

## CLINICAL AND TRANSLATIONAL SCIENCE

### OVERVIEW

Clinical and Translational Science (CTS) is a framework that helps us understand and develop new approaches to improving human health by linking basic biology, clinical medicine and community health. CTS students learn to design, execute and report studies of how biologic and non-biologic aspects of health care interact to influence individuals and populations. Our programs provide individuals with diverse backgrounds the opportunity to work with faculty from many disciplines and offer an Educational and Career Development Program to prepare them for roles as important and productive contributors to CTS.

### DEGREES

- Clinical and Translational Science CGS
- Clinical and Translational Science M.S.
- Clinical and Translational Science Ph.D.

### FACULTY

**Bentil, Daniel;** Associate Professor, Department of Mathematics and Statistics; PHD, University of Oxford

**Callas, Peter W.;** Research Associate Professor, Department of Mathematics and Statistics; PHD, University of Massachusetts Amherst

**Freeman, Kalev;** Assistant Professor, Department of Surgery; MD, University of Colorado Boulder

**Galbraith, Richard A.;** Professor, Department of Medicine-Clinical Pharmacology; MD, Kings College University

**Jones, Christopher Arthur-Anthony;** Assistant Professor, Department of Surgery; PHD, University of Oxford

**Kennedy, Amanda G.;** Associate Professor, Department of Medicine-General Internal Medicine Research; PHARMD, Northeastern University

**Littenberg, Benjamin;** Professor, Department of Medicine-General Internal Medicine Research; MD, Case Western Reserve University

**MacLean, Charles Duncan;** Professor, Department of Medicine-General Internal Medicine Research; MD, McGill University

**Pinckney, Richard G.;** Associate Professor, Department of Medicine-General Internal Medicine Research; MD, SUNY Buffalo

**Rubin, Alan Saul;** Associate Professor, Department of Medicine-General Internal Medicine Research; MD, New York University

**Van Eeghen, Constance O.;** Department of Medicine-General Internal Medicine Research; DrPH, University of North Carolina

### Courses

#### CTS 200. Introduction to CTS I. 3 Credits.

Teaches the principles of human subjects research for those pursuing a path as research assistants or coordinators.

#### CTS 201. Introduction to CTS II. 3 Credits.

Teaches the principles of human subjects research for those pursuing a path as research assistants or coordinators. Prerequisite: CTS 200.

#### CTS 271. Intro Biomedical Informatics. 3 Credits.

This survey course provides an overview of the field of biomedical informatics covering relevant topics in computer science, healthcare, biology, and social science.

#### CTS 272. Applied Biomedical Informatics. 3 Credits.

Pragmatic coverage of topics/resources relevant to biomedical informatics. Computing skills include Unix, programming, and databases; examples will involve clinical, biomedical, and public health data.

#### CTS 275. Informatics Practicum. 3-12 Credits.

Practicum experience with an informatics research or service project. Prerequisite: At least one of CTS 271, CTS 272, MMG 231, MMG 232, CS 231, or CS 232.

#### CTS 301. Design Clin&Translational Res. 3 Credits.

Seminar emphasizing the skills for designing and executing clinical and translational research. Prerequisite: Graduate standing, or Instructor permission.

#### CTS 302. Quality in Health Care. 3 Credits.

This interprofessional course provides students with the skills and knowledge needed to apply quality improvement approaches to the design and management of health care services. Prerequisite: Graduate standing, or Instructor permission. Cross-listed with: NH 302.

#### CTS 305. Cell To Society I. 2 Credits.

A two-semester seminar that addresses a medical issue from molecule to market. CTS students must take both semesters. Non-CTS students may take either semester independently. Prerequisite: Graduate standing, or Instructor permission.

#### CTS 306. Cell To Society II. 2 Credits.

A two-semester seminar that addresses a medical issue from molecule to market. CTS students must take both semesters. Non-CTS students may take either semester independently. Prerequisite: Graduate standing, or Instructor permission.

