

# Report on the 19th International Scientific Workshop and Postgraduate Course on Electroporation-Based Technologies and Treatments (EBTT)

## Date and Location:

The 19th edition of the International Scientific Workshop and Postgraduate Course on Electroporation-Based Technologies and Treatments (EBTT) took place from November 10–15, 2025, at the University of Ljubljana, Faculty of Electrical Engineering, in Ljubljana, Slovenia. The event was also held in a hybrid format, allowing participants to join online.

## Background:

The EBTT course has been part of the PhD programme in Biomedicine at the University of Ljubljana since 2003. Initially held biennially, the course has been conducted annually since 2011. It is designed for both newcomers and seasoned experts in the field of electroporation, including doctoral students, researchers, and end-users.

## Participation:

This year's EBTT School attracted 38 participants, including 29 attendees on-site and 9 online. The event also featured 22 speakers (21 on-site and 1 online) from 22 different countries. Registration for the on-site participation was closed in mid-October due to reaching full capacity.

## Key Highlights:

A key event during the EBTT was the roundtable discussion on "*Non-thermal ablation and drug delivery by electroporation: expanding current indications.*" This session featured 10 panellists and was followed by an interactive discussion with more than 100 participants, both in-person and online. A diverse audience attended, including representatives from academic institutions (47%), companies (39%), governmental organizations (11%), and healthcare providers (2%). The complete edited recording of the roundtable is available for viewing online (<https://2025.ebtt.org/round-table-recording/>) and has already garnered substantial interest.

## Topics Covered:

The focus of the 2025 EBTT covered a range of subjects in electroporation technology, including:

- Electrical properties of cells and tissues and their behavior in an electric field
- Physical chemistry of membrane electroporation
- Electroporation in vitro and in vivo
- Development of electroporation devices and electrodes
- Electrochemotherapy of tumors
- Applications of electroporation in gene transfection

Lectures were delivered by both faculty members and invited experts, who provided cutting-edge insights into their respective fields. Notable speakers included:

- Helmut Pürerfellner (Austria) on his experience with new PFA technology
- Indrawati Oey (New Zealand) on PEF in food processing
- Tobian Muir (United Kingdom) on bleomycin electro sclerotherapy in treatment of vascular malformations
- Martijn Meijerink (The Netherlands) on the role of IRE in interventional radiology and oncology
- Frederic Deschamps (France) on electrochemotherapy as salvage therapy for vertebral metastases
- Quim Castellvi (CardioFocus, USA) on electrophysiological effects of electroporation on myocardium
- Matevž Jan (Slovenia) on pulsed field ablation treatment for cardiac arrhythmias

#### **Practical Exercises and Laboratory Sessions:**

The course featured both theoretical and practical components. In the mornings, participants gained theoretical knowledge through lectures, while the afternoons were dedicated to hands-on laboratory sessions. Participants were invited to the laboratories for practical experience, with 21 different lab exercises offered. A total of 18 exercises were conducted on-site, including in wet labs, clinics, computer rooms (for simulations), and hardware labs. Additionally, 4 online lab exercises were available for remote participants.

#### **Commercial Exhibits and Demonstrations:**

During the Friday coffee break and lunch, a display of commercially available and "home-made" electroporators from the Laboratory of Biocybernetics, Faculty of Electrical Engineering, University of Ljubljana, was set up. Participants had the opportunity to explore and try out the devices.

#### **Social Event:**

The social event was organized for students on Tuesday evening. Students gathered for a fun-filled bowling night, sharing laughs, friendly competition, and plenty of high-fives. Whether they were seasoned bowlers or trying it for the first time, everyone enjoyed a relaxed evening of music, conversation, and unforgettable gutter balls. It was a great opportunity to unwind, meet new people, and create memories outside the classroom.

#### **Conclusion:**

The 19th edition of the EBTT School was a resounding success, with a diverse and engaged audience, as well as a comprehensive programme covering both theoretical and practical aspects of electroporation technology. Since its inception, the EBTT course has welcomed

1288 participants from 46 countries. Our commitment to delivering high-quality experiences remains a priority, and we continue to strive for further improvements to meet the needs of all participants, whether attending on-site or online.

The next edition of the EBTT is already being planned, with a goal to expand on the success of this year's course and provide even greater learning opportunities for future participants.

The Bioelectrochemical Society has supported EBTT continuously for 22 years for which we are very grateful.

Chairman of the EBTT:

Saša Haberl Meglič, PhD

Course Director:

Professor dr. Damijan Miklavcic, dr.h.c.



Lecture room, 2025.



Round table, 2025.



Poster session, 2025.



Social event – Icebreaker, 2025.