


NEW *roscience* 2018



Looking for Epilepsy Cure Along Centuries and Across Cultures
From Demons and Blessings to Brain Complex Networks and DNA Editing

Scientific Program
International Symposium NEWroscience 2018
Looking for Epilepsy Cure along Centuries and across Cultures
From Demons and Blessings to Brain Complex Networks and DNA
Editing

September 18th to 21st
Venue: Anfiteatro da Faculdade de Direito
Campus da Universidade de São Paulo
Ribeirão Preto -São Paulo - Brasil

Scientific Committee
Norberto Garcia-Cairasco
Faculdade de Medicina de Ribeirão Preto – Universidade de São Paulo
Marcio Flavio Dutra Moraes
Núcleo de Neurociências – Universidade Federal de Minas Gerais
Rodrigo Neves Romcy-Pereira
Instituto do Cérebro – Universidade Federal do Rio Grande do Norte

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September 18th

18:00 – 19:20 – Secretariat Opening, Registration and Material Pick-Up

19:20 – 19:30 – Opening Remarks

Norberto Garcia-Cairasco

Faculdade de Medicina de Ribeirão Preto – Universidade de São Paulo - Brasil

19:30 – 20:30 – Opening Lecture

Self-Reflected Brain: Dreams and Consciousness in Neuroscience and the Arts

Greg Dunn

Greg A Dunn Design

E-mail:gdunnart@gmail.com

20:30 – 22:00 – Opening Cocktail

September 19th

Morning - Round Table 1

***Controversies and Convergences in the History of Science and the Arts in
Neuropsychiatry and the Epilepsies***

Chairman: Peter Wolf

Danish Epilepsy Centre, Dianalund, Denmark

Ancient Western cultures and cultures relating to non-Western traditions, quite before the existence of modern science, have adventured into the realm of brain diseases, generally based upon supernatural beliefs and speculations. Those initial views were replaced by ancient Greek philosophy of nature, and the search for localization of functions and sicknesses in specialized organs, being, for example, *heart* versus *brain*, a clear picture of this paradigm. In many ways the philosophy of nature was related to religious interpretations, but it ended with the construction of modern science in Europe in 17th century. Those natural steps resulted in contemporary times with science as the source for technology. The current Round Table, as the more philosophical and conceptual section of the **NEWroscience** Symposium, will travel on the above contexts with interpretations of neurological and neuropsychiatric diseases and comorbidities, with widespread ancient, traditional and contemporary scientific and technological attempts to diagnose and cure those diseases.

08:00 – 08:25

The Epilepsies: Dialogues between Traditional Healers and Contemporary Neurologists in Africa

Lamine Gueye

University of Dakar, Senegal, África

E-mail:lamine.gueye@uadb.edu.sn

08:25 – 08:50

Contribution of Precolumbian and Contemporary Indian Cultures to the Treatment of Epilepsies and Associated Neurological Syndromes

Jaime Fandiño Franky

Fundación Centro Colombiano de Epilepsia y Enfermedades Neurológicas - FIRE

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08:50 – 9:15

Renaissance Philosophy of Nature and Epilepsy

Eduardo Kickhofel

Universidade Federal Paulista, Brasil

E-mail:kickhofel@hotmail.com

09:15 – 9:40

The Epilepsies of Dostoievski (Russia) and Machado de Assis (Brazil): The Working Brains of Bright Writers with Epilepsy

Peter Wolf

Danish Epilepsy Centre, Dianalund, Denmark

E-mail:wolfcph@gmail.com

09:40 - 10:10

Coffee-Break

10:10 – 10:35

Ayahasca, an Ancient Substance with Traditional and Contemporary use in Neuropsychiatry and Neuroscience

Rafael Guimarães

Departamento de Neurociências e Ciências do Comportamento

Faculdade de Medicina de Ribeirão Preto – Universidade de São Paulo

Ribeirão Preto, SP, Brasil

E-mail:banisteria@gmail.com

10:35 – 11:00

The Modern Use of Cannabis for Epilepsy: From Bench to Clinical Trials of Cannabidiol

Fabricio Moreira

Universidade Federal de Minas Gerais – Belo Horizonte, Brasil

E-mail:fabriciomoreira@icb.ufmg.br

11:00 – 11:30

General Discussion

Moderator: Peter Wolf

11:30 – 12:00

Brainstorm and Final Statement 1 – Controversies and Future Challenges (From Round Table 1)

