

Modeling Migraine: From Nonlinear Dynamics to Clinical Neurology

Coordinators: Markus A. Dahlem (TU Berlin) and Sebastiano Stramaglia (University of Bari & INFN)

Wednesday July 22nd

8:30 - 9:15	Registration	Opening remarks
9:15 - 9:20	Markus Dahlem	Morning session I
		Ion dynamics during migraine
		<i>Chair: Hugh R. Wilson</i>
9:20 - 10:00	George Somjen	Why simulate SD? Empirical data and the search for their explanation
10:05 - 10:20	Wytse Wadman	Modeling Ionic Mechanisms in Spreading Depression
10:25 - 11:00	Coffee break	
		Morning session II
		Potassium dynamics & excitability
		<i>Chair: Uwe Heineman</i>
11:00 - 11:15	Ernest Barreto	Ion concentration dynamics and neuronal excitability
11:20 - 11:35	Gerson Florence	Effects of depressed K^+ currents caused by high $[K^+]_o$ on the different stages of spreading depression
11:40 - 11:55	Flavio Fröhlich	Potassium dynamics: new insights on an old topic
12:00 - 12:15	Tony Gardner-Medwin	Spatial buffering of K^+ in relation to SD models
12:20 - 13:45	Lunch break	
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13:45 - 14:45	Moderated discussions	<i>Chair: Jens Dreier</i>
		Topic: Spreading depression, hypoxic depolarization, peri-infarct depolarization etc.: Processes of the same nature, need for a generic term?
		Afternoon session I
		Cellular and membrane dynamics
		<i>Chair: Sebastiano Stramaglia</i>
14:45 - 15:00	Oscar Herreras	Polarization gradients and current loops within single cells raise the DC potential in spreading depression: from single channels to macroscopic fields
15:05 - 15:20	Thomas Heimburg	Action potentials as electromechanical pulses
15:25 - 15:40	Rubem C.A. Guedes	Effects of AC- and DC-electrical brain stimulation on CSD
15:45 - 16:45	Coffee break	
		Afternoon session II
		Functional abnormalities in channel mutations
		<i>Chair: Frank Richter</i>
16:45 - 17:00	Daniela Pietrobon	Enhanced excitatory transmission at cortical synapses as the basis for facilitated spreading depression in CaV2.1 knockin migraine mouse models.
17:05 - 17:20	Thomas Friedrich	Functional abnormalities due to Na,K-ATPase α_2 -subunit mutations identified in familial hemiplegic migraine type 2.
17:25 - 17:40	Gianluca Coppola	New approaches to analysis of high frequency somatosensory oscillations in healthy subjects and migraine patients.

Thursday July 23rd

	Morning session I
	Migraine Aura: window to brain hyperexcitability <i>Chair: Markus Dahlem</i>
09:00 - 09:35 <i>Frances Wilkinson</i>	Hypersensitivity in migraine: Does this imply cortical hyperexcitability?
09:40 - 09:55 <i>Alex Shepherd</i>	Pattern sensitivity in migraine
10:00 - 10:15 <i>Hugh R. Wilson</i>	Neural Network Simulations of Aura Characteristics
10:05 - 10:40	Coffee break
	Morning session II
	EEG and Hyper-synchronization <i>Chair: Frank Starmer</i>
10:40 - 10:55 <i>Marina de Tommaso</i>	News inside hyper-synchronization pattern in migraine. (1) Clinical
11:00 - 11:15 <i>Sebino Stramaglia</i>	News inside hyper-synchronization pattern in migraine. (2) Techniques aspects
11:20 - 12:20	Moderated discussions <i>Markus Dahlem, Eckehard Schöll & Heinz G. Schuster</i> Topic: Chaos Control of hyper-synchronization/excitability – new therapeutic approaches?
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12:20 - 14:00	Lunch break
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	Afternoon session I
	Spatial aspects I: Imaging spreading depression <i>Chair: Eckehard Schöll</i>
14:00 - 14:15 <i>Michael Müller</i>	Intrinsic optical signals: light scattering changes creating the optical signature of spreading depression
14:20 - 14:35 <i>Vera de Lima</i>	The synergetic modulation of the excitability of central gray matter by a neuro-peptide
14:40 - 14:55 <i>Rudolf Graf</i>	Imaging cortical spreading depression in experimental ischemia
15:00 - 15:15 <i>Frank Richter</i>	Spreading depression and anoxic depolarization in adult rat brainstem - electrophysiology and their influences on heart rate, blood pressure and local blood flow
15:20 - 16:00	Coffee break
	Afternoon session II
	Spatial aspects II: SD propagation pattern <i>Chair: Rudolf Graf</i>
16:00 - 16:15 <i>Markus Dahlem</i>	Spreading depression wave patterns in two spatial dimensions: A new paradigm
16:20 - 16:35 <i>Frank Starmer</i>	Initiating a propagating wave in an excitable media
16:40 - 16:55 <i>Harald Engel</i>	Shape and velocity of stabilized wave segments in excitable media
17:00 - 17:15 <i>Lutz Schimansky-Geier</i>	Waves in heterogeneous neural tissues
17:20 - 17:25 <i>Sebino Stramaglia</i>	Announcement Migraine Symposium in Bari 2010
<i>Markus Dahlem</i>	Farewell