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October 1, 2006

Dear Faculty Search Committee,

I am writing to apply for the recently advertised faculty position in your department.

As a primary investigator, I hope to bring my expertise with *in vivo* extracellular recording together with intracellular techniques *in vitro* and *in vivo* to understand better the microcircuits and biophysical mechanisms that contribute to state-dependent response modulation in the neocortex. My proposed studies will not only provide insight into the specific mechanisms of visual receptive field construction, but will also reveal the general neural mechanisms employed by the brain for communicating information from one region to another.

Three general approaches will be used in rodent and carnivore animal models. Pharmacological manipulation of cellular targets will be tested *in vivo* to determine the role of these mechanisms on receptive field modulator inputs. Next, *in vitro* experiments will examine the synaptic and intrinsic membrane basis of state-dependent modulation. Lastly, anatomical analysis using juxtacellular or intracellular labeling *in vivo* will help correlate cell type specificity to particular sources of modulatory input.

My overall goal is to explore the fundamental cellular mechanisms that govern visual perception. Given the interdisciplinary nature of neuroscience, it is essential to approach systems level questions from many angles, and this has motivated me to acquire complementary tools to approach these questions. My training in biomedical engineering as an undergraduate student at Northwestern University and neural science as a graduate student in the laboratory of Robert Shapley at NYU has prepared me to explore these issues from the cellular to the psychophysical level. The postdoctoral training that I have received at the University of California, Davis and Stanford University has allowed me to expand my range of techniques to include whole-cell patch clamp recording *in vitro*, *in vivo* pharmacological manipulations, and single cell labeling *in vitro* and *in vivo*.

I am well-prepared to lead a productive research group. I have the technical skills and quantitative background required to carry out the experiments that I am proposing. Having worked very independently as both a graduate student and a postdoctoral fellow, I am confident in my ability to conduct an independent research program. During my postdoctoral experiences I have independently introduced new experimental techniques and approaches and have developed novel analysis and protocols. These are necessary skills to establish an independent research program. I have been able to closely observe and participate in the establishment of new labs from their earliest stages. Importantly,

during my training, I have gained invaluable experience with mentoring students and managing and coordinating the work of fellow researchers.

I hope that you will consider my application for your job opening. My research goals complement those already established at your department, while adding a new perspective in the study of systems neurophysiology. Dr. Robert M. Shapley, Dr. Michael J. Hawken, Dr. Barbara Chapman and Dr. M. Bruce MacIver will serve as primary references. Their contact information, my curriculum vitae and a summary of my current and future research goals are attached.

Thank you for your time and consideration.

Sincerely,

Michael P. Sceniak, Ph.D.

## Teaching Statement — Michael P. Sceniak

A commitment to teaching is an important component to success as a professor. My undergraduate experience at Northwestern University emphasized the importance of a strong understanding of the fundamentals in science and mathematics. Teaching not only benefits the student, but also the professor. As we advance in our investigations of cutting edge science, it is important to be aware of this work as it relates to the big picture of the field. Teaching forces the professor to be aware of different perspectives and more fundamental issues in science.

During my graduate training at New York University's Center for Neural Science, I was a teaching assistant for the laboratory component of the core course in neural science twice. The course ran for one semester and consisted of a section on neuroanatomy, both gross and cellular, as well as a section on biophysics. I assisted the students in learning neuroanatomy by answering questions and designing and administering exams. The course covered human, sheep, cat, monkey and rat neuroanatomy. We also covered basic methods of anatomical preparation including rat perfusion, histology and microscope techniques. The latter portion of the course covered biophysics. During the course I gave lectures and assisted in the experiments. The students were required to perform intracellular recording of leech and frog neurons. I assisted the students in making the preparations and explaining and assisting in the actual recording. This included extensive explanation of the computer controlled data acquisition system.

My graduate and undergraduate experience has exposed me to subjects ranging from basic science and engineering to advanced subjects in neuroscience and psychology. I feel confident teaching courses ranging from biophysics and neuroanatomy to specialized courses within visual neurophysiology and psychophysics. I also have experience explaining and teaching others computational methods and analysis.

During my time as a graduate student and as a postdoc, I have given many public lectures on my work. I have given talks and poster presentations at the annual meeting for the Society of Neuroscience and the ARVO annual meeting. I was also an invited speaker at the Smith Kettlewell Eye Research Institute and Department of Physiology at Northwestern University. Recently I have given presentations at departmental seminars as well as the 2005 Annual Anesthesia Department Awards Dinner at Stanford University Medical Center. These experiences have given me exposure to lecturing in front of large audiences, teaching and seminar format lectures.

The success of any academic department ultimately depends both on the quality of its research and the quality of its teaching. As a Professor, I look forward to the challenges and rewards of research and teaching.

### **Teaching Experience:**

1995	TA	Neural Science I — laboratory in neuroanatomy and biophysics
1997	TA	Neural Science I — laboratory in neuroanatomy and biophysics