



SEMMELWEIS  
UNIVERSITY 1769

SEMMELWEIS FOR GLOBAL HEALTH

# BioAFM Summer School

## THEORY & HANDS-ON TRAINING

SEMMELWEIS UNIVERSITY  
Budapest, Hungary

July 6-7, 2026

**Organizer:** Semmelweis University, Department of Biophysics and Radiation Biology  
Directorate of International Relations and Alumni Affairs  
**Venue:** Basic Medical Science Center, Semmelweis University  
Tűzoltó utca 37-47, Budapest, Hungary

# WHO WE ARE

## About Semmelweis University



### SEMMEWEIS UNIVERSITY IN WORLD RANKINGS

#### Times Higher Education Rankings by Subject 2026

Medical and Health TOP 176-200

#### THE World University Rankings 2026

TOP 251-300

#### Shanghai Ranking 2025

Pharmacy & Pharmaceutical Sciences TOP 51-75  
Clinical Medicine TOP 151-200

#### US News Best Global Universities 2025

Cardiac and Cardiovascular Systems #35  
Clinical Medicine #181

## EDUCATION, RESEARCH, AND HEALTHCARE

Semmelweis University was **founded in 1769**, more than 250 years ago. Today Semmelweis University is one of **the leading medical higher education institutions, healthcare providers**, and centers of research excellence in Hungary and Central Europe.

With its six faculties and a Doctoral College, the University covers all aspects of medical and health sciences education, offering a wide range of programs from undergraduate to doctorate level in three languages: Hungarian, English, and German.

International students from around the world choose Semmelweis University to acquire hands-on, competitive knowledge from distinguished professors in an environment equipped with state-of-the-art technology.

Semmelweis University is widely known for its strong emphasis on a balanced ratio of **theoretical knowledge and practical skill development in the field of medicine and health sciences**.

Our **more than 40 patient care units** provide the perfect environment for students to develop their practical skills, enabling them to become future-proof health professionals.

The international **short courses and intensive training programs** offer a unique opportunity for students and professionals to get an insight into Semmelweis University's international education, scientific and patient care activities, and also gain valuable professional and cultural experiences.

We are looking forward to welcoming international students for our short courses and training programs in Budapest, Hungary!

**Dr. Tamás Hegedüs**

Director of International Relations and Alumni Affairs



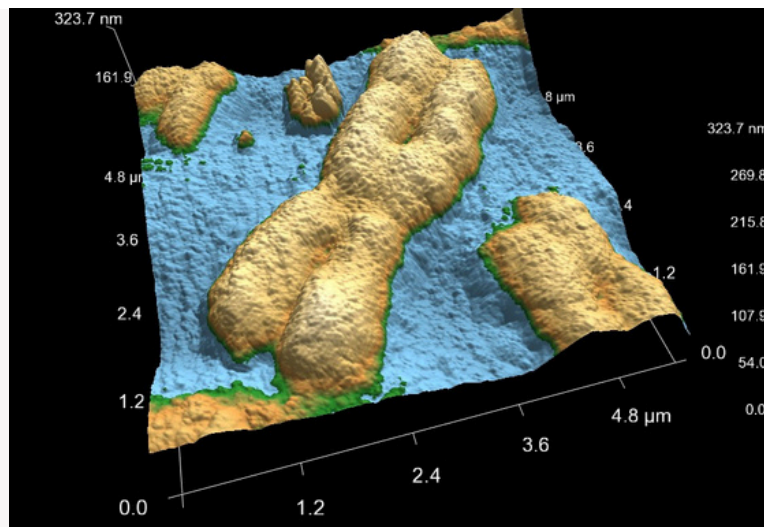
Find out more about Semmelweis University [here](#).

# WHAT WE OFFER



## About the course

The BioAFM Summer School is a two-day, hands-on training course for PhD students, postdoctoral fellows, and researchers interested in biophysics, molecular mechanics, structural biology, and advanced bioimaging. Organized by the Department of Biophysics and Radiation Biology at Semmelweis University, the course introduces participants to the biological applications of Atomic Force Microscopy (AFM), combining theoretical foundations with practical laboratory experience.