Chairman: Eduardo Kickhofel

Universidade Federal de São Paulo – Guarulhos, Brasil

E-mail:kickhofel@hotmail.com

Co-Chairman: Gabriel Arisi

Universidade Federal de São Paulo – São Paulo, Brasil

E-mail:arisi@unifesp.br

September 19th

Afternoon - Round Table 2

From Connectomes to Multilayered Complex Networks in the Epilepsies and Neuropsychiatric Comorbidities

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Chairman: Fernando Cendes

Departamento de Neurologia - Universidade Estadual de Campinas, Campinas, Brasil

The epilepsies as complex disorders can be described and studied as interacting levels of networks, the so-called connectomes, with additional complexity when comorbidities are also included in the analysis. Currently, an enormous diversity of well-developed brain imaging, electrophysiological and computational neuroscience and modeling techniques are used to describe in each level of complexity the nodes and their interactions, for example those associated to the default mode network, consciousness, epileptogenesis. This Round Table has the main aim of discussing how the contemporary multifactorial models of the epilepsies and their comorbidities are able to mimic the myriad of behaviors of those sub-systems of neural networks, with their intrinsic interactions and those with the outside environment.

14:00 – 14:25

Mood, Anxiety Disorders and the Concept of Epilepsy as a Network Disease

Fernando Cendes

Departamento de Neurologia – Universidade Estadual de Campinas

E-mail: fcendes@unicamp.br

14:25 – 14:50

Epilepsies, Autistic and Mood Disorders as Complex Networks Diseases

Andres Kanner

Department of Neurology, University of Miami, Miller School of Medicine, Miami, USA.

E-mail: a.kanner@med.miami.edu

14:50 – 15:15

Matrix Macromolecules, Gliosis, Mesial Sclerosis and Memory Impairments in Temporal Lobe Epilepsy

João Pereira Leite

Departamento de Neurociências e Ciências do Comportamento

Faculdade de Medicina de Ribeirão Preto – Universidade de São Paulo

Ribeirão Preto, SP, Brasil

E-mail: jpleite@fmrp.usp.br

15:15 – 15:45

Coffee Break - Poster

15:45 – 16:10

Hippocampal-Frontal Networks in Experimental Models of Neuropsychiatric Disorders in Epilepsy Models

Cleiton Lopes Aguiar

Núcleo de Neurociências e Comportamento- Instituto de Ciências Biológicas

Universidade Federal de Minas Gerais – Belo Horizonte, Brasil

E-mail: cleitonbiousp@gmail.com

16:10 – 16:35

Mapping Molecular Gene Cascades in Epilepsy and Autism

Rodrigo Neves Romcy Pereira

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Instituto do Cérebro – Universidade Federal do Rio Grande do Norte

E-mail: rnrpereira@neuro.ufrn.br

16:35 – 17:00

Contributions of Basic Science to a Network Analysis of Epilepsy and Comorbidities

Cristiane Q. Tilelli

Universidade Federal de São João Del Rei – Divinópolis, Brasil

E-mail: ctilelli@ufsj.edu.br

17:00 – 18:00

General Discussion

Moderators:

Fernando Cendes

Departamento de Neurologia – Universidade Estadual de Campinas, Campinas, Brasil

Cleiton Lopes Aguiar

Núcleo de Neurociências e Comportamento- Instituto de Ciências Biológicas

Universidade Federal de Minas Gerais – Belo Horizonte, Brasil

September 20th

Morning - Round Table 3

Cell and Molecular Mechanisms of the Epilepsies

Chairman:

Asla Pitkanen

Department of Neurobiology - A.I. Virtanen Institute for Molecular Sciences

University of Eastern Finland

Kuopio, Finland

In the current Round Table, pieces of the challenging puzzle of cellular and molecular components associated to the expression of the epilepsies will be presented. In fact, when looking for cellular and molecular mechanisms of the epilepsies, researchers have discovered neuronal, glial, endothelial, neuroinflammatory alterations in the form of interconnected networks, with a variety of behavioral, electrophysiological and cellular counterparts. However, what is, in fact, the contributive part of each of those factors, and what are the associations between them, in order to be rationally attacked by means of a variety of traditional therapeutic agents and newly technological developments? This is really not known, and a contemporary view of this scenario will be presented.

14:00 – 14:25

How Might Novel Technologies such as Optogenetics and DREADDS Lead to Better Treatments in Epilepsy?

