

KBOR Program Review
Biochemistry and Molecular Biology
November 25, 2013

1. Faculty in the Program

Fall 2009

| Faculty Name | Degree | Graduate Status |
|------------------------|--------|--------------------|
| 1. Wilf Arnold | PhD | Regular |
| 2. Glen Andrews | PhD | Dissertation Chair |
| 3. James Calvet | PhD | Dissertation Chair |
| 4. Gerald Carlson | PhD | Regular |
| 5. Joan Conaway | PhD | Special |
| 6. Ron Conaway | PhD | Special |
| 7. Chunying Du | PhD | Special |
| 8. Aron Fenton | PhD | Dissertation Chair |
| 9. Harvey Fisher | PhD | Dissertation Chair |
| 10. Mark Fisher | PhD | Dissertation Chair |
| 11. Joseph Fontes | PhD | Regular |
| 12. Jennifer Gerton | PhD | Special |
| 13. Jared Grantham | PhD | Regular |
| 14. Todd Holyoak | PhD | Regular |
| 15. Alexey Ladokhin | PhD | Dissertation Chair |
| 16. Kenneth Peterson | PhD | Dissertation Chair |
| 17. Allen Rawitch | PhD | Dissertation Chair |
| 18. Liskin Swint-Kruse | PhD | Dissertation Chair |

Fall 2010

| Faculty Name | Degree | |
|---------------------|--------|------------------------|
| 1. Wilf Arnold | PhD | Regular retired 7/1/11 |
| 2. Glen Andrews | PhD | Dissertation Chair |
| 3. James Calvet | PhD | Dissertation Chair |
| 4. Gerald Carlson | PhD | Regular |
| 5. Joan Conaway | PhD | Special |
| 6. Ron Conaway | PhD | Special |
| 7. Chunying Du | PhD | Special |
| 8. Aron Fenton | PhD | Dissertation Chair |
| 9. Harvey Fisher | PhD | Dissertation Chair |
| 10. Mark Fisher | PhD | Dissertation Chair |
| 11. Joseph Fontes | PhD | Regular |
| 12. Jennifer Gerton | PhD | Special |
| 13. Jared Grantham | PhD | Regular |
| 14. Todd Holyoak | PhD | Regular |

| | | |
|------------------------|-----|--------------------|
| 15. Alexey Ladokhin | PhD | Dissertation Chair |
| 16. Kenneth Peterson | PhD | Dissertation Chair |
| 17. Allen Rawitch | PhD | Dissertation Chair |
| 18. Liskin Swint-Kruse | PhD | Dissertation Chair |

Fall 2011

| Faculty Name | Degree | |
|------------------------|--------|--------------------------------|
| 1. Antonio Artigues | PhD | Special |
| 2. Glen Andrews | PhD | Dissertation Chair |
| 3. James Calvet | PhD | Dissertation Chair |
| 4. Gerald Carlson | PhD | Regular |
| 5. Joan Conaway | PhD | Special |
| 6. Ron Conaway | PhD | Special |
| 7. Chunying Du | PhD | Special |
| 8. Aron Fenton | PhD | Dissertation Chair |
| 9. Harvey Fisher | PhD | Dissertation Chair |
| 10. Mark Fisher | PhD | Dissertation Chair |
| 11. Joseph Fontes | PhD | Regular |
| 12. Jennifer Gerton | PhD | Special |
| 13. Jared Grantham | PhD | Regular |
| 14. Todd Holyoak | PhD | Dissertation Chair left 9/1/11 |
| 15. Alexey Ladokhin | PhD | Dissertation Chair |
| 16. Kenneth Peterson | PhD | Dissertation Chair |
| 17. Allen Rawitch | PhD | Dissertation Chair |
| 18. Chad Slawson | PhD | Regular |
| 19. Liskin Swint-Kruse | PhD | Dissertation Chair |

