



# Physiology Graduate Student Handbook

Department of Molecular & Integrative Physiology

University of Kansas School of Medicine

## Welcome to the Physiology Department

*A little note from the Physiology Society President:*

I would like to thank all of the graduate students who wrote sections for this handbook during the spring and summer of 2004. We can all find joy in the fact that long after we graduate from this department, this handbook may still be helping incoming students. Of course the website addresses will be obsolete and the health insurance will have changed again, but I'm sure the complaints about navigating the Enroll & Pay will be as relevant as ever.

For the new students in Physiology, I would like to congratulate you on choosing a great department to join. We are fortunate to have a department that always supports graduate students, from financing study room renovations to underwriting the Physiology Society and the Neuroscience Journal Club. We have excellent mentors in a wide variety of biomedical fields, as well as extensive support services for research. But above all, we have camaraderie among the graduate students that will not only help you through the rough times, but will leave you with friends for life. So, welcome and please, enjoy your stay.

Ann Stowe  
*President-elect, Physiology Society*  
2004-2005

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## Enrollment and Fee Payment:

The **KU Enroll & Pay** (Peoplesoft) website was not designed to be navigated easily, so for newcomers here is a link-by-link (a.k.a. ⤴) instruction for finding classes, enrolling and paying.

- ☐ Macintosh users may need to go to a PC to access this system.

Go to the office of registrar webpage

<http://www.kumc.edu/studentcenter/registrar.html>

- ⤴: Enrollment and tuition/Fees information
- ⤴: How to enroll
- ⤴: Enroll and pay

Here you will find all the information about the course catalog

Or go directly to

<https://sa.ku.edu/servlets/iclientservlet/saku/?cmd=login>

*Enter your KUMC network login and your password*

- ⤴: Enter and pay
- ⤴: Learning services
- ⤴: Academics
- ⤴: Enroll in a class
- ⤴: Current term you want to enroll in
- ⤴: Add classes

- To add a class to your schedule, enter the Class Number in the Class Number field, or click the lookup button to view the schedule of classes.

⤴: Submit

- Class information options, enter the number of units
  - Enroll in 6 credits, fall/spring; 3 credits, summer; 1 credit, final semester dissertation.

- ⤴: Return to Academics
- ⤴: Finances
- ⤴: Account summary/Make payment
- ⤴: On the term you want to pay
- ⤴: View account detail

- *Look at the required Campus fee*-This is the amount you have to pay, not the tuition, your department takes care of that (if you are international student, you need to pay the International student Service Fee)

⤴: Finances

- ☞: Account summary/Make payment
- *Make payment*- enter the amount of your fees & choose method of payment. You may pay by e-check (free) or credit card (MC/VISA) (2.25% charge), then print and keep the receipt

## Course Selection

Invariably, the mentor and the graduate student prior to entering the department full-time will determine the required courses. After basic course work has been finished, the student will enroll in *PHSL 850 Research* (3 credit hours summer, 6 credit hours fall/sprint), with the corresponding course number for their mentor. Only during the final semester of research will the student enroll in the *PHSL 999 Doctoral Dissertation* (1 credit hour).

## Student Certification

This is a form for the waiver of your fees that will then be paid by your department. It states that we are 50% time and it is the reason we only need to enroll 6-credits/ semester. The form is available in PDF at: <http://www.kumc.edu/studentcenter/regenroll.html>  
Complete the GTA/GRA Appt. form *every semester* you enroll into and send it to:  
Office of Graduate Studies  
5015 Wescoe, Mail Stop 1040  
588-1238

## International Visas, other international concerns

- International Students are advised to go the Office of International Programs located at the Student Center building (4016) for an update on recent regulations since these continually change. It is strongly suggested you pay them a visit especially before traveling overseas to make sure all your papers are in order for travel and re-entry into the U.S. You might want to give them a call before you go over (8-1485).
- The I-20 form that will be handed to you on admission should be kept together with your passport at all times. The signature for the I-20 needs to be renewed every year. Make sure you check this out before you leave. It is also important you have you I-94 form stapled onto your passport.