Esther Krook-Magnuson E

Neuroscience Department, University of Minnesota, Minneapolis, USA

E-mail: ekrookma@umn.edu

14:25 – 14:50

Looking for Biomarkers for Epileptogenesis and Functional Outcome after Brain Injury

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Asla Pitkanen

*Department of Neurobiology - A.I. Virtanen Institute for Molecular Sciences
University of Eastern Finland
Kuopio, Finland
Email: asla.pitkanen@uef.fi*

14:50 – 15:15

Interneurons: Role in Maintaining and Restoring Synaptic Plasticity

Maria Elisa Calcagnotto

*Neurophysiology and Neurochemistry of Neuronal Excitability and Synaptic Plasticity
Laboratory, Biochemistry Department, Universidade Federal do Rio Grande do Sul ,
Porto Alegre , Brazil.
E-mail: melisacal@yahoo.com*

15:15 – 15:45

Coffee Break – Poster

15:45 – 16:10

***Characterizing Molecular, Biochemical and Genetic Changes in Neurotransmitters in
the Brain of Experimental Models of Drug-Resistant Epilepsy***

Luisa Lilia Rocha Arrieta

*Pharmacobiology Department. Center for Research and Advanced Studies. Mexico,
D.F.
E-mail: lrocha@cinvestav.mx*

16:10-16:35

***New Avenues in Molecular Genetics for Diagnosis and Therapeutics, as Applied to the
Epilepsies***

Íscia Lopes-Cendes

*Departamento de Genética – Universidade Estadual de Campinas, Campinas, Brasil
E-mail: icendes@unicamp.br*

16:35-17:00

***Molecular Tools to Characterize Seizure Susceptibility in Rodent Genetic Models of
Epilepsy***

Dolores E. Lopez

*Instituto de Neurociencias – Universidad de Salamanca, Salamanca, España
E-mail: lopezde@usal.es*

17:00 – 18:00

General Discussion

Moderators:

Esther Krook-Magnuson E

*Neuroscience Department, University of Minnesota, Minneapolis, USA
E-mail: ekrookma@umn.edu*

Íscia Lopes-Cendes

*Departamento de Genética – Universidade Estadual de Campinas, Campinas, Brasil
E-mail: icendes@unicamp.br*

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September 20th

Afternoon - Round Table 4

Epilepsy Hijacking Brain Oscillations: a Gradual Corruption from Normal Activity

Chairman: Marcio F.D. Moraes

Universidade Federal de Minas Gerais – Belo Horizonte, Brasil

A paradigm shift is urgently needed in the way we think about epilepsy in order to significantly impact diagnosis, treatment, prediction and prognosis. Many researchers have considered the hypothesis that epileptogenic and/or ictogenic mechanisms may derive from gradual, but permanent, corruptions of normal neural network behavior. In fact, such gradual changes could explain the myriad of psychiatric and neurological comorbidities that accompany the epileptic condition, as a grayscale that expands from normality. The active probing of specific circuits could not only highlight dysfunctional behavior in its early stages, but could also evaluate if network activity states are evolving towards seizure onset. Also, proper interference in an epileptogenic/ictogenic network has been shown to block the onset and spread of ictal activity. In this Round Table it will be discussed that altogether, such an approach might lead to closed-loop solutions for patients with epilepsy.

14:00 – 14:25

Closed loop control of seizures

Dean Freestone

University of Melbourne - Australia

E-mail: deanrf@unimelb.edu.au

14:25 – 14:50

Synchronization and Desynchronization in Epilepsy: Controversies and Hypotheses

Premek Jiruska

Czech Academy of Sciences - Czech Republic

E-mail: jiruskapremysl@gmail.com

14:50 – 15:15

The Emergence of Single Neurons in Clinical Epileptology

Sydney Cash

Massachusetts General Hospital - Harvard Medical School - United States of America

E-mail: SCASH@mgh.harvard.edu

15:15 – 15:45

Coffee Break

15:45 – 16:10

Periodic and Non-Periodic Deep Brain Stimulation in Epilepsy Models: Effects on Network Synchronization

Vinícius Rosa Cota

Universidade Federal de São João del Rei

E-mail: vrcota@gmail.com

16:10 – 16:35

Deep Brain Stimulation in Epilepsy: Actively Probing Neural Networks

Marcio F.D. Moraes

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Núcleo de Neurociências (NNC) - Instituto de Ciências Biológicas
Universidade Federal de Minas Gerais, Belo Horizonte, Brasil
E-mail:marcionnc@gmail.com

