ThompsonLab3_Report

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This document goes through the R exercises (1-4) we did in class for Chapter 8 part 2 in which we practice adding and eliminating rows and columns from the data set: Test_V_output.csv.

Exercise 1: Rows and Columns

The total score column was assigned as a vector tot_score. I chose to calculate the total score for row 3, resulting in 340 as the answer. I also looked for what molecules were interacting and found them to be a protein and gem which underwent phosphorylation.

```
Test_V_output <- read.csv("/cloud/project/Test_V_output.csv")

tot_score<-Test_V_output$Total.Score
tot_score[3]
```

```
## [1] 340
```

Exercise 2: Mean and Standard Deviation

I found the mean and standard deviation of the total scores in the set using the following code. The mean resulted in 63.79919 and the standard deviation was 55.29295.

```
mean(tot_score)
```

```
## [1] 63.79919
```

```
sd(tot_score)
```

```
## [1] 55.29295
```

Exercise 3: Vectorization

This section is calculating the total score based off of the combination of the kind scores, evidence scores, match scores, and epistemic values. new_tot was named as a new vector.

```
new_tot = (Test_V_output$Kind.Score+(Test_V_output$Evidence.Score*Test_V_output$Match.Score))
```

Exercise 4: Subsets

For this section, the locations, cell type, and organism columns were deleted and only the top 100 scored interactions were kept.

```
Test_V_output<-Test_V_output[,!names(Test_V_output)%in% c("Location","Organism","Cell.Type")]
Test_V_output[1:100,]
```

```
##         X        Target.Name                           Target.Type  Target.ID
## 1     43                 akt  protein family|protein complex          akt
## 2    649                 p53                             protein      p04637
## 3     92                 atm                             protein      q13315
## 4    920                 src  protein family|protein complex          src
## 5    966                tsc2                             protein      p49815
## 6    242                chk1                             protein      o14757
## 7    243                chk1                             protein      o14757
## 8    662                 p53                             protein      p04637
## 9    237                chk1                             protein      o14757
## 10   618                 p21                             protein      p38936
## 11   741                pi3k  protein family|protein complex         pi3k
## 12   912                 src  protein family|protein complex          src
## 13   244                chk1                             protein      o14757
## 14   392                gsk3  protein family|protein complex         gsk3
## 15   650                 p53                             protein      p04637
## 16   261                chk2                             protein      o96017
## 17   964                tsc2                             protein      p49815
## 18   543              mtorc1  protein family|protein complex       mtorc1
## 19   384           gsk-3beta                             protein      p49841
## 20   382          gsk-3alpha                             protein      p49840
## 21   263                cip1                             protein      p38936
## 22   255                chk2                             protein      o96017
## 23   257                chk2                             protein      o96017
## 24   254                chk2                             protein      o96017
## 25   253                chk2                             protein      o96017
## 26   262                chk2                             protein      o96017
## 27   681                 p53                             protein      p04637
## 28   670                 p53                             protein      p04637
## 29   680                 p53                             protein      p04637
## 30   672                 p53                             protein      p04637
## 31   673                 p53                             protein      p04637
## 32   674                 p53                             protein      p04637
## 33   249                chk2                             protein      o96017
## 34   179           caspase 3                             protein      p42574
## 35   180           caspase 8                             protein      q14790
## 36   739                pi3k  protein family|protein complex         pi3k
## 37   490                mdm2                             protein      q00987
## 38   656                 p53                             protein      p04637
## 39   239                chk1                             protein      o14757
## 40   226                cdk4                             protein      p11802
## 41   657                 p53                             protein      p04637
## 42   654                 p53                             protein      p04637
## 43   420    hif-1alpha protein                          protein      q16665
## 44   652                 p53                             protein      p04637
## 45   418          hif-1alpha                             protein      q16665
## 46   406             gsk3beta                             protein      p49841
## 47   404             gsk3beta                             protein      p49841
## 48   540              mtorc1  protein family|protein complex       mtorc1
## 49   443                 irs                      protein family      pf02174
## 50   494                mdm2                             protein      q00987
## 51   499                mdm2                             protein      q00987
## 52   523                mtor                             protein      p42345
## 53   928               stat3                             protein      p40763
```

```
## 54  925           stat3                            protein    p40763
## 55  924           stat3                            protein    p40763
## 56  629         p27 kip1                           protein    p46527
## 57  630         p27 kip1                           protein    p46527
## 58  631         p27 kip1                           protein    p46527
## 59  632         p27 kip1                           protein    p46527
## 60  633         p27 kip1                           protein    p46527
## 61  319     erk protein family|protein complex         erk
## 62  640     p38 protein family|protein complex         p38
## 63  628         p27 kip1                           protein    p46527
## 64  393     gsk3 protein family|protein complex       gsk3
## 65  350      fos protein family|protein complex fos_family
## 66  245           chk1                             protein    o14757
## 67  491           mdm2                             protein    q00987
## 68   67           akt1                             protein    p31749
## 69  865             s6                    protein family  ipr000529
## 70  789           rad53                            protein    o96017
## 71  790           rad53                            protein    o96017
## 72  791           rad53                            protein    o96017
## 73  863             s6                    protein family  ipr000529
## 74   82            arf                             protein    q8n726
## 75   84            