

Such as:

- data property(aim_of_treatment-description-taken_by) in individual(warfarin)
- data property(waist_size-how_to_measure_it) in individual(visceral_fat)
- data property(symptoms_or_conditions-causes) in individual(testosterone)
- data property(definition) in individual(prostate_specific_antigen)
- data property(effects_on_the_body) in individual(oxidative_stress)
- data property(problems_with_leptin-how_leptin_controlled) in individual(lepton)
- data property(molar_mass-formula-code) in individual(glutathione)
- data property(biological_target-code-formula-normal_range-use) in individual(vitamins)

then we collect this data from different websites and we integrate it with existing data

then we expressed this integration with ontology.

```

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX PC: <http://www.w3.org/2001/XMLSchema#>

SELECT ?subject ?object
WHERE { ?subject rdfs:subClassOf ?object }

```

subject	object
Living environment	Environmental factor
Tetrahydrofolate	Folate
Bisphenol A	Plastic
Water source	Nature
Enterolactone	Lignan
Fat and oil	Lipid and fat
Omega-3 Fatty Acid	Polyunsaturated Fatty Acid
Plastic	Living environment
Anti-Inflammatory agent	Drug
Prostate cancer in fathers or brothers	Family history
Fruit	Vegetables and fruits
Vitamin E	● decrease some 'Oxidative stress'
Cytokine Expression Profile	Immune function testing
Rice	Grain
Delta-tocopherol	Vitamin E
Hazardous waste	Pesticide
Epididymitis	Reproductive system disease
Lamb	Red meat
Blood pressure	● diagnose some Hypertension
Grapeseed oil	● decrease some 'Oxidative stress'

Execute

```

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX PC: <http://www.w3.org/2001/XMLSchema#>

SELECT ?subject ?predicate ?object
WHERE { ?subject ?predicate ?object }
LIMIT 20
OFFSET 35

```

subject	predicate	object
6642ac1f_cc34_4b14_a5f7_cfb6eb18f594	hashCode	"1538407339"^^<http://www.w3.org/2001/XMLSchema#int
6642ac1f_cc34_4b14_a5f7_cfb6eb18f594	sourceOntology	ab91f13c_80f1_41e1_9856_123f30bff0b9
glucosinolate	rdf:type	Glucosinolate
Glucosinolate	rdf:type	owl:Class
glucosinolate	rdf:type	owl:NamedIndividual
d1a6623e_71ea_4951_9084_90364d2e6aa8	hashCode	"1457477317"^^<http://www.w3.org/2001/XMLSchema#int
d1a6623e_71ea_4951_9084_90364d2e6aa8	sourceOntology	ab91f13c_80f1_41e1_9856_123f30bff0b9
Thyroid stimulating hormone	reference	"NCI Thesaurus Code:C2280"
reference	rdftype	owl:AnnotationProperty
657062c4_855e_4f11_b989_3ea4aaa56d0c	hashCode	"1143358466"^^<http://www.w3.org/2001/XMLSchema#int
657062c4_855e_4f11_b989_3ea4aaa56d0c	sourceOntology	ab91f13c_80f1_41e1_9856_123f30bff0b9
Eicosapentaenoic Acid	rdf:type	owl:Class
990307fe_55ce_4ed4_aede_2673aa3de356	hashCode	"-871396310"^^<http://www.w3.org/2001/XMLSchema#int
990307fe_55ce_4ed4_aede_2673aa3de356	sourceOntology	ab91f13c_80f1_41e1_9856_123f30bff0b9
Metabolic factor	rdfs:isDefinedBy	"عامل التغير المناخي" Specific metabolic changes that characterize the change in climate and which are in turn caused by increased levels of greenhouse gases in the atmosphere
rdfs:isDefinedBy	rdftype	owl:AnnotationProperty
8f168da3_b41a_4271_b894_027eb1ce2390	hashCode	"2091138188"^^<http://www.w3.org/2001/XMLSchema#int
8f168da3_b41a_4271_b894_027eb1ce2390	sourceOntology	ab91f13c_80f1_41e1_9856_123f30bff0b9
Living environment	rdfs:subClassOf	Environmental factor
Living environment	rdftype	owl:Class

Execute

SPARQL Queries



PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX PC: <http://www.w3.org/2001/XMLSchema#>

