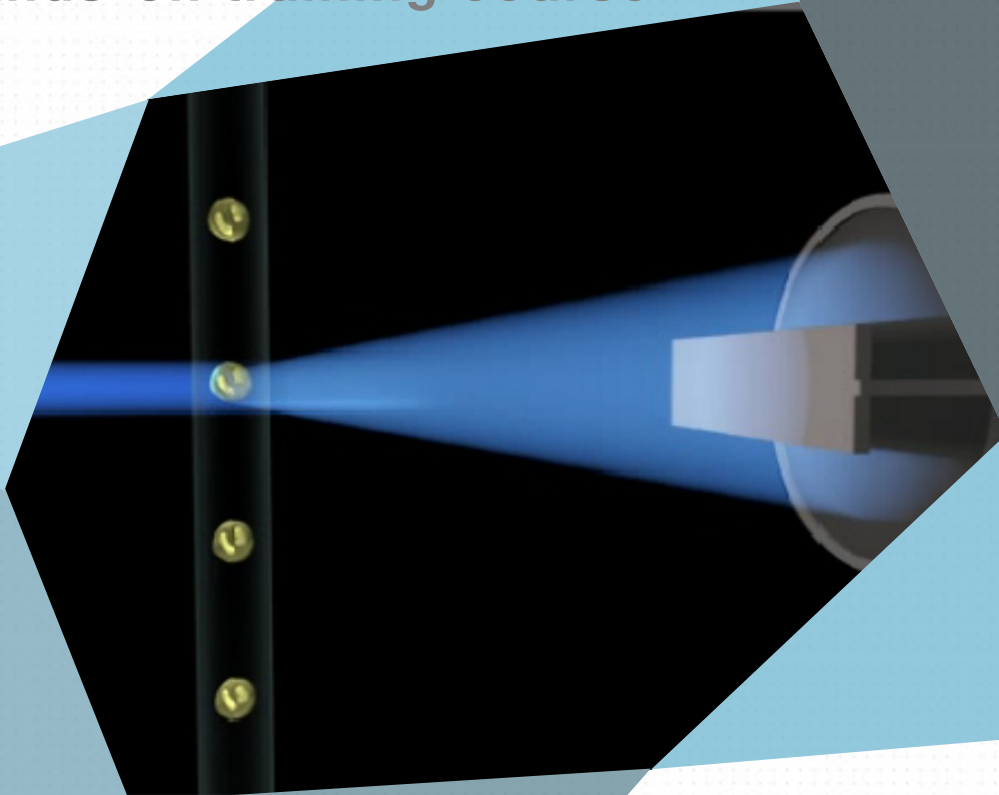


# FLOW CYTOMETRY

Hands-on training course



**Center for  
Biomedical Training**  
*Learning by Doing*

**VIỆN TẾ BÀO GỐC**

Trung tâm Đào tạo Y Sinh học

Trường Đại học Khoa học Tự nhiên, Đại học Quốc gia Tp.HCM

<http://www.biomedicaltrainingcenter.org>

# Biomedical Training Center STEM CELL INSTITUTE



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## Biomedical Training Center

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# Introduction

Flow cytometry (FCM) is the most powerful, valuable and modern tool to analyze and characterize the cells. Therefore, it becomes an essential technique in the all experimental laboratory from microorganism, plant to animal as well as human cell research.