arf                             protein    q8n726
## 76   89            atm                             protein    q13315
## 77  110           bcl-2                            protein    p10415
## 78  109           bcl-2                            protein    p10415
## 79   94            atm                             protein    q13315
## 80  788           rad53                            protein    o96017
## 81  779           puma                             protein    q96pg8
## 82   48     akt protein family|protein complex         akt
## 83   47     akt protein family|protein complex         akt
## 84   46     akt protein family|protein complex         akt
## 85   98            atm                             protein    q13315
## 86  646            p53                             protein    p04637
## 87  419        hif-1alpha                          protein    q16665
## 88  301           egfr                             protein    p00533
## 89  193       caspase-9                            protein    p55211
## 90  296           egfr                             protein    p00533
## 91  252           chk2                             protein    o96017
## 92  661            p53                             protein    p04637
## 93  521           mtor                             protein    p42345
## 94   40     akt protein family|protein complex         akt
## 95   41     akt protein family|protein complex         akt
## 96  888    smad protein family|protein complex        smad
## 97  218           cdk4                             protein    p11802
## 98  796           raf-1                            protein    p04049
## 99  797           raf-1                            protein    p04049
## 100 663            p53                             protein    p04637
##                Location.ID          Cell.Line
## 1                     nan                nan
## 2                     nan cellosaurus:cvcl_9771
## 3                     nan                nan
## 4             go:0009986 cellosaurus:cvcl_0022
## 5             go:0005856                nan
## 6                     nan                nan
```

```
## 7                               nan                        nan
## 8                               nan                        nan
## 9                        go:0005737                        nan
## 10                              nan                        nan
## 11                       go:0005886                        nan
## 12                              nan cellosaurus:cvcl_0045
## 13                              nan                        nan
## 14                              nan                        nan
## 15                              nan cellosaurus:cvcl_9771
## 16                       go:0005813                        nan
## 17                              nan                        nan
## 18                              nan                        nan
## 19                              nan cellosaurus:cvcl_4461
## 20                              nan cellosaurus:cvcl_4461
## 21                              nan cellosaurus:cvcl_0060
## 22                              nan                        nan
## 23                       go:0005634 cellosaurus:cvcl_0031
## 24                              nan                        nan
## 25                              nan                        nan
## 26                          sl-0276                        nan
## 27                              nan           uaz:cvcl_9115
## 28                              nan                        nan
## 29                              nan           uaz:cvcl_9115
## 30                              nan                        nan
## 31                              nan                        nan
## 32                              nan                        nan
## 33                              nan                        nan
## 34                              nan cellosaurus:cvcl_0042
## 35                              nan                        nan
## 36                              nan                        nan
## 37                              nan                        nan
## 38                              nan                        nan
## 39                              nan cellosaurus:cvcl_0062
## 40                              nan                        nan
## 41                              nan                        nan
## 42                              nan                        nan
## 43                              nan cellosaurus:cvcl_0035
## 44                              nan cellosaurus:cvcl_w397
## 45                              nan cellosaurus:cvcl_1905
## 46                              nan           uaz:cvcl_9115
## 47                              nan                        nan
## 48                              nan                        nan
## 49                              nan                        nan
## 50                              nan                        nan
## 51  go:0005634 ++++ go:go:0005730 cellosaurus:cvcl_0030
## 52                              nan cellosaurus:cvcl_m034
## 53  go:0005737 ++++ go:go:0042641                        nan
## 54                       go:0005634                        nan
## 55                       go:0005737                        nan
## 56                              nan cellosaurus:cvcl_0102
## 57                              nan cellosaurus:cvcl_0102
## 58                              nan                        nan
## 59                              nan           uaz:cvcl_9115
## 60                       go:0005634 cellosaurus:cvcl_0102
```

```
## 61                      nan cellosaurus:cvcl_1905
## 62                      nan                      nan
## 63                      nan cellosaurus:cvcl_0102
## 64                      nan                      nan
## 65                      nan                      nan
## 66                      nan                      nan
## 67                      nan                      nan
## 68                      nan                      nan
## 69                      nan                      nan
## 70                      nan cellosaurus:cvcl_6353
## 71                      nan cellosaurus:cvcl_6353
## 72                      nan                      nan
## 73                      nan cellosaurus:cvcl_1905
## 74               go:0005737                      nan
## 75                      nan                      nan
## 76                      nan                      nan
## 77                      nan                      nan
## 78                      nan                      nan
## 79                      nan                      nan
## 80                      nan cellosaurus:cvcl_6353
## 81                      nan                      nan
## 82                      nan                      nan
## 83                      nan                      nan
## 84                      nan                      nan
## 85                  sl-0276                      nan
## 86                      nan cellosaurus:cvcl_0060
## 87                      nan                      nan
## 88               go:0016020 cellosaurus:cvcl_s979
## 89               go:0005739                      nan
## 90                      nan cellosaurus:cvcl_0045
## 91                      nan                      nan
## 92                      nan                      nan
## 93                      