SELECT ?x ?y
WHERE { ?x rdf:type ?y}

LIMIT 250

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX PC: <http://www.semanticweb.org/ontologies/Prostate_cancer#>

```
SELECT ?name ?code ?formula ?use ?normal_range ?biological_target
WHERE{
?name PC:code ?code.
?name PC:formula ?formula.
?name PC:use ?use.
?name PC:normal_range ?normal_range.
?name PC:biological_target ?biological_target
}
```

	x	y
s:isDefinedBy		owl:AnnotationProperty
s:isDefinedBy		owl:Class
s:isDefinedBy		owl:AnnotationProperty
s:isDefinedBy		owl:AnnotationProperty
s:isDefinedBy		owl:AnnotationProperty
s:isDefinedBy		owl:NamedIndividual
s:isDefinedBy		owl:AnnotationProperty
s:isDefinedBy		owl:NamedIndividual
s:isDefinedBy		owl:Class
s:isDefinedBy		owl:AnnotationProperty
s:isDefinedBy		Glucosinolate
s:isDefinedBy		owl:Class
s:isDefinedBy		owl:NamedIndividual
s:isDefinedBy		owl:AnnotationProperty
s:isDefinedBy		owl:Class
s:isDefinedBy		owl:AnnotationProperty
s:isDefinedBy		owl:Class
s:isDefinedBy		owl:AnnotationProperty
s:isDefinedBy		owl:NamedIndividual

name	code	formula	use	normal_range	biological_target
vitamin_a	"017509"	"C20H30O"	"are essential for maintaining "from 20 to 60 (mcg/dl)"	"target tissue cellularity, integ	
vitamin_c	"A150H5"	"C6H8O6"	"Vitamin C has a definitive role "from 0.6 to 2 (mg/dl)"	"liver injury and associated b	
vitamin_k	"B02BA"	"C31H46O2"	"deficiency, dosage, food sol "from 0.2 to 3.2 (ng/ml)"	"Vitamin k target in cancer"	
vitamin_d	"D35000"	"117IU"	"rickets, osteoporosis, Vitam "from 20 to 40 (ng/ml)"	"Vitamin D receptor"	
vitamin_e	"A11HA03"	"C29H50O2"	"Vitamin E deficiency, antioxidant "in adults from 5.5 to 17 (mg/ "reactive oxygen species"		

Execute

Execute

SPARQL Queries

Active ontology × Entities × Individuals by class × OWLViz × DL Query × OntoGraf × SPARQL Query × Active ontology × Entities × Individuals by class × OWLViz × DL Query × OntoGraf × SPARQL Query ×

SPARQL query:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX PC: <http://www.semanticweb.org/ontologies/Prostate_cancer#>

SELECT ?name ?code ?formula ?use ?normal_range ?biological_target
WHERE{
?name rdf:type PC:Vitamin_C.
?name PC:code ?code.
?name PC:formula ?formula.
?name PC:use ?use.
?name PC:normal_range ?normal_range.
?name PC:biological_target ?biological_target
}
```

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX PC: <http://www.semanticweb.org/ontologies/Prostate_cancer#>

SELECT ?name ?aim_of_treatment ?description ?taken_by ?code ?formula ?use ?normal_range ?biological_target
WHERE{
?
?name PC:description ?description.
?name PC:aim_of_treatment ?aim_of_treatment.
?name PC:taken_by ?taken_by.
}
UNION
?
?name rdf:type PC:Vitamin_K.
?name PC:code ?code.
?name PC:formula ?formula.
?name PC:use ?use.
?name PC:normal_range ?normal_range.
?name PC:biological_target ?biological_target
}
```

name	code	formula	use	normal_range	biological_target	name	aim_of_treatment	description	taken_by	code	formula	use	normal_range	biological_target
vitamin_c	"A150H5"	"C6H8O6"	"Vitamin C has a definitive role in the prevention of scurvy. It is also important for the health of skin, bones, blood vessels, and teeth." "from 0.6 to 2 (mg/dl)"	"liver injury and associated conditions"		warfarin	"is to thin your blood"	"Warfarin is a type of anticoagulant. It is taken by adults and children."						
						vitamin_k				"B02BA"	"C31H46O2"	"deficiency, dosage"	"from 0.2 to 3.2 (ng/dl)"	"Vitamin K target in the blood"

Execute

Execute

SPARQL Queries

Active ontology	Entities	Individuals by class	OWLviz	DL Query	OntoGraf	SPARQL Query	Active ontology	Entities	Individuals by class	OWLviz	DL Query	OntoGraf	SPARQL Query
sparql queries													
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>						PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>							
PREFIX owl: <http://www.w3.org/2002/07/owl#>						PREFIX owl: <http://www.w3.org/2002/07/owl#>							

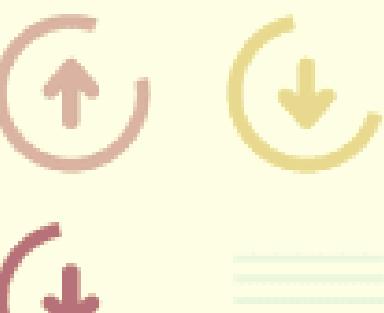
name	increased_energy	functions	benefits	effects_on_the_body	causes	name	blood_pressure_range
oxidative_stress				"is a normal and necessary p "caused by an imbal	blood_pressure_2		"120/80"
ginseng	"ginseng may help stimulate "may improve thinking proces"	"peapole have traditionally tak			blood_pressure_3		"125/80"
					blood_pressure_1		"140/90."

