

## Neurobiology Commission

### Annual Report 2023

#### MEMBERS

David C. Henshall (Ireland), chair  
Aristea Galanopoulou (USA), past chair  
Christophe Bernard (France)  
Kathryn Davis (USA)  
Marco de Curtis (Italy)  
Elif Tugce Erdevi (Turkey)  
Premysl Jiruska (Czech Republic)

Hyunyoung Koh (USA)  
Nico Moshe (USA)  
Terry O'Brien (Australia)  
Vikram Rao (USA)  
Raman Sankar (USA)  
Ed Bertram (USA), MC liaison

#### HIGHLIGHTS

##### WONOE XVII

The Neurobiology Commission planned and led the XVII Workshop on the Neurobiology of Epilepsy on 28 August – 1 September 2023. This three-day workshop was held at Kilkea Castle in Ireland and gathered 50 participants from across all career stages and around the world, invited after competitive selection of submitted abstracts. The topic of the meeting was 'The extracellular space in epilepsy: pathomechanisms, biomarkers and treatment targets'. The overall purpose of WONOE XVII was to provide novel insights into the extracellular environment and inter-cellular communication spanning molecules to cells, how this is disrupted in acquired and genetic epilepsies, how this can be detected with a view to biomarker applications and strategies towards the development of new treatments. As part of the meeting, the 'Uwe Heinemann Plenary Lecture' was delivered by Giuliano Avanzini on the topic of 'Reflections on a lifelong experience in epilepsy research'.

##### Joint ILAE-AES Translational Task Force

Several reports of the working groups of the ILAE/AES Joint Translational Task Force have been published in *Epilepsia* and *Epilepsia Open*. These include commentary on the definition of drug-resistant epilepsy and on whether in vitro studies can aid in the development and use of antiseizure therapies and preclinical common data elements for general pharmacological studies.

##### Critical reviews on the topics of WONOE XVI

The Neurobiology Commission WONOE Task Force members coordinated the writing of four critical reviews and commentaries on the main sessions held at WONOE XVI in Talloires, France (2022) on the topic of 'Early onset epilepsies: neurobiology and novel therapeutic strategies'. These will be submitted for publication in *Epilepsia*.

#### MEETINGS

The Neurobiology Commission met five times in 2023.

## ACTIVITIES

The Commission's activities focused on four areas, each championed by a sub-chair.

### Research and Innovation

This Committee, led by Kathryn Davis, has oversight of three Task Forces. This Committee focuses on the latest developments in neurobiology and includes the Task Force on Networks, Task Force on the Chronobiology of Epilepsy and Task Force on Gene Therapies. Each Task Force is preparing a paper on the topic. The Chair of the Networks Task Force continued monthly free world-wide seminars by distinguished scientists to keep researchers up to date with breakthrough science.

### Research Training and Professional Development

Led by Premysl Jiruska and in partnership with the 4EU+ European university alliance, Neurobiology Commission members of this Committee ran the second International Online Course on the Pathogenesis of Epilepsy, endorsed by ILAE and Neurobiology Commission. Members of this Committee and Neurobiology Commission chair also held meetings with the Education Council chair on the development of additional curriculum offerings in neurobiology for clinical trainees and in clinical epileptology for basic scientists. To support this collaboration, Premysl Jiruska was appointed to the Education Council to represent neurobiology. This committee also continued to work closely with the Career Development Commission to promote training and career development, mentoring, leadership, and networking.

In collaboration with the Young Epilepsy Section, the Neurobiology Commission also organized two teaching sessions focused on epilepsy models and the role of EEG in epilepsy research at the 35<sup>th</sup> International Epilepsy Congress (IEC 2023). YES members subsequently ran a mini-seminar series where each speaker from IEC 2023 delivered an expanded version of their talk during an online seminar.

The Neurobiology Commission selected and awarded workshop, travel and research skills bursaries. This included support for the 2<sup>nd</sup> LBE-BRAINN Workshop of Basic Research in Epilepsy, to be held at the University of Campinas, Brazil, in 2024 and the 5<sup>th</sup> Workshop on Neurobiology of Epilepsy (focused on immunity and neuroinflammation), which will be held in the Dominican Republic, also in 2024.

In the research skills category, five awards were made which are supporting early career researchers to gain hands-on skills in cutting edge basic and translational techniques at top epilepsy labs at Harvard University, University of Calgary, RCSI University of Medicine and Health Sciences, University of Buenos Aires and the VIB-University of Antwerp. In the travel bursary category three awards were made which are supporting early-career trainees attend neurobiology-focused, non-ILAE sponsored meetings.

### ILAE/AES Joint Translational Task Force

The ILAE/AES Joint Translational Task Force completed some of the final preclinical epilepsy common data elements (CDEs) and published the reports. Some remaining reports of working groups are expected to be finished in 2024.