nan cellosaurus:cvcl_0031
## 94                      nan                      nan
## 95                      nan                      nan
## 96               go:0009986                      nan
## 97               go:0005737                      nan
## 98               go:0016020                      nan
## 99               go:0016020                      nan
## 100                     nan                      nan
##                                         Source.Name
## 1                                            mtorc2
## 2                                              p300
## 3                                               gem
## 4                                          pkcdelta
## 5                                               rsk
## 6                                               atr
## 7                                               atr
## 8                                               cbp
## 9                                              cdk1
## 10                                             cdk7
## 11            egfr*1, grb2-associated binder 1*1+
## 12                                              ep2
## 13                                              gem
```

```
## 14                                              nan
## 15                                              p300
## 16                               polo-like kinase-3
## 17                                         ppargamma
## 18                                              rheb
## 19           rsk1*1, epidermal growth factor*1+
## 20           rsk1*1, epidermal growth factor*1+
## 21                                            twist1
## 22                                              wip1
## 23                                              wip1
## 24                                              smrt
## 25                                              dbc1
## 26                                              trf2
## 27                                              wip1
## 28                                              dbc1
## 29                                               pp1
## 30                                           myr-akt
## 31                                               pp1
## 32                                              smrt
## 33                                              wip1
## 34                                              smrt
## 35                                            c-flip
## 36                                              shp2
## 37                                               atr
## 38                                               pp1
## 39                                              wip1
## 40                                               p27
## 41                                               pp1
## 42                                             iaspp
## 43                                             foxo4
## 44                                              cape
## 45                                               p27
## 46                                              pyk2
## 47                                               apc
## 48                                            deptor
## 49                                              shp2
## 50                                              wip1
## 51                                               npm
## 52                                              rheb
## 53                                             pdgfr
## 54                                             rig-i
## 55                                             pdgfr
## 56                                              skp2
## 57                                              skp2
## 58                                              skp2
## 59                                              skp2
## 60                                        galectin-3
## 61                                               p27
## 62                                              smrt
## 63                                        galectin-3
## 64                                           pi3k-akt
## 65                                              smrt
## 66                                               pp1
## 67                                              atrx
```

```
## 68                                                  phlpp2
## 69                                                     p27
## 70                                                    ptc2
## 71                                                    ptc3
## 72                                                    ptc3
## 73                                                     p27
## 74                                                     npm
## 75                                                    bmi1
## 76                                                    wip1
## 77                                                tgf-beta
## 78                                                    creb
## 79                                                    smrt
## 80                                                    pp2c
## 81                                                    dbc1
## 82                                                    shp2
## 83                                                  phlpp2
## 84                                                  phlpp1
## 85                                                    trf2
## 86                                                   14-3-3
## 87                                                    akt1
## 88                                             amphiregulin
## 89                                                  apaf-1
## 90                                                arrestin1
## 91                                                     atr
## 92                                                     atr
## 93                                                     atr
## 94                                                     atr
## 95                                                     atr
## 96                                                     bmp
## 97                                                     cak
## 98  calcium/calmodulin-dependent protein kinase ii
## 99                                                 camk-ii
## 100                                                  ccar2
##                       Source.Type        Source.ID Source.Location
## 1    protein family|protein complex       mtorc2             nan
## 2                          protein       q09472             nan
## 3                          protein       p55040             nan
## 4                          protein       p83099           other
## 5    protein family|protein complex          rsk           other
## 6                          protein       p20848             nan
## 7                          protein       p20848             nan
## 8                          protein       q92793             nan
## 9                          protein       p06493       cytoplasm
## 10                         protein       p50613             nan
## 11              protein, protein p00533, q13480.p plasma membrane
## 12                         protein       q08648             nan
## 13                         protein       p55040             nan
## 14                             nan          nan             nan
## 15                         protein       q09472             nan
## 16                         protein        q9h4b4           other
## 17                         protein       p37231             nan
## 18                         protein       q15382             nan
## 19              protein, protein   q15418, p01133             nan
## 20              protein, protein   q15418, p01133             nan
```

