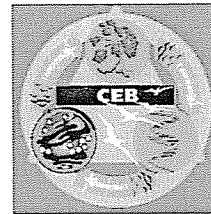


ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY



Center for Environmental Biotechnology

September 30, 2005

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

Dear Dr. Brun:

I am writing this letter in support of Dr. Matthew Fields, who is applying for an Assistant Professor position in experimental and/or computational Systems Biology.

I am a microbial ecologist and a senior scientist at the Lawrence Berkeley National Laboratory, DOE BER Distinguished Scientist, and have been heading the Environmental Remediation Technology program, Center for Environmental Biotechnology, and Ecology Department for several years. In 2002, I founded and became co-director of the Virtual Institute for Microbial Stress and Survival (VIMSS) after receiving a \$36.6 million competitive award from the United States Department of Energy (DOE) Genomes to life program. I am also chair of DOE's Natural and Accelerated Bioremediation Research field research review panel since its inception in 1999. Based on my achievements, I was selected as a fellow of the American Academy of Microbiology in 1991. I have five U.S. Patents that are licensed by more than 50 U.S. Companies. The results of my research have appeared in over 175 archival publications and more than 800 scientific presentations. I have also received numerous awards including two R&D 100 awards for the best new technologies.

I have known Dr. Fields for the last 5 years, starting with our collaboration on VIMSS. Dr. Fields was a key member of Dr. Jizhong Zhou's world-renowned functional genomics lab at the Oak Ridge National Laboratory. Since he moved to Miami University, Dr. Fields has retained his key role and gone on to develop his own niche within the program. With the goal of the Department of Energy to provide the biological and environmental discoveries necessary to clean and protect our nation's environment, the focus of our project is on experimentally elucidating and computationally modeling the stress response pathways of three target metal and radionuclide reducing organisms: *Desulfovibrio vulgaris*, *Shewanella oneidensis* MR-1, and *Geobacter metallireducens*. Dr. Field's exceptional achievements are invaluable to the Department of Energy's Environmental Remediation Initiative because microbial metal reduction plays an important role in the bioremediation of metals, radionuclides, and organic contaminants frequently found in DOE facilities throughout the United States. The goal of the Genomics:GTL program is to provide the fundamental science that will serve as the basis for development of cost-effective bioremediation and long-term stewardship of radionuclides and metals in the subsurface at the DOE facilities and breakthrough science is the general area of microbial ecogenomics.

Dr. Fields is an expert in the molecular microbial ecology, bioinformatics and cutting-edge DNA microarray technology to understand cellular activities at the whole-genome level, which has led him to a number of significant breakthroughs in bacterial stress response. His work on *Desulfovibrio vulgaris* for the first time revealed at the transcriptional level the key genes responsible for the detoxification and adaptation of microbial cells to a number of stressors including chromium. He has also demonstrated the key links between community structure and particular functional genes and physical/chemical parameters in groundwater. Because of Dr. Fields' productivity and contributions, on-going research efforts have been able to rapidly shift to the deduction of response pathways in response to other important environmental stressors. Dr. Fields' has also made substantial progress in elucidating the transcriptional response of other important metal and radionuclide reducing bacteria, *Shewanella oneidensis* MR-1, and *Geobacter metallireducens*. With Dr. Zhou's group his pioneering work greatly advanced our understanding of regulatory mechanisms and cellular responses to different environmental factors affecting the metal reduction activity in situ and serves as the basis for the design of effective and low-cost bioremediation strategies for heavy metal and radionuclide contamination.

Indeed, Dr. Field's achievements are only possible with his unique interdisciplinary expertise and extensive research experiences in bioinformatics, microbiology, and functional genomics (Systems Biology). Improving our ability to treat environmental contamination requires complex studies that span field site investigation, laboratory experiments, and computational modeling. No single bioinformaticist or scientist would likely make nearly the same level of contributions that Dr. Fields has achieved. His research is absolutely cutting edge.

