

LIFS 5070: Workshops in Biosciences (Fall 2023)

Course Instructors:

Prof. Joseph WONG (course director) : botin@ust.hk

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Prof. Hyokuen Park : Hkpark@ust.hk

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A letter grade will be provided for each session, which has its own assessment exercise. The quota is limited as this is a PG experimental course.

Week 1: Introduction to the course

Week 3 Flow Cytometry Prof. Joseph WONG

Flow cytometry, involving precision laminar flow of cells and laser detection, enables the quantification of each cell in a population. The section will include the basics and application of flow cytometry, and demonstration of sample preparation. There will be an introduction, a hand-on session, and a result discussion session.

Week5/6 Bioinformatics Prof. Tom CHEUNG

The bioinformatics section will cover common bioinformatic tools that are publicly available. The goal of this section is to provide skills set for students to perform simple data analysis on publicly available data and extract essential information from these datasets. A hands-on, interactive section will be conducted for the analysis of publicly available microarray data via a problem set. Also, students will acquire a basic understanding of new sequencing technologies, as well as tools for data analysis for this type of data.

Week 9-11 Fluorescence microscopy Prof. Hyokuen Park

Fluorescence microscopy is one of the most powerful techniques in biology. Immunolabeling is a biochemical process that enables the detection and localization of an antigen to a particular site within a cell, tissue, organ, or organism. Antigens can be visualized using a combination of antigen-specific antibody associated with a means of detection. The immunolabeling process reveals information about a cell or its substructures. You will get hands-on experience of immunolabeling.

Week 12/13 Super-resolution microscopy by Prof. Zhen LIU

Super-resolution imaging is a collection of techniques that push the resolution of light microscopy to nanometers, which provides unprecedented resolving power on the details of subcellular structures/assemblies. This section will introduce the principles and applications of super-resolution microscopy. A hands-on session will allow students to learn two popular super-resolution techniques: 3D-SIM and STORM