Alpha\_Diversity\_analysis\_and\_plots.R

Pedro\_Torres

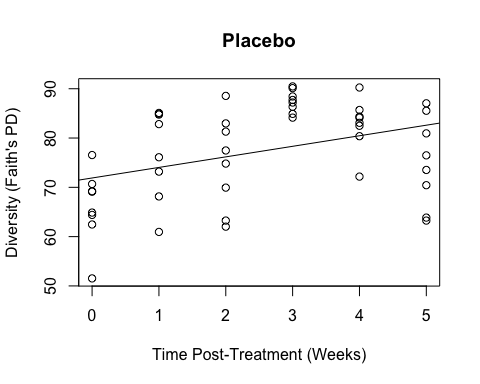
# Alpha Diversity Analysis for Torres et al. 2017 Developmental Stage Influences metabolic and gut microbiome of PCOS mouse model  
# Used the output from qiime using alpha\_diversity.py followed by add\_alpha\_to\_mapping\_file  
getwd()

## [1] "/Volumes/PBD/PCOS.PhD/Microbiome\_Torres.et.al.Files"

#setwd("/Volumes/PBD/PCOS.PhD/Microbiome\_Torres.et.al.Files")  
  
setwd("/Users/Pedro\_Torres/Desktop/PCOS\_Analysis/PCOS.16S.PhD/Age\_study\_not\_merged")  
#import mapping file with diversity metrics  
mapping\_file=read.csv("mapping\_file\_kina\_dropped\_samples\_alphaDiv.csv", header=T, sep=",", as.is = T, row.names = 1, check.names = F )  
#labels(mapping\_file)  
  
# alpha diverity  
  
#placebo-------  
placebo=subset(mapping\_file, Treatment =="Placebo")  
  
#PD  
lm.pd.p=with(placebo, lm(PD\_whole\_tree\_alpha~time))  
summary(lm.pd.p)

##   
## Call:  
## lm(formula = PD\_whole\_tree\_alpha ~ time)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -20.370 -6.436 2.043 7.093 12.365   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 71.8947 2.3500 30.593 < 2e-16 \*\*\*  
## time 2.1428 0.7762 2.761 0.00826 \*\*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 9.184 on 46 degrees of freedom  
## Multiple R-squared: 0.1421, Adjusted R-squared: 0.1235   
## F-statistic: 7.621 on 1 and 46 DF, p-value: 0.008258

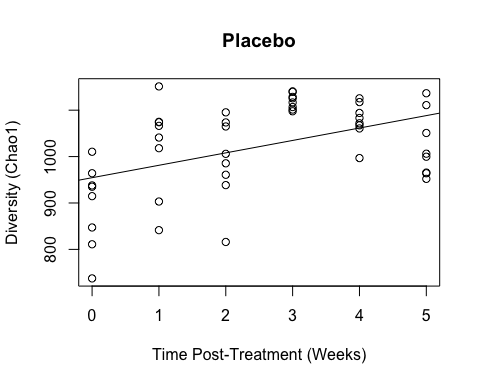
with(placebo,plot(time,PD\_whole\_tree\_alpha, title("Placebo"), xlab="Time Post-Treatment (Weeks)", ylab="Diversity (Faith's PD)"))  
abline(lm.pd.p)



#chao1  
lm.chao1.p=with(placebo, lm(chao1\_alpha~time))  
summary(lm.chao1.p)

##   
## Call:  
## lm(formula = chao1\_alpha ~ time)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -217.01 -65.95 15.88 65.82 169.99   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 954.476 22.911 41.660 < 2e-16 \*\*\*  
## time 26.771 7.567 3.538 0.000935 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 89.54 on 46 degrees of freedom  
## Multiple R-squared: 0.2139, Adjusted R-squared: 0.1968   
## F-statistic: 12.52 on 1 and 46 DF, p-value: 0.0009348

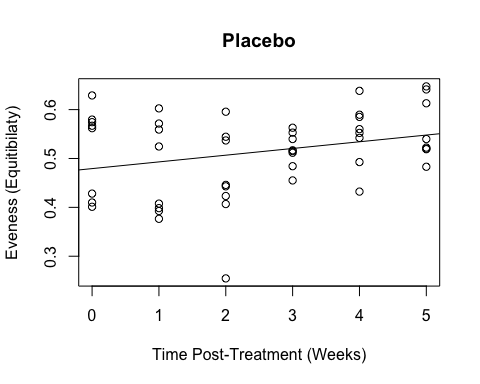
with(placebo, plot(time,chao1\_alpha,title("Placebo"), xlab="Time Post-Treatment (Weeks)", ylab="Diversity (Chao1)"))  
abline(lm.chao1.p)



#equitability-eveness  
lm.equitability=with(placebo, lm(equitability~time))  
summary(lm.equitability)

##   
## Call:  
## lm(formula = equitability ~ time)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.252096 -0.063970 0.002159 0.065369 0.149715   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 0.47929 0.02065 23.211 <2e-16 \*\*\*  
## time 0.01372 0.00682 2.011 0.0502 .   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.0807 on 46 degrees of freedom  
## Multiple R-squared: 0.08084, Adjusted R-squared: 0.06086   
## F-statistic: 4.046 on 1 and 46 DF, p-value: 0.05017

with(placebo, plot(time,equitability,title("Placebo"),xlab="Time Post-Treatment (Weeks)", ylab="Eveness (Equitibilaty)"))  
abline(lm.equitability)



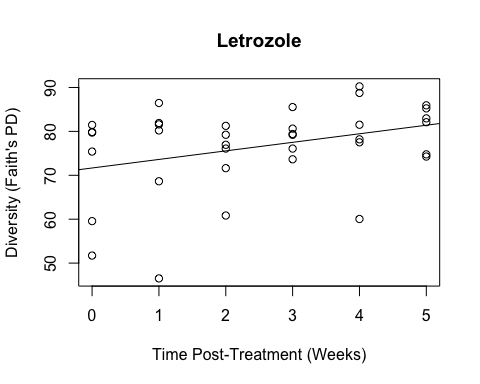
#letrozole----------------  
letrozole=subset(mapping\_file, Treatment =="Letrozole")  
unique(letrozole)

