X-Sieve: CMU Sieve 2.2
To: Jeremy Bennett <jebennet@indiana.edu>
From: Yves Brun <ybrun@indiana.edu>
Subject: Fwd: Robert Shanks
Date: Wed, 21 Sep 2005 08:58:16 -0500
X-Mailer: Apple Mail (2.622)

Hi Jeremy,--Please add this to Robert Shank's application when it comes in. Thanks.--Yves

Begin forwarded message:

> From: Urs Jenal <urs.jenal@unibas.ch>
> Date: September 21, 2005 5:53:48 AM EST
> To: Yves Brun <ybrun@bio.indiana.edu>
> Subject: Robert Shanks
>
> Dear Yves,
> this is a quick mail to the chairman of the search committee for a Microbiology position at Indiana University. Robert Shanks has informed me that he has applied for a position in your departement and has asked me to send you a letter that expressing my impression of his work. As you might know, Rob has been one of the 16 chosen ones of ABG04. You might actually have met him when you visited CSH that year. To make it really short: Considering intellectual abilities, hands on capabilities, creativity, reliability, and social skills, Rob was by far the top student in the class. Not only was he always ahead of everybody else but his experiments had an incredible success rate. At the same time he is just a very very nice guy. This said, he had also to take care of a partner that started at a much lower level. You know the ABG course format and the tremendous work load during these three weeks, and if I remember correctly you also had a lab partner that though being smart had no elaborate lab skills. So you must know what it means to perform for two. Rob did it easily.
> While we had a few people that could match Rob's intellectual level, considering all the rest, he would certainly be the guy that I would chose as a colleague in my department.
> Hope things are going fine.
> Best,
> Urs.
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--Yves

http://www.bio.indiana.edu/facultyresearch/faculty/Brun.html

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October 5, 2005

Systems Biology / Microbiology Faculty Search
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Dear Yves:

I am writing to give my enthusiastic support for **Dr. Robert Shanks** in his application for the position of Assistant Professor position in the Department of Biological Sciences at the University of Indiana. Rob has been a member of my lab for ~3 years. Since joining my lab, Rob has established a new research direction for the group and made several important contributions I will outline below.

Rob joined my lab after his rigorous training in microbial (fungal) genetics in the Department of Microbiology at the Tufts School of Medicine, one of the strongest microbiology programs in the country. He had a productive graduate career studying meiosis in fungi and published four papers as a result of his graduate work. Additionally, because one of the strengths of his graduate department is bacteriology, he also has had broad training in bacterial physiology and pathogenesis in a classroom and seminar setting.

Rob came to my lab with the expressed goal of obtaining a position in a research university, both establishing a funded research program and teaching. In my opinion he has all the tools to accomplish these goals. Since joining my laboratory, Dr. Shanks has made remarkable progress in developing three new projects in my lab, both revolving around the genetic analysis of biofilm formation in *S. aureus*. Previous to Dr. Shanks' arrival, a graduate student performed a directed study focusing on a previously

described protein (alpha toxin) in *S. aureus* biofilm formation. Dr. Shanks greatly expanded the scope of the *S. aureus* work in my group. He performed a transposon mutagenesis that identified several new loci involved in biofilm formation. He has focused his efforts on elucidating the mechanism by which one of these loci contributes to biofilm development. His studies have combined the genetic analysis of this locus, microscopy, and the initiation of structure-function studies. We plan to submit the results of these studies for publication sometime this fall. I want to emphasize that although Dr. Shanks has made a concerted effort to dissect one particular genetic locus from this screen involved in biofilm formation, his project has great future potential because he has identified several other new loci required for *S. aureus* biofilm formation that will serve as the basis for his future work.

