Immunological Synapses In Human Health And Disease

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Abstract
We have a long-standing interest in the study of the molecular composition, dynamics and function of immunological synapses formed between cells of the human immune system. I will start my seminar with a concise outline of our work on TH cell/mast cell synaptic interactions. I will then focus on the lytic synapses formed by human cytotoxic T lymphocyte (CTL) when interacting with target cells.

In the first part of my talk, I will summarize our contribution to the field of human CTL biology and in particular to the notion of the high sensitivity, rapidity and efficacy of CTL responses. I will introduce the concept of lytic versus stimulatory synapse dichotomy in human CTLs and I will illustrate how this concept evolved on the basis of our recent findings on the heterogenous killing behaviors of individual CTLs.

In the second and main part of my talk, I will expose our recent findings on the molecular mechanism of human CTL-mediated cytotoxicity by describing the events occurring on both sides of the CTL/target cell lytic synapses during the very early moments of cell-cell interaction. I will discuss: i) how extremely rapid steps of lytic granule secretion occur at the lytic synapse and ii) how melanoma cells defend themselves from the CTL attack at the lytic synapse via the rapid secretion of their lysosomes.

About the Speaker
Salvatore Valitutti, M.D., former full professor of immunology at the University of Toulouse, France is Director of Research at INSERM. He studied Medicine in Rome Italy. He obtained the degree in Medicine in 1986 and the recidency in Pathology in 1990. He has been working for more than twenty years on T lymphocyte activation by antigenic determinants displayed on antigen presenting cell (APC) surface and has acquired uncommon expertise on in vitro and in tissue study of human immune cell responses. Dr. Valitutti has been member of the Basel Institute for Immunology in Basel, Switzerland where he contributed to the understanding of basic mechanisms of T lymphocyte activation. More recently, in Lausanne (Switzerland) and in Toulouse (France), Dr. Valitutti has contributed to define the structure, dynamics and function of immunological synapses, formed by both helper and cytotoxic T cells.

His research team develops, at the INSERM UMR 1043 in Toulouse, a multi-disciplinary research program in which, biologists in collaboration with clinicians, physicists and mathematicians, investigate different aspects of the intercellular communication occurring at immunological synapses in human health and disease.