## BarcodeSequence RunDate SequencingRunPlate DNA\_ng\_ul Treatment  
## 49.T0 ATCCTTTGGTTC 6\_20\_16 Seqrun1.Plate1.2 24.7 Letrozole  
## 49.T1 GCGATATATCGC 6\_20\_16 Seqrun1.Plate1.2 27.7 Letrozole  
## 49.T2 GAACACTTTGGA 6\_20\_16 Seqrun1.Plate1.2 34.7 Letrozole  
## 49.T3 ACGGGTCATCAT 7\_12\_16 Seqrun2.Plate1.2 32.0 Letrozole  
## 49.T4 TTAAGACAGTCG 7\_12\_16 Seqrun2.Plate1.2 31.8 Letrozole  
## 49.T5 ACGATTCGAGTC 7\_12\_16 Seqrun2.Plate1.2 31.3 Letrozole  
## 51.T0 ACCGGTATGTAC 6\_20\_16 Seqrun1.Plate1.2 25.8 Letrozole  
## 51.T1 AGTCGTGCACAT 6\_20\_16 Seqrun1.Plate1.2 14.3 Letrozole  
## 51.T2 TTGGGTACACGT 6\_20\_16 Seqrun1.Plate1.2 30.6 Letrozole  
## 51.T3 CGTACTCTCGAG 7\_12\_16 Seqrun2.Plate1.2 30.7 Letrozole  
## 51.T4 CGCAGATTAGTA 7\_12\_16 Seqrun2.Plate1.2 20.6 Letrozole  
## 51.T5 CTGATCCATCTT 7\_12\_16 Seqrun2.Plate1.2 13.3 Letrozole  
## 52.T0 AATTGTGTCGGA 6\_20\_16 Seqrun1.Plate1.2 47.5 Letrozole  
## 52.T1 GTATCTGCGCGT 6\_20\_16 Seqrun1.Plate1.2 28.0 Letrozole  
## 52.T2 AAGGCGCTCCTT 6\_20\_16 Seqrun1.Plate1.2 18.8 Letrozole  
## 52.T3 TCAGTTCTCGTT 7\_12\_16 Seqrun2.Plate1.2 18.7 Letrozole  
## 52.T4 TGGGTCCCACAT 7\_12\_16 Seqrun2.Plate1.2 29.0 Letrozole  
## 52.T5 TATGTGCCGGCT 7\_12\_16 Seqrun2.Plate1.2 15.9 Letrozole  
## 54.T0 AGTCGAACGAGG 6\_20\_16 Seqrun1.Plate1.2 29.2 Letrozole  
## 54.T1 CAAATTCGGGAT 6\_20\_16 Seqrun1.Plate1.2 13.9 Letrozole  
## 54.T2 TCGGAATTAGAC 6\_20\_16 Seqrun1.Plate1.2 36.4 Letrozole  
## 54.T3 GTTATCGCATGG 7\_12\_16 Seqrun2.Plate1.2 35.2 Letrozole  
## 54.T4 AACGTAGGCTCT 7\_12\_16 Seqrun2.Plate1.2 26.0 Letrozole  
## 54.T5 TGTAAGACTTGG 7\_12\_16 Seqrun2.Plate1.2 21.7 Letrozole  
## 55.T0 ACCAGTGACTCA 6\_20\_16 Seqrun1.Plate1.2 28.2 Letrozole  
## 55.T1 AGATTGACCAAC 6\_20\_16 Seqrun1.Plate1.2 10.4 Letrozole  
## 55.T2 TGTGAATTCGGA 6\_20\_16 Seqrun1.Plate1.2 33.6 Letrozole  
## 55.T3 GATCACGAGAGG 7\_12\_16 Seqrun2.Plate1.2 30.9 Letrozole  
## 55.T4 AGTTGTAGTCCG 7\_12\_16 Seqrun2.Plate1.2 19.4 Letrozole  
## 55.T5 CGGATCTAGTGT 7\_12\_16 Seqrun2.Plate1.2 23.9 Letrozole  
## 56.T0 GAATACCAAGTC 6\_20\_16 Seqrun1.Plate1.2 28.9 Letrozole  
## 56.T1 AGTTACGAGCTA 6\_20\_16 Seqrun1.Plate1.2 13.6 Letrozole  
## 56.T2 CATTCGTGGCGT 6\_20\_16 Seqrun1.Plate1.2 18.0 Letrozole  
## 56.T3 GTAAATTCAGGC 7\_12\_16 Seqrun2.Plate1.2 23.1 Letrozole  
## 56.T4 TCGTCAAACCCG 7\_12\_16 Seqrun2.Plate1.2 26.8 Letrozole  
## 56.T5 CGATCTTCGAGC 7\_12\_16 Seqrun2.Plate1.2 17.1 Letrozole  
## Barcode\_set time Cage Description PD\_whole\_tree\_alpha  
## 49.T0 1a\_P1 0 E1 49.T0 51.71626  
## 49.T1 1a\_P1 1 E1 49.T1 80.21453  
## 49.T2 1a\_P1 2 E1 49.T2 76.08502  
## 49.T3 2b\_P2 3 E1 49.T3 85.54226  
## 49.T4 2b\_P2 4 E1 49.T4 77.51220  
## 49.T5 2b\_P2 5 E1 49.T5 74.77120  
## 51.T0 1a\_P1 0 F1 51.T0 79.72917  
## 51.T1 1a\_P1 1 F1 51.T1 68.64109  
## 51.T2 1a\_P1 2 F1 51.T2 76.94639  
## 51.T3 2b\_P2 3 F1 51.T3 76.08697  
## 51.T4 2b\_P2 4 F1 51.T4 81.51367  
## 51.T5 2b\_P2 5 F1 51.T5 82.96513  
## 52.T0 1a\_P1 0 F1 52.T0 75.40186  
## 52.T1 1a\_P1 1 F1 52.T1 46.51578  
## 52.T2 1a\_P1 2 F1 52.T2 79.23088  
## 52.T3 2b\_P2 3 F1 52.T3 79.21762  
## 52.T4 2b\_P2 4 F1 52.T4 78.18981  
## 52.T5 2b\_P2 5 F1 52.T5 74.26601  
## 54.T0 1a\_P1 0 G1 54.T0 79.87359  
## 54.T1 1a\_P1 1 G1 54.T1 81.59621  
## 54.T2 1a\_P1 2 G1 54.T2 71.62608  
## 54.T3 2b\_P2 3 G1 54.T3 73.64440  
## 54.T4 2b\_P2 4 G1 54.T4 88.75732  
## 54.T5 2b\_P2 5 G1 54.T5 85.24173  
## 55.T0 1a\_P1 0 H1 55.T0 59.56198  
## 55.T1 1a\_P1 1 H1 55.T1 86.46497  
## 55.T2 1a\_P1 2 H1 55.T2 81.25913  
## 55.T3 2b\_P2 3 H1 55.T3 80.62918  
## 55.T4 2b\_P2 4 H1 55.T4 90.24585  
## 55.T5 2b\_P2 5 H1 55.T5 85.93229  
## 56.T0 1a\_P1 0 H1 56.T0 81.46596  
## 56.T1 1a\_P1 1 H1 56.T1 81.91059  
## 56.T2 1a\_P1 2 H1 56.T2 60.83813  
## 56.T3 2b\_P2 3 H1 56.T3 79.40086  
## 56.T4 2b\_P2 4 H1 56.T4 60.05086  
## 56.T5 2b\_P2 5 H1 56.T5 82.08821  
## PD\_whole\_tree\_normalized\_alpha PD\_whole\_tree\_alpha\_label chao1\_alpha  
## 49.T0 0.1183062 bin\_1\_of\_4 783.4531  
## 49.T1 0.7666159 bin\_4\_of\_4 1062.1364  
## 49.T2 0.6726733 bin\_3\_of\_4 988.5625  
## 49.T3 0.8878170 bin\_4\_of\_4 1082.3148  
## 49.T4 0.7051404 bin\_3\_of\_4 1048.8854  
## 49.T5 0.6427851 bin\_3\_of\_4 1096.1458  
## 51.T0 0.7555744 bin\_4\_of\_4 1083.0280  
## 51.T1 0.5033307 bin\_3\_of\_4 919.7429  
## 51.T2 0.6922687 bin\_3\_of\_4 1051.0083  
## 51.T3 0.6727177 bin\_3\_of\_4 1036.2222  
## 51.T4 0.7961702 bin\_4\_of\_4 1027.3609  
## 51.T5 0.8291896 bin\_4\_of\_4 1062.1111  
## 52.T0 0.6571321 bin\_3\_of\_4 982.5592  
## 52.T1 0.0000000 bin\_1\_of\_4 778.6230  
## 52.T2 0.7442388 bin\_3\_of\_4 1025.0000  
## 52.T3 0.7439371 bin\_3\_of\_4 1034.1387  
## 52.T4 0.7205554 bin\_3\_of\_4 1031.1275  
## 52.T5 0.6312925 bin\_3\_of\_4 1003.8400  
## 54.T0 0.7588599 bin\_4\_of\_4 1066.2038  
## 54.T1 0.7980479 bin\_4\_of\_4 1058.0667  
## 54.T2 0.5712365 bin\_3\_of\_4 1008.5833  
## 54.T3 0.6171515 bin\_3\_of\_4 971.1707  
## 54.T4 0.9609566 bin\_4\_of\_4 1118.8309  
## 54.T5 0.8809802 bin\_4\_of\_4 1126.6905  
## 55.T0 0.2967892 bin\_2\_of\_4 824.0862  
## 55.T1 0.9088078 bin\_4\_of\_4 1073.2240  
## 55.T2 0.7903796 bin\_4\_of\_4 1053.8394  
## 55.T3 0.7760488 bin\_4\_of\_4 1026.8608  
## 55.T4 0.9948193 bin\_4\_of\_4 1095.0550  
## 55.T5 0.8966898 bin\_4\_of\_4 1083.9458  
## 56.T0 0.7950848 bin\_4\_of\_4 1040.8543  
## 56.T1 0.8051998 bin\_4\_of\_4 1031.3148  
## 56.T2 0.3258204 bin\_2\_of\_4 887.9192  
## 56.T3 0.7481057 bin\_3\_of\_4 1017.1210  
## 56.T4 0.3079108 bin\_2\_of\_4 867.5143  
## 56.T5 0.8092405 bin\_4\_of\_4 1008.7619  
## chao1\_normalized\_alpha chao1\_alpha\_label observed\_otus\_alpha  
## 49.T0 0.11113395 bin\_1\_of\_4 424  
## 49.T1 0.78466555 bin\_4\_of\_4 879  
## 49.T2 0.60684961 bin\_3\_of\_4 838  
## 49.T3 0.83343355 bin\_4\_of\_4 957  
## 49.T4 0.75264003 bin\_4\_of\_4 821  
## 49.T5 0.86686085 bin\_4\_of\_4 795  
## 51.T0 0.83515729 bin\_4\_of\_4 874  
## 51.T1 0.44052384 bin\_2\_of\_4 684  
## 51.T2 0.75777093 bin\_4\_of\_4 814  
## 51.T3 0.72203533 bin\_3\_of\_4 822  
## 51.T4 0.70061897 bin\_3\_of\_4 898  
## 51.T5 0.78460452 bin\_4\_of\_4 922  
## 52.T0 0.59234065 bin\_3\_of\_4 849  
## 52.T1 0.09946021 bin\_1\_of\_4 405  
## 52.T2 0.69491306 bin\_3\_of\_4 884  
## 52.T3 0.71699976 bin\_3\_of\_4 883  
## 52.T4 0.70972226 bin\_3\_of\_4 865  
## 52.T5 0.64377282 bin\_3\_of\_4 782  
## 54.T0 0.79449593 bin\_4\_of\_4 897  
## 54.T1 0.77482976 bin\_4\_of\_4 896  
## 54.T2 0.65523667 bin\_3\_of\_4 728  
## 54.T3 0.56481656 bin\_3\_of\_4 738  
## 54.T4 0.92168689 bin\_4\_of\_4 1003  
## 54.T5 0.94068223 bin\_4\_of\_4 932  
## 55.T0 0.20933743 bin\_1\_of\_4 583  
## 55.T1 0.81146254 bin\_4\_of\_4 974  
## 55.T2 0.76461319 bin\_4\_of\_4 920  
## 55.T3 0.69941021 bin\_3\_of\_4 873  
## 55.T4 0.86422460 bin\_4\_of\_4 1037  
## 55.T5 0.83737533 bin\_4\_of\_4 970  
## 56.T0 0.73323031 bin\_3\_of\_4 913  
## 56.T1 0.71017493 bin\_3\_of\_4 906  
## 56.T2 0.36361127 bin\_2\_of\_4 571  
## 56.T3 0.67587086 bin\_3\_of\_4 880  
## 56.T4 0.31429596 bin\_2\_of\_4 548  
## 56.T5 0.65566825 bin\_3\_of\_4 904  
## observed\_otus\_normalized\_alpha observed\_otus\_alpha\_label  
## 49.T0 0.02861446 bin\_1\_of\_4  
## 49.T1 0.71385542 bin\_3\_of\_4  
## 49.T2 0.65210843 bin\_3\_of\_4  
## 49.T3 0.83132530 bin\_4\_of\_4  
## 49.T4 0.62650602 bin\_3\_of\_4  
## 49.T5 0.58734940 bin\_3\_of\_4  
## 51.T0 0.70632530 bin\_3\_of\_4  
## 51.T1 0.42018072 bin\_2\_of\_4  
## 51.T2 0.61596385 bin\_3\_of\_4  
## 51.T3 0.62801205 bin\_3\_of\_4  
## 51.T4 0.74246988 bin\_3\_of\_4  
## 51.T5 0.77861446 bin\_4\_of\_4  
## 52.T0 0.66867470 bin\_3\_of\_4  
## 52.T1 0.00000000 bin\_1\_of\_4  
## 52.T2 0.72138554 bin\_3\_of\_4  
## 52.T3 0.71987952 bin\_3\_of\_4  
## 52.T4 0.69277108 bin\_3\_of\_4  
## 52.T5 0.56777108 bin\_3\_of\_4  
## 54.T0 0.74096385 bin\_3\_of\_4  
## 54.T1 0.73945783 bin\_3\_of\_4  
## 54.T2 0.48644578 bin\_2\_of\_4  
## 54.T3 0.50150602 bin\_3\_of\_4  
## 54.T4 0.90060241 bin\_4\_of\_4  
## 54.T5 0.79367470 bin\_4\_of\_4  
## 55.T0 0.26807229 