

Alliance for Global Health and Science 2021 Virtual Institute

The Alliance for Global Health and Science (the Alliance) is a partnership between the University of California, Berkeley and Makerere University. The Alliance seeks to make a tangible, enduring impact by focusing on locally identified health research needs and strengthening collaborations between faculty at UC Berkeley and Makerere University.

The Alliance Summer Institute is an opportunity for Makerere University students to learn cutting edge, vital skillsets for bioscience researchers from world class scientists from the University of California system, the Chan Zuckerberg Biohub, SciDIP Global, and Makerere University. This year, the Institute will be held completely virtually, keeping in mind the public health crisis of COVID-19.

If you are interested in participating in the Summer Institute, please fill out this application form which can be found at: <https://forms.gle/d1WZVBin3sbfyZdF6>

All applications require 1) a letter of interest outlining which course(s) you are interested in participating in, how you will benefit from this coursework, and how you intend on using it to advance your scientific career, and 2) an up-to-date resume listing relevant prerequisites, experience, and coursework with references.

Applications are due by June 30th, 2021 at the latest. The courses being offered this year are as follows:

Introduction to Next Generation Sequencing and Genomic Epidemiology (July 19 - 30)

Taught by: Dr. Vida Ahyong, Dr. Manu Vanaerschot, Dr. Cristina Tato, Dr. Chaz Langelier, Dr. Katrina Kalantar, Dr. Elizabeth Fahsbender, Dr. Allison Black, Dr. Patrick Ayscue-Tse

This course will be tackled in two parts: 1) NGS applications and wet lab methods and 2) phylogenetic tree building & genomic epidemiology. Students will learn about metagenomic NGS analysis, advanced methods for NGS, phylogeographic inference, applied epidemiology for outbreak response, and other related topics.

Prerequisites: A background in molecular biology is recommended.

Bioentrepreneurship: Small Molecule Therapeutic and Diagnostic Development (July 19 - 23)

Taught by: Dr. Julia Schaletzky, Dr. Stephen Isaacs, Rich Robbins, Dr. Michael Rape, and other guest speakers

This course will be taught by experts in therapeutic and diagnostic development and bioentrepreneurship, ranging on topics from key methodologies for drug and diagnostic development to fundraising and breaking into a market.

Prerequisites: Entrepreneurial interest, participants are welcome to bring a business idea to work on

Bioinformatics: Covid19 Pandemic Genome Sequence Analysis and Phylogenomics (August 2 - 13)
Taught by: Dr. Matthew Settles

This Bioinformatic course will cover the analysis of Illumina PCR based whole viral genome sequence data from raw data to assembly and analysis. We'll explore the assessment of sequence quality, PCR impact, and determinant of lineage (variant assignment). We'll perform phylogenetic placement of samples into a greater context. The course will cover all the details from initial sample, library preparation and sequencing to end results and interpretation.

Prerequisites: Familiarity with the linux command line and R, a general understanding of DNA Sequencing. Some time will be devoted to introductory and prerequisite materials, but having some prior familiarity is required in order to be successful in this course.

Scientific Diplomacy (August 2 - 13)
Taught by: Dr. Sanjana Mukherjee, Dr. Marga Gual Soler
Prerequisites: None

Concepts and techniques in modern vaccine design for global infectious disease (July 26 - August 6)
Taught by: Dr. Sarah Stanley, Dr. Oren Rosenberg

For devastating global infectious diseases including HIV and tuberculosis, traditional, largely empirical approaches to vaccine development have failed. Recent advances including reverse vaccinology, new adjuvants, structure based vaccine design, and germline targeting have revolutionized approaches to vaccine development. In this course we will engage in an in-depth analysis of the primary literature in both TB and HIV immunology to understand the state of the art in rational vaccine design. In addition, we will conduct a series of dry labs in which we learn techniques relevant to vaccine development and testing including immunological analysis using flow cytometry and single cell RNA sequencing, and evaluation of antibody/target interactions using structural biology. This workshop will be highly interactive, combining lectures with both large and small group discussions and presentations from the students.

Prerequisites: Coursework in immunology

Scientific Grantwriting & Presentation (August 9 - 13)
Taught by: Dr. Nevan Krogan, Jacqueline Fabius

Students will gain foundational experience and skills in scientific grantwriting and presentation. This five day intensive course will allow for students to prepare research presentations and develop grant proposals, receive feedback, refine their work, and practice the presentation and critique process.

Prerequisites: Students who are actively engaged in research will benefit most from this course.