

X-Sieve: CMU Sieve 2.2
Date: Sat, 15 Oct 2005 09:31:45 -0400 (EDT)
From: James Collins <jcollins@bu.edu>
To: jebennet@indiana.edu
Subject: letter of reference for Gabor Balazsi

Dear Search Committee,

I am happy to write a letter of support for Gabor Balazsi. I think Gabor is a solid candidate for a faculty position in Bioinformatics and Computational Biology.

Gabor joined my group a few months ago as a postdoc. As you know, Gabor has a background in physics. He previously did a postdoc with Zoltan Oltvai at Northwestern, where he focused on a project dealing with transcription factor networks. Gabor applied novel data analysis techniques to existing expression data, and demonstrated that such networks respond in highly selective ways depending upon the external stimulus. This work was recently published in PNAS.

With our group, Gabor is beginning to work on a number of projects dealing with gene-protein regulatory networks. Thus far, I have been particularly impressed with Gabor's interest in the biological aspects of the problem. He does not fixate on the more technical or mathematical aspects, as is common among physicists transitioning into biology.

Gabor is very bright and marvelously enthusiastic about scientific research. He has already established a number of collaborations within our group. I am confident he will produce interesting and novel results with our group.

If you invite Gabor to give a talk, you will see that he is an effective communicator. He is also a friendly, garrulous individual. I think he will make a very good teacher.

With proper support and mentoring, I think Gabor could become a young leader in the computational biology community.

I give Gabor my enthusiastic recommendation and support.

Sincerely,

Jim Collins

J.J. Collins
University Professor
Professor of Biomedical Engineering

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UNIVERSITY OF
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DEPARTMENT OF PHYSICS

October 13, 2005

Professor Yves Brun
Systems Biology/Microbiology
Faculty Search Dept. of Biology
Indiana University
Jordan Hall 142
1001 East 3rd Street
Bloomington IN 47405-7005

Dear Professor Brun:

It is a pleasure to recommend Dr. Gábor Balázsi for a position in your institution. I met Gábor three years ago, when he joined the laboratory of my collaborator, Zoltán Oltvai, as a Postdoctoral Research Associate. Yet, I have heard of him and his work well before it, finding his graduate work on stochastic resonance, synchronization and its applications to neuroscience interesting and of great potential impact for our work as well. Thus, I was quite glad to hear that he was interested in joining our joint Northwestern-Notre Dame research group.

After arriving to the Oltvai Laboratory, he became quickly accustomed to the new environment and the new research problems, focusing on networks in molecular cell biology. The Oltvai laboratory and my research group here at Notre Dame have joint group discussions roughly every month. During these meetings, Gábor demonstrated very early his ability to quickly grasp the discussed ideas, and to ask pertinent questions, to the benefit of the whole research group. Following a short period of independent investigation and reading, he picked a problem on his own, choosing to work on the space and time aspects of gene regulation. Using cell cycle microarray data, he first observed a peculiar spatial-temporal along the DNA and periodicity in gene expression. At first it looked as this could be a real effect. Yet, with meticulous work, and a great deal of ingenuity he showed that the observed periodicity is rooted in systematic biases in the microarray experiments. Most people would have gotten disappointed and dropped the project at this stage. Yet, Gábor saw an opportunity in the failure, and developed a method to effectively filter these periodic effects out from the experimental data, and therefore significantly improve the quality of microarray analysis. This research was carried out very independently, with only minor guidance from me and from his current advisor, Zoltán Oltvai. The method, published recently will surely be unavoidable for all those that are interested in serious microarray analysis, as the observed periodicity appears to be a general feature of all chips.

In another publication, he investigated the distribution of essential genes along the *E. coli* chromosome, as well as the relationship between essentiality and evolutionary conservation. This was part of a massive experimental project, and Gábor quickly developed the statistical tools to analyze the experimental

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data, his contribution being crucial for the theoretical success of this study. He did so by talking closely with the experimental team, and turning their results into quantitative answers. He is an excellent link between theory and experiment, because he can explain in simple terms the principle behind complicated molecular biological procedures.

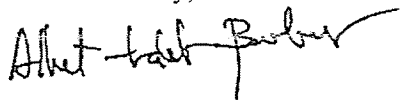
His most interesting work, published in PNAS in 2005, focuses on the structure of the regulatory network of E coli. The main finding is rather simple, but with many potential consequences: he demonstrated that the regulatory network can be organized into a set of slightly overlapping orisons, which represents a group of genes that are regulated by a single transcription factor. The importance of the orison concept is that it offers a clear method to delineate the impact of specific environmental changes that affect only one or a few transcription factors. He was able to show that specific environmental perturbation indeed affect in a very selective fashion only the genes within single orisons, and leave other gene's transcription level largely unaltered. I view this as a conceptually interesting result that offers a way to generate experimentally testable large scale hypotheses about regulatory processes.

Besides his excellent research skills, Gábor is an outstanding lecturer, who can easily convey complex scientific information to audiences with varying background. He can explain biology to physicists, and physics to biologists. He often points out analogies between the material being presented and the audience's background, making the lecture quite fun and insightful. I believe he could be an excellent teacher if he is given the opportunity. He has an excellent command of English, which applies to both spoken and written communication. He presents scientific ideas with logic and simplicity, factors that are crucial for writing research papers and grant proposals as well.

Personally, I find him a reliable and kind person with a wide variety of interests, with whom it is fun to discuss scientific ideas in an informal setting, during brainstorming sessions. He is eager to think about new problems, and to investigate them with the depth and rigor required by the rapidly developing area of quantitative or system biology.

In conclusion, I strongly support Dr. Gábor Balázsi's application for a faculty position - I think an institution should be proud of having him. He has acquired the knowledge and reached the maturity to become an independent investigator. Should you have any further questions do not hesitate to contact me.

Yours sincerely,



Albert-László Barabási
Emil T. Hofman Professor of Physics