bin\_2\_of\_4  
## 55.T1 0.85692771 bin\_4\_of\_4  
## 55.T2 0.77560241 bin\_4\_of\_4  
## 55.T3 0.70481928 bin\_3\_of\_4  
## 55.T4 0.95180723 bin\_4\_of\_4  
## 55.T5 0.85090361 bin\_4\_of\_4  
## 56.T0 0.76506024 bin\_4\_of\_4  
## 56.T1 0.75451807 bin\_4\_of\_4  
## 56.T2 0.25000000 bin\_2\_of\_4  
## 56.T3 0.71536145 bin\_3\_of\_4  
## 56.T4 0.21536145 bin\_1\_of\_4  
## 56.T5 0.75150602 bin\_4\_of\_4  
## shannon\_alpha shannon\_normalized\_alpha shannon\_alpha\_label  
## 49.T0 4.312945 0.4790957 bin\_2\_of\_4  
## 49.T1 5.496714 0.7399012 bin\_3\_of\_4  
## 49.T2 4.105549 0.4334027 bin\_2\_of\_4  
## 49.T3 5.320233 0.7010193 bin\_3\_of\_4  
## 49.T4 5.260193 0.6877915 bin\_3\_of\_4  
## 49.T5 4.782739 0.5825999 bin\_3\_of\_4  
## 51.T0 6.014835 0.8540527 bin\_4\_of\_4  
## 51.T1 6.170527 0.8883544 bin\_4\_of\_4  
## 51.T2 5.456383 0.7310156 bin\_3\_of\_4  
## 51.T3 5.582865 0.7588819 bin\_4\_of\_4  
## 51.T4 5.158099 0.6652982 bin\_3\_of\_4  
## 51.T5 6.058156 0.8635970 bin\_4\_of\_4  
## 52.T0 4.268684 0.4693443 bin\_2\_of\_4  
## 52.T1 4.297194 0.4756256 bin\_2\_of\_4  
## 52.T2 4.614274 0.5454839 bin\_3\_of\_4  
## 52.T3 5.408282 0.7204182 bin\_3\_of\_4  
## 52.T4 4.989104 0.6280657 bin\_3\_of\_4  
## 52.T5 5.889065 0.8263432 bin\_4\_of\_4  
## 54.T0 5.287435 0.6937933 bin\_3\_of\_4  
## 54.T1 5.181782 0.6705161 bin\_3\_of\_4  
## 54.T2 5.502417 0.7411577 bin\_3\_of\_4  
## 54.T3 6.677275 1.0000000 bin\_4\_of\_4  
## 54.T4 6.026913 0.8567136 bin\_4\_of\_4  
## 54.T5 6.422205 0.9438035 bin\_4\_of\_4  
## 55.T0 4.675508 0.5589750 bin\_3\_of\_4  
## 55.T1 5.123769 0.6577349 bin\_3\_of\_4  
## 55.T2 5.072086 0.6463482 bin\_3\_of\_4  
## 55.T3 4.991900 0.6286817 bin\_3\_of\_4  
## 55.T4 5.074998 0.6469896 bin\_3\_of\_4  
## 55.T5 5.470821 0.7341967 bin\_3\_of\_4  
## 56.T0 5.154870 0.6645868 bin\_3\_of\_4  
## 56.T1 4.901845 0.6088411 bin\_3\_of\_4  
## 56.T2 4.490728 0.5182645 bin\_3\_of\_4  
## 56.T3 5.448034 0.7291761 bin\_3\_of\_4  
## 56.T4 5.022124 0.6353405 bin\_3\_of\_4  
## 56.T5 5.751237 0.7959772 bin\_4\_of\_4  
## simpson\_alpha simpson\_normalized\_alpha simpson\_alpha\_label  
## 49.T0 0.8609331 0.7956662 bin\_4\_of\_4  
## 49.T1 0.9197360 0.9111378 bin\_4\_of\_4  
## 49.T2 0.8625037 0.7987505 bin\_4\_of\_4  
## 49.T3 0.9006278 0.8736149 bin\_4\_of\_4  
## 49.T4 0.8927174 0.8580813 bin\_4\_of\_4  
## 49.T5 0.8745990 0.8225020 bin\_4\_of\_4  
## 51.T0 0.8588172 0.7915112 bin\_4\_of\_4  
## 51.T1 0.9078190 0.8877364 bin\_4\_of\_4  
## 51.T2 0.8286759 0.7323226 bin\_3\_of\_4  
## 51.T3 0.9268164 0.9250418 bin\_4\_of\_4  
## 51.T4 0.9388092 0.9485920 bin\_4\_of\_4  
## 51.T5 0.8921313 0.8569303 bin\_4\_of\_4  
## 52.T0 0.9122006 0.8963405 bin\_4\_of\_4  
## 52.T1 0.9159764 0.9037552 bin\_4\_of\_4  
## 52.T2 0.9466447 0.9639787 bin\_4\_of\_4  
## 52.T3 0.8141132 0.7037258 bin\_3\_of\_4  
## 52.T4 0.9013927 0.8751171 bin\_4\_of\_4  
## 52.T5 0.8593781 0.7926126 bin\_4\_of\_4  
## 54.T0 0.8450185 0.7644147 bin\_4\_of\_4  
## 54.T1 0.8769362 0.8270917 bin\_4\_of\_4  
## 54.T2 0.8785000 0.8301625 bin\_4\_of\_4  
## 54.T3 0.8907199 0.8541588 bin\_4\_of\_4  
## 54.T4 0.9511820 0.9728885 bin\_4\_of\_4  
## 54.T5 0.8681339 0.8098066 bin\_4\_of\_4  
## 55.T0 0.9121979 0.8963353 bin\_4\_of\_4  
## 55.T1 0.9409924 0.9528793 bin\_4\_of\_4  
## 55.T2 0.9587976 0.9878434 bin\_4\_of\_4  
## 55.T3 0.9165145 0.9048117 bin\_4\_of\_4  
## 55.T4 0.8865968 0.8460622 bin\_4\_of\_4  
## 55.T5 0.8807630 0.8346063 bin\_4\_of\_4  
## 56.T0 0.8591503 0.7921653 bin\_4\_of\_4  
## 56.T1 0.9274719 0.9263289 bin\_4\_of\_4  
## 56.T2 0.9187878 0.9092759 bin\_4\_of\_4  
## 56.T3 0.9649882 1.0000000 bin\_4\_of\_4  
## 56.T4 0.9107963 0.8935828 bin\_4\_of\_4  
## 56.T5 0.9112980 0.8945682 bin\_4\_of\_4  
## simpson\_reciprocal\_alpha simpson\_reciprocal\_normalized\_alpha  
## 49.T0 7.190783 0.2003184  
## 49.T1 12.458881 0.3974449  
## 49.T2 7.272925 0.2033921  
## 49.T3 10.063175 0.3078002  
## 49.T4 9.321176 0.2800354  
## 49.T5 7.974417 0.2296412  
## 51.T0 7.083016 0.1962859  
## 51.T1 10.848223 0.3371758  
## 51.T2 5.836891 0.1496573  
## 51.T3 13.664272 0.4425493  
## 51.T4 16.342320 0.5427589  
## 51.T5 9.270530 0.2781403  
## 52.T0 11.389595 0.3574334  
## 52.T1 11.901422 0.3765854  
## 52.T2 18.742280 0.6325628  
## 52.T3 5.379619 0.1325467  
## 52.T4 10.141239 0.3107213  
## 52.T5 7.111267 0.1973430  
## 54.T0 6.452385 0.1726884  
## 54.T1 8.125868 0.2353083  
## 54.T2 8.230453 0.2392217  
## 54.T3 9.150797 0.2736600  
## 54.T4 20.484237 0.6977449  
## 54.T5 7.583452 0.2150117  
## 55.T0 11.389253 0.3574206  
## 55.T1 16.946980 0.5653846  
## 55.T2 24.270430 0.8394201  
## 55.T3 11.978125 0.3794555  
## 55.T4 8.818091 0.2612105  
## 55.T5 8.386658 0.2450668  
## 56.T0 7.099765 0.1969126  
## 56.T1 13.787754 0.4471699  
## 56.T2 12.313421 0.3920019  
## 56.T3 28.561840 1.0000000  
## 56.T4 11.210292 0.3507241  
## 56.T5 11.273707 0.3530970  
## simpson\_reciprocal\_alpha\_label simpson\_e\_alpha  
## 49.T0 bin\_1\_of\_4 0.006726645  
## 49.T1 bin\_2\_of\_4 0.012622980  
## 49.T2 bin\_1\_of\_4 0.007599712  
## 49.T3 bin\_2\_of\_4 0.012242305  
## 49.T4 bin\_2\_of\_4 0.010556258  
## 49.T5 bin\_1\_of\_4 0.010805443  
## 51.T0 bin\_1\_of\_4 0.008113420  
## 51.T1 bin\_2\_of\_4 0.012327526  
## 51.T2 bin\_1\_of\_4 0.006686015  
## 51.T3 bin\_2\_of\_4 0.014145209  
## 51.T4 bin\_3\_of\_4 0.015373773  
## 51.T5 bin\_2\_of\_4 0.010043911  
## 52.T0 bin\_2\_of\_4 0.012434056  
## 52.T1 bin\_2\_of\_4 0.012936328  
## 52.T2 bin\_3\_of\_4 0.020755570  
## 52.T3 bin\_1\_of\_4 0.006544549  
## 52.T4 bin\_2\_of\_4 0.012352301  
## 52.T5 bin\_1\_of\_4 0.007919005  
## 54.T0 bin\_1\_of\_4 0.007459404  
## 54.T1 bin\_1\_of\_4 0.008101563  
## 54.T2 bin\_1\_of\_4 0.007936792  
## 54.T3 bin\_2\_of\_4 0.016698535  
## 54.T4 bin\_3\_of\_4 0.020987948  
## 54.T5 bin\_1\_of\_4 0.009158759  
## 55.T0 bin\_2\_of\_4 0.011562693  
## 55.T1 bin\_3\_of\_4 0.024349109  
## 55.T2 bin\_4\_of\_4 0.040116414  
## 55.T3 bin\_2\_of\_4 0.013473706  
## 55.T4 bin\_2\_of\_4 0.013692688  
## 55.T5 bin\_1\_of\_4 0.010616023  
## 56.T0 bin\_1\_of\_4 0.008930522  
## 56.T1 bin\_2\_of\_4 0.014954180  
## 56.T2 bin\_2\_of\_4 0.015746063  
## 56.T3 bin\_4\_of\_4 0.030645751  
## 56.T4 bin\_2\_of\_4 0.011557002  
## 56.T5 bin\_2\_of\_4 0.012470914  
## simpson\_e\_normalized\_alpha simpson\_e\_alpha\_label equitability  
## 49.T0 0.09644969 bin\_1\_of\_4 0.5297093  
## 49.T1 0.25600861 bin\_2\_of\_4 0.5678625  
## 49.T2 0.12007550 bin\_1\_of\_4 0.4382719  
## 49.T3 0.24570729 bin\_1\_of\_4 0.4976726  
## 49.T4 0.20008167 bin\_1\_of\_4 0.5538135  
## 49.T5 0.20682479 bin\_1\_of\_4 0.4867962  
## 51.T0 0.13397679 bin\_1\_of\_4 0.6257596  
## 51.T1 0.24801342 bin\_1\_of\_4 0.6540106  
## 51.T2 0.09535020 bin\_1\_of\_4 0.6069513  
## 51.T3 0.29720117 bin\_2\_of\_4 0.5953604  
## 51.T4 0.33044697 bin\_2\_of\_4 0.5514801  
## 51.T5 0.18621721 bin\_1\_of\_4 0.6348978  
## 52.T0 0.25089619 bin\_2\_of\_4 0.4652611  
## 52.T1 0.26448802 bin\_2\_of\_4 0.5217491  
## 52.T2 0.47608214 bin\_2\_of\_4 0.4978779  
## 52.T3 0.09152206 bin\_1\_of\_4 0.5799371  
## 52.T4 0.24868386 bin\_1\_of\_4 0.5534546  
## 52.T5 0.12871579 bin\_1\_of\_4 0.6467236  
## 54.T0 0.11627867 bin\_1\_of\_4 0.4095793  
## 54.T1 0.13365594 bin\_1\_of\_4 0.5219327  
## 54.T2 0.12919710 bin\_1\_of\_4 0.5471787  
## 54.T3 0.36629595 bin\_2\_of\_4 0.5715944  
## 54.T4 0.48237044 bin\_2\_of\_4 0.5184723  
## 54.T5 0.16226437 bin\_1\_of\_4 0.6671358  
## 55.T0 0.22731651 bin\_1\_of\_4 0.5345374  
## 55.T1 0.57332580 bin\_3\_of\_4 0.5419312  
## 55.T2 1.00000000 bin\_4\_of\_4 0.5560620  
## 55.T3 0.27902985 bin\_2\_of\_4 0.5461448  
## 55.T4 0.28495564 bin\_2\_of\_4 0.5364897  
## 55.T5 0.20169897 bin\_1\_of\_4 0.5818090  
## 56.T0 0.15608814 bin\_1\_of\_4 0.5495080  
## 56.T1 0.31909250 bin\_2\_of\_4 0.5327224  
## 56.T2 0.34052140 bin\_2\_of\_4 0.5190371  
## 56.T3 0.74371730 bin\_3\_of\_4 0.5838158  
## 56.T4 0.22716251 bin\_1\_of\_4 0.5857699  
## 56.T5 0.25189361 bin\_2\_of\_4 0.6027013