*Human metaphase chromosome*

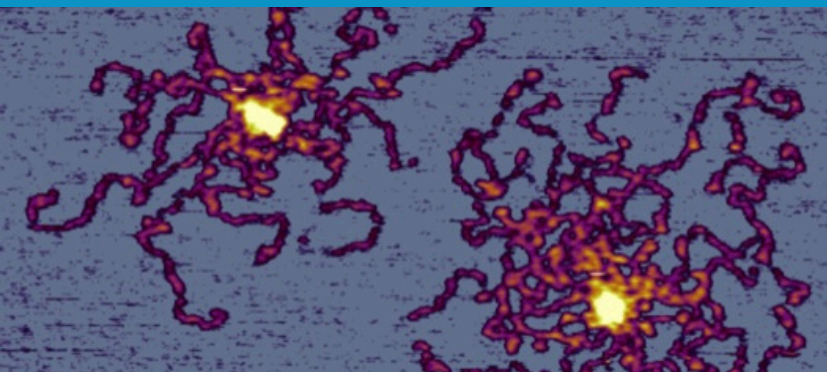
## Why attend

Participants will explore the key principles and practical use of AFM, including cantilever mechanics, resonance, imaging modes, sample preparation, and biomolecular scanning. Guided by Semmelweis University faculty with more than two decades of AFM-based research experience, the course offers practical insight into nanoscale imaging and force measurements on biomolecules, cells, and tissues.

## What you will gain

By the end of the course, participants will be able to:

- Understand the basic physical principles behind AFM imaging and force measurements.
- Explain key AFM components, imaging modes, and biological applications.
- Prepare biological samples and perform basic AFM measurements.
- Acquire and interpret AFM images of biomolecules and cells.
- Recognize how AFM can support research in structural biology, molecular mechanics, and biomedical sciences.



*Oligomers of the giant muscle protein titin*

# SCHEDULE

## Day 1-2



### 2026. JULY 6

#### DAY 1. FUNDAMENTALS & INSTRUMENTATION

9:00-12:00	AFM principles, imaging modes, cantilever types, surface types, and biological applications. Introduction to the physical principles of AFM, including Hooke's law, resonance, resonant frequency, and force spectroscopy.
12:00-13:00	Lunch break
13:00-15:00	Lab practice using an educational AFM model: cantilever deflection, resonance, resonant frequency measurement, and principles of AFM scanning.
15:00-15:20	Coffee break
15:20-16:00	Summary, Q&A

### 2026. JULY 7

#### DAY 2. MEASUREMENTS & HANDS-ON TRAINING

9:00-16:00	Demonstration and hands-on AFM measurements on biological samples using three AFM instruments in parallel. Surface preparation, cantilever placement and tuning, basic scanning, individual image acquisition, and multimodal imaging.
16:00-17:00	Opportunity to investigate participant-provided samples, followed by closing remarks and distribution of certificates.

#### Available AFM instruments:

- [Cypher AFM – Asylum Research](#) (now Oxford Instruments)
- [MFP-3D - Asylum Research](#) (now Oxford Instruments) (combined with TIRF microscopy)
- [Nanosurf Drive AFM](#) (combined with phase contrast and epifluorescence microscopy)

# JOIN THE PROGRAM

## Application & Registration



## APPLICATION PROCESS

### 1. APPLICATION & REGISTRATION

- Interested participants are required to complete their registration via our [online registration platform](#). Registration is only considered valid upon successful payment.

### 2. PAYMENT

- The course fee can be paid immediately upon registration through our SimplePay online payment system.

### 3. COURSE FEE

- 300 EUR / person

### 4. PAYMENT DEADLINE

- June 29, 2026

**Course fee:**  
**300 EUR / person**

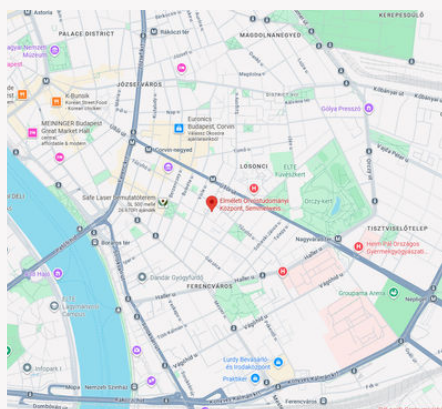
For more information, please contact Dr. Zsolt Mártonfalvi at [martonfalvi.zsolt@semmelweis.hu](mailto:martonfalvi.zsolt@semmelweis.hu)

## VENUE

Semmelweis University  
Basic Medical Science Center

Directly accessible by metro  
line M3.

Address: 37-47 Tűzoltó utca,  
Budapest, 1094





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## CONTACT

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Find more information about the Directorate [HERE](#).