

Yves Brun
Systems Biology Faculty Search
Department of Biology, Indiana University
Jordan Hall 142
1001 E 3rd Street
Bloomington, IN 47405-3700
USA

E-mail ybrun@indiana.edu

31 October 2005

Dear Dr Brun

It is with great pleasure that I provide Dr Eric Kramer with a reference for the Systems Biology position at the Biocomplexity Institute at Indiana University, Bloomington. I have known Dr Kramer for the last two years during which time we have forged a close working relationship.

Dr Kramer represents one of those rare academics capable of bridging several distinct disciplines. Originally pursuing graduate research in Physics, Dr Kramer has more recently applied this knowledge to address important questions relating to plant biology. Whilst modelling vascular patterning in trees, Dr Kramer's studies led him to realise the importance of hormone signals such as auxin. In an attempt to understand the role of auxin, Dr Kramer developed a 2D model designed to stimulate hormone transport in a group of vascular cells. The work was considered very original and merited publication in the journal 'Trends in Plant Science'. What impressed me most about the model was its attempt to incorporate parameters most mathematicians almost always overlook, such as the impact of the cell wall, the permeability of cellular membranes and the non-homogenous distribution of hormone carrier proteins within and between plant cells.

Dr Kramer's careful attention to detail, sound grasp of the literature and strong mathematical background enabled him to create a model with real predictive value. As a life scientist contemplating the potential of systems biology as a tool to guide experimental design, here was someone I could finally communicate with. During the last 12 months, Dr Kramer advanced his model to become truly 3D and expanded his algorithms to encompass over 1,200 cells, this time in the root elongation zone. This model incorporated research observations relating to auxin carrier proteins subcellular distribution generated in my own and other laboratories. When my laboratory tested these predictions experimentally, his simulations proved to have real predictive value in relation to fluxes of auxin following gravity stimulus. This work represents one of the first real examples of an Integrated Systems Biology approach in plants and has recently been accepted for publication in Nature Cell Biology.

Dr Kramer recently visited my laboratory as part of a discipline bridging initiative at the University of Nottingham. The timing of his visit was very fortuitous as my Institute has recently been short-listed by the BBSRC (the UK research council) for an integrated Systems Biology Centre award. Dr Kramer had a significant

input into the final proposal and was flagged as an important International Collaborator with funds allocated for him to visit for one month annually for the 5-year duration of the award. The proposed BBSRC ISB Centre would create a virtual root to which Dr Kramer would be anticipated to make a significant contribution, particularly in the simulation of hormone distributions in root apical tissues.

In summary, Dr Kramer is an exceptional individual who I recommend without reservation. His expertise in physical and biological sciences make him ideally suited for the position of in your Department.

Yours sincerely

Malcolm Bennett

Professor Malcolm Bennett
Professor of Plant Science