#PD  
lm.pd=with(letrozole, lm(PD\_whole\_tree\_alpha~time))  
summary(lm.pd)

##   
## Call:  
## lm(formula = PD\_whole\_tree\_alpha ~ time)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -27.095 -3.878 1.804 6.949 12.854   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 71.6637 2.7696 25.875 <2e-16 \*\*\*  
## time 1.9471 0.9148 2.128 0.0406 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 9.374 on 34 degrees of freedom  
## Multiple R-squared: 0.1176, Adjusted R-squared: 0.09163   
## F-statistic: 4.53 on 1 and 34 DF, p-value: 0.04062

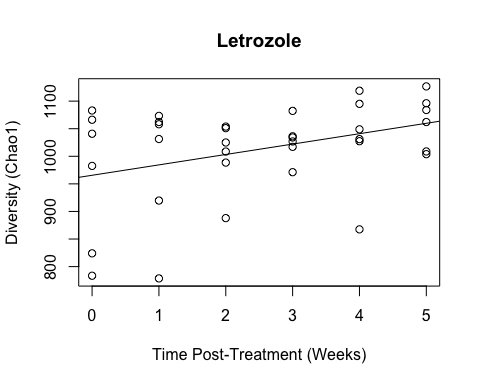
with(letrozole,plot(time,PD\_whole\_tree\_alpha,title("Letrozole"), xlab="Time Post-Treatment (Weeks)", ylab="Diversity (Faith's PD)"))  
abline(lm.pd)



#chao1  
lm.chao1=with(letrozole, lm(chao1\_alpha~time))  
summary(lm.chao1)

##   
## Call:  
## lm(formula = chao1\_alpha ~ time)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -205.79 -23.75 13.09 55.65 117.45   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 965.574 24.204 39.893 <2e-16 \*\*\*  
## time 18.840 7.994 2.357 0.0243 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 81.92 on 34 degrees of freedom  
## Multiple R-squared: 0.1404, Adjusted R-squared: 0.1151   
## F-statistic: 5.554 on 1 and 34 DF, p-value: 0.02434

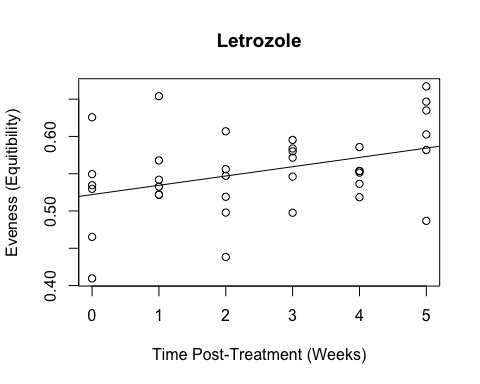
with(letrozole, plot(time,chao1\_alpha,title("Letrozole"),xlab="Time Post-Treatment (Weeks)", ylab="Diversity (Chao1)"))  
abline(lm.chao1)



#equitability  
lm.equitability.L=with(letrozole, lm(equitability~time))  
summary(lm.equitability.L)

##   
## Call:  
## lm(formula = equitability ~ time)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -0.112451 -0.022252 0.003843 0.025186 0.119526   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 0.522030 0.015785 33.071 <2e-16 \*\*\*  
## time 0.012455 0.005214 2.389 0.0226 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.05342 on 34 degrees of freedom  
## Multiple R-squared: 0.1437, Adjusted R-squared: 0.1185   
## F-statistic: 5.707 on 1 and 34 DF, p-value: 0.0226

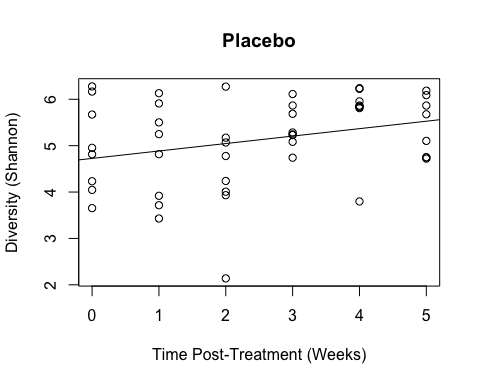
with(letrozole, plot(time,equitability,title("Letrozole"),xlab="Time Post-Treatment (Weeks)", ylab="Eveness (Equitibility)"))  
abline(lm.equitability.L)



# Supplementary Material and more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
  
  
#placebo supplementary material  
#shannon  
lm.shannon.p=with(placebo, lm(shannon\_alpha~time))  
summary(lm.shannon.p)

##   
## Call:  
## lm(formula = shannon\_alpha ~ time)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -2.9074 -0.7031 0.1080 0.5951 1.5527   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 4.72496 0.23167 20.395 <2e-16 \*\*\*  
## time 0.16041 0.07652 2.096 0.0416 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.9054 on 46 degrees of freedom  
## Multiple R-squared: 0.08721, Adjusted R-squared: 0.06736   
## F-statistic: 4.395 on 1 and 46 DF, p-value: 0.04158

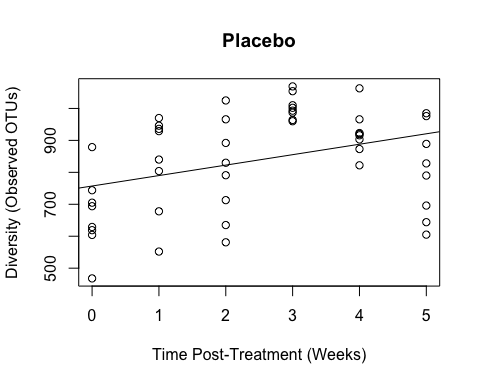
with(placebo,plot(time, shannon\_alpha, title("Placebo"), xlab="Time Post-Treatment (Weeks)", ylab="Diversity (Shannon)"))  
abline(lm.shannon.p)



#observedotus.  
lm.observed.otus.p=with(placebo, lm(observed\_otus\_alpha~time))  
summary(lm.observed.otus.p)

##   
## Call:  
## lm(formula = observed\_otus\_alpha ~ time)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -315.65 -110.15 21.54 133.24 213.74   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 757.18 37.76 20.055 <2e-16 \*\*\*  
## time 32.69 12.47 2.622 0.0118 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 147.6 on 46 degrees of freedom  
## Multiple R-squared: 0.13, Adjusted R-squared: 0.1111   
## F-statistic: 6.873 on 1 and 46 DF, p-value: 0.01182

with(placebo, plot(time, observed\_otus\_alpha, title("Placebo"), xlab="Time Post-Treatment (Weeks)", ylab="Diversity (Observed OTUs)"))  
abline(lm.observed.otus.p)

