

Kennedy Krieger
Research Institute

October 18, 2005

Yves Brun, Systems Biology/Microbiology Faculty Search
Department of Biology
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Dear Search Committee Members;

It is with great pleasure that I recommend Yingbin Fu for a faculty position. Yingbin will become a successful scientist and run a highly productive research program. He is a sure bet!

I first met Yingbin when I was still a post-doctoral fellow at the Carnegie Institution of Washington, prior to taking a faculty position in the Department of Neuroscience at Johns Hopkins University nearly 5 years ago. He contacted me all excited about the possibility of expressing cone opsin genes in frog rod photoreceptors. His excitement was contagious. So, I helped him undertake those studies, which we continued in my own laboratory and which culminated in a publication in *Nature* in 2003 showing that the intrinsic noise and kinetic properties of cone photoreceptors are at least in part encoded by the higher rate of spontaneous isomerization of cone pigments relative to the rod pigment, rhodopsin. However, this was only one of several exciting projects that Yingbin has undertaken during his postdoctoral training in the laboratory of King-Wai Yau. He also performed highly significant work on the role of the chromophore (vitamin A1 versus vitamin A2 based) in mediating the rate of spontaneous isomerizations in photoreceptors. He has contributed significantly to establishing melanopsin as the pigment that mediates direct light response in a subset of retinal ganglion cells in mice. And besides these studies that are either published or soon to be published, he has ongoing studies addressing the role of bg subunits of transducin in mice, and studies that address the signaling downstream of melanopsin using transgenic *Xenopus*. All of these studies speak to several of his main strengths: his ability to identify and address highly relevant research questions, his high degree of competence, and his high productivity.

Yingbin is proposing to run a laboratory that works in both frogs and mice as experimental model organisms. While I cannot speak directly to his competence and potential as it pertains to running a "mouse lab", I believe that his record on this speaks for itself. Besides, his other two recommendations will do a better job of addressing this point. I can speak about his competence and potential as it relates to running a successful "frog lab". We consider ourselves one of the best laboratories not only in generating transgenic frogs but also in "everything frog" including frog husbandry. The frog nuclear transfer transgenesis procedure is one that is not easy to learn, and some very competent people have not been able to master it. Yingbin has mastered the procedure, and I have little doubt that he will be able to start up a frog transgenesis operation in his own laboratory. In recent years, instead of doing the transgenesis procedure himself, he has been managing personnel who have helped him to generate and raise the transgenic animals. Initially, that required help from personnel in my laboratory. More recently, his personnel have been doing nearly everything independently. This is an important point, because frog procedures are not as standardized as mouse

procedures, and having the ability to set up a successful frog lab might pose a challenge to some; but, not to Yingbin. As far as I am concerned, Yingbin will have no trouble setting up a frog operation quickly and having it run smoothly. In fact, in interacting with some of the personnel working under Yingbin, it is evident that he also has the proven ability to manage personnel productively – one of the greatest challenges for new faculty. Yingbin is demanding, but also willing to get his hands dirty when he needs to. All this is to say that I look forward to Yingbin running his own successful frog lab, so that we may continue to interact.

Let me address my perceptions regarding Yingbin as a scientist and colleague. Yingbin is very knowledgeable about current molecular methodologies and is generous with his time. He is intellectually curious. He also has a great sense of humor. All this is to say, that he will make a good colleague. In his own research, Yingbin will always want to address questions at the cutting edge of knowledge and of high impact. He is extremely knowledgeable about the visual transduction field and knows exactly what the next important question is. Indeed, I often go to him when I want to find out the latest buzz in the field. However, he also is quite astute and knows that the most important questions are the ones that many others, including big established laboratories with deep purses, are likely to be asking, and he knows his own limitations. Yingbin knows when to hold and when to fold, when running a little faster than the competition will get him there first, and when taking a different angle on a problem will allow him to be competitive. I believe that it is for all these reasons that he is taking the wise approach of working in both mice and frogs. There are many, perhaps most, questions that are best asked in mice. However, there are often many labs that will be taking the same approaches in mice. Yingbin will only undertake a project in mice if he thinks he can get to the punch-line first. And for this, he has the molecular expertise and drive to out-compete larger operations. However, Yingbin also appreciates that some questions can be answered faster and often better in *Xenopus*, especially those that can be answered by the rapid and inexpensive transgenesis that is available in *Xenopus*. I believe that the ability to do both mice and frogs in a single lab will prove a powerful combination. And Yingbin has the right stuff to take full advantage of this combination.

