



SUMMER SCHOOL Medical Bionics For Hearing

Medical Bionics for Hearing Summer School August 27th - September 3rd 2016, Split (Croatia)

Summer School: Medical Bionics for Hearing

DATE: August 27th – September 3rd, 2016

LOCATION: Split, Croatia, University of Split School of Medicine, Šoltanska 2, Split, Croatia

APPLICATION DEADLINE: July 15th, 2016 via online application form

Web: <http://school.medicalbionics.eu>

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Directors: Damir Kovačić (School of Medicine and Faculty of Science, University of Split, Croatia)
Myles Mc Laughlin (Department of Neurosciences, KU Leuven, Leuven, Belgium)

Local Organizing Committee: Speech and Hearing Research Lab,
University of Split-School of Medicine

DESCRIPTION:

Medical bionics is a rapidly advancing scientific and technological field aimed at not only restoring lost or damaged sensory, motor and cognitive functions, but also at enhancing natural abilities in humans and animals by effective interfacing and connecting biological substrates with artificial machines. Cochlear and auditory brainstem implants are by far the most successful neuroprosthetic devices, though with fundamental limitations which have yet to be addressed.

This School aims at presenting important theoretical and experimental knowledge and practices in the field of medical bionics for hearing. Generally, core presentations will be given by the invited speakers in the morning and early afternoon sessions, followed by workshop sessions in late afternoon and short presentations of students in the evening. We intend to stimulate cross-disciplinary interactions between students and researchers in a highly non-formal and stimulating environment. The overarching goal of the School is to bring together scientists and students to the same place in order to offer a “playground” for ideas and issues contributing to the development of novel bionic devices for hearing and communication.

The School is appropriate for graduate students, postdocs, and faculty in natural and medical sciences with the strong focus on hearing and medical bionics. Students are expected to have a strong background in one discipline (such as neuroscience, physics, biology, engineering, medical sciences), but not necessarily involved in auditory research or hearing. Our goal is to develop the science and the technology of medical bionics for hearing and to support new generation of researchers in this field.

The School is limited to 30 participants.



The project was financed by the European Union from the European Social Fund, and by the Split-Dalmatia County from the Program of technological development, research and innovation application.

The School will cover a range of topics, including:

- Auditory periphery & cochlear mechanics
- Neural processing in hearing
- Auditory neuroelectronics
- Cellular aspects of hearing
- In vitro culturing of auditory neurons devices
- Current solutions in medical bionics (cochlear implants, auditory brainstem implants, deep brain stimulation etc.)
- Future and emergent technologies in medical bionics for hearing

CONFIRMED INVITED SPEAKERS (alphabetically)

1. Dries Braeken, PhD (imec, Leuven, Belgium)
2. Andreas Hierlemann, PhD (ETH, Zurich, Switzerland)
3. Chris James, PhD (Cochlear, Toulouse, France)
4. Wei Liu, PhD (Uppsala University, Sweden)
5. Colette McKay, PhD (Bionics Institute, Melbourne, Australia)
6. Myles Mc Laughlin, PhD (KU Leuven, Belgium)
7. Kirill Nourski, MD, PhD (University of Iowa, USA)
8. Richard Reilly, PhD (Trinity College Dublin, Ireland)
9. Luis Robles, PhD (University of Chile, Santiago de Chile, Chile)
10. Ivan Veselić, PhD (Technische Universität Chemnitz, Germany)

Target audience: 30 PhD students, postdocs and other researchers

Accommodation and travel: to be booked and organized individually (School Web site provides additional info and options)

Registration fee: PhD students: 80 EUR, Postdocs: 100 EUR, Others: 150 EUR. The fee provides meals (lunch, refreshments, and snack dinners) as well costs of excursion.

TENTATIVE PROGRAM

Time/Day	Sat 27/08	Sun 28/08	Mon 29/08	Tue 30/08	Wed 31/08	Thu 01/09	Fri 02/09	Sat 03/09
		AUDITORY PERIPHERY AND COCHLEAR MECHANICS	NEURAL PROCESSING IN HEARING		CELLULAR ASPECTS OF HEARING	CURRENT SOLUTIONS IN MEDICAL BIONICS	FUTURE AND EMERGENT TECHNOLOGIES	
8.15-8.30		Overview of the School: Damir Kovačić	Intro Session: Myles McLaughlin		Intro Session: Kiril Nourski	Intro Session: Dries Braeken	Intro Session: Damir Kovačić	
8.30-10.00		Myles Mc Laughlin (Leuven): Auditory Periphery	Colette McKay (Melbourne): Neural Processing in Hearing		Wei Liu (Uppsala): Morphological characteristics of auditory neurons	To be announced	Andreas Hierlemann (Zurich): High-density microelectrode arrays	
10.00-10.30		COFFEE BREAK			COFFEE BREAK			
10.30-12.00		Luis Robles (Santiago de Chile): Biophysics of Hearing	Kirill Nourski (Iowa): Auditory Processing in Human Brain		Dries Braeken (Leuven): In vitro recordings of neural activity	Colette McKay (Melbourne): Auditory Brainstem Implants (ABI)	Myles McLaughlin (Leuven): Deep brain stimulation	
12.00-13.00		LUNCH			LUNCH			
13.00-14.30		Chris James (Toulouse): Sound processing in hearing	Richard Reilly (Dublin): High-density EEG		Damir Kovačić (Split): Auditory neuroelectronic interfaces	Kirill Nourski (Iowa): Direct intracranial recordings	Dries Braeken (Leuven): Multi-electrode-optrode array for in vitro optogenetics	
14.30-15.00		COFFEE BREAK			COFFEE BREAK			
15.00-15.45		Workshop I	Workshop III		Workshop V	Workshop VII	Final Discussion & Wrap up	
15.45-16.30		Workshop II	Workshop IV		Workshop VI	Workshop VIII		
16.30-20.00		FREE AFTERNOON			FREE AFTERNOON			
20.00-22.00	Welcome reception	Snack & 7min talks by students	School Dinner		Snack & 7min talks by students	Snack & 7min talks by students	Farewell party	

Funding

„Research scholarships for the professional development of young researchers and postdoctorands in the field of medical neuroelectronics“, Croatia, (HR.3.2.01-0320)



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