Supplemental Material

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Title: MEDI 501: Principles of Preclinical Translational Science: A Case Study from Cancer Drug Discovery and Development

Course description: Translation is the scientific work of accelerating the application of observations from the laboratory, clinic and community into interventions that improve the health of individuals and the public. Translational research typically involves a team of collaborators whose expertise spans multiple levels of analysis, disciplines, and fields who work together to advance the science toward human applications.

But what approaches are needed for scientists, who are typically trained in a specialized subfield of research, to work together to accomplish this successfully? What are the varied roles of academic faculty and institutions, industry, and government agencies in advancing translation? What scientific, technical, and operational knowledge and skills are essential to the functioning of these collaborations? What administrative and legal issues must be addressed?

This course will introduce students to "Translational Science," an emerging field of research that aims to answer these questions, and provide evidence-based scientific and operational principles that can be applied to a wide variety of translational research collaborations. Students will learn key principles of translational science by way of a case study of a highly successful translational research partnership involving the National Center for Advancing Translational Sciences (NCATS) and the National Cancer Institute (NCI) of the US National Institutes of Health, Northwestern University, and the University of Kansas. It produced a promising potential drug shown to inhibit metastasis in animal models and that will be examined in a first-in-human clinical trial in 2020.

Course learning objectives:

- Understand the definitions and goals of translational research and translational science, and how they differ
- Recognize there are preclinical translational science principles that can be applied across many different research projects
- Identify a range of both scientific and operational preclinical translational science principles that can be applied to one's future work
- Learn about the research process and collaborations (inter-agency, and team-based) necessary to enable a scientific discovery to lead to an effective compound that can be used in humans