Fall 2012

| Faculty Name | Degree | |
|----------------------|--------|--------------------|
| 1. Antonio Artigues | PhD | Special |
| 2. James Calvet | PhD | Dissertation Chair |
| 3. Gerald Carlson | PhD | Regular |
| 4. Joan Conaway | PhD | Special |
| 5. Ron Conaway | PhD | Special |
| 6. Aron Fenton | PhD | Dissertation Chair |
| 7. Harvey Fisher | PhD | Dissertation Chair |
| 8. Mark Fisher | PhD | Dissertation Chair |
| 9. Joseph Fontes | PhD | Regular |
| 10. Jennifer Gerton | PhD | Special |
| 11. Alexey Ladokhin | PhD | Dissertation Chair |
| 12. Owen Nadeau | PhD | Special |
| 13. Kenneth Peterson | PhD | Dissertation Chair |
| 14. Allen Rawitch | PhD | Dissertation Chair |
| 15. Chad Slawson | PhD | Regular |

16. Liskin Swint-Kruse PhD

Dissertation Chair

Fall 2013

| Faculty Name | Degree | Graduate Status |
|------------------------|--------|--------------------|
| 1. Antonio Artigues | PhD | Special |
| 2. James Calvet | PhD | Dissertation Chair |
| 3. Gerald Carlson | PhD | Regular |
| 4. Joan Conaway | PhD | Special |
| 5. Ron Conaway | PhD | Special |
| 6. Aron Fenton | PhD | Dissertation Chair |
| 7. Harvey Fisher | PhD | Dissertation Chair |
| 8. Mark Fisher | PhD | Dissertation Chair |
| 9. Joseph Fontes | PhD | Regular |
| 10. Jennifer Gerton | PhD | Special |
| 11. Alexey Ladokhin | PhD | Dissertation Chair |
| 12. Owen Nadeau | PhD | Special |
| 13. Kenneth Peterson | PhD | Dissertation Chair |
| 14. Allen Rawitch | PhD | Dissertation Chair |
| 15. Chad Slawson | PhD | Regular |
| 16. Liskin Swint-Kruse | PhD | Dissertation Chair |
| 17. Jinxi Wang | PhD | Dissertation Chair |

2. Graduate Students in the Program

Fall 2009

| Student Name | Student Status |
|------------------------|----------------------------------|
| 1. Aron Gottschalk | Post-comps, defended in May 2010 |
| 2. Matthew Goering | Post-comps |
| 3. Troy Johnson | Post-comps |
| 4. Hiroo Katayama | Post-comps |
| 5. Lu Chen | Post-comps |
| 6. Subhashchandra Naik | Post-comps |
| 7. Shuai Lu | Pre-comps |

Fall 2010

| Student Name | Student Status |
|--------------------------|--|
| 1. Matthew Goering | Post-comps, defended in December 2010 |
| 2. Troy Johnson | Post-comps, defended in August 2011 |
| 3. Hiroo Katayama | Post-comps |
| 4. Lu Chen | Post-comps |
| 5. Subhashchandra Naik | Post-comps |
| 6. Shuai Lu | Post-comps in November 2010 |
| 7. Rachel Grau | First year, switched departments in spring |
| 8. Dan Parente | MD/PhD student, passed comps in May 2011 |
| 9. Mauricio Vargas Uribe | Pre-comps |

Fall 2011

| Student Name | Student Status |
|--------------------------|---|
| 1. Hiroo Katayama | Post-comps, medical leave, left program |
| 2. Lu Chen | Post-comps |
| 3. Subhashchandra Naik | Post-comps |
| 4. Shuai Lu | Post-comps |
| 5. Dan Parente | MD/PhD student, post-comps |
| 6. Mauricio Vargas Uribe | Pre-comps, passed comps Dec 2011 |
| 7. Jason Barnett | Pre-comps, left program |
| 8. Rushi Trivedi | Pre-comps, passed comps May 2012 |

Fall 2012

Student Name

1. Lu Chen
2. Subhashchandra Naik
3. Shuai Lu
4. Dan Parente
5. Mauricio Vargas Uribe
6. Rushi Trivedi
7. Mary Ashley Rimmer
8. Allen Chazelle
9. Zhen Zhang

Student Status

Post-comps
Post-comps, defended November 2012
Post-comps
MD/PhD student, post-comps
Post-comps
Post-comps
Transfer from Microbiology, pre-comps
Pre-comps
Pre-comps

Fall 2013

Student Name

1. Lu Chen
2. Shuai Lu
3. Dan Parente
4. Mauricio Vargas Uribe
5. Rushi Trivedi
6. Mary Ashley Rimmer
7. Allen Chazelle
8. Zhen Zhang
9. Ee Phie Tan
10. Jackie Thompson
11. Matt Stroh