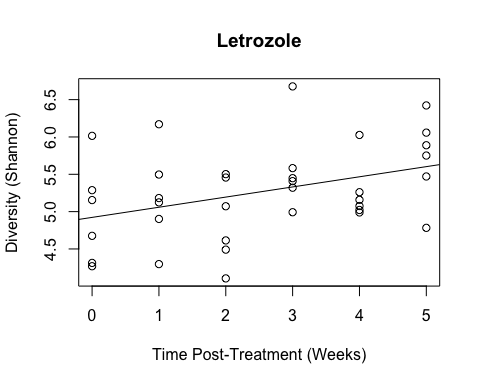


#letrozole

#shannon  
lm.shannon=with(letrozole, lm(shannon\_alpha~time))  
summary(lm.shannon)

##   
## Call:  
## lm(formula = shannon\_alpha ~ time)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -1.08927 -0.40509 0.02719 0.29153 1.34643   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 4.92276 0.16962 29.023 <2e-16 \*\*\*  
## time 0.13603 0.05602 2.428 0.0206 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 0.5741 on 34 degrees of freedom  
## Multiple R-squared: 0.1478, Adjusted R-squared: 0.1227   
## F-statistic: 5.896 on 1 and 34 DF, p-value: 0.02062

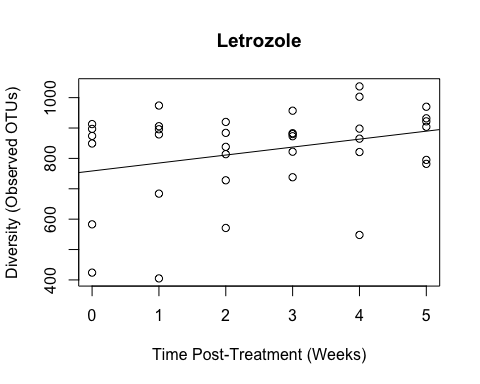
with(letrozole, plot(time,shannon\_alpha, title("Letrozole"),xlab="Time Post-Treatment (Weeks)", ylab="Diversity (Shannon)"))  
abline(lm.shannon)



#observed otus  
lm.observed\_otus=with(letrozole, lm(observed\_otus\_alpha~time))  
summary(lm.observed\_otus)

##   
## Call:  
## lm(formula = observed\_otus\_alpha ~ time)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -379.80 -85.94 35.14 109.53 189.20   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 758.58 43.22 17.550 <2e-16 \*\*\*  
## time 26.22 14.28 1.837 0.075 .   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 146.3 on 34 degrees of freedom  
## Multiple R-squared: 0.09028, Adjusted R-squared: 0.06352   
## F-statistic: 3.374 on 1 and 34 DF, p-value: 0.07499

with(letrozole,plot(time, observed\_otus\_alpha, title("Letrozole"),xlab="Time Post-Treatment (Weeks)", ylab="Diversity (Observed OTUs)"))  
abline(lm.observed\_otus)



letrozole$observed\_otus\_alpha

## [1] 424 879 838 957 821 795 874 684 814 822 898 922 849 405  
## [15] 884 883 865 782 897 896 728 738 1003 932 583 974 920 873  
## [29] 1037 970 913 906 571 880 548 904

placebo=subset(mapping\_file, Treatment =="Placebo")  
unique(placebo)