His second project grew out of interactions he had with Martha Graber, M.D., a clinician in the kidney dialysis until at the Dartmouth-Hitchcock Medical Center. Rob fostered this collaboration with Dr. Graber and after several conversations, it was clear to him that he should explore the role of the anti-coagulant heparin in biofilm formation. Heparin is used to prevent coagulation in the dialysis catheters between visits to the clinic. He hypothesized that heparin may contribute to biofilm formation and performed a series of studies to address this hypothesis. Rob showed that heparin stimulates biofilm formation by lab and clinical isolates of *Staphylococcus aureus* and does so by stimulating cell-to-cell interactions. Furthermore, he demonstrated that this heparin stimulation of biofilm formation is dependent upon protein synthesis. And the most exciting part of this work is that heparin was shown to rescue the biofilm formation defect of all known biofilm mutants of *S. aureus*, suggesting that Rob has identified a novel pathway for biofilm formation by this organism. This work is described in a recently published manuscript:

Shanks, R.M.Q., N.P. Donegan, M.L. Graber, S.E. Buckingham, M.E. Zegans, A.L. Cheung, G. A. O'Toole. 2005. Heparin Stimulates *Staphylococcus aureus* Biofilm Formation. Infect. Immun. 73(8):4596-606.

Rob is currently looking for mutants defective in heparin-stimulated biofilm formation and has identified candidates from a pilot screen he has performed along with a graduate student in the lab. He will also shortly submit a second manuscript that is part of a collaborative study with Dr. Graber assessing the role of several clinically utilized anticoagulants in biofilm formation. This work has been recently submitted. I think this collaboration nicely illustrates that fact that Rob's work is at the interface of clinical and basic science. Furthermore, these studies have identified a third pathway for biofilm formation utilized by *Staphylococcus aureus* that is induced in response to metal limitation (such as Magnesium), which is a key signal for pathogens in the host. Rob has identified several genetic factors required for this novel biofilm pathway.

Rob has also collaborated with Mike Zegans, M.D., an ophthalmologist who performs a KO8-funded research in my lab. Their work together has generated a review article and they are currently examining the biofilm-forming potential of pathogens isolated from eye infections. I think this interaction once again demonstrates the potential of Dr. Shanks' project to generate productive collaborative projects with clinician/researchers.

Finally, Rob has made a remarkable contribution to developing a tool set of cloning, expression and gene knockout vectors for staphylococci. While these organisms are important pathogens, they lack tools to help facilitate molecular genetic studies. Rob took advantage of his background studying *Saccharomyces cerevisiae* to develop a series of shuttle vectors that replicate in yeast and *S. aureus*. These vectors facilitate cloning by using the power of in vivo yeast recombination and were designed such that a single PCR product containing a gene of interest can be fused to several different tags and controlled by an arabinose-inducible promoter. He built a similar set of vectors for *Pseudomonas*. We have submitted this work to Nature Methods. These tools have not only sped Rob's work but have facilitated almost every other project in the lab. I think this work nicely illustrates that Rob cannot only drive several research projects, but also has the foresight to develop the tools and approaches he will need to more effectively drive his scientific program forward in the future.

Dr. Shanks is a clear thinker with the ability to develop and drive not only an individual project, but also to establish a research program. His accomplishments to date support my beliefs. He has developed three projects essentially "from scratch" and has been quite productive doing so. And he has not only made terrific progress on his main projects, but he has also developed several tools that have helped speed his current work, have been helpful to my entire lab and will also be quite valuable in the future. He has also co-authored a review article on biofilm formation in clinical settings. Rob is a promising young scientist. His contributions to the understanding of biofilm development, the identification of a novel biofilm pathway and his contribution to tool development will all contribute to his reputation in the field going forward. He has also secured is own funding, with an NRSA to his credit.

Dr. Shanks clearly has the ability to manage several projects simultaneously (and as mentioned below, mentor as well), a key attribute for anyone interested in starting an academic research program. In addition to his excellent bench work, Dr. Shanks has also mentored an undergraduate student, helping her develop a project that will form the basis of her undergraduate thesis. He has worked closely with this student over the past year, including helping her prepare a poster presentation of her studies. He has also effectively mentored two rotation students that will be co-authors on the clinically oriented

manuscript mentioned above. He clearly has the aptitude to be a mentor to students. Most importantly, I believe, Rob has made contributions to almost every other project in the lab – and with 10 other students, post-docs and technicians in the group, that is no small feat. His help has ranged from providing advice or technical expertise to developing a tool to help push a student's project forward.