16:35 – 17:00

The Genesis of an Epileptic Hippocampus

Claudio Queiroz

Instituto do Cérebro – Universidade Federal do Rio Grande do Norte
E-mail:clausqueiroz@neuro.ufrn.br

General Discussion

Moderator: Marcio F.D. Moraes

Universidade Federal de Minas Gerais, Belo Horizonte, Brasil
17:00 – 18:00

Brainstorm and Final Statement – Controversies and Future Challenges (From Round Tables 2, 3 and 4)

Chairman: Sydney Cash

Massachusetts General Hospital - Harvard Medical School - United States of America

Co-Chairman: Cristiane Q. Tilelli

Universidade Federal de São João Del Rei – Divinópolis, Brasil
E-mail:ctilelli@ufsj.edu.br

Moderators:

Daniel de Castro Medeiros

Universidade Federal de Minas Gerais, Belo Horizonte, Brasil
E-mail:dacamemg@gmail.com

Claudio Queiroz

Instituto do Cérebro – Universidade Federal do Rio Grande do Norte
E-mail:clausqueiroz@neuro.ufrn.br

September 21st

Morning - Round Table 5

Precision Medicine and Technological Challenges in Neuroscience and Epileptology

Chairman:

Ashok Shetty

Department of Molecular and Cellular Medicine, Texas A&M Health Science Center
College of Medicine, College Station, Texas, USA

In this Round Table, will be introduced a sample of diverse and powerful pharmacological, molecular and technological advances, from characterized natural products to more technologically developed protocols. All of them allow, even individual approaches, either in experimental models or in people with epilepsy, with high impact in both the diagnosis, therapeutic approaches and in the interpretations of singularities and patterns of the associated brain networks.

08:00 – 08:25

Human Brain Slices for Epilepsy Research: Pitfalls, Solutions and Future Challenges

Mark O. Cunningham

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Trinity Biomedical Sciences Institute, Trinity College, University of Dublin, Dublin,
Ireland

Email: mark.cunningham@ncl.ac.uk

8:25 – 08:50

Intranasal Mesenquimal Stem Cell-Derived A1-Exosomes ease Inflammation, and Prevent Abnormal Neurogenesis and Memory Dysfunction after Status Epilepticus

Ashok Shetty

Department of Molecular and Cellular Medicine, Texas A&M Health Science Center
College of Medicine, College Station, Texas, USA

E-mail: shetty@medicine.tamhsc.edu

08:50 – 09:15

Complementary MRI/DTI and Chemogenetics/Optogenetics to Pinpoint Epileptogenic Networks in Experimental Models of Epilepsy

Patrick Forcelli

Department of Pharmacology & Physiology, Georgetown University School of
Medicine, Washington, DC, USA.

E-mail: paf22@georgetown.edu

09:15 – 09:45

Coffee Break – Poster

09:45 – 10:10

Networks for Tonic Respiratory Drive, Chemoreception and SUDEP in Epilepsies

George Richerson

Department of Neurology, University of Iowa, Iowa City, United States

E-mail: george-richerson@uiowa.edu

10:10 – 10:35

Molecular and Neuroanatomical Neuroplasticity in Neurogenetic Niches in Experimental Epilepsy Models

Victor Rodrigues Santos

Universidade Federal de Minas Gerais, Belo Horizonte, Brasil

E-mail: victorrsantos@gmail.com

10:35 – 11:00

Experimental and Ethnopharmacological Characterization of Substances with Anti-Epileptogenic and Neuroprotective Actions

Olagide Wagner Castro

Laboratório de Farmacologia e Fisiologia Integrativa

Universidade Federal de Alagoas, Maceió, Brasil

E-mail: olagidewww@gmail.com

11:00 – 12:00

General Discussion

Moderators:

Ashok Shetty

Department of Molecular and Cellular Medicine, Texas A&M Health Science Center
College of Medicine, College Station, Texas, USA

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E-mail: shetty@medicine.tamhsc.edu

Mark O. Cunningham

Trinity Biomedical Sciences Institute, Trinity College, University of Dublin, Dublin, Ireland.