## Student Health Insurance

Get the brochure: *Student Injury and Sickness Insurance Plan, The MEGA Life and Health Insurance Company, Student insurance, Plan for the University of Medical Center, Designed for GTA and GRA*

From the Student center G116,  
shinsurance@kumc.edu  
Phone: (913) 588-4695, Fax: (913) 588-6597  
Or from Sara Honeck, 588-6211, G5004,

Our department pays for 80% of the insurance.  
Year 2003 the cost we had to pay was (20% of the remaining cost):  
Fall and spring semester: 59\$ each  
Summer semester: 22\$  
Total: 140\$ per year

You can make one payment for the entire year at the beginning of the fall semester or pay for each semester. The student center is supposed to contact you to remind you of the due date of the payment for each semester. I recommend marking your calendar and make sure you do your payment before the due date.

Info about the insurance can be found on-line at:

<http://www.student-resources.net/>

**Do NOT enroll on-line** since the 80% discount paid by our department does not apply. You have to enroll through the Student center to get this discount.

- *Because the department currently has students with children, we asked for a graduate student to comment on this insurance as it pertains to family enrollment*

### Ryan's Story

You will find that putting your entire family (in my case, wife and children) on the MegaLife plan is not wise, both from the perspective of good health care for your children, and from an economic point of view. First of all, not having preventive care for children and treating pregnancy as a "sickness or injury" is just asking for something to go wrong in terms of health care. In addition, we were spending about \$1,500 out-of-pocket per year on medical care, including shots, meds, visits not covered, etc. So it's not a good financial decision either.

My suggestion, *if you have a family*, is to put them on your spouse's work

insurance, no matter how much that costs. If, however, your wife stays at home with the kids (i.e., you only have your stipend as income), I would suggest you apply for Healthwave, which is the State of Kansas-sponsored health insurance. For more information, go to:

<http://www.kansashealthwave.org/main.htm> .

A few tips about Healthwave:

They tell you that you can only apply if you do not currently have insurance. That is not true. Just send a letter stating that your current insurance (MegaLife) will be terminated at the end of the X semester and you will be without insurance at that time. It worked for us. Apply for your whole family even if you just want it for the children. This way, they have you in the system for future circumstances. For instance, our stipend puts the adults in the family above the cut-off for qualification, and only the children will qualify. However, if your wife gets pregnant, the cut-off line changes dramatically and she will qualify. Because you originally applied for your entire family, she is already in their system. You do not have to reapply, simply send in a proof-of-pregnancy from the doctor and she is covered.

- Hands down, Healthwave is the best health insurance I have ever seen. First of all, you can go to any doctor you want to (basically). And everything is covered. We now pay \$0 out-of-pocket. We even went through a pregnancy with this insurance. We got the doctor we wanted, the hospital we wanted, and we paid nothing.

## **Departmental Activities**

### Seminar Series

- Try to attend at least 2-3 seminars per month; otherwise you will receive dirty looks from the senior faculty members in the hallway. The seminar series is every Monday during the Fall and Spring semesters. Cookies and Coffee are served at 3:30 in the Phys library, and the seminar is 4-5.

### Meeting with Faculty Candidates

- Try to attend each meeting with faculty candidates. These are excellent opportunities to network, and you will most often receive a free meal.

## Doctoral Activities

*Shalmica Williams has been kind enough to give examples for a number of items listed below. They will be made available in the graduate student room either in hard copy form in the desk, or in PDF format on the shared computer.*

### Selecting a committee

- Members of your committee should be decided on between you and the mentor, preferably as soon as possible.

