



Biochemistry & Molecular Biology

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Getting to know your faculty.....



This semester's featured BMB faculty member is Dr. David Gilmour, Professor of Molecular and Cell Biology and a member of the Center for Gene Regulation in the Eberly College of Science. Dr. Gilmour's research focuses on the *Transcriptional Regulation of the HSP70 Heat Shock Protein in Drosophila*.

Protein in Drosophila.

BMB Undergraduate Newsletter asks each of our featured faculty the same four questions – much as is currently being done with political candidates!

1. What is the immediate goal of the research being conducted in your laboratory?

The immediate goal of the research we are currently doing is to understand how transcription by RNA polymerase is regulated in *Drosophila*. RNA polymerase is responsible for decoding the information in DNA so that an organism can make proteins at the appropriate time and in the appropriate cells. Our attention is directed at understanding processes that appear to regulate the ability of RNA polymerase to read the DNA (transcription elongation) and stop reading the DNA (transcription termination).

2. What are the possible larger implications/applications for the findings of your research?

Control of gene expression is critical to the development and survival of all organisms. Diseases such as cancer often have their basis in the mis-expression of specific genes. Transcription is often viewed as the first step in gene expression and is often the step that goes awry to cause

developmental defects. Thus, understanding mechanisms that control transcription will ultimately provide us with the knowledge needed to cure some diseases.

3. Why did you choose to pursue a career in academic research and why in your particular field?

I chose to pursue a career in academic research because I wanted to have the opportunity to control what I worked on. I ended up working on gene regulation largely by chance. As a new graduate student, I did a rotation in a laboratory that used *Drosophila* as a model for studying gene regulation. I enjoyed the types of experiments and the subject so much that I never bothered studying anything else.

4. What do you look for in selecting an undergraduate student to do research in your lab?

I look for someone who is enthusiastic and has a strong desire to be working in the lab. The ideal student is one who is capable, careful, and self-motivated. The student should have a minimum GPA of 3.0 with at least a "B" in BMB courses, and I have a slight preference for honors students because they are required to do research that could constitute their honors thesis.



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Curriculum Changes Coming for FA08

The University Faculty Senate recently approved changes that will affect all BMB and Micrb majors and some Biotc majors. With the Fall semester, the BMB Department will begin to offer BMB 401 and 401H, General Biochemistry, for **3 credits**. These courses have previously been offered for 2 credits. Also beginning with the Fall semester, BMB 400, Molecular Biology of the Gene, will be offered for **2-3 credits**. It has previously been offered for 3 credits only. This change is a result of the fact that many of the topics which were part of BMB 400 when it was originally developed are now included in several courses that students in the BMB, Micrb and Biotc majors are required to take earlier in their program, such as BMB 251/252. At the same time, the increase in credits for BMB 401/401H is a response to the widely-held view that more time is needed to cover topics included in the 2-credit course. The extra class time will allow for discussion of additional examples under existing topics and a brief treatment of bioenergetics of the glycolytic pathway.

While the overall number of credits for the sequence BMB 400, 401/401H and 402/402H will remain unchanged at 8 credits, the values for the first two courses will be reversed. The approved changes will result in a 2:3:3 credit pattern instead of the current 3:2:3. The variable number of credits (2-3) for BMB 400 reflects the fact that some majors, most notably Forensic Science, will continue to require their students to take the 3-credit version while majors in the BMB Department will take the 2-credit version. A control will be placed on the 3-credit form of BMB 400 so BMB, Micrb and Biotc majors will be unable to register for that version.

RESULTING ADVISING RECOMMENDATIONS:

1. Students who have not begun the biochemistry sequence should plan to schedule BMB 400 for **2 credits**, BMB 401/401H for **3 credits**, and BMB 402/402H for 3 credits.

2. Students who have completed BMB 401/401H for 2 credits, but have not yet taken BMB 400 should schedule BMB 400 for **2 credits**. It is recommended that the remaining requirement for 1 credit be applied to the 400-level BMB elective category.

Another change to the curriculum for all three majors offered by the BMB Department is that **Biol 322, Genetic Analysis**, will replace Biol 222, Genetics, as the required course in genetics. For the foreseeable future, Biol 322 will be offered only in Spring semesters, so students should plan their schedules accordingly. Biol 222 will continue to be taught for students outside the Biol, BMB, Biotc and Micrb majors, but will only be offered in Fall semesters.