Execute

Execute



SPARQL Queries



Active ontology	Entities	Individuals by class	OWLviz	DL Query	OntoGraf	SPARQL Query	Active ontology	Entities	Individuals by class	OWLviz	DL Query	OntoGraf	SPARQL Query																																																								
SPARQL query:																																																																					
<pre>PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> PREFIX owl: <http://www.w3.org/2002/07/owl#> PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#> PREFIX xsd: <http://www.w3.org/2001/XMLSchema#> PREFIX PC: <http://www.semanticweb.org/ontologies/Prostate_cancer#> SELECT ?name ?Accession_Number ?Drugs ?Description ?ATC_Classification WHERE{ ?name PC:Description ?Description. ?name PC:ATC_Classification ?ATC_Classification. ?name PC:Drugs ?Drugs. ?name PC:Accession_Number ?Accession_Number. FILTER(?Accession_Number="DBCAT000410") }</pre>																																																																					
<pre>PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#> PREFIX xsd: <http://www.w3.org/2001/XMLSchema#> PREFIX PC: <http://www.semanticweb.org/ontologies/Prostate_cancer#> SELECT ?name ?benefits ?increased_energy ?function ?description ?code ?molar_mass ?defintion ?formula WHERE{ ? ?name PC:benefits ?benefits. ?name PC:increased_energy ?increased_energy. ?name PC:function ?function } UNION { ?name PC:description ?description FILTER regex(?description,"mustard") } UNION { ?name PC:code ?code. ?name PC:formula ?formula. ?name PC:molar_mass ?molar_mass. ?name PC:defintion ?defintion } }</pre>																																																																					
<table border="1"> <thead> <tr> <th>name</th><th>Accession_Number</th><th>Drugs</th><th>Description</th><th>ATC_Classification</th><th>name</th><th>benefits</th><th>increased_energy</th><th>function</th><th>description</th><th>code</th><th>molar_mass</th><th>defintion</th><th>formula</th></tr> </thead> <tbody> <tr> <td>antihypertensive_agent_1</td><td>"DBCAT000410"</td><td>"Clonidine Bosentan Prazosin Min"</td><td>"Drugs used in the treatment of act "C — CARDIOVASCULAR: HYPERTENSION"</td><td></td><td>ginseng</td><td>"peapole have tradl"</td><td>"ginseng may help</td><td>"may improve think</td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td></td><td></td><td></td><td></td><td></td><td>glucosinolate</td><td></td><td></td><td></td><td>"are natural compo</td><td></td><td></td><td></td><td></td></tr> <tr> <td></td><td></td><td></td><td></td><td></td><td>glutathione</td><td></td><td></td><td></td><td></td><td>"V03AB32"</td><td>"307.3235 (g/mol)"</td><td>"is an antioxidant ir"</td><td>"C10H17N3O6S"</td></tr> </tbody> </table>														name	Accession_Number	Drugs	Description	ATC_Classification	name	benefits	increased_energy	function	description	code	molar_mass	defintion	formula	antihypertensive_agent_1	"DBCAT000410"	"Clonidine Bosentan Prazosin Min"	"Drugs used in the treatment of act "C — CARDIOVASCULAR: HYPERTENSION"		ginseng	"peapole have tradl"	"ginseng may help	"may improve think											glucosinolate				"are natural compo										glutathione					"V03AB32"	"307.3235 (g/mol)"	"is an antioxidant ir"	"C10H17N3O6S"
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Execute**Execute**


SPARQL Queries

SPARQL query:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX PC: <http://www.semanticweb.org/ontologies/Prostate_cancer#>

SELECT ?name ?total_fat_mass
WHERE{
?name PC:total_fat_mass ?total_fat_mass.
FILTER(?total_fat_mass < 85)
}
```

name	total_fat_mass
fat_mass_2	"56"^^<http://www.w3.org/2001/XMLSchema#short>
fat_mass_3	"14"^^<http://www.w3.org/2001/XMLSchema#short>
fat_mass_5	"78"^^<http://www.w3.org/2001/XMLSchema#short>
fat_mass_6	"57"^^<http://www.w3.org/2001/XMLSchema#short>
fat_mass_1	"35"^^<http://www.w3.org/2001/XMLSchema#short>

SPARQL query:

