

5.2b SES and Microbiome - twin discordance

LESS STRINGENT

December 06, 2018

Paired discordance of OTUs using EdgeR

Education

```
## Coefficient:  DiscordanceLDep
##              Kingdom          Phylum          Class
## denovo604 k__Bacteria      p__Firmicutes      c__Clostridia
## denovo495 k__Bacteria      p__Firmicutes      c__Clostridia
## denovo88  k__Bacteria      p__Firmicutes      c__Clostridia
## denovo165 k__Bacteria      p__Firmicutes      c__Clostridia
## denovo8   k__Bacteria      p__Bacteroidetes  c__Bacteroidia
## denovo76  k__Bacteria      p__Firmicutes      c__Clostridia
## denovo111 k__Bacteria      p__Firmicutes      c__Clostridia
## denovo173 k__Bacteria      p__Tenericutes     c__Mollicutes
## denovo4   k__Bacteria      p__Proteobacteria  c__Gammaproteobacteria
## denovo40  k__Bacteria      p__Bacteroidetes  c__Bacteroidia
##              Order          Family          Genus
## denovo604   o__Clostridiales      f__          g__
## denovo495   o__Clostridiales      f__Lachnospiraceae      g__
## denovo88    o__Clostridiales      f__Ruminococcaceae      g__
## denovo165   o__Clostridiales      f__Lachnospiraceae      g__
## denovo8     o__Bacteroidales      f__Prevotellaceae      g__Prevotella
## denovo76    o__Clostridiales      f__Ruminococcaceae      g__
## denovo111   o__Clostridiales      f__Ruminococcaceae      g__Ruminococcus
## denovo173   o__RF39              f__          g__
## denovo4     o__Enterobacteriales  f__Enterobacteriaceae      g__
## denovo40    o__Bacteroidales      f__Bacteroidaceae      g__Bacteroides
##              Species      logFC      logCPM      LR      PValue      FDR
## denovo604      s__      1.0889136  10.79897  12.828708  0.0003413414  0.01945646
## denovo495      s__      -0.9943345  10.88653   9.477717  0.0020798264  0.05927505
## denovo88       s__      -0.7623931  14.89692   3.543339  0.0597850054  0.90585455
## denovo165      s__      -0.5560401  12.80012   3.441739  0.0635687404  0.90585455
## denovo8        s__copri  0.8544375  18.74675   1.715070  0.1903288677  0.97914438
## denovo76       s__      0.7142574  14.88601   1.602759  0.2055126174  0.97914438
## denovo111      s__      -0.4716200  13.97125   1.345434  0.2460779338  0.97914438
## denovo173      s__      0.5744391  11.68180   1.305799  0.2531567358  0.97914438
```

## denovo4	s__	0.7545204	18.61378	1.208533	0.2716228045	0.97914438
## denovo40	s__	0.5171439	14.99081	1.173106	0.2787638763	0.97914438

Income

## Coefficient: DiscordanceLDep						
##	Kingdom	Phylum	Class			
## denovo400	k__Bacteria	p__Firmicutes	c__Erysipelotrichi			
## denovo2	k__Bacteria	p__Verrucomicrobia	c__Verrucomicrobiae			
## denovo77	k__Bacteria	p__Bacteroidetes	c__Bacteroidia			
## denovo1750	k__Bacteria	p__Firmicutes	c__Clostridia			
## denovo469	k__Bacteria	p__Firmicutes	c__Clostridia			
## denovo165	k__Bacteria	p__Firmicutes	c__Clostridia			
## denovo495	k__Bacteria	p__Firmicutes	c__Clostridia			
## denovo22	k__Bacteria	p__Actinobacteria	c__Actinobacteria			
## denovo99	k__Bacteria	p__Firmicutes	c__Clostridia			
## denovo60	k__Bacteria	p__Firmicutes	c__Bacilli			
##	Order	Family				
## denovo400	o__Erysipelotrichales	f__Erysipelotrichaceae				
## denovo2	o__Verrucomicrobiales	f__Verrucomicrobiaceae				
## denovo77	o__Bacteroidales	f__Prevotellaceae				
## denovo1750	o__Clostridiales	f__Lachnospiraceae				
## denovo469	o__Clostridiales	f__Ruminococcaceae				
## denovo165	o__Clostridiales	f__Lachnospiraceae				
## denovo495	o__Clostridiales	f__Lachnospiraceae				
## denovo22	o__Bifidobacteriales	f__Bifidobacteriaceae				
## denovo99	o__Clostridiales	f__Veillonellaceae				
## denovo60	o__Lactobacillales	f__Streptococcaceae				
##	Genus	Species	logFC	logCPM		
## denovo400	g__Coprobacillus	s__	0.61071044	11.92574		
## denovo2	g__Akkermansia	s__muciniphila	-0.98232046	20.33570		
## denovo77	g__Prevotella	s__	0.68584996	14.83980		
## denovo1750	g__[Ruminococcus]	s__gnavus	-0.44213558	10.86009		
## denovo469	g__Faecalibacterium	s__prausnitzii	0.64753237	14.46680		
## denovo165	g__	s__	0.36110820	14.79665		
## denovo495	g__	s__	-0.35576261	12.59660		
## denovo22	g__Bifidobacterium	s__adolescentis	0.21246331	18.39142		
## denovo99	g__Acidaminococcus	s__	-0.14984141	15.61010		
## denovo60	g__Streptococcus	s__	0.03127444	15.41680		
##	LR	PValue	FDR			
## denovo400	2.898575401	0.08865787	0.4918161			
## denovo2	2.214951718	0.13667934	0.4918161			
## denovo77	2.097451911	0.14754484	0.4918161			
## denovo1750	1.479406450	0.22386741	0.5497926			

```
## denovo469 1.192150139 0.27489628 0.5497926
## denovo165 0.823180827 0.36425181 0.5886087
## denovo495 0.672946809 0.41202610 0.5886087
## denovo22 0.135267296 0.71303204 0.8912901
## denovo99 0.055049374 0.81449900 0.9049989
## denovo60 0.006319754 0.93663742 0.9366374
```