### Committee meetings

- First meeting
  - Bring a committee and mentor progress report form for them to sign
  - Give a handout with information on your undergraduate degree and graduate course work, etc.
    - *See available example*
  - Prepare a nice PowerPoint presentation that includes a lot of background information that describes your research focus. State your hypothesis clearly and place emphasis on how your research will be beneficial in your field. Include any preliminary data that you may have
    - *See available example*
  - Perhaps give a paper copy of the abstract and specific aims being proposed.
  - **Always remember that your committee should be a part of the development process, so don't write your entire thesis proposal before the first meeting. Invariably, specific aims and methodologies will change and you will have done a lot of work for nothing.**
- Other committee meetings will be needed to apprise your committee of your progress. PowerPoint presentations should always be used.
- Next to the last committee meeting (i.e. when you are ready to wrap things up)
  - Bring a committee and mentor progress report form for them to sign
  - In the presentation:
    - Give a little bit of background information, by this time they are pretty much familiar with your work.
    - Clearly define what you proposed dissertation chapters are, and how much data/manuscripts will be placed in the dissertation.
    - After presenting data summarize what will go into each chapter. Insert a completion chart so that they will clearly know what you have completed and what you have left to do.
    - At the end include a timetable for when you will defend.
    - *See available example*

## Comprehensive Exam

- Refer to website, follow guidelines
  - *See available example.*
- For the oral exam, be well prepared to answer questions concerning your written proposal (they can and will ask you any and everything about what you wrote in your proposal). If you haven't taken advanced courses, review your old notes/exams thoroughly. Also be familiar with the course material that your committee members teach (as it pertains to your own research). Ask other students their experiences in the exam, it will help to hear their comments and have them ask *really hard* questions.
- It may also help to give your presentation to other graduate students who can offer advice, scare you into practicing more and ask questions that your committee might ask but that you've never thought of before.

## Post-Doc Search

- Figure out what you want to work on during your postdoc
  - Do you want to stay in the same field or switch to another field?
- Read a few papers that contain research that is interesting to you, and decide on several (at least 3) investigators that you want to contact.
- Go to PubMed and make sure that they are well published
  - This means that they publish frequently (at least 1-2 nice papers/ year)
  - You don't want to go to a lab that has a slow publication history, because you may spend 2-3 years in a lab and have nothing to show for it (you could have worked at Quicktrip for the same amount of time and made more money)
- Go to the CRISP website and find out if they have a sufficient funding history (make sure that they can afford to pay you)
  - [http://crisp.cit.nih.gov/crisp/crisp\\_query.generate\\_screen](http://crisp.cit.nih.gov/crisp/crisp_query.generate_screen)
- Design each cover letter specifically for each researcher that you plan to contact
  - Clearly state what you study and why you want to come to their lab
  - *See available example*
- Update your CV
  - *See available example*
- Send each researcher an email explaining at what stage you are in your matriculation, when you plan to defend, and ask for an invitation to interview for a postdoc position
  - Attach researcher-specific cover letter and CV
  - *See available example*

## MD/PHD Coursework

### IGPBS – Core Curriculum

Thermodynamics, Protein Structure, Analysis of Reactions, and Binding Kinetics (3 hours);

Cell Metabolism (1);

Molecular Biology (4);

Cell and Developmental Biology (5)

Molecular and Physiological Basis of Disease (3)

Biographics (1)

Laboratory Rotations (6)

Introduction to Faculty Research (1)

Introduction to Ethics (1)

### Medical Coursework

Medical Biochemistry I & II (8 hours)

Cell and Tissue Biology I & II (6)

Human Anatomy & Embryology I & II (9)

Medical Physiology I & II (8)

General and Systemic Pathology (16)

Medical Microbiology (9)

Introduction to Clinical Medicine II:  
Medical Ethics (1)

#### Other Courses:

Neuroscience (5)

Pharmacology (9)

Introduction to Clinical Medicine I & II (14)

Advanced Topics (16 hours total)

Research (25 hours total)

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**25 Credit Hours**

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**125 Credit Hours**

## Predocctoral Funding Opportunities

*There are internal and external funding sources that are available to graduate students that will pay partial or all of your stipend, enrollment fees, travel expenditures, and research materials. Below is a list of websites to some of the common funding opportunities, but you can always "google" your field of interest to find some of the more obscure awards. Also note: some of the awards require applications in the first or second year, no later, so begin browsing now.*

