PRESS RELEASE

Dr. Vassiliki Nikoletopoulou, Researcher at the IMBB, earned a highly competitive ERC starting grant. This grant is a funding scheme that supports young talented research leaders to gain independence and build their own research laboratory in Europe. The research interests and expertise of Dr. Nikoletopoulou bridge over the fields of neurobiology and metabolism.

Dr. Nikoletopoulou will investigate the role of neuronal metabolism, particularly of autophagy, in synaptic plasticity. The synapse, the point of communication between neurons, is comprised of a highly dynamic pool of proteins that includes receptors for neurotransmitters, scaffolding molecules and signaling proteins among others. Coordination between protein synthesis and protein catabolism (degradation) is crucial not only for basal synaptic function but also for the synapse remodeling that underlies the ability of the nervous system to adapt to a changing environment, form memories and learn new tasks. Aberrant synapse morphogenesis or remodeling underlies numerous neurological disorders entailing intellectual disability and cognitive impairment.

Autophagy is the major catabolic pathway dedicated to the recycling not only of protein aggregates but also lipids, nucleic acids, polysaccharides and defective or superfluous organelles, among others. Genetic studies have revealed that autophagy is crucial for neuronal integrity; yet, its regulation in the brain remains elusive. Similarly, while it is widely accepted that protein degradation is required for synaptic function, the contribution of autophagy in synapse morphogenesis and plasticity remains unknown.

Dr. Nikoletopoulou's funded research aims to determine how autophagy regulates synaptic plasticity and how its deregulation contributes to synaptic defects and behavioural deficits. In particular, the objectives aim to: 1) Monitor and characterize the presence of the autophagic machinery in pre- and post-synaptic sites. 2) Identify autophagic substrates residing in synapses and whose turnover via autophagy determines synaptic plasticity. 3) Characterize the synaptic defects and ensuing behavioural deficits arising from impaired autophagy in the hippocampus.

Biographical sketch

Dr. Vassiliki Nikoletopoulou completed her undergraduate studies in the University of Ottawa, Canada and then earned her PhD in the University of Basel, Switzerland, in the lab of Prof. Yves-Alain Barde (Biozentrum, Basel). During her PhD studies, she exploited the differentiation of embryonic stem (ES) cells into defined populations of neurons to study neuronal specification in the developing cortex. Subsequently, she used this tool along with mouse genetic models to reveal novel roles of neurotrophin receptors in the vertebrate nervous system.

In 2011 she joined the lab of Prof. Tavernarakis (IMBB-FORTH Crete, Greece) as a post-doctoral fellow, where she expanded her knowledge into the field of metabolism and gained experience with another genetic model, the nematode *C. elegans*. During this time, she attracted competitive funding for her

independent research: This includes an EMBO long term fellowship for postdoctoral studies, a fellowship from the Hellenic General Secretariat for Research and Technology (GSRT) and a Marie Curie "career re-start" fellowship.

Her work has been published as original articles in prominent journals, such as Nature and Cell Stem Cell.