

## **Seminar IRH-ICUB**

### **Consciousness and Cognition: An Interdisciplinary Approach**

<https://irhunibuc.wordpress.com/2016/04/05/new-seminar-consciousness-in-philosophy-and-neuroscience/convenor>

**Dr. Diana Stanciu**

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**Date: Tuesday, 18 October 2016, 17h**

**Place: IRH-ICUB (D. Brandza 1), conference room**

## **Dr. Beatrice Mihaela Radu**

**Research associate, University of Verona, Department of Neurosciences, Biomedicine and Movement Sciences, IT**

**Lecturer, University of Bucharest, Faculty of Biology**

**Dr. Beatrice Mihaela Radu** is Research associate at the University of Verona, Department of Neurosciences, Biomedicine and Movement Sciences, and Lecturer at the University of Bucharest, Faculty of Biology, Department of Anatomy, Animal Physiology and Biophysics. She has a Bachelor degree in Biophysics (2001) and a Master degree in Neurobiology (2003) at the University of Bucharest. In 2005, Dr. Radu got her doctoral degree in Biology at the University of Bucharest, under the supervision of Prof. Dr. Flonta, and, since 2014 she has been enrolled in a second PhD program in Neuroscience, Psychological and Psychiatric Sciences at the University of Verona, under the supervision of Prof. Fabene. In 2011 and 2012, Dr. Radu was twice awarded the IBRO fellowship as part of the Young investigator programme to receive training in two prestigious epilepsy research groups led by Dr. Paolo Fabene (University of Verona, Verona, Italy) and Dr. Liset Menendez de la Prida (Laboratory of Neuronal Circuits, Institute Cajal, Madrid, Spain), respectively. She conducted studies on diabetic neuropathy focusing on the alterations of different ion channels expressed in neurons from dorsal root ganglia. Her current research interests include the activation of non-neuronal components of the neurovascular unit in epilepsy and neurodegenerative disorders. At the beginning of this year, Dr. Radu received the prize of the Best Romanian Student in Europe 2016 – Postuniversity level, awarded by the League of Romanian Students Abroad.

## ***Neurovascular Unit – An Integrative View of Our Brain***

The existence of the blood-brain barrier is of common knowledge nowadays, although its existence was rather controversial at the beginning of the '90s. In 1885, the Nobel price laureate Paul Ehrlich offered the first experimental proofs supporting the existence of a 'barrier' that 'separates' brain and spinal cord from the rest of the body.

In 2002, Harders' group introduced the new concept of neurovascular unit as being an anatomical-functional unit integrating the activity of neurons, interneurons, astrocytes, smooth muscle cells, pericytes, endothelial cells and the extracellular matrix. Since then several groups have contributed to the extension of the concept that presently includes also microglia and immune cells (T lymphocytes, neutrophils). Complex interactions between different components of the neurovascular unit have been described. There is continuous 'talking' between neurons and the cerebral vasculature and there is no neuronal soma farther than about 15  $\mu\text{m}$  from a capillary.

Recent studies point out that neurovascular unit and its activation plays an essential role in the integrative physiology of our brain. Moreover, the alteration of one of its components is sensed

by the whole neurovascular unit. The idea of neuroinflammation and the role played by the neurovascular unit has become very popular in explaining many neurological disorders, such as epilepsy, stroke, neurodegenerative diseases (Alzheimer, Parkinson or Huntington disease etc.). Immune cells are not only part of the neurovascular unit but there is a permanent trafficking from the periphery to the central nervous system and also a top-down communication between the affected brain area, neurovascular unit, and peripheral immune cells.