```
## 21                          protein          q15672          nan
## 22                          protein          o15297          nan
## 23                          protein          o15297      nucleus
## 24                          protein          q9y618          nan
## 25                          protein          o60477          nan
## 26                          protein          p62380        other
## 27                          protein          o15297          nan
## 28                          protein          o60477          nan
## 29  protein family|protein complex             ppp1          nan
## 30                          protein          p54644          nan
## 31  protein family|protein complex             ppp1          nan
## 32                          protein          q9y618          nan
## 33                          protein        o15297.t          nan
## 34                          protein          q9y618          nan
## 35                          protein          o15519          nan
## 36                          protein          q06124          nan
## 37                          protein          p20848          nan
## 38  protein family|protein complex             ppp1          nan
## 39                          protein          o15297          nan
## 40                          protein          p40305          nan
## 41  protein family|protein complex             ppp1          nan
## 42                          protein          q8wuf5          nan
## 43                          protein          p98177          nan
## 44                          protein          o95347          nan
## 45                          protein          p40305          nan
## 46                          protein          q14289          nan
## 47                          protein        p25054.d          nan
## 48                          protein          q8tb45          nan
## 49                          protein          q06124          nan
## 50                          protein          o15297          nan
## 51                          protein          p06748        other
## 52                          protein          q15382          nan
## 53  protein family|protein complex            pdgfr        other
## 54                          protein          o95786      nucleus
## 55  protein family|protein complex            pdgfr    cytoplasm
## 56                          protein          q13309          nan
## 57                          protein        q13309.t          nan
## 58                          protein          q13309          nan
## 59                          protein        q13309.t          nan
## 60                          protein        p17931.t      nucleus
## 61                          protein          p40305          nan
## 62                          protein          q9y618          nan
## 63                          protein          p17931          nan
## 64  protein family|protein complex              akt          nan
## 65                          protein          q9y618          nan
## 66  protein family|protein complex             ppp1          nan
## 67                          protein          p46100          nan
## 68                          protein          q6zvd8          nan
## 69                          protein        p40305.t          nan
## 70                          protein          q9y6c5          nan
## 71                          protein          p34221          nan
## 72                          protein          p34221          nan
## 73                          protein          p40305          nan
## 74                          protein          p06748    cytoplasm
```

```
## 75                         protein        p35226            nan
## 76                         protein       o15297.t           nan
## 77  protein family|protein complex         tgfb             nan
## 78  protein family|protein complex        creb.p            nan
## 79                         protein        q9y618            nan
## 80                  protein family        pf00481           nan
## 81                         protein        o60477            nan
## 82                         protein        q06124            nan
## 83                         protein        q6zvd8            nan
## 84                         protein        o60346            nan
## 85                         protein        p62380          other
## 86                  protein family        pf00244           nan
## 87                         protein       p31749.t           nan
## 88                         protein        p15514          other
## 89                         protein        o14727    mitochondria
## 90                         protein        p51486            nan
## 91                         protein        p20848            nan
## 92                         protein        p20848            nan
## 93                         protein        p20848            nan
## 94                         protein        p20848            nan
## 95                         protein        p20848            nan
## 96                  protein family        pf02608         other
## 97                         protein        p50613       cytoplasm
## 98                         protein        p22517          other
## 99  protein family|protein complex    camk2_complex       other
## 100                        protein    q8n163.p@t454         nan
##               Source.Location.ID   Sign Connection.Type
## 1                            nan positive              d
## 2                            nan positive              d
## 3                            nan positive              i
## 4                     go:0009986 positive              d
## 5                     go:0005856 negative              i
## 6                            nan positive              d
## 7                            nan positive              i
## 8                            nan positive              d
## 9                     go:0005737 positive              d
## 10                           nan positive              i
## 11                    go:0005886 positive              i
## 12                           nan positive              i
## 13                           nan positive              i
## 14                           nan positive              i
## 15                           nan positive              i
## 16                    go:0005813 positive              d
## 17                           nan positive              i
## 18                           nan positive              i
## 19                           nan positive              i
## 20                           nan positive              i
## 21                           nan positive              i
## 22                           nan negative              d
## 23                    go:0005634 negative              d
## 24                           nan negative              d
## 25                           nan negative              i
## 26                       sl-0276 negative              i
## 27                           nan negative              d
```

