

## **CERTIFICATE IN TRANSLATIONAL RESEARCH**

### **Program Curriculum**

This program curriculum consists of a minimum of 9 credits as outlined below. Courses are taught by faculty at the School of Medicine, the Global Public Health Institute and the Graduate School of Arts and Sciences.

### **Required Courses**

Clinical Research Methods  
Introduction to Biostatistical Analysis

### **Electives**

#### **One of the following:**

Advanced Epidemiology  
Biomolecular Medicine  
Clinical Trials Design  
Drug Development in a New Era  
Health Services Research  
Medical Informatics  
Molecular Signaling and Drug Development

### **Certificate in Translational Research Course Descriptions:**

#### **Clinical Research Methods**

This course provides an overview and in-depth introduction to principles of clinical research, utilizing reading, protocol development, problem sets, and seminars. Brief mini-lectures to review concepts are followed by in-depth discussions built on assigned reading and exercises. Each learner develops a research protocol following an iterative process in which practical feedback is received in individual and small group protocol review sessions. By the end of the course, students write and present a research protocol that describes in detail the aims, background, and study plan for an investigation to address the question formulated by the student.

#### **Introduction to Biostatistics**

This practical and interactive course introduces students to probability and statistical methods utilized in the analysis and interpretation of experimental and epidemiological data.

#### **Advanced Epidemiology**

This course is designed to introduce students in all fields to the background, basic principles and methods of public health epidemiology. Topics covered include: measures of disease frequency and risk; epidemiologic study designs, both experimental and non-experimental; understanding bias; and measures of effect and association. In addition, students will develop skills to read, interpret and evaluate health information from published epidemiological studies and mass media sources.

## **Drug Development in a New Era**

The goal of this course is to provide an overview of new drug development to entry-level professionals in the medical sciences. Seminars include a combination of lectures and discussions. Invited speakers from the academic and private sectors offer an array of different viewpoints. Completion of this course will enable each participant to:

1. learn the vocabulary and principles of new drug development
2. assess the non-clinical background of a drug
3. learn practical skills for interacting with regulatory agencies during the course of new drug development, and
4. discuss the financial and marketing issues behind new drugs

## **Medical Informatics**

This course introduces trainees to medical informatics, the interdisciplinary science of information management in medicine. Focusing on areas relevant to clinical research, students will learn innovative methods to capture, store, and retrieve clinical and population level data, as well as ways in which information systems can support research intervention.

## **Biomolecular Medicine**

This course familiarizes students with current technologies that may be useful in answering their scientific questions. Students will also be introduced to faculty members who may be able to assist them in advancing their projects. For students who do not require use of such technologies themselves, the course strives to improve their ability to understand the background science and literature pertinent to their scientific interest, and to help them collaborate with basic scientists in the future.

## **Clinical Trials Design**

This course will provide students an overview of clinical trial design using multiple examples to showcase a range of different approaches. Students will learn to frame a focused clinical trial question; specify patient eligibility and distinguish between inclusion and exclusion criteria; describe the administrative structure of a clinical trial; perform sample size determinations; explain a statistical analysis plan; distinguish between different forms of clinical benefit; and interpret clinical trial data from published articles.

## **Advanced Biostatistics**

Learners in this course gain expertise in doing and interpreting multiple regression analysis and applying methods learned to their own research data. The course will focus on analytic methods, assumptions, diagnostics, modeling options, tests of significance, and interpretation for multiple linear and logistic regression.

## **Health Services Research Methods**

This research methods course reviews core methodologic approaches and general principles of population health research. Lectures will be combined with practical discussions applying course principles to the students' research projects.