Email: mark.cunningham@ncl.ac.uk

September 21st

Afternoon - Round Table 6

Epilepsies and Comorbidities: Challenging and Integrating Multiples Levels of Complexity

Chairman: Norberto Garcia-Cairasco

Faculdade de Medicina de Ribeirão Preto –

Universidade de São Paulo, Ribeirão Preto, SP, Brasil

Once the epilepsies and their comorbidities have been seen as the expression, not only of complex systems, but also of interacting multivariate networks, able to generate emergent properties, the main task is to conjugate, in both multidisciplinary and interdisciplinary approaches, and that is the current main challenge, all the data coming from disciplines such as clinical neurology and neuropsychiatry, neuropsychology, neuroimaging, behavioral and computational neuroscience, cell and molecular neuroscience, *in vivo*, *in vitro* and *in silico* modeling. Although we need to recognize that both panoramic views (*zoom-out*) and reductionist approaches (*zoom-in*) are jointly needed, we need to build reconstruction and convergent methodologies to incorporate them, not only in the diagnosis arsenal, but also in the therapeutics, anti-epileptogenic drug design and in the efforts to predict, either from animals or *in silico* models, or from *in vitro* human preparations and actual clinical settings.

14:00 – 14:25

Non-invasive Imaging in Epilepsy using Biomarkers

Edson Amaro Júnior

Hospital Israelita Albert Einstein – São Paulo, Brasil

E-mail: eamaro@usp.br

14:25 – 14:50

Computational Neuroscience and the Epilepsies

Antônio Carlos Roque da Silva Filho

Departamento de Física Médica – FFCLRP

Universidade de São Paulo, Brasil

E-mail: antonior@usp.br

14:50 – 15:15

Complex Systems Approach for Innovation in AEDs Discovery

Alan Talevi

Universidad Nacional de la Plata, La Plata, Argentina

Email: atalevi@biol.unlp.edu.ar

15:15 – 15:40

Network Science for the Identification of Novel Therapeutic Targets in Epilepsy

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Rodney Scott

Department of Neurological Sciences, University of Vermont College of Medicine,
Vermont, USA

E-mail: Rodney.Scott@med.uvm.edu

15:40 – 16:05

Coffee Break

16:10 – 16:35

MicroRNAs, Gene Networks, Gene Therapy: Promises and Challenges for Treating Epilepsies and their Comorbidities

Michele Simonato

Department of Medical Sciences, Neuroscience Center, University of Ferrara, Ferrara,
Italy

E-mail: michele.simonato@unife.it

16:35 – 17:00

Complexity Systems and Emergent Properties Views as Applied to Epilepsy Research: A Paradigm Shift Eagerly Needed

Norberto Garcia-Cairasco

Neurophysiology and Experimental Neuroethology Laboratory

Ribeirão Preto School of Medicine, University of São Paulo, Ribeirão Preto, Brazil

E-mail: ngcairas@usp.br

17:00 – 18:00

Brainstorm and Statement 3 – Controversies and Future Challenges (From Round Tables 5 and 6)

Chairman: Norberto Garcia- Cairasco

Neurophysiology and Experimental Neuroethology Laboratory

Ribeirão Preto School of Medicine, University of São Paulo, Ribeirão Preto, Brazil

E-mail: ngcairas@usp.br

Co-Chairman: Rodney Scott

Department of Neurological Sciences, University of Vermont College of Medicine,
Vermont, USA

E-mail: Rodney.Scott@med.uvm.edu

Moderators:

Michele Simonato

Department of Medical Sciences, Neuroscience Center, University of Ferrara, Ferrara,
Italy

E-mail: michele.simonato@unife.it

Antonio Carlos Pinheiro de Oliveira

Universidade Federal de Minas Gerais – Belo Horizonte, Brasil

E-mail: acpoliveira@gmail.com

18:00 – 18:30

Awards Ceremony

I. Celebrating Women in Science & Art

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1. Best Scientific Poster in *Epilepsy*. **Cassidy Megan, the Founder of the Purple Day, Award**
2. Best Scientific Poster in *Neuroscience*. **Rosalind Franklin, the Mother of the DNA, Award**
3. Best Poster in *Neuroscience & Arts*. **Nise da Silveira, the Rebel Psychiatrist, Award**

II. The Diploma Leonardo da Vinci Award

Given to LNNE PhD Students Graduated from 2013 to 2018

18:30 – 18:40

Closing Remarks

Scientific Committee

Norberto Garcia-Cairasco

Marcio F.D. Moraes

Rodrigo N. Romcy-Pereira

19:10 - Farewell Dinner