## BarcodeSequence RunDate SequencingRunPlate DNA\_ng\_ul Treatment  
## 41.T0 TCCCTTGTCTCC 6\_20\_16 Seqrun1.Plate1.2 26.6 Placebo  
## 41.T1 GTAGATCGTGTA 6\_20\_16 Seqrun1.Plate1.2 29.5 Placebo  
## 41.T2 GCATATGCACTG 6\_20\_16 Seqrun1.Plate1.2 37.5 Placebo  
## 41.T3 TTAGAGCCATGC 7\_12\_16 Seqrun2.Plate1.2 28.4 Placebo  
## 41.T4 AGTGTTTCGGAC 7\_12\_16 Seqrun2.Plate1.2 24.1 Placebo  
## 41.T5 TAATCGGTGCCA 7\_12\_16 Seqrun2.Plate1.2 23.6 Placebo  
## 42.T0 ACGAGACTGATT 6\_20\_16 Seqrun1.Plate1.2 16.1 Placebo  
## 42.T1 TAACGTGTGTGC 6\_20\_16 Seqrun1.Plate1.2 34.8 Placebo  
## 42.T2 CAACTCCCGTGA 6\_20\_16 Seqrun1.Plate1.2 12.1 Placebo  
## 42.T3 TGAACCCTATGG 7\_12\_16 Seqrun2.Plate1.2 21.2 Placebo  
## 42.T4 ACACGCGGTTTA 7\_12\_16 Seqrun2.Plate1.2 20.0 Placebo  
## 42.T5 TTGATCCGGTAG 7\_12\_16 Seqrun2.Plate1.2 16.5 Placebo  
## 43.T0 GCTGTACGGATT 6\_20\_16 Seqrun1.Plate1.2 30.0 Placebo  
## 43.T1 CATTATGGCGTG 6\_20\_16 Seqrun1.Plate1.2 25.3 Placebo  
## 43.T2 TTGCGTTAGCAG 6\_20\_16 Seqrun1.Plate1.2 32.7 Placebo  
## 43.T3 AGAGTCTTGCCA 7\_12\_16 Seqrun2.Plate1.2 29.0 Placebo  
## 43.T4 TGGCAAATCTAG 7\_12\_16 Seqrun2.Plate1.2 29.9 Placebo  
## 43.T5 CGGGTGTTTGCT 7\_12\_16 Seqrun2.Plate1.2 30.9 Placebo  
## 44.T0 ATCACCAGGTGT 6\_20\_16 Seqrun1.Plate1.2 27.5 Placebo  
## 44.T1 CCAATACGCCTG 6\_20\_16 Seqrun1.Plate1.2 24.2 Placebo  
## 44.T2 TACGAGCCCTAA 6\_20\_16 Seqrun1.Plate1.2 25.8 Placebo  
## 44.T3 ACAACACTCCGA 7\_12\_16 Seqrun2.Plate1.2 27.0 Placebo  
## 44.T4 CACCTTACCTTA 7\_12\_16 Seqrun2.Plate1.2 30.0 Placebo  
## 44.T5 TTGACCGCGGTT 7\_12\_16 Seqrun2.Plate1.2 20.6 Placebo  
## 45.T0 TGGTCAACGATA 6\_20\_16 Seqrun1.Plate1.2 27.5 Placebo  
## 45.T1 GATCTGCGATCC 6\_20\_16 Seqrun1.Plate1.2 33.3 Placebo  
## 45.T2 CACTACGCTAGA 6\_20\_16 Seqrun1.Plate1.2 27.8 Placebo  
## 45.T3 CGATGCTGTTGA 7\_12\_16 Seqrun2.Plate1.2 7.1 Placebo  
## 45.T4 TTAACCTTCCTG 7\_12\_16 Seqrun2.Plate1.2 21.8 Placebo  
## 45.T5 GTGCAACCAATC 7\_12\_16 Seqrun2.Plate1.2 5.5 Placebo  
## 46.T0 ATCGCACAGTAA 6\_20\_16 Seqrun1.Plate1.2 22.5 Placebo  
## 46.T1 CAGCTCATCAGC 6\_20\_16 Seqrun1.Plate1.2 33.3 Placebo  
## 46.T2 TGCAGTCCTCGA 6\_20\_16 Seqrun1.Plate1.2 26.8 Placebo  
## 46.T3 ACGACTGCATAA 7\_12\_16 Seqrun2.Plate1.2 30.9 Placebo  
## 46.T4 TGCCGTATGCCA 7\_12\_16 Seqrun2.Plate1.2 31.7 Placebo  
## 46.T5 GCTTGAGCTTGA 7\_12\_16 Seqrun2.Plate1.2 5.3 Placebo  
## 47.T0 GTCGTGTAGCCT 6\_20\_16 Seqrun1.Plate1.2 37.7 Placebo  
## 47.T1 CAAACAACAGCT 6\_20\_16 Seqrun1.Plate1.2 25.1 Placebo  
## 47.T2 ACCATAGCTCCG 6\_20\_16 Seqrun1.Plate1.2 31.4 Placebo  
## 47.T3 ACGCGAACTAAT 7\_12\_16 Seqrun2.Plate1.2 56.7 Placebo  
## 47.T4 CGTGACAATAGT 7\_12\_16 Seqrun2.Plate1.2 24.9 Placebo  
## 47.T5 CGCTGTGGATTA 7\_12\_16 Seqrun2.Plate1.2 22.5 Placebo  
## 48.T0 AGCGGAGGTTAG 6\_20\_16 Seqrun1.Plate1.2 31.8 Placebo  
## 48.T1 GCAACACCATCC 6\_20\_16 Seqrun1.Plate1.2 31.8 Placebo  
## 48.T2 TCGACATCTCTT 6\_20\_16 Seqrun1.Plate1.2 26.0 Placebo  
## 48.T3 AGCTATGTATGG 7\_12\_16 Seqrun2.Plate1.2 28.5 Placebo  
## 48.T4 CGCTACAACTCG 7\_12\_16 Seqrun2.Plate1.2 24.1 Placebo  
## 48.T5 CTGTCAGTGACC 7\_12\_16 Seqrun2.Plate1.2 23.1 Placebo  
## Barcode\_set time Cage Description PD\_whole\_tree\_alpha  
## 41.T0 1a\_P1 0 A1 41.T0 69.22104  
## 41.T1 1a\_P1 1 A1 41.T1 68.15270  
## 41.T2 1a\_P1 2 A1 41.T2 74.81491  
## 41.T3 2b\_P2 3 A1 41.T3 84.13741  
## 41.T4 2b\_P2 4 A1 41.T4 80.37366  
## 41.T5 2b\_P2 5 A1 41.T5 85.53588  
## 42.T0 1a\_P1 0 A1 42.T0 70.67871  
## 42.T1 1a\_P1 1 A1 42.T1 82.82465  
## 42.T2 1a\_P1 2 A1 42.T2 81.29916  
## 42.T3 2b\_P2 3 A1 42.T3 84.90024  
## 42.T4 2b\_P2 4 A1 42.T4 85.69109  
## 42.T5 2b\_P2 5 A1 42.T5 76.48541  
## 43.T0 1a\_P1 0 B1 43.T0 64.39882  
## 43.T1 1a\_P1 1 B1 43.T1 84.75644  
## 43.T2 1a\_P1 2 B1 43.T2 69.93751  
## 43.T3 2b\_P2 3 B1 43.T3 88.43326  
## 43.T4 2b\_P2 4 B1 43.T4 90.24899  
## 43.T5 2b\_P2 5 B1 43.T5 87.04385  
## 44.T0 1a\_P1 0 B1 44.T0 51.52512  
## 44.T1 1a\_P1 1 B1 44.T1 85.08902  
## 44.T2 1a\_P1 2 B1 44.T2 63.25865  
## 44.T3 2b\_P2 3 B1 44.T3 87.72111  
## 44.T4 2b\_P2 4 B1 44.T4 84.34614  
## 44.T5 2b\_P2 5 B1 44.T5 70.43273  
## 45.T0 1a\_P1 0 C1 45.T0 64.87947  
## 45.T1 1a\_P1 1 C1 45.T1 60.95226  
## 45.T2 1a\_P1 2 C1 45.T2 77.47602  
## 45.T3 2b\_P2 3 C1 45.T3 90.12409  
## 45.T4 2b\_P2 4 C1 45.T4 83.08485  
## 45.T5 2b\_P2 5 C1 45.T5 63.86060  
## 46.T0 1a\_P1 0 C1 46.T0 62.46389  
## 46.T1 1a\_P1 1 C1 46.T1 76.10122  
## 46.T2 1a\_P1 2 C1 46.T2 82.96659  
## 46.T3 2b\_P2 3 C1 46.T3 87.20374  
## 46.T4 2b\_P2 4 C1 46.T4 84.13512  
## 46.T5 2b\_P2 5 C1 46.T5 80.94496  
## 47.T0 1a\_P1 0 D1 47.T0 69.11403  
## 47.T1 1a\_P1 1 D1 47.T1 84.91711  
## 47.T2 1a\_P1 2 D1 47.T2 88.54577  
## 47.T3 2b\_P2 3 D1 47.T3 90.47358  
## 47.T4 2b\_P2 4 D1 47.T4 82.48754  
## 47.T5 2b\_P2 5 D1 47.T5 63.25606  
## 48.T0 1a\_P1 0 D1 48.T0 76.54924  
## 48.T1 1a\_P1 1 D1 48.T1 73.18145  
## 48.T2 1a\_P1 2 D1 48.T2 62.02122  
## 48.T3 2b\_P2 3 D1 48.T3 86.33641  
## 48.T4 2b\_P2 4 D1 48.T4 72.17664  
## 48.T5 2b\_P2 5 D1 48.T5 73.52439  
## PD\_whole\_tree\_normalized\_alpha PD\_whole\_tree\_alpha\_label chao1\_alpha  
## 41.T0 0.5165240 bin\_3\_of\_4 935.0084  
## 41.T1 0.4922203 bin\_2\_of\_4 903.1271  
## 41.T2 0.6437795 bin\_3\_of\_4 985.5034  
## 41.T3 0.8558579 bin\_4\_of\_4 1097.6571  
## 41.T4 0.7702360 bin\_4\_of\_4 1060.6329  
## 41.T5 0.8876718 bin\_4\_of\_4 1110.9032  
## 42.T0 0.5496847 bin\_3\_of\_4 937.8481  
## 42.T1 0.8259938 bin\_4\_of\_4 1074.8792  
## 42.T2 0.7912903 bin\_4\_of\_4 1005.8846  
## 42.T3 0.8732116 bin\_4\_of\_4 1106.8000  
## 42.T4 0.8912027 bin\_4\_of\_4 1071.7248  
## 42.T5 0.6817818 bin\_3\_of\_4 1006.2000  
## 43.T0 0.4068229 bin\_2\_of\_4 914.7333  
## 43.T1 0.8699403 bin\_4\_of\_4 1066.1656  
## 43.T2 0.5328231 bin\_3\_of\_4 938.5392  
## 43.T3 0.9535846 bin\_4\_of\_4 1140.4768  
## 43.T4 0.9948908 bin\_4\_of\_4 1117.4264  
## 43.T5 0.9219768 bin\_4\_of\_4 1136.5000  
## 44.T0 0.1139579 bin\_1\_of\_4 737.4699  
## 44.T1 0.8775062 bin\_4\_of\_4 1074.0118  
## 44.T2 0.3808851 bin\_2\_of\_4 815.9759  
## 44.T3 0.9373838 bin\_4\_of\_4 1125.6410  
## 44.T4 0.8606063 bin\_4\_of\_4 1125.5769  
## 44.T5 0.5440889 bin\_3\_of\_4 965.5091  
## 45.T0 0.4177573 bin\_2\_of\_4 847.2245  
## 45.T1 0.3284168 bin\_2\_of\_4 841.4615  
## 45.T2 0.7043173 bin\_3\_of\_4 1073.5821  
## 45.T3 0.9920494 bin\_4\_of\_4 1128.5688  
## 45.T4 0.8319131 bin\_4\_of\_4 1094.0791  
## 45.T5 0.3945789 bin\_2\_of\_4 999.6786  
## 46.T0 0.3628050 bin\_2\_of\_4 811.0259  
## 46.T1 0.6730419 bin\_3\_of\_4 1018.0791  
## 46.T2 0.8292228 bin\_4\_of\_4 1064.8636  
## 46.T3 0.9256141 bin\_4\_of\_4 1116.6025  
## 46.T4 0.8558058 bin\_4\_of\_4 1083.1560  
## 46.T5 0.7832326 bin\_4\_of\_4 1050.8443  
## 47.T0 0.5140896 bin\_3\_of\_4 964.1210  
## 47.T1 0.8735954 bin\_4\_of\_4 1041.0000  
## 47.T2 0.9561441 bin\_4\_of\_4 1095.3416  
## 47.T3 1.0000000 bin\_4\_of\_4 1139.6364  
## 47.T4 0.8183248 bin\_4\_of\_4 1067.3158  
## 47.T5 0.3808262 bin\_2\_of\_4 964.0690  
## 48.T0 0.6832339 bin\_3\_of\_4 1010.3725  
## 48.T1 0.6066198 bin\_3\_of\_4 1151.2340  
## 48.T2 0.3527347 bin\_2\_of\_4 960.7890  
## 48.T3 0.9058831 bin\_4\_of\_4 1101.3631  
## 48.T4 0.5837612 bin\_3\_of\_4 996.7875  
## 48.T5 0.6144213 bin\_3\_of\_4 