## CONTENTS

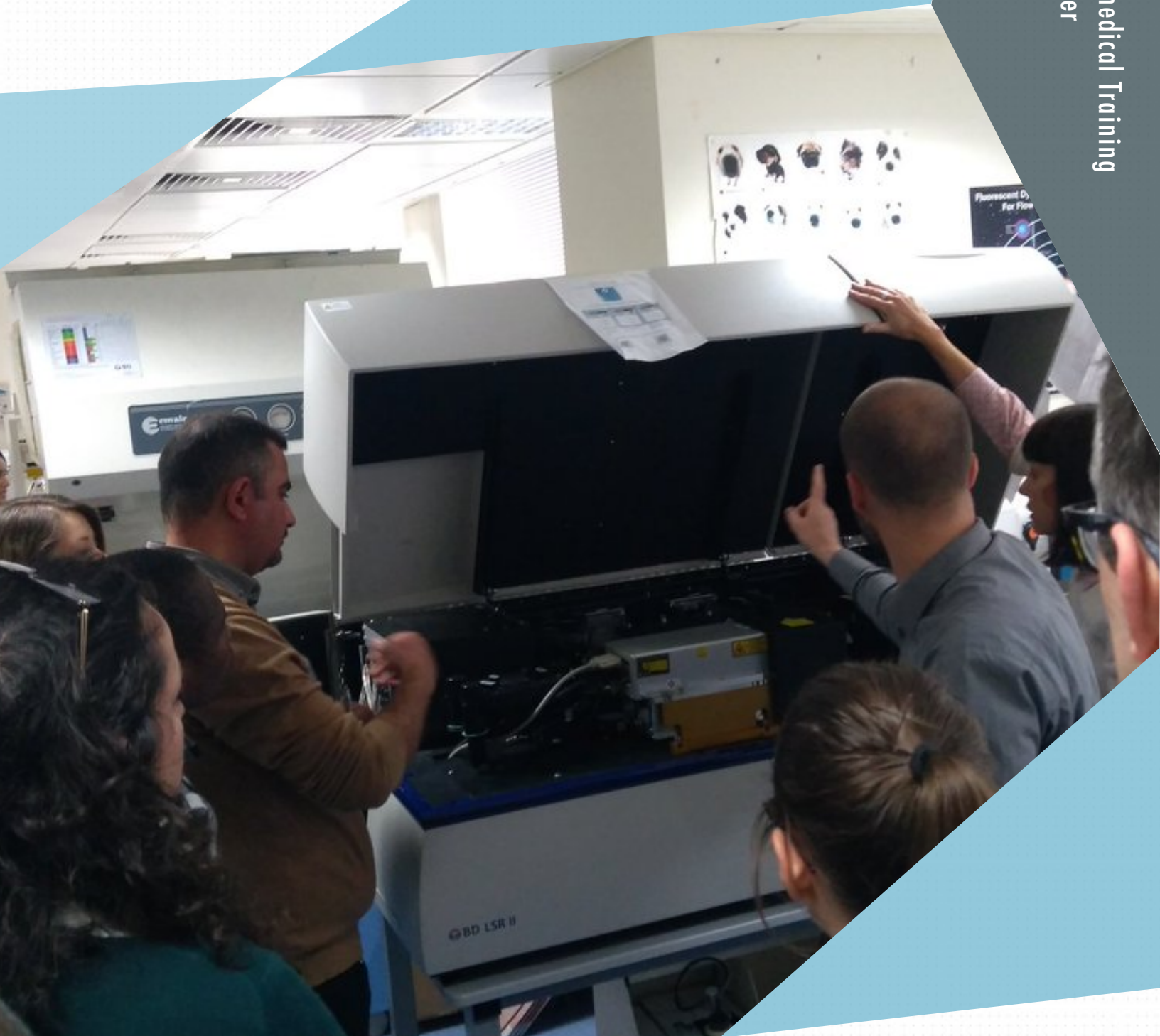
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Understanding demands for FCM training, Biomedical Training Center - Stem Cell Institute (University of Science, VNUHCM) (BTC-SCI) would like to open the FCM hands-on training course to help students, doctors, scientists, researchers use this tool in research.

Because of broad applications of FCM in biology, medicine, and biomedicine, the FCM hands-on training course will be divided into some different classes from primary to advanced.

BTC-SCI hopes that FCM hands-on training course will help trainees understand and practice the FCM.

## BTC-SCI



Class:  
FCM1

BASIC  
FLOW CYTOMETRY

# FCM 1 :

## BASIC FLOW CYTOMETRY

### INTRODUCTION

FCM1 is basic flow cytometry course to provide the fundamental knowlegdement for beginners.

### DURATION

2 days

- Time: **02 months/class**
- Max. Participants/class: **10**
- Min. Participants/class: **05**
- Language: **VN + EN**
- Place: **Stem Cell Institute**
- Target group: **Any person interested in using flow cytometry and its applications.**

- Setup of scatter and fluorescence detectors
- Staining of cell samples
- Compensation and data acquisition
- Analysis of flow cytometry data, including identification of cell populations and the meaning of statistical values

#### Learning objectives

- Understand principles of flow cytometry and its applications
- Design, perform, and analyze a multiparameter flow cytometry experiment, including setting up proper controls and adjusting instrument settings

#### Training includes

- Training materials, including handouts of presentations and application notes
- Certificate of completion
- Handouts for practical training
- Flow cytometry data for exercises and software practice

