New York University
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Department of Biology

1009 Silver Center
100 Washington square East
New York NY 10003-6688

Claude Desplan
Tel: (212) 998 8218
Private Fax: (212) 995 4710
E-Mail: cd38@nyu.edu

December 7, 2005

Yves Brun, Systems Biology/Microbiology Faculty Search
Department of Biology, Indiana University
Jordan Hall 142, 1001 E 3rd Street
Bloomington, IN 47405-7005

Dear Committee Members:

It is a very special pleasure to write this letter to recommend **Robin Hiesinger** to a Faculty position in your department.

I met Robin when he joined the very large laboratory of Hugo Bellen as a postdoctoral fellow. After a PhD in Germany with Karl Fischbach, he had decided to use more molecular approaches to neurobiology and to combine his expertise in neuroanatomy with the power of molecular genetics. He has clearly achieved this goal and Robin is the most important postdoc in Hugo's lab and an intellectual force behind much of what is being done there.

Robin is interested in broad questions of neural circuitry and he has chosen to study the process of neural superposition in the lamina part of the *Drosophila* optic lobe as a model system. I consider neural superposition as one of the most fascinating problems in neurobiology that one could hope to solve in the near future: in the visual system of the fly, the neurons coming from the retina establish an amazingly complex and regular array of projections to the first neuropil of the optic lobe, which allows the fly to increase its sensitivity and resolution as compared to most other insects: Rather than keeping strict retinotopic projections, the photoreceptor neurons target the neural cartridges of the lamina that process information coming from a single direction in space: indeed, the peculiar arrangement of photoreceptors under the small lens of the ommatidium does not allow them to sit in the center of the lens, and in fact, all 6 outer photoreceptors from one ommatidium point toward 6 different directions in space. However, the regular arrangement of the fly eye allows six photoreceptors, one in each of 6 different ommatidia, to all point to the same direction: neural superposition is the mechanisms by which these six photoreceptor neurons all converge to the same neural cartridge.

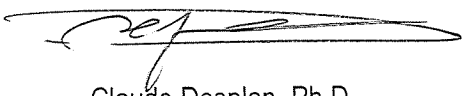
The process has been described in much detail by the neuro-anatomists, but it had remained largely unexplored by the developmental neurobiologists except for a single study from Tom Clandinin and Larry Zipursky. In Hugo's lab, Robin undertook to develop a large scale genetic screen for mutations that affect the process. Over the last few years, a large part of Hugo's lab has worked on this screen and a large number of important functions have come out of it, but much of the credit for the screen goes to

Robin. The flies are first selected because they are blind but have a normal electroretinogram. The next step consists in looking in the lamina and this is where Robin has a unique contribution as he is able to obtain an amazingly precise description of the projection patterns. Indeed, one of Robin's strengths is to dedicate much energy, expertise and cleverness to obtain precise imaging of the brain (lamina in this case) as a necessary requirement to advance our understanding of neurobiology.

The screen has been very productive, and Robin has identified many mutations that fit the general problems of synapsogenesis that is the center of Hugo's lab. Robin has studied in depth several of these genes that affect synapse formation and vesicle trafficking, and although these functions are very important for our understanding of the synapse, and have indeed led to publications in Cell and Neuron, I consider them as distractions to what Robin is trying to achieve with neural superposition. Robin has taken the views of a Principal Investigator rather that those of a postdoc (likely with the encouragements of Hugo!) and has moved on a number of projects. This only reflects a strategic decision as Robin is an ambitious leader who can run multiple projects rather than trying to secure a nice and small piece of work. But the core of his work on neural superposition is already very advanced and I never fail to encourage him to move in this more risky direction rather than on the solid work on the synapse. His live imaging work on *in vivo* preparations is powerful, and combined with molecular genetic techniques such as MARCM or the many Gal4 drivers available, place him is a unique situation. He is one of these rare scientists with the brilliant mind, dedication to achieve great original work. This view is shared by many in the field and Robin is indeed very well known. As a postdoc, he was invited twice to talk at the Gordon conference on eye development.

Thus, Robin has chosen a very difficult and ambitious goal, but he has clearly already reached the first milestones and he is promised to a brilliant future: There are very few scientists of this caliber, extremely smart, uniquely creative and ambitious. He is also a very nice and charismatic colleague. He represents a new breed of scientists who combine neurobiology, genetics and imaging in a broad intellectual context. My very strong recommendation is to interview him and he will convince the committee that he is the perfect candidate.

Sincerely,



Claude Desplan, Ph.D.
Silver Professor
Center for Developmental Genetics