Student Status

Post-comps, defended September 2013
Post-comps, defended November 18, 2013
MD/PhD, post-comps, defense planned Apr 2014
Post-comps
Post-comps
Pre-comps, comps planned Jan 2014
Pre-comps, comps planned Nov 21, 2013
Post-comps
Pre-comps
Pre-comps
Neurobiology training program, pre-comps

3. Degrees Conferred

Academic Year 2009 (Summer 2008 through Spring 2009)

| Name | Degree Conferred | Date of Defense | Thesis Title | Committee Chair | Present Position |
|--------------------|------------------|-----------------|--|-----------------|---|
| Raymond Camahort | Ph.D. | Nov. 14, 2008 | "Composition and Formation of <i>Saccharomyces cerevisiae</i> Centromere Nucleosome" | Andrews | Business Development Associate; Research Fellow in Medicine, Dept of Stem Cell and Regenerative Biology, Harvard University |
| Benjamin P. Weaver | Ph.D. | April 3, 2009 | "Regulatory Mechanisms of Slc39a4 (Zip4) and Slc39a5 (Zip 5)" | Andrews | Postdoc, Biology, University of Colorado-Boulder. |

Academic Year 2010 (Summer 2009 through Spring 2010)

| Name | Degree Conferred | Date of Defense | Thesis Title | Committee Chair | Present Position |
|------------------|------------------|-----------------|---|-----------------|--|
| Aaron Gottschalk | Ph.D. | May 27, 2010 | "Biochemical and developmental characterization of the Snf2-like ATPase Amplified in Liver Cancer 1 (ALS1)" | Andrews | Postdoc Research Assoc., Stowers Institute |

Academic Year 2011 (Summer 2010 through Spring 2011)

| Name | Degree Conferred | Date of Defense | Thesis Title | Committee Chair | Present Position |
|--------------|------------------|------------------|---|-----------------|-----------------------------------|
| Matt Goering | Ph.D. | December 3, 2010 | "The Effect of Cohesion Network Mutations on Meiotic Recombination" | Andrews | Director of REI Lab, OB/GYN, KUMC |

Academic Year 2012 (Summer 2011 through Spring 2012)

| Name | Degree Conferred | Date of Defense | Thesis Title | Committee Chair | Present Position |
|--------------|-------------------------|------------------------|--|------------------------|--|
| Troy Johnson | Ph.D. | August 16, 2011 | "Conformational Entropy in PEPCK Catalysis: Dynamic motions critical to function | Fenton | Postdoc, MD Anderson Cancer Center, Houston TX |

Academic Year 2013 (Summer 2012 through Spring 2013)

| Name | Degree Conferred | Date of Defense | Thesis Title | Committee Chair | Present Position |
|--------------|-------------------------|------------------------|---|------------------------|--|
| Subhash Naik | Ph.D. | November 29, 2012 | "On the development of a GroEL based platform for identifying pharmacological chaperones" | M. Fisher/Ladokhin | Postdoc, M. Fisher lab, Biochemistry and Molecular Biology, KUMC |

Academic Year 2014 (Summer 2013 through Spring 2014)

| Name | Degree Conferred | Date of Defense | Thesis Title | Committee Chair | Present Position |
|-------------|-------------------------|------------------------|--|------------------------|-------------------------|
| Lu Chen | Ph.D. | September 10, 2013 | "Organization and functions of the human INO80 chromatin remodeling complex" | Fenton | Stowers Institute |

4. Curriculum

1. Course Requirements for Ph.D.

Complete the IGPBS core curriculum. Students who have not previously mastered undergraduate biochemistry strengthen any areas of weakness by taking [BCHM 850](#) Topics in Biochemistry in the summer between the IGPBS and Year Two.

Year Two, Fall Semester.

[BCHM 862](#) Biochemical Research-Literature Seminar (1 hour)

[BCHM 890](#) Master's Research (1-5 hours)

Required elective (may be taken in Year Three):

[BCHM 922](#) Advanced Molecular Genetics (3)

Year Two, Spring Semester.

[BCHM 862](#) Biochemical Research-Literature Seminar (1 hour)

[BCHM 890](#) Master's Research (1-5 hours)

Required elective (choose one):

[BCHM 808](#) Methods for Analyzing Biomolecules (3 hours) **or**

[BCHM 923](#) Protein Structure and Function (3 hours)

Year Three, Fall Semester.