```
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX PC: <http://www.semanticweb.org/ontologies/Prostate_cancer#>

SELECT ?name ?how_leptin_controlled ?Problems_with_Leptin ?num_of_years_educated ?stress_Coping ?defintion ?foods_provide ?amount
WHERE{
{
?name PC:how_leptin_controlled ?how_leptin_controlled.
?name PC:Problems_with_Leptin ?Problems_with_Leptin .
}
UNION
{
?name PC:num_of_years_educated ?num_of_years_educated .
?name PC:stress_Coping ?stress_Coping .
FILTER regex(?stress_Coping,"large")
}
UNION
{
?name PC:amount ?amount .
?name PC:foods_provide ?foods_provide .
?name PC:defintion ?defintion .
}
}
```

name	how_leptin_controll...	Problems_with_Le...	num_of_years_edu...	stress_Coping	defintion	foods_provide	amount
leptin	"because leptin is prc "When the body is fun						
years_of_education_;			"30"^^<http://www.w3. "large"				
years_of_education_!			"42"^^<http://www.w3. "large"				
years_of_education_`			"40"^^<http://www.w3. "large"				
years_of_education_`			"55"^^<http://www.w3. "large"				
years_of_education_`			"35"	"large"			
iodine							"is a mineral found in "fish-iodized salt-dairy "depends on you

Execute

Execute

SPARQL Queries

SPARQL query:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX PC: <http://www.semanticweb.org/ontologies/Prostate_cancer#>

SELECT ?name ?description ?causes ?symptoms_or_conditions
WHERE{
?name PC:description ?description.
?name PC:causes ?causes.
?name PC:symptoms_or_conditions ?symptoms_or_conditions
}
```

name	description	causes	symptoms_or_conditions
testosterone	"estosterone is the male sex hormone that i "Some persons are born with conditions tha	"Low sex drive Fatigue Reduced lean musc	

SPARQL Queries

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
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No cells are currently selected

ONTOLOGY HIERARCHIES

Prostate_cancer x

- Thing
 - Prostate_cancer
 - Prostate_cancer_lifestyle
 - Clinical_characteristic
 - Biochemical_examination
 - Disease
 - Drug
 - Electrocardiogram
 - Immune_function_testing
 - Physical_examination
 - Radiographic_examination
 - Surgery
 - Demographic_characteristic
 - Environmental_factor
 - Food_and_beverage
 - Habit_and_behavior
 - Nutrient_and_bioactive_food_component
 - Physiological_characteristic
 - Social_factor
 - Income
 - Insurance
 - Occupation
 - Personality
 - Stress

VALUE TYPE AND PROPERTY

Free text

Include a property

Accession_Number

ALLOWED VALUES

Amy

RIGHT FIELD TOOL

Environmental factor

Cancer RightField.xlsx

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Calibri 11 A⁺ A⁻ General Merge and Center Wrap Text Conditional Formatting

Environmental factor

D	E	J	K	L	M	N	O
prostate cancer life cycle (Direct subclasses)				Prostate cancer lifestyle			
prostate cancer life cycle (instances)				Prostate cancer lifestyle			
Clinical Characteristics (Direct subclasses)				Clinical characteristic			
Environmental Factor (Direct subclasses)				Environmental factor			
Diseases (classes)				Living environment			
Physiological characteristic (subclasses)				Nature			
Demographic characteristic (Direct subclasses)				Occupational exposure			
Family history (subclasses)				Persistent organic pollutant			
Habit and behaviour (Direct subclasses)				Radiation			
Nutrient and bioactive food component (Direct subclasses)				Xenobiotics			
Vitamin Direct (subclasses)				Habit and behaviour			
Mineral (subclasses)				Nutrient and bioactive food component			
Immune Function testing (subclasses)				Vitamin			
Biochemical examination (subclasses)				Mineral			
Physical Examination (Direct subclasses)				Immune function testing			
				Biochemical examination			
				Physical examination			

Right Field Tool in Excel

Prostate cancer lifestyle

Cancer RightField.xlsx

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Calibri 11 A⁺ A⁻ General Merge and Center Wrap Text Conditional Formatting