951.9817  
## chao1\_normalized\_alpha chao1\_alpha\_label observed\_otus\_alpha  
## 41.T0 0.4774182 bin\_2\_of\_4 694  
## 41.T1 0.4003663 bin\_2\_of\_4 678  
## 41.T2 0.5994564 bin\_3\_of\_4 791  
## 41.T3 0.8705134 bin\_4\_of\_4 960  
## 41.T4 0.7810320 bin\_4\_of\_4 873  
## 41.T5 0.9025270 bin\_4\_of\_4 976  
## 42.T0 0.4842812 bin\_2\_of\_4 744  
## 42.T1 0.8154629 bin\_4\_of\_4 929  
## 42.T2 0.6487143 bin\_3\_of\_4 892  
## 42.T3 0.8926102 bin\_4\_of\_4 964  
## 42.T4 0.8078393 bin\_4\_of\_4 966  
## 42.T5 0.6494765 bin\_3\_of\_4 828  
## 43.T0 0.4284166 bin\_2\_of\_4 604  
## 43.T1 0.7944035 bin\_4\_of\_4 946  
## 43.T2 0.4859516 bin\_2\_of\_4 713  
## 43.T3 0.9740016 bin\_4\_of\_4 1002  
## 43.T4 0.9182924 bin\_4\_of\_4 1063  
## 43.T5 0.9643902 bin\_4\_of\_4 985  
## 44.T0 0.0000000 bin\_1\_of\_4 468  
## 44.T1 0.8133666 bin\_4\_of\_4 970  
## 44.T2 0.1897362 bin\_1\_of\_4 581  
## 44.T3 0.9381459 bin\_4\_of\_4 1010  
## 44.T4 0.9379910 bin\_4\_of\_4 923  
## 44.T5 0.5511333 bin\_3\_of\_4 696  
## 45.T0 0.2652589 bin\_2\_of\_4 619  
## 45.T1 0.2513308 bin\_2\_of\_4 552  
## 45.T2 0.8123280 bin\_4\_of\_4 830  
## 45.T3 0.9452219 bin\_4\_of\_4 1054  
## 45.T4 0.8618660 bin\_4\_of\_4 916  
## 45.T5 0.6337153 bin\_3\_of\_4 605  
## 46.T0 0.1777727 bin\_1\_of\_4 629  
## 46.T1 0.6781865 bin\_3\_of\_4 840  
## 46.T2 0.7912569 bin\_4\_of\_4 966  
## 46.T3 0.9163012 bin\_4\_of\_4 993  
## 46.T4 0.8354666 bin\_4\_of\_4 920  
## 46.T5 0.7573745 bin\_4\_of\_4 889  
## 47.T0 0.5477784 bin\_3\_of\_4 705  
## 47.T1 0.7335824 bin\_3\_of\_4 936  
## 47.T2 0.8649172 bin\_4\_of\_4 1025  
## 47.T3 0.9719703 bin\_4\_of\_4 1069  
## 47.T4 0.7971834 bin\_4\_of\_4 903  
## 47.T5 0.5476528 bin\_3\_of\_4 644  
## 48.T0 0.6595609 bin\_3\_of\_4 879  
## 48.T1 1.0000000 bin\_4\_of\_4 804  
## 48.T2 0.5397256 bin\_3\_of\_4 635  
## 48.T3 0.8794700 bin\_4\_of\_4 987  
## 48.T4 0.6267281 bin\_3\_of\_4 822  
## 48.T5 0.5184398 bin\_3\_of\_4 790  
## observed\_otus\_normalized\_alpha observed\_otus\_alpha\_label  
## 41.T0 0.43524096 bin\_2\_of\_4  
## 41.T1 0.41114458 bin\_2\_of\_4  
## 41.T2 0.58132530 bin\_3\_of\_4  
## 41.T3 0.83584337 bin\_4\_of\_4  
## 41.T4 0.70481928 bin\_3\_of\_4  
## 41.T5 0.85993976 bin\_4\_of\_4  
## 42.T0 0.51054217 bin\_3\_of\_4  
## 42.T1 0.78915663 bin\_4\_of\_4  
## 42.T2 0.73343373 bin\_3\_of\_4  
## 42.T3 0.84186747 bin\_4\_of\_4  
## 42.T4 0.84487952 bin\_4\_of\_4  
## 42.T5 0.63704819 bin\_3\_of\_4  
## 43.T0 0.29969880 bin\_2\_of\_4  
## 43.T1 0.81475904 bin\_4\_of\_4  
## 43.T2 0.46385542 bin\_2\_of\_4  
## 43.T3 0.89909639 bin\_4\_of\_4  
## 43.T4 0.99096385 bin\_4\_of\_4  
## 43.T5 0.87349398 bin\_4\_of\_4  
## 44.T0 0.09487952 bin\_1\_of\_4  
## 44.T1 0.85090361 bin\_4\_of\_4  
## 44.T2 0.26506024 bin\_2\_of\_4  
## 44.T3 0.91114458 bin\_4\_of\_4  
## 44.T4 0.78012048 bin\_4\_of\_4  
## 44.T5 0.43825301 bin\_2\_of\_4  
## 45.T0 0.32228916 bin\_2\_of\_4  
## 45.T1 0.22138554 bin\_1\_of\_4  
## 45.T2 0.64006024 bin\_3\_of\_4  
## 45.T3 0.97740964 bin\_4\_of\_4  
## 45.T4 0.76957831 bin\_4\_of\_4  
## 45.T5 0.30120482 bin\_2\_of\_4  
## 46.T0 0.33734940 bin\_2\_of\_4  
## 46.T1 0.65512048 bin\_3\_of\_4  
## 46.T2 0.84487952 bin\_4\_of\_4  
## 46.T3 0.88554217 bin\_4\_of\_4  
## 46.T4 0.77560241 bin\_4\_of\_4  
## 46.T5 0.72891566 bin\_3\_of\_4  
## 47.T0 0.45180723 bin\_2\_of\_4  
## 47.T1 0.79969879 bin\_4\_of\_4  
## 47.T2 0.93373494 bin\_4\_of\_4  
## 47.T3 1.00000000 bin\_4\_of\_4  
## 47.T4 0.75000000 bin\_4\_of\_4  
## 47.T5 0.35993976 bin\_2\_of\_4  
## 48.T0 0.71385542 bin\_3\_of\_4  
## 48.T1 0.60090361 bin\_3\_of\_4  
## 48.T2 0.34638554 bin\_2\_of\_4  
## 48.T3 0.87650602 bin\_4\_of\_4  
## 48.T4 0.62801205 bin\_3\_of\_4  
## 48.T5 0.57981928 bin\_3\_of\_4  
## shannon\_alpha shannon\_normalized\_alpha shannon\_alpha\_label  
## 41.T0 6.165986 0.8873539 bin\_4\_of\_4  
## 41.T1 5.911393 0.8312625 bin\_4\_of\_4  
## 41.T2 5.068324 0.6455193 bin\_3\_of\_4  
## 41.T3 5.242996 0.6840027 bin\_3\_of\_4  
## 41.T4 5.809629 0.8088420 bin\_4\_of\_4  
## 41.T5 6.185245 0.8915969 bin\_4\_of\_4  
## 42.T0 4.233810 0.4616610 bin\_2\_of\_4  
## 42.T1 4.816596 0.5900591 bin\_3\_of\_4  
## 42.T2 4.007705 0.4118459 bin\_2\_of\_4  
## 42.T3 5.687300 0.7818907 bin\_4\_of\_4  
## 42.T4 6.240144 0.9036922 bin\_4\_of\_4  
## 42.T5 4.720743 0.5689411 bin\_3\_of\_4  
## 43.T0 5.670629 0.7782178 bin\_4\_of\_4  
## 43.T1 6.131224 0.8796951 bin\_4\_of\_4  
## 43.T2 6.273034 0.9109384 bin\_4\_of\_4  
## 43.T3 6.113270 0.8757395 bin\_4\_of\_4  
## 43.T4 5.863900 0.8207990 bin\_4\_of\_4  
## 43.T5 5.676631 0.7795402 bin\_4\_of\_4  
## 44.T0 4.814909 0.5896875 bin\_3\_of\_4  
## 44.T1 3.919084 0.3923213 bin\_2\_of\_4  
## 44.T2 2.138379 0.0000000 bin\_1\_of\_4  
## 44.T3 5.865572 0.8211673 bin\_4\_of\_4  
## 44.T4 5.954562 0.8407734 bin\_4\_of\_4  
## 44.T5 5.865345 0.8211173 bin\_4\_of\_4  
## 45.T0 6.277632 0.9119514 bin\_4\_of\_4  
## 45.T1 5.502023 0.7410709 bin\_3\_of\_4  
## 45.T2 5.171940 0.6683478 bin\_3\_of\_4  
## 45.T3 5.284192 0.6930789 bin\_3\_of\_4  
## 45.T4 5.845819 0.8168154 bin\_4\_of\_4  
## 45.T5 6.089475 0.8704970 bin\_4\_of\_4  
## 46.T0 3.653310 0.3337665 bin\_2\_of\_4  
## 46.T1 3.716442 0.3476754 bin\_2\_of\_4  
## 46.T2 4.239057 0.4628168 bin\_2\_of\_4  
## 46.T3 5.228248 0.6807535 bin\_3\_of\_4  
## 46.T4 5.834171 0.8142491 bin\_4\_of\_4  
## 46.T5 5.102636 0.6530787 bin\_3\_of\_4  
## 47.T0 4.953307 0.6201789 bin\_3\_of\_4  
## 47.T1 5.248366 0.6851858 bin\_3\_of\_4  
## 47.T2 4.776968 0.5813284 bin\_3\_of\_4  
## 47.T3 4.740867 0.5733746 bin\_3\_of\_4  
## 47.T4 6.223763 0.9000831 bin\_4\_of\_4  
## 47.T5 4.751802 0.5757839 bin\_3\_of\_4  
## 48.T0 4.045893 0.4202595 bin\_2\_of\_4  
## 48.T1 3.430052 0.2845786 bin\_2\_of\_4  
## 48.T2 3.932258 0.3952235 bin\_2\_of\_4  
## 48.T3 5.083116 0.6487781 bin\_3\_of\_4  
## 48.T4 3.797382 0.3655081 bin\_2\_of\_4  
## 48.T5 4.742708 0.5737802 bin\_3\_of\_4  
## simpson\_alpha simpson\_normalized\_alpha simpson\_alpha\_label  
## 41.T0 0.9079961 0.8880841 bin\_4\_of\_4  
## 41.T1 0.8061826 0.6881524 bin\_3\_of\_4  
## 41.T2 0.9534232 0.9772897 bin\_4\_of\_4  
## 41.T3 0.9006498 0.8736582 bin\_4\_of\_4  
## 41.T4 0.9040608 0.8803565 bin\_4\_of\_4  
## 41.T5 0.7944442 0.6651017 bin\_3\_of\_4  
## 42.T0 0.9197956 0.9112550 bin\_4\_of\_4  
## 42.T1 0.8606077 0.7950273 bin\_4\_of\_4  
## 42.T2 0.8105671 0.6967623 bin\_3\_of\_4  
## 42.T3 0.9525873 0.9756482 bin\_4\_of\_4  
## 42.T4 0.8062980 0.6883790 bin\_3\_of\_4  
## 42.T5 0.7470110 0.5719568 bin\_3\_of\_4  
## 43.T0 0.8715646 0.8165433 bin\_4\_of\_4  
## 43.T1 0.9016567 0.8756354 bin\_4\_of\_4  
## 43.T2 0.9113188 0.8946090 bin\_4\_of\_4  
## 43.T3 0.7606628 0.5987648 bin\_3\_of\_4  
## 43.T4 0.9092079 0.8904638 bin\_4\_of\_4  
## 43.T5 0.8067086 0.6891852 bin\_3\_of\_4  
## 44.T0 0.9026519 0.8775898 bin\_4\_of\_4  
## 44.T1 0.7982377 0.6725509 bin\_3\_of\_4  
## 44.T2 0.9382928 0.9475779 bin\_4\_of\_4  
## 44.T3 0.6468762 0.3753215 bin\_2\_of\_4  
## 44.T4 0.9344504 0.9400327 bin\_4\_of\_4  
## 44.T5 0.9596847 0.9895854 bin\_4\_of\_4  
## 45.T0 0.8782972 0.8297642 bin\_4\_of\_4  
## 45.T1 0.9200686 0.9117910 bin\_4\_of\_4  
## 45.T2 0.8699060 0.8132864 bin\_4\_of\_4  
## 45.T3 0.8864219 