[BCHM 862](#) Biochemical Research-Literature Seminar (1 hour)

[BCHM 990](#) Doctoral Research (1-5 hours)

Required elective (if not taken in Year Two):

[BCHM 922](#) Advanced Molecular Genetics (3 hours)

Year Three, Spring Semester.

[BCHM 802](#) Formal Research Seminar (1 hour)

[BCHM 990](#) Doctoral Research (1-5 hours)

Required elective (choose one):

[BCHM 808](#) Methods for Analyzing Biomolecules (3 hours) **or**

[BCHM 923](#) Protein Structure and Function (3 hours)

Additional electives include the following courses; they may be substituted for a required elective on a case-by-case basis.

- [BCHM 850](#) Topics in Biochemistry (1 hour)
- [ANAT 868](#) Advanced Developmental Biology (2 hours)
- [MICR 920](#) Advanced Microbial Molecular Genetics: Prokaryotes (3 hours)
- [PATH 803](#) Stem Cell Biology (2 hours)

The student must maintain at least a B average in all non-research and non-seminar courses. Credit in research cannot be used to earn this grade-point average. The student completes her or his curriculum by enrolling in [BCHM 990](#) Doctoral Research and writing and defending a Doctoral Dissertation for [BCHM 999](#). All graduate students on half-time assistantships are required to enroll in at least 6 credit hours each regular semester and 3 credit hours for the summer session.

Examinations

Comprehensive written and oral examinations are administered during the Year Two spring semester. The written examination comprises an NIH-style proposal independently developed

by the student. The oral examination covers aspects of biochemistry and molecular biology related to the proposal as well as the broader subject area.

Dissertation

The student must complete original research, write a dissertation that is acceptable to a dissertation committee, present the results in a formal seminar, and defend the dissertation to a doctoral committee.

2. Course Requirements for M.S.

The curriculum normally requires a minimum of 30 semester credit hours. Half of these hours are usually formal course work and the remainder research and thesis. Students generally must complete the IGPBS core curriculum. Other required courses are [BCHM 862](#) Biochemical Research-Literature seminar, [BCHM 890](#) Masters Research, and [BCHM 899](#) Masters Thesis.

The student must maintain a B average in nonresearch and nonseminar credit hours as well as an overall grade-point average of B. Upon completion of research work, the student writes a thesis, presents it as a formal seminar, and defends it to a thesis committee. A final draft of the thesis, approved by the research advisor, is given to the thesis committee at least 3 weeks before the final oral defense.

3. Graduate Courses offered by the Program

Catalog Title: BCHM 801: Research in Biochemistry (1-10)

Description: *LEC*

Prerequisites: None

Last Offered: Fall Semester, 2013

Number of students enrolled: 0

Catalog Title: BCHM 802: Biochemistry Seminar (1)

Description: Near the completion of their dissertation research, students present a 1 hour formal seminar to the department about literature relevant to their project.

Prerequisites: None

Last Offered: Spring Semester, 2013

Number of students enrolled: 2

Catalog Title: BCHM 808: Methods for Analyzing Biomolecules (3)

Description: Application of physical techniques to the study of biological macromolecules in solution. Emphasis on utilization of data obtained from such studies in interpreting biological processes at the molecular level. Course will be taught in the spring.

Prerequisite: Consent of instructor. *LEC*

Last Offered: Spring Semester, 2012 (offered in Spring of even years)

Number of students enrolled: 5

Catalog Title: BCHM 850: Topics in Biochemistry (1-3)

Description: Selected topics in biochemistry with varying subject matter. Students should inquire before enrolling. Topics are in-depth studies of current research areas. The course may consist of formal lectures and/or directed readings and studies. *IND*

Prerequisites: None

Last Offered: Fall Semester, 2013

Number of students enrolled: 0

Spring Semester 2013: 2 students enrolled

Catalog Title: BCHM 862: Biochemical Research-Literature Seminar (1)

Description: Students and faculty meet once weekly to discuss the research of students or the current biochemical literature. The student is required to make one presentation.