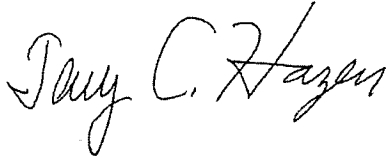
Matthew has 18 peer-reviewed publications that are being cited (24 published) and 2 more in press and several more in preparation. His papers are being published in some of the highest impact journals in environmental science, e.g. ES&T, AEM, J. Bacteriol., FEMS Microbiol. Lett. These papers have already been cited 88 times, or on average 4.9 times per paper. This rate of scholarly achievement is more typical of beginning associate professors. Considering that he just received his Ph.D. in 2001, this is truly outstanding. Several of his previous papers show up in international databases and one of them has been cited over 28 times already. This suggests that his current and future science potential are excellent.

Matthew is a dynamic and interesting speaker and teacher. During the last few years I have been at several different international meetings when he gave presentations, and each time I had colleagues remark to me directly how good a speaker he was and what "great" research he was doing. He gives them an amazing depth and breadth of instruction that is superb. He is also an attentive and exceptional mentor and teacher.

In all the time I have known Dr. Fields I have considered him to be a person of exceptional character: kind, strong intellectual curiosity, keen wit, and a caring instructor/supervisor. I know of no problems he has had with students or colleagues and they all think highly of him.

I recommend Dr. Fields without reservation for your position and believe if selected he will become an asset for your University. I would be happy to answer any further questions you may have.

Sincerely,

A handwritten signature in black ink that reads "Terry C. Hazen". The signature is written in a cursive, flowing style.

Terry C. Hazen, Ph.D.
Senior Staff Scientist
DOE BER Distinguished Scientist
Head, Ecology Department
Head, Center for Environmental Biotechnology
Co-Director VIMSS
Lawrence Berkeley National Laboratory
MS 70A-3317
Berkeley, CA 94720
Phone: 510-486-6223
Fax: 510-486-7152
Cell: 707-631-6763
Email: tchazen@lbl.gov



Biochemistry Department
University of Missouri-Columbia

**College of Agriculture,
Food and Natural Resources and
School of Medicine**

Room 117
Schweitzer Hall
Columbia, MO 65211

Phone: 573-882-8726
Fax: 573-882-5635
Email: wallj@missouri.edu

September 26, 2005

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

Dear Dr. Brun:

It is a delight to recommend Dr. Matthew Fields as an outstanding candidate for a faculty position in the Department of Biology and the Biocomplexity Institute. I have been fortunate enough to collaborate with Matthew for the past four years. Before that, my acquaintance with Matthew was through the Department of Energy's NABIR program where annual PI meetings allow mutual scrutiny of research results. Interestingly in this gathering of prestigious environmental microbiologists, he excelled even while a post doctoral fellow.

The diversity of Matthew's research expertise and his productivity is amazing. Remarkably, he is a biochemist, has designed microarrays, has analyzed microarray data, knows how to sample environmental sites, can isolate bacteria from environmental samples, and understands microbial physiology. Thus his skills run the spectrum of microbial studies from communities in soil or groundwater to pure culture and biochemistry. Most recently he has even initiated a study of biofilm development with the sulfate-reducing bacteria for which we will be constructing a number of mutants.

It was only two years ago that Matthew took his first faculty position at the University of Miami of Ohio. Whereas the student body is exceptionally talented, the demands on faculty time for teaching are enormous. In spite of the teaching load he had to carry the last two years, Matthew established a productive laboratory, recruited excellent research personnel, has multiple grant support sources, and is incredibly productive.

As a fellow faculty member, I cannot imagine a more agreeable neighbor. Matthew has the ability to collaborate productively with scientists of many differing temperaments. He is certainly not afraid of hard work and is willing to do his share of "departmental duties." While I have not seen him in the classroom, I have heard his presentations, both formal and informal, on many occasions. Thus I know that he provides a thoughtful, logical progression in his lectures and is keenly aware of his audience's responses.

Matthew will be a major player in microbial ecology and environmental systems research for the next 30 years regardless of his location. If given the opportunity of the stimulating culture in the Department of Biology and the Biocomplexity Institute at Indiana, his contributions may be commensurately greater. I recommend Matthew with the greatest of enthusiasm. Good luck on his recruitment.

Sincerely,

Judy D. Wall
Byler Distinguished Professor