

IMMUNOLOGY AND CANCER THERAPY

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BIOGRAPHY

Irene Athanassakis is a Professor of Immunology at University of Crete, Greece. She obtained her PhD in Immunology from the Medical School of the University of Alberta, Canada. She has published 114 papers and book reviews and has given more than 70 invited talks in international meetings and has 180 abstracts in congresses with H-index 21; 154 co-authors; RG score=36.98 and more than 1500 citations. She is an active reviewer for 19 international journals.

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SOLUBLE MHC CLASS II MOLECULES IN IMMUNE REGULATION AGAINST AUTOIMMUNITY

The involvement of major histocompatibility complex (MHC) antigens in the regulation of immune response has been well defined over the years. During the intracellular trafficking, from synthesis to antigen loading and transport to the cell membrane MHC antigens find a way to be excreted by the cells, since they can be found as soluble MHC class I (sMHC I) and class II (sMHC II) molecules in all body fluids. Although secretion mechanisms have not been sufficiently studied, sMHC molecules have been shown to display important immunoregulatory properties. Concentrating on sMHC II molecules, latest findings indicate that these are loaded with self-peptides and play an important role in tolerance maintenance. Antigen-specific tolerogenic stimulation has been shown to increase serum sMHC II levels as compared to the corresponding immunogenic stimulus in mice *in vitro* as well as *in vivo*. Serum isolated syngeneic sMHC II proteins were shown to stimulate spleen cell proliferation, their major target being the CD4-positive cell population. At the physiological level, sMHC II proteins were shown to suppress not only an antigen-specific but also antigen-non-specific immune activation, correlated to increase of CD25 and CTLA-4 and decrease CD28 expression on naive CD4-positive cells, decreased IL-2 and increased IL-10 production. In addition, these molecules inhibited phosphorylation of ZAP-70 and especially LAT proteins in the downstream pathways of TCR activation signalling. Taking advantage of the above properties of sMHC II, these were applied on experimental mouse models of systemic lupus erythematosus (SLE) as well as autoimmune hepatitis (AIH) and it was shown that syngeneic or allogeneic sMHC II proteins could alleviate SLE and AIH symptoms in experimental mouse models *in vitro* as well as *in vivo*, introducing thus the ability of sMHC II proteins to suppress specific autoantigen responses, opening new areas of research and offering novel therapeutic approaches to SLE and AIH with expanding features to other autoimmune diseases.