Rob has also fully taken advantage of the training opportunities here at Dartmouth, including journal clubs, lab meetings and the annual retreat – he both attends and participates in these programs. His oral presentation and writing skills are excellent. He has also served as a guest lecturer in the course I teach for graduate students. Rob also participated in a 3 week course on microbial genetics at Cold Spring Harbor lab. He not only learned a great deal, but it provided him with the opportunity to interact with a number of microbiology colleagues. Rob has also had the opportunity to attend two national meetings where he presented his work in oral presentations.

Dr. Shanks is an important and contributing member of my laboratory and I have no reservations that he will be a fantastic member of your department and an outstanding colleague. There are many skills required to be a successful academic besides being productive at the bench. It has been a pleasure for me to watch Rob step into a leadership position in the group and to discuss with him what he will need to do when he becomes a PI. Without my prompting, he has become a "go-to" person in the lab – someone students and post-docs alike turn to for help and advice and he clearly has the aptitude to take on and excel in this role. He has a knack for building team interactions. I think this experience will serve to prepare him well (and bodes well) for the day he runs his own group. I truly believe Rob has exhibited ALL the skills necessary to develop a research program, mentor students and teach.

As I final point I want to make it clear that Rob and I have discussed the aspects of the project that are his to take. The entire heparin pathway work, with the exception of 1-2 mutants a graduate student will work on in my group, is his to take to his new lab. Similarly, the biofilm mutants he has already identified are also his to take. I WILL NOT compete with Rob on these projects.

Sincerely,

George O'Toole, Ph.D.
Associate Professor of Microbiology & Immunology

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October 6, 2005

Yves Brun
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Re: Robert Shanks PhD

Dear Dr. Brun,

I am writing to express my strong support for Robert Shanks application a position as a faculty member at Indiana University. I have known Dr. Shanks since 2002 and have worked closely with him on several projects. Based on these experiences, I believe that he has the creativity, drive and organizational ability to establish a successful, independent research laboratory.

Dr Shanks is an outstanding molecular microbiologist. His background in yeast genetics provide him with a powerful set of tools to answer complicated questions in microbiology. Furthermore, he has a curious and flexible mind. As an MD researcher working on translation projects, this has made him a valued colleague in discussing and pursuing projects of medical relevance. A prime example of this quality is his project on the effect of heparin on biofilm formation of *S. aureus*. After discussions about the clinical importance of heparin in catheter lock solutions, he developed a research plan to assess its effects on biofilm formation of *S. aureus*, a common cause of catheter infections. He followed up his interesting and potentially clinically important observation of increased biofilm formation in the presence of heparin, with an elegant series of experiments that defined much of the biology and genetics of this phenomenon. His ability to assimilate clinical knowledge and then devise laboratory experiments which explore these questions using state of the art microbiology is of prime importance to a researcher working in the biomedical community. The medical relevance of his work will enhance his ability to successfully complete for NIH funds.

Rob genuinely loves microbiology and his enthusiasm will attract students and post-docs to his lab. His ethical character, organized approach to research, willingness to teach and easy going personality will keep them there. During his productive years as a post-doc, Rob created many useful reagents for studying *S. aureus* which will provide ready projects future students under his supervision. Finally, the managerial challenges of starting a new lab can be overwhelming. Rob is a disciplined person with a balanced life. Because of these characteristics, I believe that he will be able to organize and maintain a productive lab for many years.

In sum, it is my pleasure to give my strong and unreserved recommendation to Dr. Shanks for his application to University of Indiana. I believe that if you hire him you will find him to be a productive scientist and valued colleague. Please don't hesitate to contact me if I can be of any additional assistance in this regard.

Very truly yours,

Michael E. Zegans, MD
Associate Professor
Department of Surgery (Ophthalmology) and
Department of Microbiology and Immunology
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