9

```
## 28                                      nan negative                    i
## 29                                      nan negative                    d
## 30                                      nan negative                    i
## 31                                      nan negative                    i
## 32                                      nan negative                    d
## 33                                      nan negative                    i
## 34                                      nan negative                    i
## 35                                      nan negative                    i
## 36                                      nan negative                    i
## 37                                      nan negative                    i
## 38                                      nan negative                    i
## 39                                      nan negative                    d
## 40                                      nan negative                    i
## 41                                      nan negative                    i
## 42                                      nan negative                    i
## 43                                      nan negative                    i
## 44                                      nan negative                    i
## 45                                      nan negative                    i
## 46                                      nan negative                    i
## 47                                      nan negative                    i
## 48                                      nan negative                    i
## 49                                      nan negative                    i
## 50                                      nan negative                    d
## 51  go:0005634 ++++ go:go:0005730 negative                    i
## 52                                      nan negative                    i
## 53  go:0005737 ++++ go:go:0042641 negative                    i
## 54                      go:0005634 negative                    i
## 55                      go:0005737 negative                    i
## 56                                      nan negative                    i
## 57                                      nan negative                    i
## 58                                      nan negative                    i
## 59                                      nan negative                    i
## 60                      go:0005634 negative                    i
## 61                                      nan negative                    i
## 62                                      nan negative                    d
## 63                                      nan negative                    i
## 64                                      nan negative                    i
## 65                                      nan negative                    i
## 66                                      nan negative                    d
## 67                                      nan negative                    i
## 68                                      nan negative                    d
## 69                                      nan negative                    i
## 70                                      nan negative                    i
## 71                                      nan negative                    i
## 72                                      nan negative                    i
## 73                                      nan negative                    i
## 74                      go:0005737 negative                    i
## 75                                      nan negative                    i
## 76                                      nan negative                    i
## 77                                      nan negative                    i
## 78                                      nan negative                    i
## 79                                      nan negative                    d
## 80                                      nan negative                    i
## 81                                      nan negative                    i
```

```
## 82                          nan negative            i
## 83                          nan negative            i
## 84                          nan negative            i
## 85                      sl-0276 negative            i
## 86                          nan positive            i
## 87                          nan positive            i
## 88                   go:0016020 positive            i
## 89                   go:0005739 positive            i
## 90                          nan positive            i
## 91                          nan positive            i
## 92                          nan positive            d
## 93                          nan positive            i
## 94                          nan positive            d
## 95                          nan positive            i
## 96                   go:0009986 positive            i
## 97                   go:0005737 positive            d
## 98                   go:0016020 positive            d
## 99                   go:0016020 positive            d
## 100                         nan positive            i
##
## 1     ['phosphorylation', 'phosphorylation', 'phosphorylation', 'phosphorylation', 'phosphorylation',
## 2                                                                  ['acetylation', 'acetyl
## 3                                                                    ['phosphorylation',
## 4                                                                    ['phosphorylation',
## 5                                                                                      [
## 6                                                                                      [
## 7
## 8
## 9                                                                                      [
## 10
## 11
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## 13                                                                                     [