### FEE

**3.500.000 VNĐ/trainee**

### PROGRAM

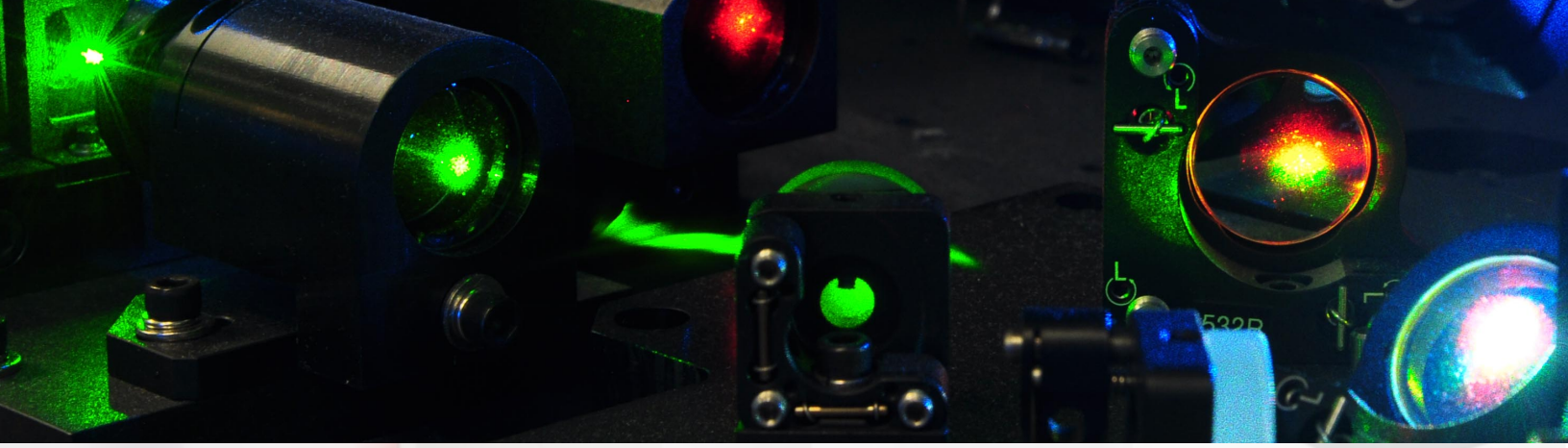
#### Course lectures and exercises include:

- Basics of flow cytometry
- Compensation of the spectral overlap of fluorochromes
- Setting up a multiparameter cell analysis experiment
- Data analysis with some Softwares from BD Bioscience



**PARTNER**

#### Laboratory practical training includes:



Class:  
FCM2

ADVANCED  
FLOW CYTOMETRY

# FCM2 ADVANCED FLOW CYTOMETRY

## INTRODUCTION

This two-day course will start by covering the fundamental areas critical for successful flow cytometry: Reagents, Hardware, Controls, Compensation, and Data Analysis. The second day will build upon these concepts with a focus on practical application of flow cytometry including: Polychromatic Panel Design, Statistics, Cell Cycle analysis, Apoptosis and Troubleshooting.

## PARTICIPANTS

**Users with basic flow cytometry knowledge** seeking to understand the essential concepts in flow cytometry and a desire to move into higher-end assays (from 4 color to 8+ color experiments). Learning these principles will ensure your flow cytometry experiments will yield results – ultimately saving you time and money in the long run.

Time	03 months/class
Participants	Min: 4, Max: 8
Language	VN + EN
Duration	02 days
Fee	7.000.000 VNĐ/trainee