IMD

```
## Coefficient: DiscordanceLDep
## Kingdom Phylum Class Order
## denovo221 k__Bacteria p__Bacteroidetes c__Bacteroidia o__Bacteroidales
## denovo114 k__Bacteria p__Bacteroidetes c__Bacteroidia o__Bacteroidales
## denovo106 k__Bacteria p__Firmicutes c__Clostridia o__Clostridiales
## denovo281 k__Bacteria p__Bacteroidetes c__Bacteroidia o__Bacteroidales
## denovo91 k__Bacteria p__Bacteroidetes c__Bacteroidia o__Bacteroidales
## denovo268 k__Bacteria p__Bacteroidetes c__Bacteroidia o__Bacteroidales
## denovo958 k__Bacteria p__Firmicutes c__Clostridia o__Clostridiales
## denovo110 k__Bacteria p__Firmicutes c__Clostridia o__Clostridiales
## denovo254 k__Bacteria p__Firmicutes c__Clostridia o__Clostridiales
## denovo170 k__Bacteria p__Bacteroidetes c__Bacteroidia o__Bacteroidales
## Family Genus Species
## denovo221 f__Prevotellaceae g__Prevotella s__
## denovo114 f__Bacteroidaceae g__Bacteroides s__coprophilus
## denovo106 f__Ruminococcaceae g__Ruminococcus s__
## denovo281 f__Bacteroidaceae g__Bacteroides s__
## denovo91 f__Porphyromonadaceae g__Parabacteroides s__distasonis
## denovo268 f__Rikenellaceae g__ s__
## denovo958 f__ g__ s__
## denovo110 f__Ruminococcaceae g__ s__
## denovo254 f__ g__ s__
## denovo170 f__S24-7 g__ s__
## logFC logCPM LR PValue FDR
## denovo221 0.24766861 17.18822 1.2798284 0.2579309 0.9905029
## denovo114 -0.21934290 16.67888 1.0259492 0.3111120 0.9905029
## denovo106 0.21715616 16.01884 0.8628232 0.3529498 0.9905029
## denovo281 -0.17368079 16.36366 0.7054190 0.4009688 0.9905029
## denovo91 0.20900336 19.64047 0.4923223 0.4828932 0.9905029
## denovo268 0.16098626 16.59451 0.4821968 0.4874289 0.9905029
## denovo958 0.10506717 14.22086 0.2692871 0.6038104 0.9905029
## denovo110 0.15817742 17.94678 0.2309763 0.6308009 0.9905029
## denovo254 -0.10783170 15.25765 0.2270809 0.6336968 0.9905029
## denovo170 0.08645575 15.40426 0.1956921 0.6582207 0.9905029
```

