



Newsletter No. 111

11th International School on Bioelectromagnetism “Alessandro Chiabrera”
Advances in Electroporation-Based Therapy: From Principles to Clinical
Applications; Erice, Sicily, Italy | May 2–7, 2025

Newsletter by: Amir Ghassabi, Sapienza University of Rome, Italy; and
Pedro Santos, Georgia Institute of Technology, GA, USA
amir.ghassabi@uniroma1.it; psilva34@gatech.edu

From Basics to Frontiers: A Structured Learning Journey

Hosted at the Centre for Scientific Culture in Erice (Sicily, Italy) — named after the renowned Italian scientist Ettore Majorana — the Erice International School of Bioelectromagnetism (EISBem) brings together experts in the field. Bioelectromagnetics topics have been featured in Erice on numerous occasions through international courses and workshops. In 2003, the Ettore Majorana Centre established the School of Bioelectromagnetism, «Alessandro Chiabrera», dedicated to studying the biological effects of electric, magnetic, and electromagnetic fields. The school is directed by Ferdinando Bersani (University of Bologna, Italy) and Maria Rosaria Scarfi (CNR-IREA, Naples, Italy). The 2025 Course on Electroporation brought together leading scientists, clinicians, engineers, and students from around the world for six days of immersive lectures, hands-on sessions, and vibrant discussion. The directors of the course were Micaela Liberti (Sapienza University of Rome, Italy) and Rafael Davalos (Georgia Tech, USA).

Day 1 – The Basics

The course opened with a comprehensive overview of electroporation principles. Lluís M. Mir who presented an incredible four lectures with significant contribution during the school introduced the fundamentals of pulsed electric field delivery, followed by Lea Rems detailing the cellular and molecular mechanisms of membrane permeabilization. Afternoon lectures addressed both reversible and irreversible electroporation (IRE/PFA), as explained by Rafael Davalos, and Maja Cemazar expanded on electroporation-based transfection techniques. Emanuela Signori offered insight into immune responses post-electroporation, laying the groundwork for its therapeutic synergy with immunotherapy.

Day 2 – The Electric Field and Engineering Considerations

Building on the foundational insights from Day 1, the second day shifted focus toward the technical and engineering side of electroporation. Micaela Liberti and Edward Jacobs compared electric field generators for reversible and irreversible applications. Antoni Ivorra explored collateral effects such as Joule heating and electrochemical interactions, while Stefania Romeo emphasized the importance of field coupling and computational modeling. Afternoon talks delved into the role of protocol parameters and the promising use of AI in modeling and treatment planning, particularly for liver tumor ablation led by Clair Poignard.

Day 3 – Practical Immersion and Industry Dialogue

Participants engaged in hands-on learning with labwork modules designed to simulate and apply field calculation techniques. Micaela Liberti and Roberta Fusco, supported by industry partners like IGEA, led simulations on basic EP configurations and personalized case studies using CT/MRI data. The vegetable tissue lab offered a tactile demonstration of electroporation effects.

Continued verso...



Newsletter Editor

Damijan Miklavčič
University of Ljubljana, Slovenia
damijan.miklavcic@fe.uni-lj.si

Newsletter Technical Editor and Website Administrator

Samo Mahnič-Kalamiza
University of Ljubljana, Slovenia
samo.mahnic-kalamiza@fe.uni-lj.si

Society Council Members

Emanuela Signori, IT
President

Indrawati Oey, NZ
President-Elect

Javier Raso, ES
Past President

Caterina Merla, IT &
Antoni Ivorra, ES
*Officer: Engineering / Physical
Sciences*

Julita Kulbacka, PL &
Anna Bulysheva, US
Officer: Biological Sciences

Clair Poignard, FR
Officer: Medical Applications

Stefan Töpfl, DE
Officer: Food Applications

Felix Schottroff, AT
Officer: Environment Applications

Christian Gusbeth, DE &
Peter Kramar, SI
Officer: At Large



...continued from previous page

Day 4 – Clinical Applications: Bench to Bedside

After extensive technical sessions and practical modules, Day 4 turned to clinical application and real-world integration. The morning began with Gregor Serša framing clinical themes. Julie Gehl and Richard Heller presented state-of-the-art applications in electrochemotherapy (ECT) and gene electrotransfer (GET), respectively. Maja Cemazar showcased veterinary oncology case studies, while Fernando Burdio discussed IRE applications in human surgery.

A highlight was Giulia Bertino's presentation on the International Network for Sharing Practices on Electrochemotherapy (Insp-ECT), emphasizing collaborative efforts to harmonize ECT protocols. An Industry Panel featuring sponsors and key speakers debated technological gaps, with lively exchanges on device innovation, clinical integration challenges, and standardization needs. The day concluded with a Medical Expert Panel led by Joseph Impellizeri, addressing regulatory, ethical, and technical hurdles in current clinical practice.

Day 5 – Future Directions in Electroporation

This session spotlighted emerging applications. The first talk, led by Qi Shao, covered vascular malformations, bone metastasis ablation, and tumor-immune interactions. Maja Cemazar and Luigi Aurisicchio presented on combining IL-12 electrotransfer with immunotherapy and developing GMP-grade genetic vaccines, respectively underscoring the growing intersection of electroporation with precision oncology and personalized medicine.

Day 6 – Reflections and Outlook

The final day synthesized insights. Francesca Apollonio recapped highlights from the 5th World Congress on Electroporation (Rome 2024). Speakers reviewed recently funded research, stimulating discussion about strategic research directions and international collaborations.

Poster Presentations: Innovation by Young Scientists

A total of 18 posters were presented by young researchers, representing a breadth of emerging research. The Best Poster Award was presented during the gala dinner, celebrating academic excellence and innovation. Winners Nina Van, Théo Le Berre and Pedro Paulo respectively from first to third place were awarded.

Course Legacy and Impact

The 2025 Erice course was attended by 25 participants (seven of them were ISEBTT members) from 8 different countries. From foundational science to applied clinical techniques, the course embodied interdisciplinary learning, hands-on training, and global collaboration. Attendees left with refined technical skills, new professional connections, and a shared mission: to bring electroporation-based therapy to the forefront of modern medicine.

Future information and registration details for the next course are available at:

<http://www.eisbem.eu/index.php/next-courses/>.

Forthcoming events

10th School on Pulsed Electric Field Applications in Food and Biotechnology

Salerno, September 1 – 5, 2025

<https://www.prodalricerche.it/en/pef-school-2025/>

17th International Bioelectrics Symposium (Bioelectrics 2025)

Eindhoven, September 14 – 17, 2025

<http://www.bioelectrics2025.nl/>

Society Council Members (cont.)

Rafael Davalos, US

Treasurer

Mihaela G. Moiescu, RO

Secretary

Social Media Committee

Michal Cifra (CZ), Stefan Töpfl (DE),

Antoni Ivorra (ES) & Claudia

Consales (IT)




www.linkedin.com/company/isebtt/



Coffee break view, Erice.

PEF SCHOOL 2025 – 10^h EDITION

 Salerno, Italy
Practical workshops

Organized by
ProdAI, Uni Salerno & NE&M

 PEFschool2025
@prodalricerche.it

The next ISEBTT-supported
event is the school in Salerno.

Newsletter is issued in electronic form
only by The International Society for
Electroporation-Based Technologies
and Treatments (ISEBTT).

ISSN: 2463-9850

© 2016-2025 ISEBTT