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ATTN: Editors of The ISME Journal

Dear Editors,

Please consider our revised manuscript “A phylogenetic model for the recruitment of species into microbial communities and application to studies of the human microbiome” for publication in *The ISME Journal*. We have thoroughly revised our manuscript with the reviewer’s comments in mind, and in our attached responses document we detail the changes we have made.

The reviewer suggested that we remove ecological theory from our introduction, and focus our paper on empirical/applied results. They voiced concern that they “don’t think it is acceptable nowadays to use patterns of phylogenetic relatedness in communities to infer community assembly processes in a dynamic system”. The reviewer cites as reason for this claim a 2010 paper by Mayfield and Levine, who discuss the idea that phylogenetic underdispersion can arise either from environmental filtering (*i.e.* selection) or from competition between distantly related species, but that phylogenetic overdispersion can only arise from competition between closely related species. In our paper, we reject the overdispersion hypothesis (and our null hypothesis), eliminating competition between closely related species as a mechanism for microbial community assembly in the data sets we analyze.

Rejecting hypotheses such as the one described above is as close as we get to “inferring community assembly processes” in empirical science. As deduction is a primary component of scientific inference, we disagree with the reviewer’s opinion. Furthermore, we feel it would be inappropriate to remove discussion of mechanism and theory from our introduction, because the hypotheses we test were not pulled from thin air. Rather, they were informed by the literature we cite.

Despite this disagreement, the reviewer’s comments have helped us improved our manuscript. We strongly feel that our paper robustly demonstrates that the human gut microbiome exhibits strong nepotism, which both reviewers support as an interesting conclusion worthy of publication. Furthermore, we eliminate competition between closely-related species (*i.e. priority effects*) as a mechanism, which has shown to be a significant mechanism in previous studies in microbial ecology. For these reasons, we think our paper is suitable for your continued consideration for publication in *The ISME Journal*.

Thank you.



John L. Darcy, PhD