# Control Means and Clearance Rates

## Code

File Name 03\_calcs\_CtrlMn+Cr.R

### SJR1 CR FUNCTION TESTING USING SPLIT APPLY COMBINE

### This is for finding out how to tell R to calculate the means of the controls counts per ml, and add them to a column of a df of the experimentals counts per ml, so that the Cmn (control mean counts per ml) appears next to the experimental counts per ml. Ref this link:

https://pages.stat.wisc.edu/~yandell/R\_for\_data\_sciences/curate/tidyverse.html

library(tidyverse)

load("data/Clearance Rates/taxaCen.Rdata")

source("scripts/01\_function\_clearanceRates.R")

### Remove the esd column from taxaCen because I don't need it right now

taxaCen <- select(taxaCen, samp\_ev, exp, rep, grp\_sz,

counts\_per\_ml)

### Create a new df with only the FC (Controls) counts per ml, and calculate the FC counts per ml means across the three replicates

taxaCenCmn <- taxaCen %>%

filter(exp == "FC",

samp\_ev =="SJR1") %>%

group\_by(samp\_ev, exp, grp\_sz) %>%

summarize(Cmn = mean(counts\_per\_ml))

### Join the above df with the df that has the T24 (experimental) counts per ml

taxaCenSJR1CmnE <- left\_join(taxaCenSJR1E, taxaCenCmn, by = "grp\_sz")

### Remove unneeded columns

taxaCenSJR1CmnE <- subset(taxaCenSJR1CmnE,

select = c(-samp\_ev.y, -exp.y))

### Rename and re-order columns

taxaCenSJR1CmnE <- select(taxaCenSJR1CmnE,

event = samp\_ev.x,

sample = exp.x,

rep,

group = grp\_sz,

cpm = counts\_per\_ml,

Cmn)

### Rename T24 to exp

taxaCenSJR1CmnE$sample <-replace(taxaCenSJR1CmnE$sample, taxaCenSJR1CmnE$sample=="T24","exp")

### Calculate clearance rates for SJR1

source("scripts/01\_function\_clearanceRates.R")

sjr1Cr <- rowwise(taxaCenSJR1CmnE) %>%

mutate(CR = cr\_func(controlMnCt = Cmn, expCt = cpm))

CLEARANCE RATE CALCULATIONS FUNCTION

cr\_func <- function(V=595, controlMnCt, expCt, numBugs=24, T=1) {

cr = (V/T) \* ((log(controlMnCt) - log(expCt))/numBugs)

if(expCt == 0 | controlMnCt == 0 | controlMnCt <= expCt){

return(NA)

} else{

return(cr)

}

}

### Note on 1/4/23: trying to fix an error, I changed if(cr ==

### Notes on if else argument:

1. if Ctrl and Exp both = 0, then Cmn needs to = NA
2. controlMnCt == 0 : if Ctrl = 0 and Exp = #, then Cmn needs to = NA
3. expCt == 0: if Ctrl = # and Exp = 0, then Cmn needs to = NA

### Note:controlMnCt is the mean count of the three replicates of the control samples;

## expCt is the counts of each of the three replicates of the experimental samples;

## numBugs is the number of copepods that were in the experimental sample

## bottles--in the Hunger Games project, it was 24 in all bottles.

## V = total volume in ml of the sample bottle;

## T = time in days, 1 day for the Hunger Games project