### WONOE Task Force

The XVII Workshop on Neurobiology of Epilepsy was held at Kilkea Castle in Ireland on 28 August – 1 September 2023. The meeting gathered 50 researchers together to discuss ‘*The extracellular space in epilepsy: pathomechanisms, biomarkers and treatment targets*’. The workshop was divided into five sessions: the role of the extracellular matrix in epilepsy, the immunopathogenesis of epilepsy, ion and channel function beyond the synapse, emerging mechanisms in epilepsy beyond the synapse, and biomarkers and treatment strategies beyond the synapse. WONOE XVII was made possible with the generous support of the ILAE, UCB, Jazz Pharmaceuticals, and the Harinarayan Family donations. ‘Raman Sankar bursaries for young investigators’ were awarded to 10 young investigators. The proceedings are currently under preparation and will be published as critical reviews.

The Task Force members subsequently were appointed to be responsible for the organization of the WONOE XVIII. Co-chairs will be David Henshall and Katja Kobow. Active planning is underway to select the topic and venue for the 2025 meeting in Portugal. A local organizing committee has also been appointed.

Lastly, members of the WONOE Task Force coordinated the writing and editing of the critical review of the XVI WONOE meeting, on the topic of ‘*Early onset epilepsies: neurobiology and novel therapeutic strategies*’. These will be submitted for publication in *Epilepsia*.

### Advocacy and Dissemination

The Neurobiology Commission liaised with various members of other working groups. This included the YES group on initiatives to increase participation of young epilepsy researchers. This resulted in the appointment of two additional members from YES to the Neurobiology Commission in 2023 to increase the representation of early-career perspectives on the Neurobiology Commission.

Other Appointments: Past chair Aristeia Galanopoulou was nominated to represent neurobiology on the Scientific Organizing Committee (SOC) for the 36<sup>th</sup> International Epilepsy Congress in Lisbon, Portugal. Chair David Henshall was nominated to join the Congress Council. Premysl Jiruska was appointed to the Education Council. Chair David Henshall was also appointed co-chair of the San Servolo Advanced Epilepsy Course, to be held in 2025.

## **ACCOMPLISHMENTS**

- WONOE XVII meeting: This three-day workshop was expertly organized and run by the Neurobiology Commission with support from the ILAE office. The topic, ‘The extracellular space in epilepsy: pathomechanisms, biomarkers and treatment targets’, gathered 50 participants from across the globe. The meeting also featured a lifetime

achievement award, The ‘Uwe Heinemann Plenary Lecture’ delivered by Giuliano Avanzini. The sessions included the role of the extracellular matrix in epilepsy, immunopathogenesis of epilepsy, ion and channel function beyond the synapse, emerging mechanisms in epilepsy beyond the synapse and biomarkers and treatment strategies beyond the synapse.

- The organization of the WONOEP XVIII Fask Force: Initial planning is underway for the next WONOEP, which will be held in Portugal in 2025.
- The provision of support to early-career researchers from less developed regions to enhance their neurobiology skills and knowledge: The Neurobiology Commission’s award of three travel and five research skills bursaries provides critical support to junior researchers to attend specialist meetings and receive bespoke training on new scientific methodologies.
- The establishment of supporting workshops in less-developed regions that focus on neurobiology: 2nd LBE-BRAINN Workshop of Basic Research in Epilepsy and the 5th Workshop on Neurobiology of Epilepsy
- The publication of research commentaries, recommendations and methodologies that support neurobiology-focused research
- The supporting of the International Course on the Pathogenesis of Epilepsy: The 50-hour course covered key topics of the neurobiology of epilepsy.
- The delivery, in collaboration with YES, of a series of research seminars on animal models of epilepsy and preclinical EEG studies
- The establishment of Task Forces that will explore and raise awareness of cutting-edge neurobiology topics
- The engagement with other commissions including the Education Council, Congress planning working groups and the Climate Change Commission to ensure high visibility of neurobiology

## RESEARCH & ARTICLES PUBLISHED

Auvin S, Galanopoulou AS, Moshé SL, Potschka H, Rocha L, Walker MC. [Revisiting the concept of drug-resistant epilepsy: A TASK1 report of the ILAE/AES Joint Translational Task Force](#). *Epilepsia*. 2023; 64: 2891–2908.

Coles L, Forcelli PA, Leclercq K, Katsarou A-M, Klein BD, Potschka H, et al. [Preclinical common data elements for general pharmacological studies \(pharmacokinetic sample collection, tolerability, and drug administration\)](#). A report of the TASK3-WG1A General Pharmacology Working Group of the ILAE/AES Joint Translational Task Force. *Epilepsia Open*. 2023; 00: 1–9.



Morris G, Avoli M, Bernard C, Connor K, de Curtis M, Dulla CG, et al. [Can in vitro studies aid in the development and use of antiseizure therapies? A report of the ILAE/AES Joint Translational Task Force](#). *Epilepsia*. 2023; 64: 2571–2585.



**WONOEP XVII attendees outside Kilkea Castle in Ireland.**



**Selection of presenters at the IEC 2023 Basic Science Teaching sessions on animal models and preclinical EEG, jointly organized by the Neurobiology Commission and YES.**

*Report submitted by David C Henshall*