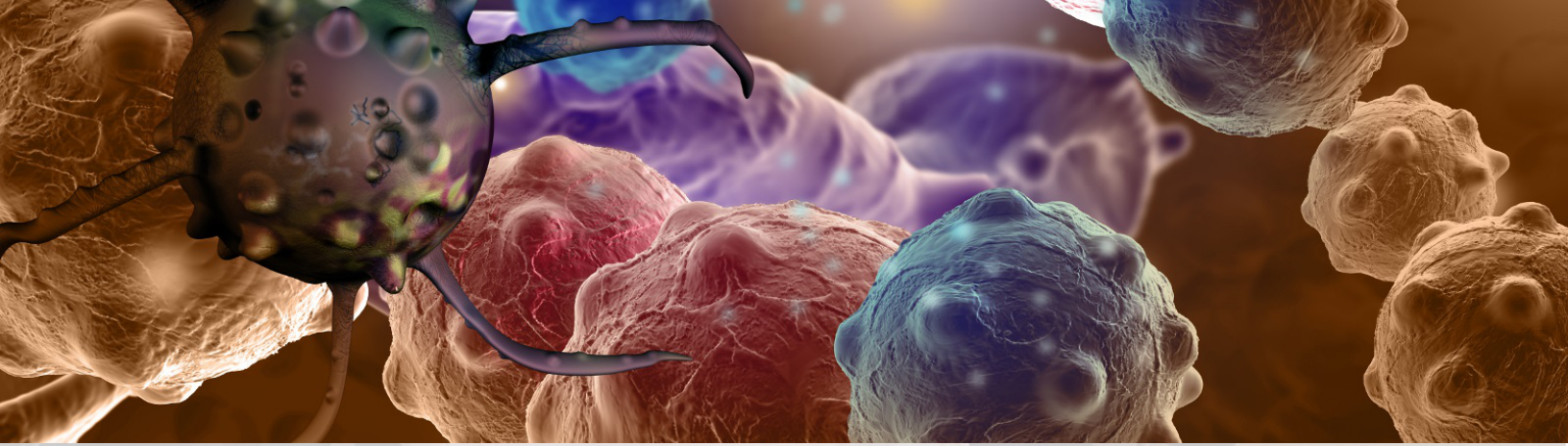
At the end of the course the participant will be able to:

1. Design and optimize a multiparameter flow cytometry experiment or procedure.
2. Implement routine measures to standardize and ensure quality of flow cytometric procedures.
3. Discuss the applications, limitations, and pitfalls of flow cytometric procedures in the following clinical areas:
  - immunophenotyping
  - apoptosis/necrosis
  - cell cycle
  - cytokine evaluation
  - DNA analysis
  - rare event detection

## TRAINING INCLUDES

- Training materials, including handouts of presentations and application notes
- Certificate of completion
- Handouts for practical training
- Flow cytometry data for exercises and software practice

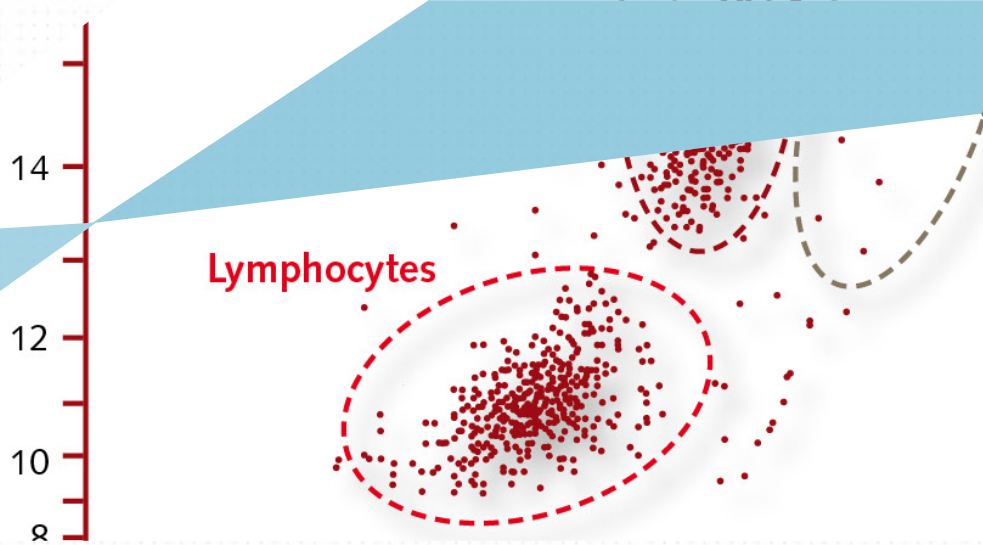




Class:  
**FCM3**

**CLINICAL**  
FLOW CYTOMETRY





# FCM 3 : CLINICAL FLOW CYTOMETRY

## INTRODUCTION

Our 2-day Clinical Flow Cytometry CPD training course helps biomedical scientists to develop an in-depth understanding of the principles, troubleshooting and applications of flow cytometry in a clinical setting.

## PARTICIPANTS

**Users with basic flow cytometry knowledge** seeking to understand the essential concepts in flow

<b>Time</b>	03 months/class
<b>Participants</b>	Min: 4, Max: 8
<b>Language</b>	VN + EN
<b>Duration</b>	02 days
<b>Fee</b>	7.000.000 VNĐ/trainee

cytometry and a desire to move into higher-end assays, especially in clinical applications.

