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April 30, 2019

Dear Editors,

We are submitting a revision of our manuscript titled “Front-end Weber-Fechner gain control enhances the fidelity of combinatorial odor coding” for publication in *eLife* as an eLife Advance to our previous paper (Gorur-Shandilya et al *eLife* 2017).

We believe we have fully addressed the reviewers’ and Editors’ concerns. We have amended our text to unpack the technical details, making the work more accessible for the broad readership of *eLife*. In particular:

1. We intuited our model in words and figures, using features familiar to neurobiologists: dose-response curves and responses to step currents of different concentrations.
2. We explained our t-SNE projection procedure in more depth, and added a figure illustrating what the t-SNE plots portray.
3. We discussed compressed sensing in more detail – why it might be useful for the decoding task and how it works in words.
4. We included a new section on the implications of relaxing Weber’s Law for odor coding.

These changes and others in response to the reviewer comments are discussed in our response letter, and are reflected in major changes to the text as well as several additions to the figures.

We thank the Editors and reviewers for their thoughtful and constructive comments and hope that the revision is now suitable for publication.

Sincerely yours,

Thierry Emonet

Associate Professor of Molecular, Cellular and Developmental Biology & Physics