



Organized by

Inst. of Photonics and Electronics
Academy of Sciences of the Czech Republic

ELECTRODYNAMIC ACTIVITY OF LIVING CELLS

Including Microtubule Coherent Modes and Cancer Cell Physics

Prague, July 1-3, 2011

1st Call for Papers

Date

July 1-3, 2011

Location

Prague, Czech Republic

Abstract submission deadline

March 31, 2011

The Symposium is organized by

**Institute of Photonics and Electronics
AS CR, v.v.i.**

(Academy of Sciences of the Czech Republic)

1st Medical Faculty

**Charles University, Prague
Institute of Physiology**

The Symposium is organized under the aegis of

Professor Tomáš Zima

Dean of the 1st Medical Faculty,
Charles University

and

Dr. Vlastimil Matějec

Director of the Institute of Photonics and
Electronics
AS CR, v.v.i.

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Main themes of the Symposium

The Symposium will continue in the series of Symposia devoted to physical processes in living cells organized in Prague, Czech Republic, since 1987. Generation of the electromagnetic field, their function, and measurement in biological systems are the key issues of the program. Oscillations of microtubules, leading to polarized electromagnetic emission, their dependence on internal microtubule properties, cellular energy system, static electric field of mitochondria and cytosol water ordering are the fundamental physical questions concerning biological activity of living cells. Physical differences between healthy and pathologically transformed cells, in particular cancer cells, will be included too. The discovery of the ballistic conductance of electrons in microtubules, measured in the Tsukuba laboratories in Japan is assumed to be presented. Detection of absorption of electromagnetic fields by tumors as a new method of cancer diagnostics will be discussed. Brain activity and consciousness may be based on coherent microtubule vibration states as well as information transfer inside the brain and between the brain and the body of the biological system.

The Symposium will also follow up topics of the recent meetings in the USA, namely the "Google Workshop on Quantum Biology" (Mountain View, October 22, 2010), the workshop "Quantum Mechanics and Cancer Biology" (Arizona State University, Phoenix, October 25-27, 2010), and the seminar "Microtubule Update: Megahertz Coherence, Ballistic Conductance and Quantum Computing" (The University of Arizona, Tucson, October 28, 2010).

The tradition of Prague meetings

Symposium "Electrodynamical Activity of Living Cells" is the 9th event in the series of international scientific meetings that started more than two decades ago. The first meeting was entitled "Biophysical Aspects of Cancer" (July 6-9, 1987) and was organized by the Faculty of Mathematics and Physics and 1st Medical Faculty of the Charles University in Prague. At this occasion the eminent anglo-german physicist H. Fröhlich presented the lecture "Coherence in Biology" and W.R. Adey the lecture "Evidence for Tissue Interactions with Microwaves and other Nonionizing Electromagnetic Fields in Cancer Promotion". The next meeting was included as a separate section into the International conference "Neuronet'93" (September 20-25, 1993). This section was devoted to the Fröhlich coherent systems and information transfer. The role of Fröhlich coherence in the neural activity was discussed too. Next meeting on "Biophysical Aspects of Coherence" was organized in September 11-15, 1995.

Institute of Radio Engineering and Electronics (now Institute of Photonics and Electronics) of the Academy of Sciences of the Czech Republic has taken over the main initiative to organize the meetings since 1998. The series continued with

"Electromagnetic Fields in Biological Systems" (September 13-15, 1998),

"Electromagnetic Aspects of Selforganization in Biology" (July 9-12, 2000),

"Endogenous Physical Fields in Biology" (July 1-3, 2002),

"Coherence and Electromagnetic Fields in Biological Systems" (July 1-4, 2005),

"Biophysical Aspects of Cancer – Electromagnetic Mechanisms" (July 1-3, 2008).

The 1st Medical Faculty of the Charles University and the Faculty of Electrical Engineering of the Czech Technical University in Prague were co-organizers of all these meetings. Their program contained estimation of the role of microtubules in generation of electrodynamic activity of living cells and the physical part of the cancer transformation pathway based on experimental data and theoretical concepts.

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Topics

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Coherence and Electrodynamics in Biological Systems

Nonlinear interactions between elastic and polarization fields
Nonlinear mechanism of coherence and coherent vibrations
Nonlinear electrodynamics in biology
Electrical polar structures – cytoskeleton: microtubules and actin filaments
Energy supply and excitation of electrodynamic activity of subcellular structures
Endogenous electromagnetic fields and cellular signaling systems
Electromagnetic transport of reaction components in cells
Ordering of water in a strong static electric field
Measurement of electrodynamic activity of microtubules and cells
Physical mechanisms in cancer cells

Interaction of Biological Systems with External Electromagnetic Fields

Biophysical mechanisms of interaction
Effects of external fields on electrically polar macromolecules
and polar structures in cells
Effects of external fields on brain processes

Medical Aspects of Cellular Electrodynamics

Malfunction of mitochondria in cancer cells and its consequences
Disintegration of the cytoskeleton in cancer cells
Restoration of physical processes in cancer cells
Brain physical processes, nerve stimulation
Electromagnetic diagnostics of cancer

Official language of the Symposium is English. The program of the Symposium will contain invited lectures and contributions as well as poster session.

Deadlines:

March 31, 2011 - deadline for sending title and short abstract of your contribution

April 15, 2011 - notification to authors about acceptance of abstracts

May 1, 2011 - deadline for online registration

Website:

<http://edalc11.ufe.cz>

Briefly on Czechia and Prague

Czechia, known also as the Czech Republic, is a landlocked country in Central Europe. Czech lands – three historical provinces of Bohemia, Moravia and Czech Silesia – are famous for their rich cultural heritage with preserved historic towns, chateaus, old castles, and picturesque villages. Amazing landscape varies from mountain ranges along the border to homy hilly midlands, both crossed by few basins of rivers. Exceeding variety of landscape is potentiated with small regions of sandstone mountains, lakes, ponds, and forests. In general, Czechia is a country of variety not only for its landscape, but also for diverse culture including famous Czech cuisine with celebrated Czech beer and Moravian wines. Whether you prefer outdoor activities or discovering cultural treasures, Czechia is the right place to go.

Prague – City of a Hundred Spires – is the capital and the largest city of Czechia. Situated in central Bohemia on the banks of Vltava river, Prague has more than 1.100 years long history; however, the area of Prague has been continuously settled since Paleolithic age. Cultural history of the city gained profit from pervasion of Czech, German and Jewish culture and Prague has also been a venue of a number of significant historical events. Architectural heritage spans all artistic styles of last 10 centuries with highlights of Prague castle and the Charles bridge. Unique topography together with preserved historical monuments give Prague its inimitable beauty which was awarded the UNESCO World Heritage status. Prague is home to a number of cultural and scientific institutions, many of which are considered leading in the region. To learn more about Czechia and Prague visit official tourism site www.praguewelcome.cz/en.



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