Prerequisite: Consent of instructor. *LEC*

Last Offered: Fall Semester, 2013

Number of students enrolled: 8

Catalog Title: BCHM 890: Master's Research (1-15)

Description: Research for the M.S. degree. *RSH*

Last Offered: Fall Semester, 2013

Number of students enrolled: 4

Catalog Title: BCHM 899: Master's Thesis (1-15)

Description: Restricted to the writing of the master's thesis. *THE*

Last Offered: Fall Semester, 2013

Number of students enrolled: 0

Catalog Title: BCHM 922: Advanced Molecular Genetics (3)

Description: An in-depth analysis of the structure and function of gene regulatory proteins and the mechanisms of gene transcription, and DNA replication and repair. Lectures and discussion of current literature. Course will be presented in the fall semester and will include several faculty leading discussions in their area of research interests. *LEC*

Prerequisite: consent of instructor.

Last Offered: Fall Semester, 2012 (Offered in Fall of even years)

Number of students enrolled: 5

Catalog Title: BCHM 923: Protein Structure and Function (3)

Description: The relationship between protein structure, binding, and physiological function. Emphasis is on proteins as enzymes, structural components, and regulators. Course will be taught in the spring.

Prerequisite: consent of instructor. *LEC*

Last Offered: Spring Semester, 2013 (Offered in Spring of odd years)

Number of students enrolled: 3

Catalog Title: BCHM 990: Doctoral Research (1-15)

Description: Research for the doctoral degree. *RSH*

Last Offered: Fall Semester, 2013

Number of students enrolled: 3

Catalog Title: BCHM 999: Doctoral Dissertation (1-15)

Description: Restricted to the writing of the doctoral dissertation. *THE*

Last Offered: Fall Semester, 2013

Number of students enrolled: 3

Catalog Title: GSMC 850 Proteins and Metabolism (2)

Description: This course is the first of four lecture units in the first year curriculum of the Interdisciplinary Graduate Program in the Biomedical Sciences. It will cover basic principles of metabolism, protein structure and an introduction to nucleic acids.

Prerequisites: Permission of Instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences. Students must co-enroll in GSMC 852 (Introduction to Biomedical Research).

Last offered: Fall, 2013

Number of students enrolled: 23

Catalog Title: GSMC 851 Molecular Genetics (2)

Description: This course is the second of four lecture units in the first year curriculum of the Interdisciplinary Graduate Program in the Biomedical Sciences. It will cover basic principles of molecular genetics, DNA replication, DNA repair, transcription and translation.

Prerequisites: Permission of Instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences. Students must co-enroll in GSMC 852 (Introduction to Biomedical Research).

Last Offered: Fall, 2013

Number of students enrolled: 24

Catalog Title: GSMC 852 Introduction to Biomedical Research (2)

Description: This is the first semester of a one year series in the Interdisciplinary Graduate Program in the Biomedical Sciences. The course is composed of weekly meetings to discuss research problems, methods and current literature. The course will interface with the lectures and students will learn to critically evaluate our scientific knowledge base. The students will be introduced to the tools that are available to obtain and evaluate information. The students will be challenged to identify areas of our scientific knowledge that require further experimentation and clarification.

Prerequisites: Permission of Instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences. Students must co-enroll in GSMC 850 (Proteins and Metabolism) and GSMC 851 (Molecular Genetics).

Last Offered: Fall, 2013

Number of students enrolled: 23

Catalog Title: GSMC 853 Cellular Structure (2)

Description: This course is the third of four lecture units in the first year curriculum of the Interdisciplinary Graduate Program in the Biomedical Sciences. It will cover basic principles of cellular structure and function. Topics include the lipid bilayer, membrane proteins, and cellular organelles.

Prerequisites: Prerequisites: Permission of Instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences. Students must co-enroll in GSMC 855 (Introduction to Biomedical Research).

Last Offered: Spring, 2013

Number of students enrolled: 27

Catalog Title: GSMC 854 Cell Communication (2)

Description: This course is the fourth of four lecture units in the first year curriculum of the Interdisciplinary Graduate Program in the Biomedical Sciences. It will cover basic principles of cell communication. Topics include G-protein-coupled signaling, cellular cytoskeleton; cell cycle control; cell death; extracellular matrix; and cancer.

Prerequisites: Permission of Instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences. Students must co-enroll in GSMC 855 (Introduction to Biomedical Research).