#### CTS 308. Intro to Research Management I. 3 Credits.

A course for beginning research coordinators, research managers, or research assistants who need to learn how to prepare and manage clinical and translational research protocols.

#### CTS 309. Intro to Research Mgmt II. 3 Credits.

A course for beginning research coordinators, research managers, or research assistants who need to learn how to prepare and manage clinical and translational research protocols.

#### CTS 310. Conduct Clin&Translational Res. 3 Credits.

Seminar emphasizing the ethics and mechanics of clinical and translational research. Pre/co-requisite: Prerequisite: Graduate standing, or Instructor permission.

**CTS 315. Report Clin&Translational Res. 3 Credits.**

Seminar emphasizing communication skills for writing, editing and presenting science. Pre/co-requisite: Prerequisite: Graduate standing, or Instructor permission.

**CTS 320. Analyze Clin&Translational Res. 3 Credits.**

Seminar emphasizing basic and analytical skills for clinical and translational research. Pre/co-requisites: Prerequisite: Graduate standing, or Instructor permission.

**CTS 325. Multi Analysis Clin&Trans Res. 3 Credits.**

Introduction to multivariate regression; models that account for effects of multiple predictors on a single outcome, including linear and logistic regression and survival analysis. Prerequisite: Graduate standing, or Instructor permission.

**CTS 326. Underpinnings Surgical Therapy. 3 Credits.**

Didactic lectures about the current scientific basis for surgical practice, including an understanding of conceptual foundations and empirical methods. Prerequisite: MD degree.

**CTS 327. Mortality&Morbidity in Surgery. 3 Credits.**

Examination of the processes of care and the therapeutic outcomes of clinical practices through problem-based learning. Pre/co-requisite: MD degree. Prerequisite: MD degree.

**CTS 330. Intro Secondary Data Analysis. 1 Credit.**

Course that orients students to broad issues of clinical research while providing specific skills in statistical analysis of large data set using specialized programs. Prerequisite: Graduate standing, or Instructor permission.

**CTS 340. Medical & Exper Human Genetics. 3 Credits.**

Overview of medical genetics, including history, techniques and ethical, legal and social implications of genetic diseases and their treatments. Prerequisite: Graduate standing, or Instructor permission.

**CTS 345. Genetic Approaches CV Disease. 2 Credits.**

Application of statistics, molecular biology, and genetics to the analysis of complex diseases such as asthma, hypertension and atherosclerotic heart disease. Prerequisite: Graduate standing, or Instructor permission.

**CTS 350. Mouse Genetics in Cancer Res. 3 Credits.**

The mouse as an experimental tool in cancer research. Prerequisite: Graduate standing, or Instructor permission.

**CTS 355. Complex Trait Analysis. 2 Credits.**

Mathematical approaches to studying complex diseases of humans using the mouse as a paradigm. Prerequisite: Graduate standing, or Instructor permission.

**CTS 382. CTS Seminar. 0.5 Credits.**

Presentation and discussion of current research. Mandatory attendance for all CTS Masters and Doctoral students. Prerequisite: Masters and Doctoral CTS students.

**CTS 385. Independent Study in CTS. 1-6 Credits.**

Individual work on a topic selected by student in consultation with Faculty member. The independent study may involve original research, project, and readings with conferences and will provide specialized knowledge relating to an area in which an appropriate course is not offered. Prerequisite: Approval from Program Advisor.

**CTS 391. Master's Thesis Research. 1-18 Credits.**

Master's Thesis Research.

**CTS 392. Master's Research Internship. 1-6 Credits.**

Requirement for the Master's in Clinical and Translational Science Research Management; includes experiential education in a research laboratory under the direction of a Research Mentor.

**CTS 395. Special Topics. 1-18 Credits.**

Special topics in Clinical and Translational Research. Prerequisite: Graduate standing, or Instructor permission.

**CTS 491. Doctoral Dissertation Research. 1-18 Credits.**

Doctoral Dissertation Research.