**At the end of the course the participant will be able to:**

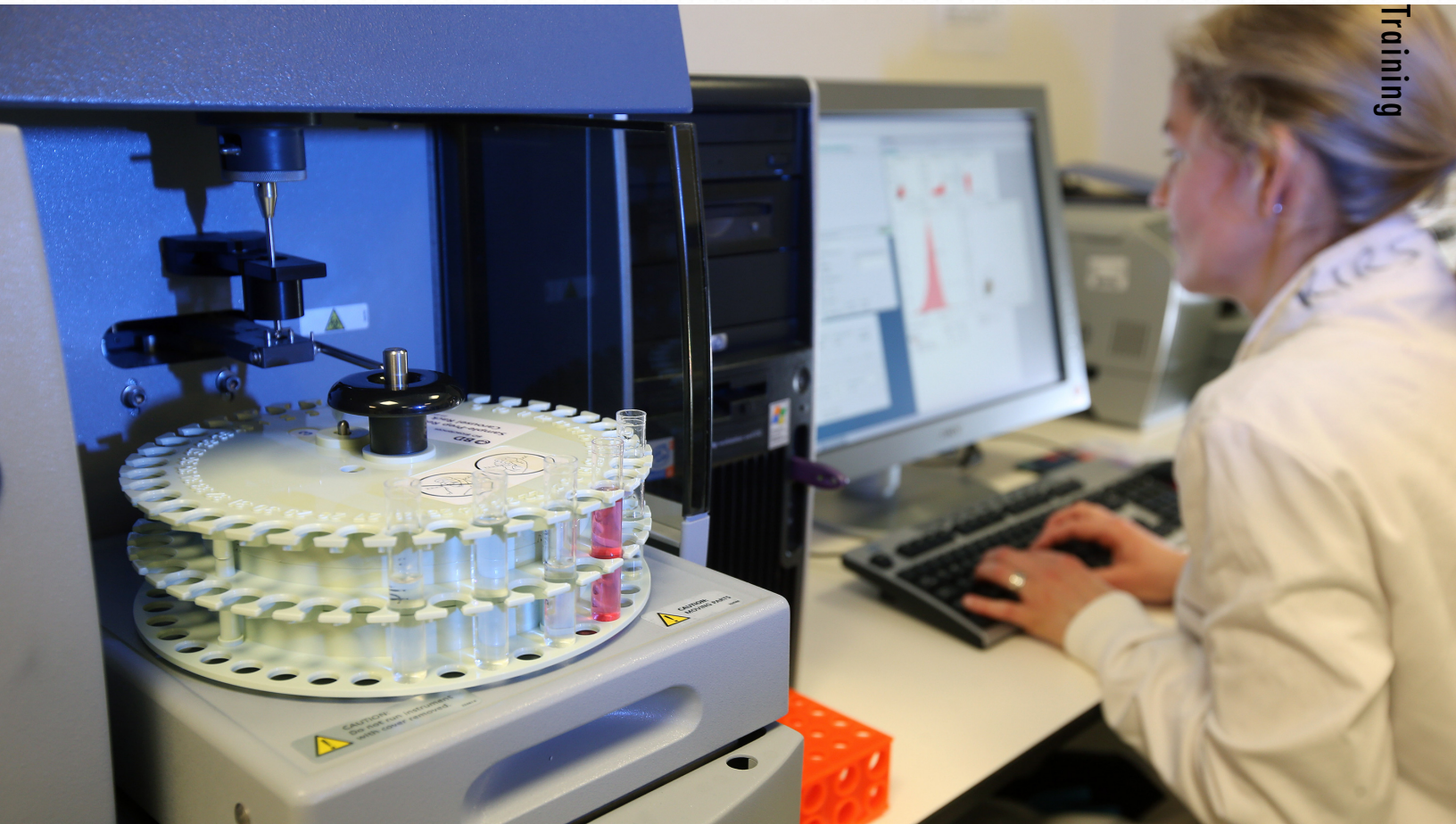
1. Design and optimize a multiparameter flow cytometry experiment or procedure.
2. Implement routine measures to standardize and ensure quality of flow cytometric procedures.
3. Discuss the applications, limitations, and pitfalls of flow cytometric procedures in the following clinical areas:
  - immune deficiency
  - CD34 enumeration
  - cytokine evaluation
  - diagnosis and monitoring of hematolymphoid neoplasms
  - DNA analysis
  - rare event detection