Last Offered: Spring, 2013

Number of students enrolled: 27

Catalog Title: GSMC 855 Introduction to Biomedical Research II (2)

Description: This is the second semester of a one year series in the Interdisciplinary Graduate Program in the Biomedical Sciences. The course is composed of weekly meetings to discuss research problems, methods and current literature. The course will interface with the lectures and students will learn to critically evaluate our scientific knowledge base. The students will be introduced to the tools that are available to obtain and evaluate information. The students will be challenged to identify areas of our scientific knowledge that require further experimentation and clarification.

Prerequisites: Permission of Instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences. Students must co-enroll in GSMC 853 (Cellular Structure) and GSMC 854 (Cell Communication).

Last Offered: Spring, 2013

Number of students enrolled: 27

Catalog Title: GSMC 856 Introduction to Research Ethics (1)

Description: The objective of this course is to introduce students to research ethics. Students will learn and discuss some of the following areas of ethics in research: 1) sources of errors in science, 2) Scientific Fraud, 3) plagiarism and misrepresentation, 4) conflicts of interest and 5) confidentiality.

Prerequisites: Permission of Instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences.

Last Offered: Spring, 2013

Number of students enrolled: 30

Catalog Title: GSMC 857 (1) Biographics

Description: The objective of the course is to teach students how to organize and present data in a clear and concise manner at national meetings. Students are taught basic principles of organizing data for presentation and then learn through the actual presentation of data in simulated platform sessions held in the course. Videotapes are made of the presentations, and students are then given a constructive critique of their presentation by the instructor and fellow students.

Prerequisites: Permission of Instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences.

Last Offered: Spring, 2013

Number of students enrolled: 21

Catalog Title: GSMC 858 (1) Introduction to Faculty Research

Description: This course was created to provide students with sufficient introduction to the research conducted at KUMC. To facilitate this point, the course is designed as a seminar series. In each session of the series, three faculty members present a brief 20-minute overview of their research programs. The series will help students to select faculty for research rotations and ultimately help them determine which faculty member they will select as a research adviser for their doctoral research.

Prerequisites: Permission of Instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences.

Last Offered: Spring, 2013

Number of students enrolled: 16

Catalog Title: GSMC 859 (1 to 4 units) Research Rotations

Description: The course will introduce students to research methods, experimental design, and the types of biomedical research conducted at KUMC. The first research rotation begins halfway through the first semester; the second and third research rotations will occur in the second semester. It is designed to help students determine which faculty member they will select as a research adviser for their doctoral research.

Prerequisites: Permission of Instructors. Students must be admitted into the Interdisciplinary Graduate Program in the Biomedical Sciences.

Last Offered: Spring, 2013

Number of students enrolled: 16

5. Department of Biochemistry and Molecular Biology, Narrative

The mission of the Department of Biochemistry and Molecular Biology (BMB) at the University of Kansas Medical Center is to (i) provide a dynamic research environment with programs in the disciplines of biochemistry and molecular biology; (ii) provide a superior educational experience for graduate students and medical students; (iii) provide a rich training environment for postdoctoral fellows; and (iv) provide service to our institution and community. The Department currently consists of eleven tenure-track faculty members, two emeritus professors, three research-track faculty members, and nine faculty members with secondary appointments in the department.

Graduate students entering the Department of Biochemistry and Molecular Biology typically seek PhD or MD/PhD degrees. These students take three advanced graduate courses that are offered by the department every other year. These courses require active student participation, with discussion and projects often centered on recent publications relevant to the course topic. Every semester, graduate students participate and present in weekly seminar courses that are evaluated by the BMB faculty. "Special Topics" courses are available to meet individual student needs. All graduate students perform research that will ultimately lead to publications and their dissertation or thesis. In addition to advanced BMB graduate courses, BMB faculty teach in the "IGPBS" courses for first year graduate students. The first IGPBS module is primarily taught by BMB faculty. Therefore, in addition to the course material, faculty efforts are directed towards helping students adapt to a new learning environment with advanced expectations.

BMB faculty members contribute to graduate studies in many other departments by serving on dissertation committees for the KUMC Departments of: Microbiology, Immunology, and Genetics; Pharmacology Toxicology, and Therapeutics; Molecular and Integrative Medicine; Anatomy and Cell Biology; Neurology; and Pathology and Laboratory Medicine. Members also serve on committees for graduate students at KU-Lawrence in the Department of Molecular Biosciences.

