

Neurobiology Commission

2022 Annual Report

MEMBERS

David C. Henshall (Ireland), chair
Aristea Galanopoulou (USA)
Kathryn Davis (USA)
Premysl Jiruska (Czech Republic)
Terry O'Brien (Australia)
Chrisophe Bernard (France)
Nico Moshe (USA)
Raman Sankar (USA)
Marco de Curtis (Italy)
Vikram Rao (USA)
Ed Bertram (USA), MC liasion

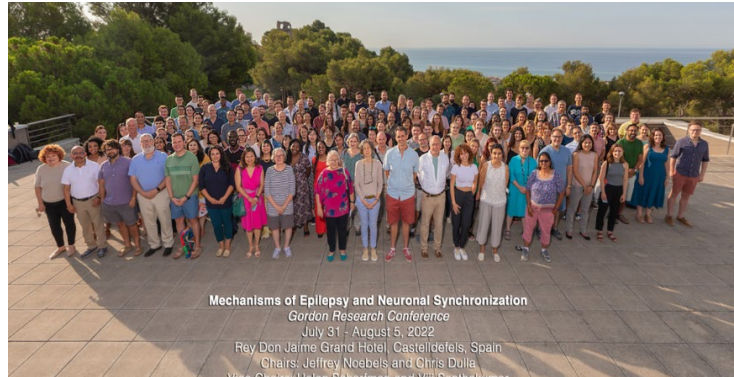


Photo: Attendees at the Gordon Research Conference, supported by Neurobiology Commission, on “Mechanisms of epilepsy and neuronal synchronization” in Spain, July 2022.

SPECIAL SCIENTIFIC TASK FORCE ON CHRONOBIOLOGY

Vikram Rao (USA), chair
Maxime Baud (Switzerland)
Christophe Bernard (France)

Birgit Frauscher (Canada)
Pip Karoly (Australia)
Cristina Reschke (Ireland)

WONOEP TASK FORCE

Aristea Galanopoulou (USA), chair
Ozlem Akman (Turkey)
Stéphane Auvin (France)
Stephanie Baulac (France)

David Henshall (Ireland)
Terry O'Brien (Australia)
Raman Sankar (USA)

RESEARCH AND INNOVATION

- Establishment of a new Task Force on the chronobiology of epilepsy. The Task Force is preparing a position paper and will lead a session at the IEC. The Chair of the Networks TF began monthly free world-wide seminars by distinguished scientists to keep researchers up to date with breakthrough science.
- The ILAE/AES Joint Translational Task Force continued their work, completing the second set of preclinical epilepsy common data elements (CDEs), covering general pharmacology, pediatric models, phenotyping, omics, and neuroimaging. Additional reports are currently being finalized.

RESEARCH TRAINING AND PROFESSIONAL DEVELOPMENT

- We organized the first International Online Course on the Pathogenesis of Epilepsy, endorsed by ILAE and Neurobiology Commission. We are closely collaborating with the ILAE Career Development Commission to promote training, mentoring, leadership, and networking.
- The Neurobiology Commission selected and awarded workshop and travel bursaries. This included the Gordon Research Conference (GRC) “Mechanisms of epilepsy and neuronal synchronization” in Spain, July 2022 and four Travel Bursaries. A new “Research Skills” bursary was launched.

WONOEP

The XVI Workshop on Neurobiology of Epilepsy was organized and occurred between 2022 July 4-8, at Talloires, France, on the topic of “Early onset epilepsies: neurobiology and novel therapeutic strategies”. This was made possible with the generous support of the ILAE and other donations. Twelve “Raman Sankar bursaries for young investigators” were awarded. The proceedings are currently under preparation and will be published as critical reviews. The committee for the next WONOEP (XVII) was formed and the topic agreed.



Photo: Commemorative photo of the participants of WONOEP 2022 at the entrance of the Tufts center in July at Talloires, France.

ADVOCACY AND DISSEMINATION

The Neurobiology Commission liaised with various members of other committees including the YES committee on initiatives to increase participation of young epilepsy researchers. The Chair organized a multi-stakeholder working group on the topic of the use of animals in epilepsy research.

ACCOMPLISHMENTS

- Planning and running the WONOEP XVI meeting. This 3-day workshop gathered ~45 international participants, invited after competitive selection. The “Uwe Heinemann Plenary Lecture” was delivered by Solomon L. Moshé on the topic of the 2022 ILAE classification of epilepsy syndromes and relevance to animal models. The sessions

covered the pathogenesis and etiologies of neurodevelopmental disorders and epilepsies, molecular and genetic insights, models, advanced diagnostic tools, and treatments for early life epilepsies.

