

IEOS Friday Seminar
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Small-molecule drug discovery in immunotherapy

Host: Anna Chiara De Luca

Conference Room, CNR, P. Castellino Campus

Small-molecule drug discovery in immunotherapy

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Abstract: Drug discovery is the process by which new candidate drugs are ascertained. In the early phase, the process concerns the identification of small molecules that can cause a biological consequence and have functional impacts. In immunotherapy, which is the use of immunity-enhancing approaches as a medical treatment, the aim is the discovery of molecules that can trigger an inducible response *to eliminate infections and damaged self-cells, and maintain physiological homeostasis and health*. Unlike the adaptive (acquired) immune system, the innate immunity response does not require training or adaptation to specific antigens and uses pathways and receptors that have developed early in evolution as an essential response to different non-self or toxic molecules. In this contribution, I will summarize the results of recent studies on the unconventional modulation of innate immunity by natural products in my laboratory. As archetype of this work, I will discuss the unprecedented case of a class of sulfolipids, e.g. the marine Sulfavant A (SULF A), that can stimulate cells including phagocytes and antigen presenting cells via mechanisms involving the triggering receptor expressed on myeloid cells 2 (TREM2). Using these molecules, we have developed new drug candidates able to potentiate the protective effects of vaccines by dendritic cell (DC) stimulation or activate microglia in order to enhance the removal of amyloid beta (A β) and slow cognitive and functional decline in Alzheimer's disease.

Biography

Angelo Fontana (ORCID N. 0000-0002-5453-461X; WOS RESEARCHER ID C-3354-2012) is Professor of Organic Chemistry at the Department of Biology of the University of Naples "Federico II" and Director of the Institute of Biomolecular Chemistry (ICB) of the National Research Council (CNR) of Italy. He is the coordinator of the group of Organic Chemistry and Chemical Biology with the focus on functional small organic molecules from marine organisms. For these studies he has received numerous national and international funding grants. In 2016 he co-founded BioSEArch SRL, an advanced biotechnology start-up company for the development of natural products in medicine, functional foods, and cosmetics. He received the 2009 Apivita Award from the Phytochemistry Society of Europe for his contribution in the field of natural products. He has supervised more than 20 doctoral students, and his research activity is summarized in over 400 papers, conference communications and patents.

He is a permanent member of the international scientific committees for the "Marine Natural Products Symposium" and "European Conference on Marine Natural Products", and fellow of the the Italian Chemical Society, Division of Organic Chemistry and of the Post-doctorate section of the Japan Society for Promotion of Science.