In addition to graduate studies, BMB faculty members teach extensively in the medical curriculum. BMB faculty members serve as directors for Foundations of Medicine (the first module of medical school), and Genetics and Neoplasia (the second module of medical school). Since these modules are the students' first exposure to medical school, BMB faculty members spend significant time introducing new learning formats (including active learning and engaged learning) and helping students acculturate to medical school. Several faculty members serve as individual mentors to first and second year medical students through the Academic Societies. In addition to the module directors, other BMB faculty lecture extensively and serve as facilitators for small groups discussion activities in the Foundations and Gen/Neo modules. Since these modules overlap with the first IGPBS graduate module, most BMB faculty members teach in multiple courses during the first fall quarter. BMB faculty members also lecture in the "Cardiopulmonary", "Renal Endocrine", and "GI Tract and Nutrition" modules.

Finally, most BMB faculty members are involved in teaching outreach. The Department sponsors an annual Heartland Undergraduate Biochemistry Forum, which includes seminars given by internationally famous scientists and poster presentations by regional undergraduate and high school students. BMB faculty members present seminars and guest lectures at regional schools. BMB laboratories frequently host regional undergraduate and high school

students for research experiences. The regional schools located in Kansas include: Kansas State University, KU-Lawrence, KU-Edwards, Haskell Indian Nations University, Pittsburgh State University, Wichita State University, the University of St. Mary, Baker University, Benedictine College, the Blue Valley ISD Center for Advanced Professional Studies (high school), the Olathe ISD Biotechnology Program (high school), and the Shawnee Mission ISD Biotechnology Program (high school) and elementary school activities.

The teaching mission of the Department of Biochemistry and Molecular Biology is enhanced by our research mission. Our areas of research strength include: regulation of gene expression and transcription; protein folding and structure determination; allosteric regulation of protein function; and signal transduction. Members of the Department of Biochemistry and Molecular Biology are involved with interdisciplinary centers and institutes at KUMC and KU-Lawrence, including: The Kidney Institute, the COBRE for Protein Structure and Function, the COBRE for Molecular Regulation of Cell Development and Differentiation, the Cancer Center, and the Institute for Fetal Maternal Biology. In total, primary faculty members in the Department have been awarded \$2,226,072 dollars in research grants for the current fiscal year.

The Department of Biochemistry and Molecular Biology supports the larger research mission of KUMC. Although it is administratively distinct, the Department houses the Mass Spectrometry Facility that serves 24 faculty in 14 departments at 3 universities. This facility houses three state-of-the-art instruments with all supporting equipment, software, and expertise. Innovative software and hardware has been designed by the facility staff.

Faculty members serve on many KUMC committees, including the Radiation Safety Committee, the Research Advisory Committee, the Executive Vice-Chancellor Search Committee, the School of Medicine (SOM) Promotion and Tenure Committee, the SOM Academic and Professionalism Committee, the SOM Phase I Curriculum Committee, and the MD/PhD Advisory Committee. Members of the BMB faculty serve on regional, national, and international committees related to their research, as editors and reviewers for numerous scientific journals, and as grant reviewers on national study sections.

The research mission of the Department serves the economic interests of the state of Kansas. The research funding earned by faculty members is used to hire graduates of local universities, including KU-Lawrence and Kansas State University. In addition, research funding is used to recruit staff from around the world to the Kansas City area, enhancing the diversity of the state. Finally, Drs. James Calvet, Gerald Carlson, Mark Fisher, and Jinxi Wang have patented technology that resulted from their research at KUMC.

Faculty members in the Department have been honored for their efforts in research and education. Recently, a publication co-authored by Drs. Owen W. Nadeau and Gerald Carlson was lauded as Journal of Biological Chemistry's Best Paper of 2012 in Computational Biology; Dr. Joe Fontes was awarded the 2012 Ruth Bohan Teaching Professorship; and the Polycystic Kidney Disease Foundation honored Dr. James Calvet with the Kaplan International PKD prize at the World Congress of Nephrology on April 11, 2011.

In summary, the Department of Biochemistry and Molecular Biology is an excellent resource for the University of Kansas Medical Center and the State of Kansas.