

Split__Apply__Combine

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R Markdown

Create “fake” datatable

Taryn made a practice table with data similar to what we might obtain from running Luminex.

```
#Create "fake" datatable
library(knitr)
library(data.table)
donor<-c(rep("A", 6), rep("B",6), rep("C",6))
stim<-rep(c("un","w","p","s","sw","sb"),3)
ifng<-rnorm(18, 2)
tnfa<-rnorm(18,10)
fake<-as.data.table(cbind(donor,stim,ifng,tnfa))
fake$ifng=as.numeric(as.character(fake$ifng))
fake$tnfa=as.numeric(as.character(fake$tnfa))
#Print "fake" datatable
library(knitr)
kable(fake)
```

donor	stim	ifng	tnfa
A	un	2.7072616	10.096821
A	w	1.5414188	9.316720
A	p	2.2535578	8.686155
A	s	1.9146406	10.489663
A	sw	3.3081768	12.578254
A	sb	0.8981832	9.800296
B	un	0.6948252	10.909559
B	w	1.8245796	10.572008
B	p	3.4785230	11.193426
B	s	1.4598965	9.614351
B	sw	1.9612774	11.115624
B	sb	1.7067704	7.940108
C	un	2.9659728	10.179783
C	w	0.9600547	8.048794
C	p	1.5316144	8.442604
C	s	2.3728438	10.715833
C	sw	1.8849110	9.710252
C	sb	2.7553293	9.713793

Split table by donor

```
library(knitr)
y<- split(fake, donor)
```

```
kable(y$A)
```

donor	stim	ifng	tnfa
A	un	2.7072616	10.096821
A	w	1.5414188	9.316720
A	p	2.2535578	8.686155
A	s	1.9146406	10.489663
A	sw	3.3081768	12.578254
A	sb	0.8981832	9.800296

```
kable(y$B)
```

donor	stim	ifng	tnfa
B	un	0.6948252	10.909559
B	w	1.8245796	10.572008
B	p	3.4785230	11.193426
B	s	1.4598965	9.614351
B	sw	1.9612774	11.115624
B	sb	1.7067704	7.940108

```
kable(y$C)
```

donor	stim	ifng	tnfa
C	un	2.9659728	10.179783
C	w	0.9600547	8.048794
C	p	1.5316144	8.442604
C	s	2.3728438	10.715833
C	sw	1.8849110	9.710252
C	sb	2.7553293	9.713793

Subtract out unstimulated values

I wrote a function called “subtractun” that pulls the unstim value for each cytokine from each donor and subtracts it from the respective stim values for the respective cytokine. The function uses the 1) split, 2) apply, 3) combine sequence to 1) generate data tables for each individual donor, 2) apply the subtraction of the unstim to the respective cytokines for those donors, and 3) take these newly calculated values for individual donors and combine them into a data table containing all donor values.

```
subtractun<-function (datatable) {  
  #Split full data table into smaller data tables for each individual donor  
  y<- split(datatable, donor)  
  #Subtract out unstim  
  newifng<-unlist(lapply(y,function(x)(x$ifng-x$ifng[x$stim=="un"])))  
  newtnfa<-unlist(lapply(y,function(x)(x$tnfa-x$tnfa[x$stim=="un"])))  
  #Merge donor and stim condition to create new sample ID  
  newsampleid<- paste(donor, stim, sep= "_")  
  #Create new datatable with unstim substractions applied to all donors
```

```
datatable <- as.data.table(cbind(newsampleid, newifng, newtnfa))
#Print datatable
datatable
}
```

```
newnewfake<-subtractun(fake)
library(knitr)
kable(newnewfake)
```

newsampleid	newifng	newtnfa
A_un	0	0
A_w	-1.16584275960373	-0.78010133521761
A_p	-0.4537037990414	-1.41066609998955
A_s	-0.79262096935449	0.392841308415599
A_sw	0.60091521025301	2.4814325865112
A_sb	-1.80907841703255	-0.29652535641765
B_un	0	0
B_w	1.12975438148189	-0.337550385827301
B_p	2.78369781668438	0.2838672965573
B_s	0.765071294993233	-1.29520816174232
B_sw	1.26645218922004	0.206065275193799
B_sb	1.01194523892276	-2.96945115412459
C_un	0	0
C_w	-2.0059181053891	-2.13098845529401
C_p	-1.43435833086233	-1.73717893234287
C_s	-0.59312896129986	0.536050133732401
C_sw	-1.08106175221039	-0.46953125432584
C_sb	-0.21064345898778	-0.4659900659366

Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.