

NeuronAge research earns Tavernarakis an ERC Advanced Investigator Grant

HERAKLION, CRETE, Nov. 3, 2008 – Nektarios Tavernarakis, a researcher at the Foundation for Research and Technology – Hellas (FORTH), has recently been awarded the prestigious European Research Council (ERC) Advanced Investigator Grant for his research proposal titled “Molecular Basis of Neuronal Ageing – NeuronAge.”

ERC advanced grants are highly competitive and allow exceptional, established research leaders in any field of science, engineering and scholarship to pursue frontier research of their choice. The aim is to encourage risk-taking and interdisciplinarity, and support pioneering frontier research projects. The research proposal must be a product of pioneering frontier research in any field of science, engineering and scholarship. Funding for each selected proposal can reach a maximum of 3.5 million Euro for up to 5 years. This is an exceptionally high level of funding for individual researches, even by international standards.

“Ageing is associated with marked decrease of neuronal function and an increased susceptibility to neurodegeneration, in organisms as diverse as the lowly worm *Caenorhabditis elegans* and humans. Although age-related deterioration of the nervous system is a universal phenomenon, its cellular and molecular underpinnings remain obscure,” said Nektarios Tavernarakis. “What mechanisms are responsible for the detrimental effects of ageing on neuronal function? The aim of the proposed research programme is to address this fundamental problem,” he added.

An interdisciplinary approach that combines the power of *C. elegans*, a highly malleable genetic model, which offers a precisely defined nervous system, with state-of-the-art microfluidics and optical imaging technologies will be adopted to manipulate and monitor neuronal activity during ageing, *in vivo*.

The objectives of NeuronAge are four-fold. The first is to develop a microfluidics platform for high-throughput manipulation and imaging of specific neurons in individual animals *in vivo*, as well as to use the platform to monitor neuronal function during ageing in isogenic populations of wild type animals, long-lived mutants and animals under caloric restriction, a condition known to extend lifespan from yeast to primates.

A follow-up activity will be the investigation of how ageing modulates susceptibility to neuronal damage in nematode models of human neurodegenerative disorders. In addition, an important part of the proposed research programme will be to conduct both forward and reverse genetic screens for modifiers of resistance to ageing-inflicted neuronal function decline.

“We will seek to identify and thoroughly characterize genes and molecular pathways involved in neuron deterioration during ageing. Ultimately, we will investigate the functional conservation of key isolated factors in more complex ageing models such as *Drosophila* and the mouse,” said Nektarios Tavernarakis. “Our hope is that these studies will lead to an unprecedented understanding of age-related breakdown of

neuronal function and will provide critical insights with broad relevance to human health and quality of life,” he concluded.

Nektarios Tavernarakis heads the *Caenorhabditis elegans* molecular genetics laboratory at the Institute of Molecular Biology and Biotechnology, in Heraklion, Crete, Greece. He earned his Ph.D. degree at the University of Crete, studying gene expression regulation in yeast, and received training in *C. elegans* genetics and molecular biology at Rutgers University, New Jersey, USA.

His research focuses on the molecular mechanisms of neuronal function and dysfunction, using the nematode *Caenorhabditis elegans* as a model organism. The broad research objectives are the delineation of the molecular mechanisms of necrotic cell death in neurodegeneration, senescent decline and ageing, the elucidation of the molecular mechanisms of sensory transduction and integration by the nervous system and the development of novel genetic tools for *C. elegans* research.

Nektarios Tavernarakis is the recipient of an International Human Frontier in Science Program Organization (HFSP) long-term award, the Bodossaki Foundation Scientific Prize for Medicine and Biology, the Alexander von Humboldt Foundation, Friedrich Wilhelm Bessel research award, the Foundation for Research and Technology, Research Excellence award, and is a European Molecular Biology Organization (EMBO) Young Investigator. More information on the research activities of the lab is available at: <http://www.imbb.forth.gr/worms>