Online Teaching Opportunity - HMX Pro: Drug Discovery and Development

HMX is looking for members of the research and clinical communities at Harvard Medical School and the affiliated hospitals who are interested in gaining experience in online education to join our team. **This is a fully remote opportunity with flexible hours and competitive compensation, beginning in September 2022.**

HMX offers fully online courses intended for students interested in health care careers as well as professionals working in life science and health care related careers. More information about our courses can be found here: [https://onlinelearning.hms.harvard.edu/hmx/courses/](https://onlinelearning.hms.harvard.edu/hmx/courses/). We are currently staffing a course on **Drug Discovery and Development** that is part of our HMX Pro Pharmacology series.

We are looking for researchers and clinicians to support our students' learning by answering questions about the course content in the discussion forums. Applicants should be able to demonstrate teaching experience, as well as in-depth knowledge in this topic area, including relevant research or clinical experience. **We welcome applications from postdoctoral and clinical fellows, as well as advanced graduate and medical students.**

Successful candidates will be part of a team of moderators with diverse areas of scientific and clinical expertise, who moderate HMX courses in genetics, pharmacology, immunology, biochemistry, and physiology. The workload for each moderator will vary but generally will be around 5 hours per week, which can be done remotely at flexible hours. Responsibilities for each course will be shared across multiple moderators, providing additional flexibility for busy schedules.

These courses run quarterly (January, April, June, and September), with the upcoming session beginning in September 2022. We prefer applicants interested in remaining with the team for multiple course sessions. For longer-term team members, there may be additional opportunities to provide feedback on and develop course content, or to participate in other collaborations with HMX.

To apply, please email YeaRim Oh (yearim_oh@hms.harvard.edu) with your current CV and a cover letter describing your interest in moderating the drug discovery and development course. **There are a limited number of spots and applicants will be reviewed on a rolling basis.**
HMX Pro - Drug Discovery and Development

Course description

With all the advances in science and with closer collaboration between different scientific disciplines, a multifaceted approach is now being applied to drug discovery and development. Therefore, learning about the process of drug discovery and development has important implications for anyone working in health care and related sectors.

In this course, we will cover some of the fundamental concepts of drug discovery and development. You will learn about project initiation and selection, drug discovery, nonclinical drug development, and clinical drug development. Project selection and initiation is the stage where the indication and unmet need are identified by the pharmaceutical or biotech company. Drug discovery is the next stage where the drug modality is selected based on the target of interest. Nonclinical drug development involves testing the drug in a variety of \textit{in vitro} and \textit{in vivo} models to establish the therapeutic profile with emphasis on drug toxicity and estimating the human dose to be used. Clinical drug development involves testing the drug in humans, often beginning with healthy volunteers, and eventually moving into patients with the condition of interest to assess the efficacy of the therapeutic.

This advanced course offers a unique way for professionals to learn from leading Harvard Medical School faculty about how drugs are developed and about the advances happening in this field that are ultimately helping to improve the treatment and prevention of disease.

Course topics

Lesson 1: Overview of Drug Discovery and Development
- Introduction to drug discovery and development
- The promise of drug discovery and development

Lesson 2: Project Initiation and Selection
- Introduction to drug research and development
- Understanding the disease/indication we are targeting
- Understanding the drug being developed
- Understanding the mechanism of action of the drug
- Understanding the effect of the drug on the disease/indication
- Having a clear plan for drug development
Lesson 3: Drug Discovery
- Pharmacological principles
- Biochemical models and cell models
- Disease models
- Small molecules
- Protein therapeutics
- Nucleic acids and genes

Lesson 4: Nonclinical Drug Development
- Goals of nonclinical drug development
- Animal pharmacology
- Good laboratory practice
- Toxicology and safety pharmacology
- Toxicology testing
- Genotoxicity, carcinogenicity, and reproductive toxicity
- Early clinical studies

Lesson 5: Clinical Drug Development
- Establishing a causal pathway
- Chance and bias
- Confounding and effect modification
- Basic epidemiologic considerations
- Surrogate endpoints
- Fundamentals of randomized trial design
- Anatomy of a randomized trial

Lesson 6: Wrap-up
- The future of drug discovery and development