Packages used

```
citation("edgeR")
```

```
##
## See Section 1.2 in the User's Guide for more detail about how to
## cite the different edgeR pipelines.
##
## Robinson MD, McCarthy DJ and Smyth GK (2010). edgeR: a
## Bioconductor package for differential expression analysis of
## digital gene expression data. Bioinformatics 26, 139-140
##
## McCarthy DJ, Chen Y and Smyth GK (2012). Differential expression
## analysis of multifactor RNA-Seq experiments with respect to
## biological variation. Nucleic Acids Research 40, 4288-4297
##
## To see these entries in BibTeX format, use 'print(<citation>,
## bibtex=TRUE)', 'toBibtex(.)', or set
## 'options(citation.bibtex.max=999)'.
```

```
citation("phyloseq")
```

```
##
## To cite phyloseq in publications, or otherwise credit, please use:
##
## phyloseq: An R package for reproducible interactive analysis and
## graphics of microbiome census data. Paul J. McMurdie and Susan
## Holmes (2013) PLoS ONE 8(4):e61217.
##
## A BibTeX entry for LaTeX users is
##
## @Article{,
##   author = {Paul J. McMurdie and Susan Holmes},
##   journal = {PLoS ONE},
##   pages = {e61217},
##   title = {phyloseq: An R package for reproducible interactive analysis and graphics of m
##   volume = {8},
##   number = {4},
##   year = {2013},
##   url = {http://dx.plos.org/10.1371/journal.pone.0061217},
## }
```

```
citation("ape")
```

```
##
```

```
## To cite ape in a publication use:
##
##   Paradis E. & Schliep K. 2018. ape 5.0: an environment for modern
##   phylogenetics and evolutionary analyses in R. Bioinformatics xx:
##   xxx-xxx.
##
## A BibTeX entry for LaTeX users is
##
##   @Article{,
##     title = {ape 5.0: an environment for modern phylogenetics and evolutionary analyses in
##       author = {E. Paradis and K. Schliep},
##       journal = {Bioinformatics},
##       year = {2018},
##       volume = {xx},
##       pages = {xxx-xxx},
##     }
##
## As ape is evolving quickly, you may want to cite also its version
## number (found with 'library(help = ape)' or
## 'packageVersion("ape")').
```

```
citation("data.table")
```

```
##
## To cite package 'data.table' in publications use:
##
##   Matt Dowle and Arun Srinivasan (2018). data.table: Extension of
##   `data.frame`. R package version 1.11.8.
##   https://CRAN.R-project.org/package=data.table
##
## A BibTeX entry for LaTeX users is
##
##   @Manual{,
##     title = {data.table: Extension of `data.frame`},
##     author = {Matt Dowle and Arun Srinivasan},
##     year = {2018},
##     note = {R package version 1.11.8},
##     url = {https://CRAN.R-project.org/package=data.table},
##   }
```

```
citation("knitr")
```

```
##
## To cite the 'knitr' package in publications use:
##
##   Yihui Xie (2018). knitr: A General-Purpose Package for Dynamic
```

```
## Report Generation in R. R package version 1.20.
##
## Yihui Xie (2015) Dynamic Documents with R and knitr. 2nd
## edition. Chapman and Hall/CRC. ISBN 978-1498716963
##
## Yihui Xie (2014) knitr: A Comprehensive Tool for Reproducible
## Research in R. In Victoria Stodden, Friedrich Leisch and Roger
## D. Peng, editors, Implementing Reproducible Computational
## Research. Chapman and Hall/CRC. ISBN 978-1466561595
##
## To see these entries in BibTeX format, use 'print(<citation>,
## bibtex=TRUE)', 'toBibtex(.)', or set
## 'options(citation.bibtex.max=999)'.
```

```
citation("rmarkdown")
```

```
##
## To cite package 'rmarkdown' in publications use:
##
## JJ Allaire, Yihui Xie, Jonathan McPherson, Javier Luraschi,
## Kevin Ushey, Aron Atkins, Hadley Wickham, Joe Cheng and Winston
## Chang (2018). rmarkdown: Dynamic Documents for R. R package
## version 1.10. https://CRAN.R-project.org/package=rmarkdown
##
## A BibTeX entry for LaTeX users is
##
## @Manual{,
##   title = {rmarkdown: Dynamic Documents for R},
##   author = {JJ Allaire and Yihui Xie and Jonathan McPherson and Javier Luraschi and Kevin
##   year = {2018},
##   note = {R package version 1.10},
##   url = {https://CRAN.R-project.org/package=rmarkdown},
## }
```

```
citation("base")
```

```
##
## To cite R in publications use:
##
## R Core Team (2018). R: A language and environment for
## statistical computing. R Foundation for Statistical Computing,
## Vienna, Austria. URL https://www.R-project.org/.
##
## A BibTeX entry for LaTeX users is
##
## @Manual{,
```

```
##      title = {R: A Language and Environment for Statistical Computing},
##      author = {{R Core Team}},
##      organization = {R Foundation for Statistical Computing},
##      address = {Vienna, Austria},
##      year = {2018},
##      url = {https://www.R-project.org/},
##    }
##
## We have invested a lot of time and effort in creating R, please
## cite it when using it for data analysis. See also
## 'citation("pkgname")' for citing R packages.
```