**Translational Biosciences**

**About Translational Biosciences**

The Translational Biosciences PhD program represents a new paradigm for graduate training in biomedical research. This program will span the entire breadth of the biomedical research spectrum, from basic science discoveries to improved clinical outcomes and population health. Students in the program will acquire a deep knowledge base of a chosen discipline and the ability to communicate and collaborate across disciplines. Grounded in research programs supported by the NexGen Precision Health Institute and the School of Medicine, the PhD trainees will be actively contributing to the UM System-wide effort to translate ground-breaking biomedical research into life-changing reality for people in Missouri and globally. Completion of this program provides state-of-the-art research training to young biomedical scientists at the beginning of their scientific careers.

**Faculty**

**Curators Distinguished Professor** M. Davis**, G. Weisman**
**Research Assistant Professor** R. Cortese**
**Director** R. Edwards**
**Lead Scientist** A. Upendran**

**Graduate**

- PhD in Translational Biosciences (http://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences/)
  - with emphasis in Biochemistry and Biophysics (http://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences-emphasis-biochemistry-biophysics/)
  - with emphasis in Cancer Biology (http://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences-emphasis-cancer-biology/)
  - with emphasis in Infection and Immunity (http://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences-emphasis-infection-immunity/)
  - with emphasis in Integrative Physiology (http://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences-emphasis-integrative-physiology/)
  - with emphasis in Nutrition and Exercise Physiology (http://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences-emphasis-nutrition-exercise-physiology/)
  - with emphasis in Precision Medicine and Health Outcomes (http://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences-emphasis-precision-medicine-health-outcomes/)

**TR_BIOSC 8001: Topics in Translational Biosciences**

Instruction in specific subject matter areas in translational biosciences.

**Credit Hour:** 1-5

**Prerequisites:** instructors consent

**TR_BIOSC 8500: Translational Biosciences I**

(same as BIOCHM 8240). This course covers foundational principles and recent advances in biochemistry and molecular/cell biology that underpin current research across a wide range of biomedical sciences, including cancer biology, microbiology, virology and physiology. This is a lecture-based course that will include weekly discussions of primary research articles. Graded on A-F basis only.

**Credit Hours:** 3

**TR_BIOSC 8550: Skills in Translational Biosciences I**

By the end of this course students should be able to: 1. Understand the different methodological approaches used in basic biomedical science, health research and clinical implementation that inform the translation of discovery into action. 2. Understand real-world unmet clinical needs by fostering the development of a shared language of basic and clinical research. Upon completion of this course, students should be able to develop a research protocol relevant to translation biosciences. This will include being able to effectively communicate the research proposal in various formats from written to oral for a range of audiences with varying levels of research experience. Students will gain the skills necessary to manage their research environment, master the basics of human ethics regulations and basic principles of equity, diversity, and inclusion for translational biosciences. They will use this information to create an individual development plan.
TR_BIOSC 8555: Professional Skills for Translational Biosciences II
By the end of this course students should be able to: 1. Understand the different methodological approaches used in basic biomedical science, health research and clinical implementation that inform the translation of discovery into action. 2. Understand real-world unmet clinical needs by fostering the development of a shared language of basic and clinical research. Upon completion of this course, students should be able to develop a research protocol relevant to translation biosciences. This will include being able to effectively communicate the research proposal in various formats from written to oral for a range of audiences with varying levels of research experience. Students will gain the skills necessary to manage their research environment, master the basics of human ethics regulations and basic principles of equity, diversity, and inclusion for translational biosciences. They will use this information to create an individual development plan.

Credit Hour: 1
Prerequisites: TR_BIOSCI 8500

TR_BIOSC 8560: Data Design and Analysis I
By the end of this course students should be able to understand how statistical methods are used by others; apply them including programming to existing data; and use them as a base for more advanced biostatistics or research methods courses.

Credit Hours: 3

TR_BIOSC 9001: Topics in Translational Bioscience
Instruction in specific subject matter areas in translational biosciences. Graded on S/U basis only.

Credit Hour: 1-5
Prerequisites: instructor consent

TR_BIOSC 9085: Rotations in Translational Bioscience
Students assigned individual problems in translational bioscience for library or lab investigation. Graded on S/U basis only.

Credit Hour: 1-99
Prerequisites: instructor's consent

TR_BIOSC 9090: Dissertation Research
Original investigations in translational biosciences in support of dissertation for doctoral candidates. Graded on S/U basis only.

Credit Hour: 1-10

TR_BIOSC 9422: Journal Club
The journal club will follow an “inverted” format. Specifically, each class (1) each class session will focus on one specific scientific question or topic rather than a particular article; (2) topics will be selected by the students, with instructor approval, and related to the students’ thesis research; (3) instead of everyone reading the same article, nominated students for that session will choose a different article to read for each class session, leading to the presentation of a variety of different papers and viewpoints for each topic; (4) during class, the nominated students (up to 4) will summarize how their chosen article addressed the question and what methodological approach was used. Graded on S/U basis only.

Credit Hour: 1
Prerequisites: enrolled in Translational Biosciences PhD Program