Mizzou
University of Missouri

Translational Biosciences

Erika Boerman, Director

Translational Biosciences PhD Program

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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 NextGen 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**, R. Mohan**, S. Segal**, X. Wan**, G. Weisman**
Professor A. Adebiyi**, L. Allen**, D. Anderson**, W. D. Arnold, O. Baker, L. Beamer**, B. Beerntsen**, D. Beversdorf**, L. Brandt**, C. Brown**, J. Bryan**, D. Burke**, C. Bysani**, M. Calcutt**, A. Chade, A. Chandrasekhar**, M. Chapman*, S. Chen**, S. Chen, D. Cornelison**, T. Cui, P. DeFigueiredo**, D. Duan**, W. Durante**, D. Duren**, M. Esebua, W. Fay**, W. Folk**, R. Foraker**, B. Froeliger, L. Gangwani**, R. Ganta, K. Gates**, V. Glinskii**, A. Griffiths, R. D. Hammer**, G. Hildebrandt, M. Hill**, S. Hyder**, J. Jeong, M. Johnson**, J. Kanaley**, M. Katz**, E. Kimchi, G. King**, D. Kireev**, D. Kline**, L. Layfield, M. Lewis**, Z. Liu**, C. Lorson**, B. Lu, D. Lubahn**, W. Ma**, C. Manrique**, L. Martrinez-Lemus**, T. Mawhinney**, B. Mittendorfer**, K. McDonald**, M. Nassir, E. Parks**, S. Peck**, M. Petris**, C. Phillips**, M. Popescu**, T. Quinn**, A. Sales**, D. Schust, S. Sheinkopf, H. Shirwan**, S. Shukla**, R. Stich**, L. Sumner**, P. Sutovsky**, J. Tanner**, M. Thakkar**, J. Thelen**, S. Van Doren**, D. Xu**, E. Yolcu**, H. Zaghouani**, S. Zhang**, X. Zou**
Associate Professor S. Ahmad**, F Alahdab, J. Amos-Landgraf**, M. Baldwin**, D Bergstralh**, B. Bostick**, P. Brown**, J. Cannon**, P. Cornish**, M. Daniels**, T. Domeier**, J. Driver, B. Edwards**, K. Everett**, A. Franz**, D. Gil-Pages**, J. Gomez-Gutierre, B. Hahm**, X. Heng**, S. Hou, A. Koo**, M. Krenz**, S. Kumar**, K. Laziuk**, L. Lei, T. Lever**, D. Li, L. Ma**, J. McElroy**, S. McKarns**, F. Nassir, N. Nichols**, R. Nistala**, J. Padilla**, A. Parrish**, R. Pierce, L. Polo-Parada**, S. Rachagani**, P. Rao, S. Rector, A. Schrum**, L. Schulz**, J. Skyberg**, G. Sowa**, V. Subramanian, H. Sun, E. Teixeiro-Pernas**, V. Vieira-Potter**, W. Winuthayanon**, I. Zachary**, R. Zhang
Assistant Professor C Amato*, K Anguah**, M. Badran, Z. Berndsen, E. Boerman**, M. Boeyer, A. Burger*, R Castoro, S. Canfield, Y. Chabu**, D. Chairman, M. Cirstea**, J. Dhillon**, C. Durie**, A. Ericsson**, TM Finegan*, S. Gates**, C. Grunewald**, H. Huang**, G. Jia, E. Johannesen, K. Kabytaev, J. Kaifi*, X. Kang**, A. Kelleher**, S Khan, T. Kim, M. Lange**, E. Leary**, M. Lewis, Y. Li**, J. Limberg**, M Methawasin*, A. Mosa**, K Moss*, V. Nguyen, C. Norton, J Nuelle*, C. Nutter**, S. Palaniyandi, A. Patterson**, D. Rao, K. Rucinski, C. Schenck**, P. Singh, P Sonawane, X. Song**, A. Srivastava, J. Stilley, R. Thomen**, K. Trout**, A. Upendran**, R. Whiting**, A. Yokom**, S. Zawieja**

* Graduate Faculty Member - membership is required to teach graduate-level courses, chair master's thesis committees, and serve on doctoral examination and dissertation committees.
** Doctoral Faculty Member - membership is required to chair doctoral examination or dissertation committees. Graduate faculty membership is a prerequisite for Doctoral faculty membership.

Undergraduate

While MU does not offer undergraduate degrees specifically in this degree program, the University does offer baccalaureate opportunities in a number of related areas in the other Schools and Colleges that make up the University. The catalog provides a complete list of these degree options (https://catalog.missouri.edu/degreesanddegreeprograms/).

Graduate

- PhD in Translational Biosciences (https://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences/)
  - with emphasis in Biochemistry and Biophysics (https://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences-emphasis-biochemistry-biophysics/)
  - with emphasis in Cancer Biology (https://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences-emphasis-cancer-biology/)
  - with emphasis in Infection and Immunity (https://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences-emphasis-infection-immunity/)
  - with emphasis in Integrative Physiology (https://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences-emphasis-integrative-physiology/)
  - with emphasis in Nutrition and Exercise Physiology (https://catalog.missouri.edu/schoolofmedicine/translationalbiosciences/phd-translational-biosciences-emphasis-nutrition-exercise-physiology/)
  - with emphasis in Precision Medicine and Health Outcomes (https://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
This course is intended to help 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 while gaining the skills necessary to manage a research environment, master the basics of human ethics regulations and basic principles for translational biosciences.

Credit Hour: 1
Recommended: This course is to be taken concurrent with MPP 8500

TR_BIOSC 8555: Professional Skills for Translational Biosciences II
In this course, students will move beyond the boundaries of implementation science to broaden their perspective on applicable information, processes, and methods in translational bioscience research.

Credit Hour: 1
Prerequisites: TR_BIOSCI 8500

TR_BIOSC 8560: Data Design and Analysis I
(same as BBME 8560). This course covers the introductory epidemiology and biostatistics concepts essential for biosciences and health research with applied programming skills in R.

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 9087: Translational Bioscience Seminars
Presentations and discussions by faculty, guest speakers, and graduate students on current topics relevant to translational biosciences. Graded on S/U basis only.

Credit Hour: 1

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
PhD students will lead discussions, analyze cutting-edge research, and explore diverse literature and methodologies. Through active participation and collaborative learning, students will cultivate critical thinking skills and build connections within the evolving realm of translational research. Graded on S/U basis only.

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

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TR_BIOSC 9476: Fellowship and Grant Proposal Writing for Biomedical Scientists
Topics include experimental design, rigor and reproducibility, writing an effective grant proposal, how to develop a training plan and the peer review process. Methods include lecture, discussion and assignments including the different components of research proposals, of F31 Fellowship proposals, and peer review critiques. In addition to peer review, there will be a faculty-led mock study section that will provide feedback to the students on their proposals.

Credit Hours: 3
Prerequisites: Enrollment in this course is restricted to graduate students and postdoctoral trainees. Graduate students must be enrolled in a biomedical PhD program and have completed their first year of graduate study. Postdoctoral trainees must have completed a terminal degree degree in biomedical research (PhD) or in medicine (MD)
Recommended: As class space is limited, preference will be given to PhD students who are enrolled in the Translational Biosciences PhD program and postdoctoral fellows who are training with faculty in the School of Medicine

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