Prochlorococcus paper analyses

**TPC**

Strain B growth curves with linear regression fits

Chart, scatter chart

Description automatically generated

Strain D growth curves with linear regression fits

Chart, scatter chart

Description automatically generated

At 20C, 23C and 25C the curve goes down suddenly at the end. Cut the last 2 days for these three (even though 20C doesn’t go down in second last day. Can fix this.)

(JUSTIFICATION??)

* Also, if going to do this, cut last points of 27C for strain B?

Or, can just change the analysis to ‘maximum growth rate’ or another way of measuring.

\*\*measurement error – erroneous measurement?

Definitely ones at end there are errors of some kind

Talk to ruth

Strain D growth curves when cut last 2 points from 20C, 23C, 25C with linear regression fits

Chart, scatter chart

Description automatically generated

Plot of strain B TPC. Mean slope (growth rate) at each temp, +/- SD. Green is control environment, red is stressful environment.

Chart, line chart

Description automatically generated

Plot of strain D TPC with no points cut. Mean slope (growth rate) at each temp, +/- SD. Green is control environment, red is stressful environment.

Chart, line chart

Description automatically generated

Plot of strain D TPC with points cut. Mean slope (growth rate) at each temp, +/- SD. Green is control environment, red is stressful environment.

Chart, line chart

Description automatically generated

**Evolution experiment**

#?I think Ruth told me that the cells were diluted to 1000 cells/10ul for each transfer

#?not sure what time 0 means then...

#?I'm assuming these cell counts are /10ul for this analysis

#to calculate growth rate: (log(Cell.count) - log(1000))/#days

#?does rep 1 in 23 correspond to rep 1 in 29 in some way? for now, assume no and make unique

#?need to check when dilutions not done/done - NAs right now messing with calculations

* When remove NAs, assume dilution not done on those days

\*\*ask ruth about

Plot of Strain B without removing NAs

Chart, line chart

Description automatically generated

Plot of strain B with removing NAs

Chart, line chart

Description automatically generated

Huge dip at one timepoint – day 125 = 2022-03-31

Plot of strain D without removing NAs

Chart, line chart

Description automatically generated

Plot of strain D with removing NAs

Chart, line chart

Description automatically generated

Big dip as well – day 118 – 2022-03-31 – same date

This dip seems to affect the next points as well – related to the covid gp? Maybe takes awhile to recover?

Use the datasets without NAs.

\*\*\*use gr pre-covid and exclude data in window that sig diff from previous ones (probs 3 timeopints in one case, 2 in other)

Strain B at 23C

Chart

Description automatically generated

Black excludes red timepoint, which seem a bit weird.

Red line: adj.r.squared = 0.09257042, y = 0.6689416883 -0.0006203942x

Black line: adj.r.squared = 0.02982014, y = 0.6589833959 -0.0001654328x

Strain B at 29C

Chart, scatter chart

Description automatically generated

Red line: adj.r.squared = 0.112175 y = 0.3459369691 +0.0007481821x

Black line: adj.r.squared = 0.2318895, y = 0.3431149544 + 0.0009564089x

Strain D at 23C

Chart, scatter chart

Description automatically generated

Red line: adj.r.squared = 0.1953174, y = 0.5580234267 -0.0008563721x

Black line: adj.r.squared = 0.1971991, y = 0.5539619632 -0.0005639677x

Strain D at 27C

Chart, scatter chart

Description automatically generated

Red line: adj.r.squared = 0.1233012, y = 0.308219391 +0.001464136x

Black line: adj.r.squared = 0.1697262, y = 0.306454257 +0.001681944x

**Reciprocal transplant**

Strain B

Chart, line chart

Description automatically generated

Chart, line chart

Description automatically generated

Chart

Description automatically generated

Strain D

Chart

Description automatically generated

Chart, line chart

Description automatically generated

Chart

Description automatically generated

\*\*\*should be sort of opposite

\*\*\*also, when check low replicate in D, rep 6 in both what I thought was 23 grown at 27 and 27 grown at 27

\*\*check data file columns with ruth

\*\*double check R code/ggplot to make sure know which is which

\*\*check one poor growing strain D – is it rep5?

\*\*frozen? Ask ruth

\*\*could measure c:n ratio relatively easily

\*\*think about how much to push data – check big journals? – background reading – j. jeff morris (alabama)

\*\*johnson paper (2006) – two strains

* Ask ruth which b and which d
  + Might be able to figure it out from the paper