## 14                                                                                     [
## 15
## 16                                                                                     [
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## 20                                                                                     [
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11

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## 89
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## 92
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## 94
## 95
## 96
## 97
## 98
## 99
## 100
##                                                                                      Paper.
## 1    ['pmc2075366', 'pmc2868031', 'pmc3291999', 'pmc3660063', 'pmc3660063', 'pmc3750018', 'pmc3837323
## 2                                              ['pmc3330162', 'pmc3330162', 'pmc3330162', 'pmc3330162
## 3                                                           ['pmc4159025', 'pmc4159025', 'pmc4159025
## 4                                                           ['pmc3709701', 'pmc3709701', 'pmc3709701
## 5                                                                       ['pmc3291999', 'pmc3291999
## 6                                                                       ['pmc2925474', 'pmc2925474
## 7                                                                       ['pmc2925474', 'pmc2954851
## 8                                                                       ['pmc2817464', 'pmc2817464
## 9                                                                       ['pmc2925474', 'pmc2925474
## 10                                                                      ['pmc3667761', 'pmc3667761
## 11                                                                      ['pmc2683723', 'pmc2683723
## 12                                                                      ['pmc4624070', 'pmc4624070
## 13                                                                      ['pmc4159025', 'pmc4159025
## 14                                                                      ['pmc2654145', 'pmc2654145
## 15                                                                      ['pmc3330162', 'pmc3330162
## 16                                                                      ['pmc4296918', 'pmc4296918
## 17                                                                      ['pmc1892639', 'pmc1892639
## 18                                                                      ['pmc4102778', 'pmc4258317
## 19                                                                      ['pmc4102778', 'pmc4102778
## 20                                                                      ['pmc4102778', 'pmc4102778
## 21                                                                      ['pmc3388235', 'pmc3388235
## 22                                                                                  ['pmc3656868
## 23                                                                                  ['pmc2954851
## 24                                                                                  ['pmc3656868
## 25                                                                                  ['pmc4245943
## 26                                                                                  ['pmc4296918
## 27                                                                                  ['pmc2954851
## 28                                                                                  ['pmc4245943
## 29                                                                                  ['pmc2954851
## 30                                                                                  ['pmc3325598
## 31                                                                                  ['pmc2954851
## 32                                                                                  ['pmc3656868
## 33                                                                                  ['pmc2954851
## 34                                                                                  ['pmc3656868
## 35                                                                                  ['pmc4700468
## 36                                                                                  ['pmc2683723
## 37                                                                                  ['pmc2954851
## 38                                                                                  ['pmc2954851
## 39                                                                                  ['pmc2954851
## 40                                                                                  ['pmc1647274
## 41                                                                                  ['pmc2954851
```

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## 86                                                                    ['pmc2817464
## 87                                                                    ['pmc2652403
## 88                                                                    ['pmc3709701
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## 96                                                                    ['pmc4347645
## 97                                                                    ['pmc1647274
## 98                                                                    ['pmc3660063
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##
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## 15   ['thus , a plausible explanation for the transcription and modification results is that p300 medi
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##     Evidence.Score Match.Score Kind.Score Epistemic.Value Total.Score
## 1                7         100         40               1         740
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## 2           4       100     40              1       440
## 3           3       100     40              1       340
## 4           3       100     40              1       340
## 5           2       100     40              1       240
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