

Chancellor's Award Lecture

in Neuroscience

FROM ALKMEON TO RITA LEVI-MONTALCINI, THE EVOLUTION OF NEUROSCIENCE



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Conference Room**

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The ancient legendary figure of Alkmeon, the Master of Kroton Medical School (VI-V century BC) is still wrapped in the mystery, although his genius is evident from fragments of his work reported by Aristotele, Plato, Theophrastus, etc. Alkmeon is now considered the Father of Neuroscience and Experimental Medicine (Nisticò *et al.*, 1989, Fidia Research Found., *Neuroscience Award Lectures*, vol. 3, Raven Press. NY, pp. 1-7). He was the first to start a new revolutionary approach to understand through systematic autopsy the anatomy and physiology of human body single organs. In his masterpiece "The Principate of the Brain", Alkmeon considered the brain as the site of motor, psychic life and the "temple" of the soul. In particular, following his experimental methodology he was able to demonstrate sensory and cranial nerves pathways from periphery to the spinal cord and through the lamina cribrosa of the ethmoid ("poroi") to the brain. In particular, he demonstrates visual, acoustic, olfactory and taste pathways from these sensory organs to the brain. Almost 2,500 years after Alkmeon, there was the revolutionary discovery by Rita Levi-Montalcini of Nerve Growth Factor (NGF) (Levi-Montalcini R. and Hamburger V.; *J. Exp.* 300:116, 321-361, 1951). NGF was shown to be essential for neuronal survival and proliferation as well as for cell differentiation, neurite outgrowth and synaptic transmission and plasticity. Thus NGF can be considered the principle ($\alpha\rho\chi\eta$) of nervous life and its lack produces apoptosis and neurodegeneration. This represents the basis for a potential therapeutic treatment with NGF of Alzheimer's disease and other neurodegenerative diseases.