## TRAINING INCLUDES

- Training materials, including handouts of presentations and application notes
- Certificate of completion
- Handouts for practical training
- Flow cytometry data for exercises and software practice

**PARTNER**





# Multiparametric Immunophenotyping of Human Hematopoietic Stem Cells and Progenitor Cells by Flow Cytometry

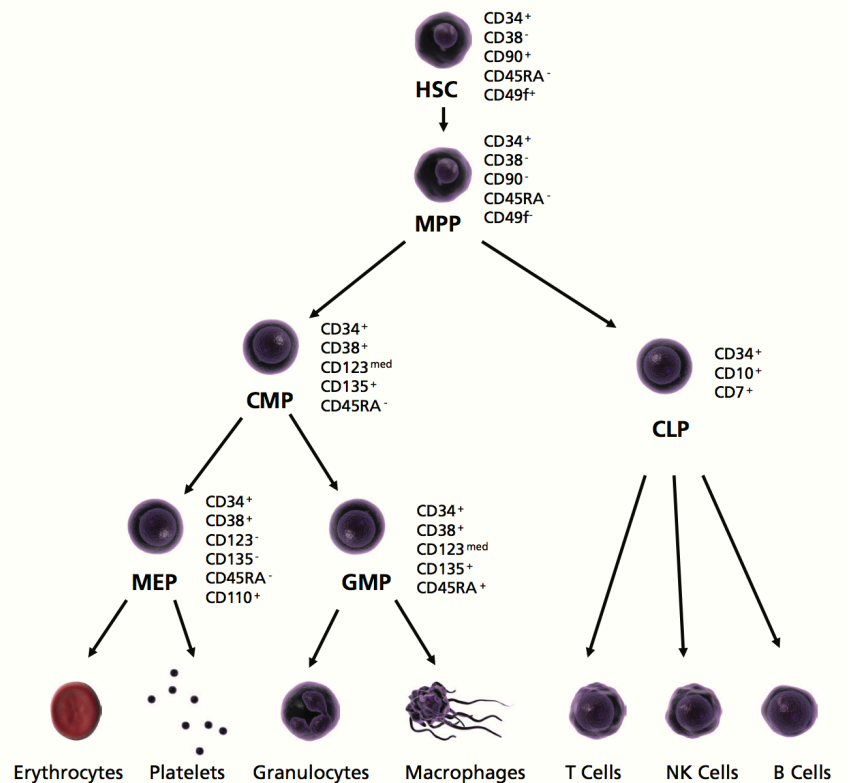
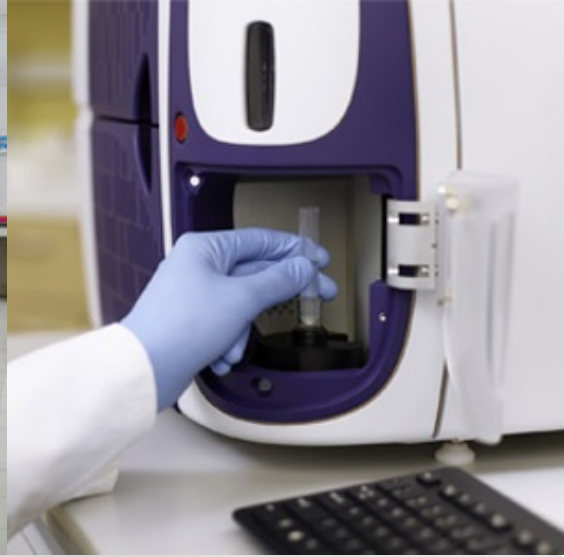
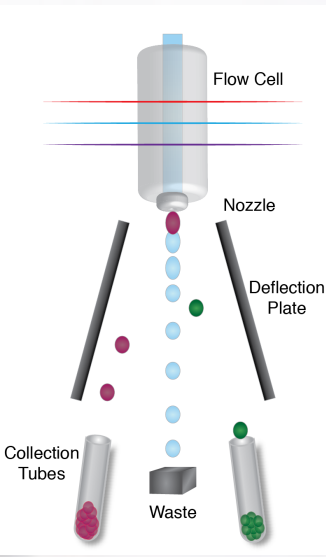
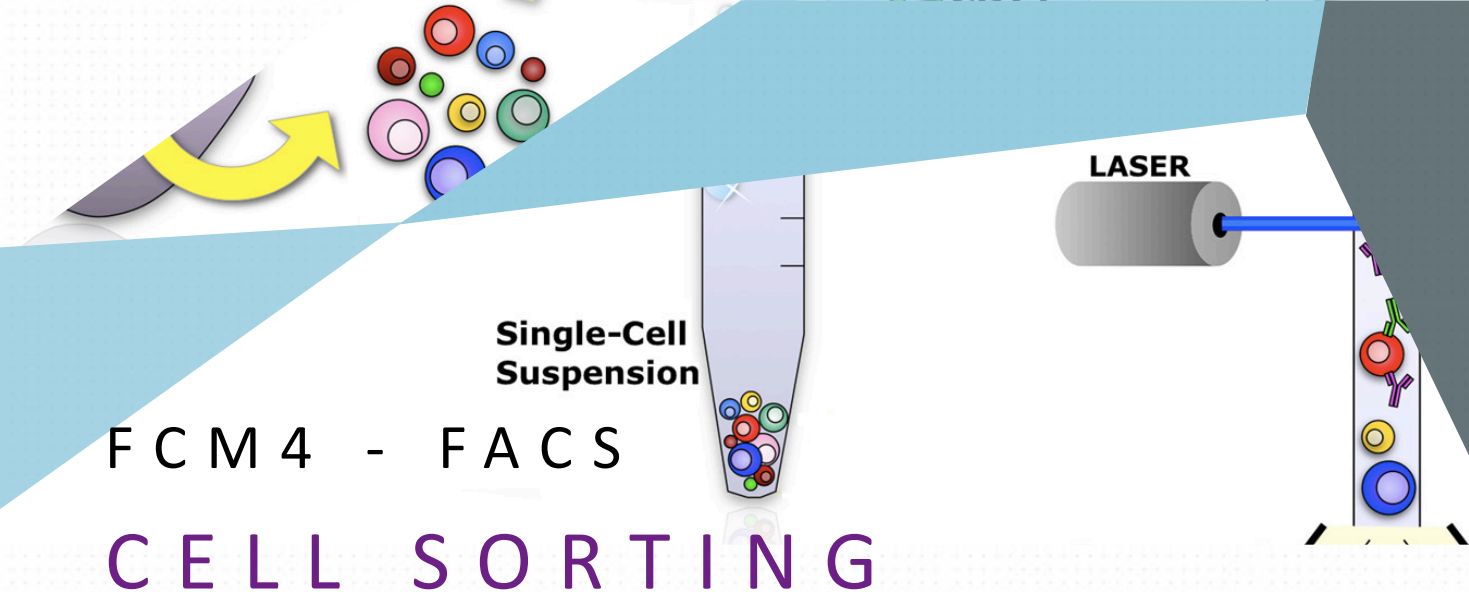