Prostate cancer lifestyle

D	E	J	K	L	M	N	O	P
prostate cancer life cycle (Direct subclasses)				Prostate cancer lifestyle				
prostate cancer life cycle (instances)				Clinical characteristic				
Clinical Characteristics (Direct subclasses)				Demographic characteristic				
Environmental Factor (Direct subclasses)				Environmental factor				
Diseases (classes)				Food and beverage				
Habit and behavior				Habit and behavior				
Nutrient and bioactive food component				Nutrient and bioactive food component				
Physiological characteristic				Physiological characteristic				
Social factor				Social factor				
Family history (subclasses)				Family history				
Habit and behaviour (Direct subclasses)				Habit and behavior				
Nutrient and bioactive food component (Direct subclasses)				Nutrient and bioactive food component				
Vitamin Direct (subclasses)				Vitamin				
Mineral (subclasses)				Mineral				
Immune Function testing (subclasses)				Immune function testing				
Biochemical examination (subclasses)				Biochemical examination				
Physical Examination (Direct subclasses)				Physical examination				

Disease

D	E	J	K	L	M	N
		prostate cancer life cycle (Direct subclasses)		Prostate cancer lifestyle		
		prostate cancer life cycle (instances)		Prostate cancer lifestyle		
		Clinical Characteristics (Direct subclasses)		Clinical characteristic		
		Environmental Factor (Direct subclasses)		Environmental factor		
		Diseases (classes)		Disease		
		Physiological characteristic (subclasses)		Acne		
		Demographic characteristic (Direct subclasses)		Acquired immunodeficiency disease		
		Family history (subclasses)		Atopy		
		Habit and behaviour (Direct subclasses)		Benign prostatic hypertrophy		
		Nutrient and bioactive food component (Direct subclasses)		Cardiorespiratory fitness		
		Vitamin Direct (subclasses)		Cardiovascular disease		
		Mineral (subclasses)		Circulatory system disease		
		Immune Function testing (subclasses)		Coronary artery disease		
		Biochemical examination (subclasses)		Diabetes		
		Physical Examination (Direct subclasses)		Immune function testing		

Vitamin

D	E	J	K	L	M	N
		prostate cancer life cycle (Direct subclasses)		Prostate cancer lifestyle		
		prostate cancer life cycle (instances)		Prostate cancer lifestyle		
		Clinical Characteristics (Direct subclasses)		Clinical characteristic		
		Environmental Factor (Direct subclasses)		Environmental factor		
		Diseases (classes)		Disease		
		Physiological characteristic (subclasses)		Physiological characteristic		
		Demographic characteristic (Direct subclasses)		Demographic characteristic		
		Family history (subclasses)		Family history		
		Habit and behaviour (Direct subclasses)		Habit and behavior		
		Nutrient and bioactive food component (Direct subclasses)		Nutrient and bioactive food component		
		Vitamin Direct (subclasses)		Vitamin		
		Mineral (subclasses)		Multivitamin		
		Immune Function testing (subclasses)		Vitamin A		
		Biochemical examination (subclasses)		Vitamin B		
		Physical Examination (Direct subclasses)		Vitamin C		



clinical characteristic

Clinical characteristic	
prostate cancer life cycle (Direct subclasses)	Prostate cancer lifestyle
prostate cancer life cycle (instances)	Prostate cancer lifestyle
Clinical Characteristics (Direct subclasses)	<input type="button" value="!"/> Clinical characteristic
Enviromental Factor (Direct subclasses)	Biochemical examination
Diseases (classes)	Disease
Physiological characterstic (subclasses)	Drug
Demographic characterstic (Direct subclasses)	Electrocardiogram
Family history (subclasses)	Immune function testing
Habit and behaviour (Direct subclasses)	Physical examination
Nutrient and bioactive food component (Direct subclasses)	Radiographic examination
Vitamin Direct (subclasses)	Surgery
Mineral (subclasses)	Nutrient and bioactive food component
	Vitamin
	Mineral

State Cancer RightField.xlsx

Nutrient and bioactive food component

D	E	J	K	L	M	N	O	P
		Nutrient and bioactive food component (Direct subclasses)		Nutrient and bioactive food component				
		Vitamin Direct (subclasses)		Vitamin				
		Mineral (subclasses)		Mineral				
		Immune Function testing (subclasses)		Immune function testing				
		Biochemical examination (subclasses)		Biochemical examination				
		Physical Examination (Direct subclasses)		Physical examination				
		Radiographic examination (subclasses)		Radiographic examination				
		surgery (subclasses)		Surgery				
		clinical characteristics (instances)		Clinical characteristic				
		Diseases (instances)		Disease				
		Habit and Behaviour (instances)		Habit and behavior				
		Nutrient and bioactive food component (instances)		Nutrient and bioactive food component				
		Physiological characteristic (instances)		energy				
				polyphenols				
				polyunsaturated fatty acid				
				vitamin a				

*Thank
you*