### External Funding Sources

- <http://www.grants.gov/Find> (search engine)
- <http://grants1.nih.gov/grants/>
- <http://www.nsf.gov/home/ehr/>
- [http://www.uams.edu/ora/pre\\_post\\_fellow.htm](http://www.uams.edu/ora/pre_post_fellow.htm) (very good website)

### Internal (KUMC) Funding Sources

- Sutton Scholarship, genetics (when announced, mentor should be notified if applicable)
- Biomedical Training Grant
- Endowment Scholarship (only available if applying for Financial Aid)
- Travel Scholarships (announced quarterly via email)

## Research Support

*Below is a list of several tools to aid you in research. While your mentor will probably explain these, particularly those relevant to your research, knowledge of other techniques could be helpful in developing a thesis proposal.*

### Microarray Core Facilities

The University of Kansas School of Medicine in partnership with the KUMC Biotechnology Support Facility (BSF) established the Kansas University Medical Center - Microarray Core (KUMC-MC). The KUMC-MC will provide centralized access to gene expression microarray technology for research conducted by investigators of KUMC, Kansas Regents Institutions and member institutions of the Kansas City Area Life Science Initiative (KCALSI).

For more information go to: <http://www2.kumc.edu/mrrc/microarray/>

- A series of 4 workshops entitled "**Bioinformatics - Microarray Data Analysis, Levels 1-4**" were held on Fridays, starting in February of 2004. They included an

overview of cDNA sample preparation, loading and accessing bioinformatics software, an introduction to Affymetrix (GCOS) and GeneSpring microarray analytical software, and advanced training sessions in microarray data analysis, graphical interpretations and biological pathways of genes of interest. This was a hands-on session, where users performed analyses at individual workstations with real datasets. Enrollment is limited to 8 users. Contact Tina Darrow (8-5970) in the MRRC for information on current bioinformatics workshops.

**Bioinformatics courses**

- KUMC Biometry course descriptions can be obtained at:  
<http://www3.kumc.edu/biometry/classes.html>

<u>Number</u>	<u>Course</u>	<u>Semester</u>	<u>Hours</u>
BMTR 800	Special Topics in Biometry		1.0-3.0
BMTR 801	ANOVA	Spring	3.0
BMTR 811	Principles of Statistical Inference	Spring	3.0
BMTR 812	Research Methodology & Statistical Application		3.0
BMTR 813	Applied Nonparametric Statistics		3.0
PRVM 804	Principles Statistics Public Health		3.0
PRVM 812	Public Health Biostatistics Lab		1.0
PRVM 814	Fundamentals of Biostatistics I		3.0
PRVM 817	Fundamentals of Biostatistics II		3.0
PRVM 872	Grant Writing		3.0
ANAT 869	Grant Writing	Spring	3.0
OCTH 725	Research Process	Spring	2.0
OCTH 727	Prof & Tech Writing	Spring	1.0

*If you opt out of doing your own statistics, there is help available:*

**Medical Statistics and Research Design Unit**

- The primary aim of the MSRDU is to provide efficient, high quality statistical collaboration and support for researchers throughout the medical center.
- The MSRDU faculty and staff members have expertise in experimental and clinical trial design, linear models, times series and longitudinal data analysis, survival analysis, probability, categorical data analysis, growth curve and structural equation modeling and cDNA microarray analysis to name a few.
- Contact Information:
  - Telephone 913-588-2646
  - FAX 913-588-2780
  - Mail-Stop 1008
  - General Information: [cgunja@kumc.edu](mailto:cgunja@kumc.edu)
  - Webmaster: [asmith5@kumc.edu](mailto:asmith5@kumc.edu)
  - <http://www.kumc.edu/prevmed/msrdu/>

**Proxy at home** (use proxy service to access library website)

- KUMC Dykes Library website <http://library.kumc.edu/>
- To access this site from home click on the Remote Access link on the QUICK LINKS column to the left then click on KUMC Proxy Server. After choosing the appropriate web browser just follow the instructions.