- Planning the WONOEP XVII meeting. The topic for the meeting is “Communication beyond the synapse: pathomechanisms, biomarkers and treatment targets”. The overall purpose will be 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. Giuliano Avanzini will deliver the “Uwe Heinemann Plenary Lecture”.
- Support of Four junior researchers to attend key research meetings on neurobiology and three new “Research Skills” awards to support training on new scientific methodologies.
- Publication of research recommendations and methodologies that support neurobiology-focused research.
- Supporting the International Elective Course on the Pathogenesis of Epilepsy The course lasted 15 weeks and covered the key topics of the neurobiology of epilepsy. The faculty included scientists and clinicians from the international epilepsy community, including members of Neurobiology Commission. We received 198 applications, and 40 participants were selected. The feedback on the course was very positive. Due to high demand, the next round is being prepared.
- Establishment of new task forces to explore cutting-edge neurobiology topics.
- Support of research meetings through awards of funding and participation in topic promotion and selection.

HIGHLIGHTS

- The WONOEP XVI (Workshop on the Neurobiology of Epilepsy) meeting was held in Talloires, France from 4-8 July 2022. It was attended by over 40 basic, translational and clinical researchers, ranging from trainees and PhDs through to recently established PIs and senior figures in the field. The topic of the meeting was early onset epilepsies: neurobiology and novel therapeutic strategies. The workshop featured five main sessions over three days. In addition, the meeting was opened with the Uwe Heinemann memorial lecture, delivered by Solomon (Nico) Moshé.
- Joint ILAE-AES Translational Task Force. Seven reports of the TASK3 working groups of the ILAE/AES Joint Translational task Force have been accepted at *Epilepsia Open* and will be included in a special issue on preclinical epilepsy CDEs that will be published at the journal. These include reports on preclinical CDEs for pediatric models of seizures and epilepsies due to genetic or acquired causes, phenotyping seizures, neuropathology, omics, and neuroimaging.
- New Task Force on the chronobiology of epilepsy. A new Task Force has begun its work, focused on the emerging topic of the chronobiology of epilepsy. The task force, chaired by Vikram Rao at UCSF, features leading researchers, and will review the science and translational and clinical applications of the topic and work to disseminate the latest

findings to the community. Members of the committee will work to promote the visibility of the topic at research meetings (including at the IEC congress in Ireland, 2023).

RESEARCH AND PUBLISHED ARTICLES

- Barker-Haliski M, Pitsch J, Galanopoulou AS et al. A companion to the preclinical common data elements for phenotyping seizures and epilepsy in rodent models. A report of the TASK3-WG1C: Phenotyping working group of the ILAE/AES joint translational task force. *Epilepsia Open*. 2022.
- Bindila L, Eid T, Mills JD et al. A companion to the preclinical common data elements for proteomics, lipidomics, and metabolomics data in rodent epilepsy models. A report of the TASK3-WG4 omics working group of the ILAE/AES joint translational TASK force. *Epilepsia Open*. 2022.
- Van Vliet EA, Immonen R, Prager O et al. A companion to the preclinical common data elements and case report forms for in vivo rodent neuroimaging: A report of the TASK3-WG3 Neuroimaging Working Group of the ILAE/AES Joint Translational Task Force. *Epilepsia Open*. 2022.
- Mantegazza M, Auvin S, Barker-Haliski M et al. A companion to the preclinical common data elements for rodent genetic epilepsy models. A report of the TASK3-WG1B: Paediatric and genetic models working group of the ILAE/AES joint translational TASK force. *Epilepsia Open*. 2022.5. van Vliet EA, Hildebrand MS, Mills JD et al. A companion to the preclinical common data elements for genomics, transcriptomics, and epigenomics data in rodent epilepsy models. A report of the TASK3-WG4 omics working group of the ILAE/AES joint translational TASK force. *Epilepsia Open*. 2022.
- Katsarou AM, Kubova H, Auvin S et al. A companion to the preclinical common data elements for rodent models of pediatric acquired epilepsy: A report of the TASK3-WG1B, Pediatric and Genetic Models Working Group of the ILAE/AES Joint Translational Task Force. *Epilepsia Open*. 2022
- Aronica E, Binder DK, Drexel M et al. A companion to the preclinical common data elements and case report forms for neuropathology studies in epilepsy research. A report of the TASK3 WG2 Neuropathology Working Group of the ILAE/AES Joint Translational Task Force. *Epilepsia Open*. 2022.

MEETINGS

The Neurobiology Commission met five times in 2022 – meetings of the Neurobiology Commission were held 9 March 2022, 11 May 2022, 5 July 2022, 5 October 2022, 12 December 2022.

Report submitted by David C. Henshall