Figure 1. Overview of hematopoietic stem cell differentiation



Class:  
**FCM4**

CELL SORTING  
FLOW CYTOMETRY



# FCM 4 - FACS CELL SORTING

## INTRODUCTION

This course on the fundamentals of high-end cell sorting will enable scientists to properly use the global upstream technology of cell sorting with high confidence. Cell sorting is essential to many studies, but researchers outside of core facilities have very limited knowledge how exactly sorting works and unknowingly produce erroneous samples or even scientifically crippling data.

## PARTICIPANTS

The course is intended for PhD students and postdocs who are starting to use, or already using flow cytometry based cell sorting in their research projects. Applicants with some previous active knowledge of basic principles of flow cytometry and a regular use of flow cytometers in daily research will profit most from the content of the course.

Time	06 months/class
Participants	Min: 4, Max: 8
Language	VN + EN
Duration	02 days
Fee	15.000.000 VNĐ/trainee

## MODULES

The topics covered will be the common principles of cell sorting applicable to all droplet sorters, how to properly maintain and evaluate the principle components of a cell sorter and how to correct or avoid technical insufficiency, performing single cell sorts for sequencing or any other common downstream method.

Our main aim is to provide our attendees with the right knowledge and experience about cell sorting so that they can go back to their research with high confidence about their sorts.

## AT THE END OF THE COURSE THE PARTICIPANT WILL BE ABLE TO:

Design and practice the cell sorting experiments.