In summary, Yingbin has the expertise, the knowledge, the intellectual maturity, and the drive to run a highly productive laboratory. He is one of few people who can tango with mice and with frogs, and do so expertly. All in all, I could not recommend Yingbin any more enthusiastically. Please feel free to contact me if you have any questions.

Truly,



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Re: Letter of Reference for Dr. Yingbin Fu

Dear Dr. Brun:

I am pleased to write this letter in support of the application of Dr. Yingbin Fu for a faculty position in your Department. I have known Yingbin since he joined Dr. King Wai-Yau's laboratory at Johns Hopkins University School of Medicine as a postdoctoral fellow. Although I have not been directly involved in research projects carried out by Yingbin, I have collaborated with King Wai-Yau's laboratory on the molecular characterization of the cGMP-gated channel in rod photoreceptors. During my visits to Baltimore and at scientific meetings I have had an opportunity to get to know Yingbin both as a scientist and a person. Indeed, I have been extremely impressed by his keen mind, genuine character, strong motivation for science, and important research contributions that he has made in King Wai-Yau's laboratory.

As a postdoctoral fellow, Yingbin has carried out elegant studies in the area of phototransduction in vertebrate rod and cone cells and analysis of the photopigment melanopsin in retinal ganglion cells. In the former research area Yingbin has tackled an important issue in vision namely understanding the molecular basis for differences in the response of cone and rod photoreceptors. He investigated the role of the visual pigment in the photoresponse of rod and cone photoreceptors using both transgenic *Xenopus laevis* and transgenic mice in which he expressed cone opsin in rod photoreceptors and rodopsin in cone cells. Importantly, he showed that thermal isomerization of the cone pigment plays a role in shaping the lower photosensitivity and faster kinetics of cones in amphibians such as *Xenopus*. Interestingly, this instability of the chromophore does not appear to play a major role in defining the cone sensitivity in mice and other mammals suggesting that other mechanisms play a crucial role. In another important area of study, Yingbin has studied the role of melanopsin in intrinsically photosensitive retinal ganglion cells. In a series of well-

role of melanopsin in intrinsically photosensitive retinal ganglion cells. In a series of well-executed experiments using knockout mice, Yingbin has provided strong evidence for the role of melanopsin as a true photopigment in these cells.

Yinbin has extensive research knowledge and experience both as a graduate student and a postdoctoral fellow. He has mastered a wide variety of current techniques in the area of biochemistry, molecular biology, immunocytochemistry, physiology and genetics and has effectively used these to tackle important problems. He has been extremely productive both as a graduate student and a postdoc having published his research in high profile journals. In addition he has written a number of book chapters and reviews including a recent review in *Current Opinions in Neurobiology*.

I have little direct insight into Yingbin's teaching accomplishments. However, in recent discussions that I have had with him, he has indicated a keen interest in teaching and supervising both student and postdoctoral trainees. I believe that he will make an excellent teacher and mentor of trainees as well as a valuable research colleague in your department.

On the basis of Yingbin's outstanding research accomplishments, strong record of productivity, broad research experience and excellent potential to further develop into a first-rate independent research scientist, I most strongly support his application for a faculty position in your department.

Sincerely yours,

A handwritten signature in cursive script that reads "R. S. Molday". The signature is written in dark ink and is positioned above the typed name.

Robert S. Molday, Ph.D.
Professor, Biochemistry and Molecular Biology
Director, Centre for Macular Research