0.8457189 bin\_4\_of\_4  
## 45.T4 0.9091810 0.8904109 bin\_4\_of\_4  
## 45.T5 0.7799624 0.6366636 bin\_3\_of\_4  
## 46.T0 0.9172251 0.9062073 bin\_4\_of\_4  
## 46.T1 0.4557471 0.0000000 bin\_1\_of\_4  
## 46.T2 0.8716650 0.8167406 bin\_4\_of\_4  
## 46.T3 0.8448772 0.7641371 bin\_4\_of\_4  
## 46.T4 0.8166076 0.7086240 bin\_3\_of\_4  
## 46.T5 0.8063179 0.6884181 bin\_3\_of\_4  
## 47.T0 0.8571585 0.7882540 bin\_4\_of\_4  
## 47.T1 0.9296211 0.9305493 bin\_4\_of\_4  
## 47.T2 0.8816166 0.8362825 bin\_4\_of\_4  
## 47.T3 0.9050243 0.8822484 bin\_4\_of\_4  
## 47.T4 0.8925280 0.8577094 bin\_4\_of\_4  
## 47.T5 0.8366367 0.7479553 bin\_3\_of\_4  
## 48.T0 0.9016348 0.8755924 bin\_4\_of\_4  
## 48.T1 0.8871107 0.8470714 bin\_4\_of\_4  
## 48.T2 0.9101811 0.8923748 bin\_4\_of\_4  
## 48.T3 0.8479594 0.7701898 bin\_4\_of\_4  
## 48.T4 0.8862632 0.8454070 bin\_4\_of\_4  
## 48.T5 0.8262346 0.7275285 bin\_3\_of\_4  
## simpson\_reciprocal\_alpha simpson\_reciprocal\_normalized\_alpha  
## 41.T0 10.869100 0.33795702  
## 41.T1 5.159496 0.12430989  
## 41.T2 21.469936 0.73462872  
## 41.T3 10.065404 0.30788361  
## 41.T4 10.423272 0.32127465  
## 41.T5 4.864860 0.11328495  
## 42.T0 12.468148 0.39779166  
## 42.T1 7.173998 0.19969036  
## 42.T2 5.278915 0.12877843  
## 42.T3 21.091411 0.72046471  
## 42.T4 5.162569 0.12442490  
## 42.T5 3.952741 0.07915446  
## 43.T0 7.786013 0.22259129  
## 43.T1 10.168461 0.31173987  
## 43.T2 11.276351 0.35319593  
## 43.T3 4.178205 0.08759107  
## 43.T4 11.014177 0.34338565  
## 43.T5 5.173535 0.12483521  
## 44.T0 10.272419 0.31562987  
## 44.T1 4.956327 0.11670754  
## 44.T2 16.205553 0.53764125  
## 44.T3 2.831868 0.03721262  
## 44.T4 15.255629 0.50209613  
## 44.T5 24.804472 0.85940339  
## 45.T0 8.216737 0.23870852  
## 45.T1 12.510731 0.39938505  
## 45.T2 7.686750 0.21887696  
## 45.T3 8.804518 0.26070262  
## 45.T4 11.010907 0.34326328  
## 45.T5 4.544678 0.10130408  
## 46.T0 12.080962 0.38330358  
## 46.T1 1.837381 0.00000000  
## 46.T2 7.792107 0.22281933  
## 46.T3 6.446505 0.17246837  
## 46.T4 5.452789 0.13528462  
## 46.T5 5.163100 0.12444477  
## 47.T0 7.000765 0.19320815  
## 47.T1 14.208804 0.46292508  
## 47.T2 8.447129 0.24732954  
## 47.T3 10.529011 0.32523126  
## 47.T4 9.304752 0.27942082  
## 47.T5 6.121327 0.16030057  
## 48.T0 10.166193 0.31165501  
## 48.T1 8.858236 0.26271269  
## 48.T2 11.133511 0.34785101  
## 48.T3 6.577192 0.17735854  
## 48.T4 8.792225 0.26024265  
## 48.T5 5.754884 0.14658868  
## simpson\_reciprocal\_alpha\_label simpson\_e\_alpha  
## 41.T0 bin\_2\_of\_4 0.015661527  
## 41.T1 bin\_1\_of\_4 0.006934806  
## 41.T2 bin\_3\_of\_4 0.035546252  
## 41.T3 bin\_2\_of\_4 0.021507273  
## 41.T4 bin\_2\_of\_4 0.016838889  
## 41.T5 bin\_1\_of\_4 0.007734277  
## 42.T0 bin\_2\_of\_4 0.017685316  
## 42.T1 bin\_1\_of\_4 0.008161545  
## 42.T2 bin\_1\_of\_4 0.012450271  
## 42.T3 bin\_3\_of\_4 0.024132049  
## 42.T4 bin\_1\_of\_4 0.006080765  
## 42.T5 bin\_1\_of\_4 0.004406624  
## 43.T0 bin\_1\_of\_4 0.013355082  
## 43.T1 bin\_2\_of\_4 0.011137416  
## 43.T2 bin\_2\_of\_4 0.016631786  
## 43.T3 bin\_1\_of\_4 0.004497530  
## 43.T4 bin\_2\_of\_4 0.011642893  
## 43.T5 bin\_1\_of\_4 0.005333541  
## 44.T0 bin\_2\_of\_4 0.018609454  
## 44.T1 bin\_1\_of\_4 0.005900389  
## 44.T2 bin\_3\_of\_4 0.017313625  
## 44.T3 bin\_1\_of\_4 0.003522224  
## 44.T4 bin\_3\_of\_4 0.017355664  
## 44.T5 bin\_4\_of\_4 0.036263848  
## 45.T0 bin\_1\_of\_4 0.020288240  
## 45.T1 bin\_2\_of\_4 0.013962869  
## 45.T2 bin\_1\_of\_4 0.007891940  
## 45.T3 bin\_2\_of\_4 0.009718011  
## 45.T4 bin\_2\_of\_4 0.013920236  
## 45.T5 bin\_1\_of\_4 0.005094930  
## 46.T0 bin\_2\_of\_4 0.016943846  
## 46.T1 bin\_1\_of\_4 0.003162446  
## 46.T2 bin\_1\_of\_4 0.009388081  
## 46.T3 bin\_1\_of\_4 0.006673401  
## 46.T4 bin\_1\_of\_4 0.005319795  
## 46.T5 bin\_1\_of\_4 0.008130867  
## 47.T0 bin\_1\_of\_4 0.008354134  
## 47.T1 bin\_2\_of\_4 0.017455533  
## 47.T2 bin\_1\_of\_4 0.009555576  
## 47.T3 bin\_2\_of\_4 0.014462927  
## 47.T4 bin\_2\_of\_4 0.010113860  
## 47.T5 bin\_1\_of\_4 0.010720363  
## 48.T0 bin\_2\_of\_4 0.010589784  
## 48.T1 bin\_2\_of\_4 0.009189041  
## 48.T2 bin\_2\_of\_4 0.011111289  
## 48.T3 bin\_1\_of\_4 0.006512072  
## 48.T4 bin\_2\_of\_4 0.008341770  
## 48.T5 bin\_1\_of\_4 0.005795452  
## simpson\_e\_normalized\_alpha simpson\_e\_alpha\_label equitability  
## 41.T0 0.33823380 bin\_2\_of\_4 0.5796063  
## 41.T1 0.10208268 bin\_1\_of\_4 0.5715188  
## 41.T2 0.87632826 bin\_4\_of\_4 0.5368873  
## 41.T3 0.49642375 bin\_2\_of\_4 0.5529037  
## 41.T4 0.37009404 bin\_2\_of\_4 0.4926823  
## 41.T5 0.12371691 bin\_1\_of\_4 0.6412835  
## 42.T0 0.39299894 bin\_2\_of\_4 0.4011386  
## 42.T1 0.13527908 bin\_1\_of\_4 0.3925421  
## 42.T2 0.25133499 bin\_2\_of\_4 0.4067791  
## 42.T3 0.56745200 bin\_3\_of\_4 0.5151342  
## 42.T4 0.07897173 bin\_1\_of\_4 0.5850258  
## 42.T5 0.03366831 bin\_1\_of\_4 0.5223446  
## 43.T0 0.27581980 bin\_2\_of\_4 0.6290018  
## 43.T1 0.21580821 bin\_1\_of\_4 0.5591492  
## 43.T2 0.36448969 bin\_2\_of\_4 0.5956838  
## 43.T3 0.03612829 bin\_1\_of\_4 0.5629662  
## 43.T4 0.22948678 bin\_1\_of\_4 0.5895351  
## 43.T5 0.05875133 bin\_1\_of\_4 0.5397639  
## 44.T0 0.41800676 bin\_2\_of\_4 0.5670029  
## 44.T1 0.07409065 bin\_1\_of\_4 0.3984509  
## 44.T2 0.38294071 bin\_2\_of\_4 0.2546264  
## 44.T3 0.00973585 bin\_1\_of\_4 0.4842382  
## 44.T4 0.38407832 bin\_2\_of\_4 0.5421553  
## 44.T5 0.89574689 bin\_4\_of\_4 0.6129868  
## 45.T0 0.46343586 bin\_2\_of\_4 0.5743448  
## 45.T1 0.29226694 bin\_2\_of\_4 0.6025411  
## 45.T2 0.12798339 bin\_1\_of\_4 0.5444725  
## 45.T3 0.17739812 bin\_1\_of\_4 0.5397907  
## 45.T4 0.29111326 bin\_2\_of\_4 0.5600860  
## 45.T5 0.05229437 bin\_1\_of\_4 0.6474981  
## 46.T0 0.37293424 bin\_2\_of\_4 0.4099412  
## 46.T1 0.00000000 bin\_1\_of\_4 0.4076741  
## 46.T2 0.16847000 bin\_1\_of\_4 0.4459543  
## 46.T3 0.09500886 bin\_1\_of\_4 0.4550945  
## 46.T4 0.05837934 bin\_1\_of\_4 0.5523467  
## 46.T5 0.13444891 bin\_1\_of\_4 0.5189980  
## 47.T0 0.14049068 bin\_1\_of\_4 0.5620133  
## 47.T1 0.38678084 bin\_2\_of\_4 0.5245600  
## 47.T2 0.17300254 bin\_1\_of\_4 0.4232010  
## 47.T3 0.30579884 bin\_2\_of\_4 0.5116921  
## 47.T4 0.18811009 bin\_1\_of\_4 0.6384015  
## 47.T5 0.20452247 bin\_1\_of\_4 0.5201372  
## 48.T0 0.20098892 bin\_1\_of\_4 0.4281478  
## 48.T1 0.16308384 bin\_1\_of\_4 0.3765073  
## 48.T2 0.21510119 bin\_1\_of\_4 0.4430307  
## 48.T3 0.09064319 bin\_1\_of\_4 0.5167619  
## 48.T4 0.14015609 bin\_1\_of\_4 0.4322458  
## 48.T5 0.07125098 bin\_1\_of\_4 0.4830733

lm.pd=with(placebo, lm(PD\_whole\_tree\_alpha~time))  
summary(lm.pd)

##   
## Call:  
## lm(formula = PD\_whole\_tree\_alpha ~ time)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -20.370 -6.436 2.043 7.093 12.365   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 71.8947 2.3500 30.593 < 2e-16 \*\*\*  
## time 2.1428 0.7762 2.761 0.00826 \*\*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 9.184 on 46 degrees of freedom  
## Multiple R-squared: 0.1421, Adjusted R-squared: 0.1235   
## F-statistic: 7.621 on 1 and 46 DF, p-value: 0.008258

with(placebo,plot(time,PD\_whole\_tree\_alpha))  
abline(lm.pd)