## TRAINING INCLUDES

- Training materials, including handouts of presentations and application notes
- Certificate of completion
- Handouts for practical training
- Flow cytometry data for exercises and software practice

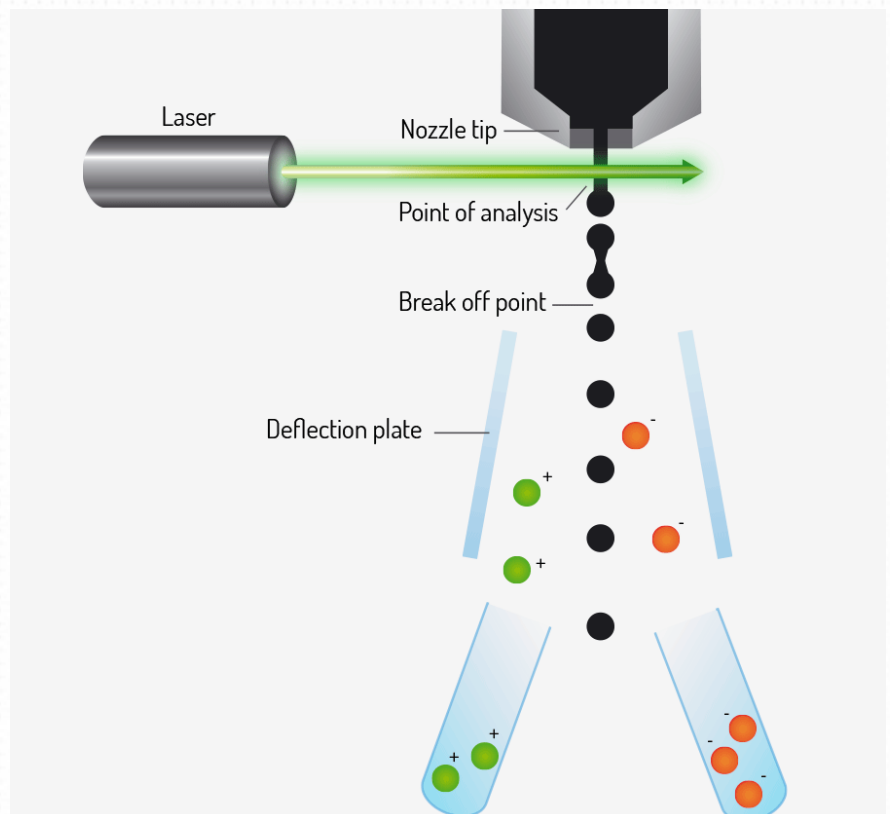
## PARTNER



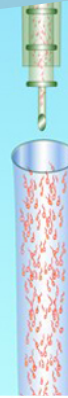


Fluorescence-activated **cell sorting** (FACS) is a specialized type of flow cytometry. It provides a method for **sorting** a heterogeneous mixture of biological **cells** into two or more containers, one **cell** at a time, based upon the specific light scattering and fluorescent characteristics of each **cell**.

## CELL SORTING - FACS



# Magnetic Activated Cell Sorting FCM5 - MACS



## CELL SORTING

### INTRODUCTION

This course aims to provide the knowledge and skill to use the MACS technique in sorting/separation cells based on the expression of surface proteins with specific antibody in conjugation with nanoparticles.

The participants can understand about theory and how to use this techniques during their experiments.

### PARTICIPANTS

The course is intended for students who are starting to use cell sorting that their labs do not have the FACS cell sorters. Applicants with some previous active knowledge of basic principles of flow cytometry.

### MODULES

Time	06 months/class
Participants	Min: 4, Max: 8
Language	VN + EN
Duration	01 days
Fee	3.500.000 VNĐ/trainee

The topics covered will be the common principles of MACS cell sorting. The participants also would be introduced some different styles of MACs for negative or positive selection.

### AT THE END OF THE COURSE THE PARTICIPANT WILL BE ABLE TO:

Design and practice the MACS cell sorting experiments.

### TRAINING INCLUDES

- Training materials, including handouts of presentations and application notes
- Certificate of completion
- Handouts for practical training



### PARTNER



## CELL SORTING - MACS

*Magnetic-activated cell sorting (MACS) is a method for separation of various cell populations depending on their surface antigens (CD molecules) invented by Miltenyi Biotec. The name MACS is a registered trademark of the company.*

*The method is performed using Miltenyi Biotec's MACS Technology, which uses superparamagnetic nanoparticles and columns. The superparamagnetic nanoparticles are of the order of 100 nm. They are used to tag the targeted cells in order to capture them inside the column. The column is placed between permanent magnets so that when the magnetic particle-cell complex passes through it, the tagged cells can be captured. The column consists of steel wool which increases the magnetic field gradient to maximize separation efficiency when the column is placed between the permanent magnets.*



Learning by doing



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