### **Interlibrary Loan/ILLiad Document Delivery System**

- Many of the journals used for research will have articles available online in PDF format. If the article is unavailable in hardcopy at the library or online, you may request an interlibrary loan. The PDF may then be available on their website with a password sent to you.
- The system has these features to help you manage your requests:
  - Track status of requests 24/7.
  - Login with your existing username and password.
  - One-time personal information registration.
  - Various payment accounts may be set up.
  - Automatic emails regarding request status.

The login link is on the Interlibrary Loan/Document Delivery homepage at: <http://library.kumc.edu/ill>.

### **KU access - prints & looks for papers free**

- A KU ID is required for this. Go to: <http://illiad.lib.ku.edu/KKU/logon.html>

### **PubMed, Pubcrawler & BLAST-Genes database**

- These are all available online and should be reviewed in your first year. Pubcrawler is a search engine specifically for PubMed that will weekly/monthly search new articles for keywords that you program - *very, very helpful* in keeping up-to-date with what is new research in your field.

### **Histology Core Facilities**

*If your mentor is a part of a particular core, then use of the services will come at a reduced cost.*

## **Inter-Departmental Activities**

### **Student Research Forum**

Each year the Graduate Student Council hosts the Student Research Forum (SRF). SRF is a two day event held in the first week of April. During the first day, Forum presentations and a keynote speech are the main events. The second day is filled by a workshop. All students affiliated with KUMC are encouraged to participate in the Forum. They will give an eight minute presentation, which will be judged by a panel of faculty judges. Cash prizes are awarded to the first place winners from each school as well as individual room winners. Participation in the Student Research Forum is an excellent means of developing the communication skills necessary to compete in today's scientific community. Students submit their abstracts online each February through the SRF Website (follow links at the GSC webpage; <http://www.kumc.edu/student/GSC/>).

The Forum is hosted every year by the Graduate Student Council in conjunction with the Office of Graduate Studies. The Student Research Forum is supported by KUMC student groups and departments as well as by businesses in the community. The SRF also includes a Poster Session with a wine & cheese reception, a Keynote Address from a respected scientist, and a workshop.

Participation in the SRF through making an oral or poster presentation is a requirement for receiving a Graduate Student Travel Scholarship from Graduate Studies.

### **Student Governing Council ([sgc.kumc.edu](http://sgc.kumc.edu))**

SGC is the primary governing body at KUMC, made up of representatives from all four schools (Allied Health, Graduate Studies, Medicine, and Nursing). SGC is responsible for expenditure of YOUR student center fees. A portion of these fees is made available to registered student organizations that apply for this funding. SGC also has over 10 committees to address issues such as technology, student union/book store, recycling, parking, Kirmayer fitness center, etc. SGC sponsors several annual traditions such as the Fall Street Fair, potluck dinners, and also funds the free legal service for students (two times per month), and distributes free cultural and sporting event tickets.

The SGC President and Vice-Presidential offices are filled by election at the end of the Spring semester, while the remaining positions are filled in the fall. Senator representatives from each school are elected/appointed by their respective schools (ie: Graduate Student Council for graduate students). The SGC always meets on the first Thursday of each month during the regular academic year at 5:30pm in the Student Center (1<sup>st</sup> floor conference room).

### **Graduate Student Council ([www.kumc.edu/student/GSC](http://www.kumc.edu/student/GSC))**

The Graduate Student Council (GSC) is the primary governing body for all students enrolled in a graduate degree granting program at KUMC. The mission of the GSC is to:

1. Promote the welfare of KUMC Graduate Students through participation in University governance activities; representation of all graduate students at KUMC in campus-wide affairs that directly and primarily affect the Graduate Students; and representation of their interests and concerns to the faculty and University administration.

2. To allocate University funds derived from your Graduate Activity Fees.
3. To enhance the cultural, social and professional growth of KUMC Graduate Students.
4. To ensure that the opportunities at the Medical Center are open to all Graduate Students regardless of race, religion, color, sex, disability, national origin, age, ancestry, marital status, parental status, sexual orientation or veteran status, as set forth in the University's Equal Opportunity and Nondiscrimination Policies.
5. To protect and enhance student's rights.

