Howard Hughes Medical Institute
Research Laboratories

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Biocomplexity Faculty Search Committee
c / o Prof. Rob de Ruyter van Steveninck
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Dear Members of the Selection Committee:

I am writing to recommend Dr. Youping Xiao, who has applied for a faculty position in your department. I was a member of Youping's Ph.D. thesis committee. While I have never work with him in the lab, I have been impressed by Youping's work, and I am happy to support his application.

Youping's thesis project was a study of the functional organization of cortical visual areas V2 and V4 in macaque monkeys, the best animal model for human cerebral cortex. The arrangement of connections between these areas has been an important question for visual cortex for many years. It was well established that the different types of compartments in V2 are elements in streams of processing that are responsible for handling different types of visual information. What happened beyond V2 was unknown, owing primarily to the difficulty of reliably placing anatomical tracers in the various compartments. One of Youping's accomplishments as a graduate student was to use optical imaging of cortical activity to identify the V2 compartments in vivo, and to use this imaging to guide injections of anatomical tracers. While the results were complex, they have significantly extended our understanding of the organization of visual cortex, and have helped clarify how higher visual areas contribute to the processing of different type of visual signals.

Another of Youping's important accomplishments was to identify a previous unrecognized organization for color sensitive neurons in V2. It had long been known that the thin cytochrome oxidase stripes in V2 contained a high proportion of color selective neurons. Using optical imaging to measure cortical responses with high spatial resolution, Youping showed that preferred color progressed in a systematic way along the long axis of these stripes. This clear mapping of preferred color was unanticipated, and challenged ideas about the way that cerebral cortex segregates and integrates different types of sensory signals.

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Youping's thesis work was an impressive technical accomplishment. Few investigators have the ability to routinely use optical imaging to reveal functional organization and to guide injections of neuroanatomical tracers. It is a demanding approach. Youping deserves considerable credit for overcoming the technical problems related to his experiments, and for putting in the substantial effort that was needed to see it through. By the time he presented his thesis, Youping also demonstrated that he had mastery of the relevant literature, and a good understanding of the subtleties involved in analyzing his data. Youping did his work in an environment that was not particularly supportive, and accomplishments reflect an ability to work with relatively little input.

Youping joined Ehud Kaplan's lab at the Mount Sinai School of Medicine to do a postdoctoral fellowship. This was an excellent choice because it gave him the opportunity to use his skills with optical imaging while learning new computational and analytical approaches. He has had the opportunity to gain skills in single unit recording and psychophysics that will be valuable to him in future work. His plan to continue work on the functional organization of color processing is a good one. Relatively few laboratories are working on cortical functional organization, although our understanding is very limited. Youping is likely to make good progress in this area.

Overall, I think Youping is a very promising and reliable young scientist with great potential for a career as an independent investigator. I am happy to recommend him.

Sincerely yours,

John Maunsell