



## **Summer School 2023 – Electron Microscopy Sample Preparation (NTEU-SS-EMSP)**

**Blended Intensive Programme in the framework of NeurotechEU  
BIP ID: 2021-1-HU01-KA131-HED-000010147-1**

Coordinating university: University of Debrecen, Debrecen, Hungary

Partners: NeurotechEU universities <https://theneurotech.eu/universities>

Scientific Coordinator: Peter Szucs

Host university teaching staff /experts: Greta Kis, Vera Etelka Szarvas, Peter Szucs

Invited on-line teaching staff: TBA – from partner universities of NeurotechEU

Dates: 10<sup>th</sup> -22<sup>th</sup> July 2023

Virtual activity (on-line lectures on the theory of sample preparation): **10<sup>th</sup> -13<sup>th</sup> July 2023**

Dates of physical activity: **17<sup>th</sup> -22<sup>th</sup> July 2023**

Location(s) of the physical activity:  
University of Debrecen, Debrecen, Hungary  
Department of Anatomy, Histology and Embryology

Target audience: Students enrolled in universities part of the NeurotechEU alliance (bachelor / master / doctoral / postgraduate studies in medicine and / or neurosciences), electron microscopy technicians, laboratory assistants. (max. 16 participants)

Applications: managed by home universities according to their procedures

Number of ECTS granted: **3**



**UNIVERSITY of  
DEBRECEN**



Language of instruction requirements: English – recommended level minimum B2.

**Brief description:**

The first part of the NTEU-SS-EMSP course will be held on-line and theoretical background of sample preparation and Electron Microscopy techniques will be discussed by tutors from UD and partners from the NeurotechEU.

The second part of the course will be a 5 day long practical course, held in the Electron Microscopy Laboratory of the Department of Anatomy, Histology and Embryology (UD). During the hands-on training participants will have the chance to observe fixation methods, sectioning with the ultramicrotome, osmification, dehydration, embedding, mounting. A separate day will be dedicated to manual and automated (ATUMtome) serial ultrathin section cutting. They will also get an introduction to recognizing basic neuronal and glial structures on EM images.

**Objectives:**

The BIP aims to provide early-stage researchers and technicians an insight and „hands-on” training in nervous tissue sample handling, and preparation for Transmission Electron Microscopy and Serial Block-Face Scanning Electron Microscopy.



Provisional schedule:

1<sup>st</sup> day (17 July, Monday)

Transcardial perfusion, brain tissue sampling / vibratome sectioning (for SBF-SEM)

2<sup>nd</sup> day (18 July, Tuesday)

Embedding of resin impregnated tissue blocks in capsules / mounting of resin impregnated sections on slides / preparation of formvar coated grids

3<sup>rd</sup> day (19 July, Wednesday)

Practical overview of osmification, dehydration and embedding steps

4<sup>th</sup> day (20 July, Thursday)

Manual and automated cutting of serial ultrathin sections using ultramicrotome and ATUMtome / glueing osmificated blocks on pins for SBF-SEM / Sightseeing (optional)

5<sup>th</sup> day (21 July, Friday)

Manual and automated cutting of serial ultrathin sections using ultramicrotome and ATUMtome / glueing osmificated blocks on pins for SBF-SEM / Sightseeing (optional)

6<sup>th</sup> day (22 July, Saturday)

Trip to Hortobágy, a nearby National Park (optional)

Accommodation: University Dormitory on Campus