The GSC has representatives from each department as well as elected officers and opportunities to serve on several committees. Your representatives on the GSC can be contacted using email ([gsc@kumc.edu](mailto:gsc@kumc.edu)).

### **International Society**

The principal purpose of the International Society is to represent international students and scholars (hereafter: the internationals) at KUMC. International Society aims (1) to create a network between internationals, international organizations and other organizations interested in global culture, (2) to help incoming internationals adjust to the American academic milieu and (3) to sponsor, promote and coordinate events which encourage communication and understanding between cultures. Contact Julia Shaw [jshaw@kumc.edu](mailto:jshaw@kumc.edu) for more information.

## **ASK A STUDENT**

We have a special webpage that allows you to ask some of our current Molecular and Integrative Physiology graduate students questions concerning our program and the University of Kansas Medical Center via e-mail (see below). Feel free to ask these or any other graduate student any question that may come to mind.

## Ning Lei



My name is Ning Lei. I am an international student in my third year of the graduate program. I am currently working on my qualifying exam. I received my B.S. from Beijing University in China.

My research interest is mammalian sexual differentiation. Currently, I am focusing on studies of *Dmrt1* (*Double sex and Mab-3 related transcription factor 1*), which is a promising gene for playing an important role in testis determination and differentiation. I am trying to determine which testis-specific transcription factors regulate *Dmrt1* expression in the testis and how they accomplish this regulation using molecular biology techniques and physiological analysis. To date, I have published two papers from this project in the journal *Biology of Reproduction* and *Molecular and Cellular Biology*. In addition to *Dmrt1*, our lab has wide interest in other critical genes involved in testis differentiation and development, such as *Steroidogenic factor-1 (SF-1)* and *Follicle-stimulating hormone receptor (Fshr)*.

I am truly glad to have joined the Department of Molecular and Integrative Physiology, not only because of the project I chose, but also because of the great mentors and friends I have met. In this department, every student has an advisory committee to help with progress of the research. In addition, every student is a member of the Physiology Society. We share good times from work and personal experiences. It's like a big family with every member trying their best to make it better. Any new student is welcome to ask anything about our department. I will be glad to have the chance to correspond with you and to share my experiences in this department.

Sincerely,  
Ning Lei  
Email: [nlei@kumc.edu](mailto:nlei@kumc.edu)

## Teresa Orth



Currently, I am a graduate student in Dr. Norberto C. Gonzalez's laboratory. We study the inflammatory response induced by low levels of oxygen in the rat microcirculation. We collaborate closely with Dr. John G. Wood's laboratory, where the hypoxia-induced inflammation was first observed.

My project focuses on exercise training and its protective effect on the microvascular response to hypoxia. Normally, hypoxia produces inflammation as evidenced by increased leukocyte-endothelial interactions, leukocyte emigration, increased vascular permeability, and mast

cell degranulation. Exercise training prevents this inflammatory response and protects the microcirculation during exposure to low levels of oxygen.

**Why did I choose to do a dual degree program?**

Let me relay my feelings in a short story: I remember my interview for the University of Kansas M.D./Ph.D. program very clearly. One question in particular struck the core of why I chose to pursue both degrees. Dr. Stechschulte asked me in summary of my research experience, “So it sounds like you have a lot of passion for science?” I was stunned for a moment because he had summed up my feelings into one word, “passion”.

I always wanted to know why something worked, how it came to work that way and whether it could be done in another, more efficient, process. I have always asked more questions than what could be answered by my professors and I have always enjoyed the pursuit of those answers on my own.

I knew research was right for me when I had my first experience in a research environment. I spent 10 weeks studying the development of the anterior chamber of the eye. I never knew an eye could be so interesting! Every aspect of science that I had learned in my undergraduate career could be applied to the eye, but it was more dynamic than a mere application. I had to use my knowledge in novel ways to shape the progress of our research.

**A Little more background on me ...**

I am originally from Kansas City, MO. I am a graduate of Northwest Missouri State University in Maryville. My interests outside of school include Iyengar yoga, horseback riding and instruction, and hiking. Please email me if you have any questions, [torth@kumc.edu](mailto:torth@kumc.edu)