Summer Course Offerings

For those readers who are contemplating catching-up or jumping-ahead in their curriculum by taking summer courses, please note that the BMB Department will be offering BMB 211 and BMB 401 (for **2 credits**, for the last time). If you choose to take BMB 401 over the summer, you may fall under the second advising recommendation in the article just preceding this one. However, for those who need to repeat BMB 401 or who have already completed BMB 400, summer would be an ideal time to complete this requirement. Students in the Biotechnology major will also have the opportunity to take either BMB 401 or BMB 211 in summer.

In addition to the two biochemistry courses, the Department will be offering Micrb 106 and 107 as well as BiSc 002 for students seeking to fulfill their Natural Science general education requirements.

Have You Heard of EXTERNSHIPS??

The Eberly College of Science's **Career and International Education** office (formerly the Co-op and Study Abroad office) has initiated an Externship/Job Shadowing program for first and second year students. These experiences are designed to be brief – one to a few days in length, and most are scheduled in the week or two after the end of Spring semester finals so students will be able to take advantage of the program before starting summer jobs. To quote the Career and International Education office web site, ***Externships are designed to provide first-year and sophomore science students with observational experiences (1-4 days) with a professional at their place of work, experiencing a "day in the life" of the host's career.*** The purpose of the program is to ***assist you in gaining an understanding of the scope of daily responsibilities included in various careers in science.*** The deadline to apply for an Externship for this summer is March 28, so first- and second-year students, **GET A MOVE ON!** This is a chance to see if a career you have been thinking about is really one that you might want to pursue. For more complete details, visit the Career & International

Education web set at

<http://www.science.psu.edu/coop/externship.html>



Kudos to Helen Freyberger – Co-op Student of the Year



It is always a pleasure to call attention to one of the department's own who has been singled out for a prestigious award. Such is the case with Helen Freyberger (BMB '07) who was selected as the College's Co-op Student of the Year for 2007. Helen participated in a co-op program from January to August of 2005 and, again, from January to August of

2007 at Walter Reed Army Institute of Research in the Division of Malaria Vaccine Development. Helen worked with a team that analyzed the immune responses in different strains of mice to the Institute's malaria vaccine product. During her second co-op, Helen's supervisor unexpectedly left for six weeks, and Helen was given full responsibility to design and perform all the required experiments on her own. Based on her work, Helen was listed as a coauthor on a paper in *Infection and Immunity* 75:838-845, and her work was included in an FDA submission. Helen graduated in August and is currently enrolled in the Master of Science program in Molecular Microbiology and Immunology at Johns Hopkins School of Public Health. Helen received a certificate of achievement and a \$500 award. She was also automatically entered in the competition for national Co-op Student of the Year.

.....and while we're talking about Co-ops.....

Last Fall was a banner semester for the BMB Department! It is really exciting to note that there were 4 BMB, 16 Biotechnology, and 3 Microbiology students who participated in the Co-op program. Eight of the 23 students worked at GlaxoSmithKline, 3 at Walter Reed Army Institute of Research (not including Helen Freyberger, see article above), 3 at Morphotek, Inc. and others at such notable places as Merck & Co., Vaxinate, Genentech, McNeil, NIH, Institute for Genomic Research, Precision Therapeutics, Inc., and

the National Health Research Institutes. These 23 students not only have a much better appreciation for what to expect in industrial and research careers following graduation, but they also have an insider's edge in landing that first permanent job as well as some very impressive references should they decide to look at other companies or institutes. It is almost an understatement to say that there are many benefits that result from participating in a co-operative education experience. **Don't miss out on such a valuable experience!**

Expand your horizons.....

One of the opportunities of a lifetime that comes with an undergraduate education is to study abroad for a semester or year. Most students will consider only those countries where English is the spoken language. However, if you have ever thought you might like to study in a country with a different language but are reluctant to do so because you lack the ability to communicate in that language, Penn State has a solution for your dilemma.....THE LANGUAGE INSTITUTE AT PENN STATE. Between June 16 and August 8, undergraduates may enroll in an intensive language program that provides the first, second and, for some languages, third levels of study. In other words, in 3-week blocks, it is possible to complete and earn 4 credits each for Spanish 001, 002 and 003, for example. Classes run from 8 a.m. to 12:15 p.m. each day, Monday through Friday. Languages taught in this format are: French, German, Latin, Russian and Spanish. Languages that are taught to the second level are: Arabic, Chinese and Japanese. This program should be of particular interest to students who would like to study abroad in their sophomore or junior years because the courses can be completed just prior to leaving for the country in which study will be undertaken. Knowledge of the language and confidence in speaking the language will be maximized through this program. One last selling point..... Even if you have studied a language in high school, you will earn credit for the first level of study through The Language Institute.

This publication is available in alternative media on request.

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