**Cover Letter**

Here we describe a unique approach for measuring physiological activity patterns in genetically labeled cell populations of the developing mouse neocortex. While traditional measures of population activity in brain networks have relied on electrical recordings, these are not easily applied to the study of neuronal subtypes and their participation in network activity. We use calcium imaging and transgenically-labeled cell types to achieve these measurements, which will be critical to future understanding of how normal and diseased brain networks function. Our system produces reliable results and that could be recreated in a number of other labs, with a requirement for resources that is less than most other techniques which are currently used to measure activity in neuronal subtypes in brain slices. We think that JOVE is an excellent way to disseminate this technique to a broader audience, as visualized experiments are an excellent way to simplify technical explanations that are more complicated on paper. Additionally, the nature of the data collected in these experiments is particularly amenable to being shared in a video format, as we measure calcium activity with CCD cameras and show changes in fluorescence over time in movies of brain activity. We hope you enjoy our submission and appreciate the opportunity to share our work with you.

**Suggested Reviewers**

Arnold Kriegstein, *University of California San Franscisco*

kriegsteina@stemcell.ucsf.edu

Jan Ramirez, *Seattle Children’s Research Institute*

jan.ramirez@seattlechildrens.org

Nicholas Spitzer, *University of California Sand Diego*

nspitzer@ucsd.edu

Albrecht Stroh, *Johannes Gutenberg Universitat Mainz*

Albrecht.stroh@unimedizin-mainz.de

Olga Garaschuk, *Universitatsklinikum Tubingen*

olga.garaschuk@uni-tuebingen.de

Knut Holthoff, *Friedrich-Schiller-Universitat Jena*

[knut.holthott@med.uni-jena.de](mailto:knut.holthott@med.uni-jena.de)

**Author Contributions**

Kevin Neuzil and Curtis Easton wrote the manuscript. Curtis Easton and William Moody designed the culture and imaging protocol, and William Moody edited the manuscript.

**Assisting Editor**

Dr. Indrani Mukherjee invited us to submit this manuscript and helped with the submission. We very much appreciate her reaching out to us and aiding in this process.