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Design of lipid and peptide antigens for immune cells using X-ray crystallography

T cells are potent effector cells of the immune system that control infection and tumorigenesis but can also lead to autoimmunity when they respond too strongly to self-antigen. While the majority of T cells are specific to peptides presented by the Major Histocompatibility Complex I and II (MHC I and II) molecules, a small population of T cells respond to lipids when presented by the non-classical MHC I homolog CD1d. Extensive functional and structural data has been accumulated that allows for the design of altered glycolipid ligands that modulate immune responses toward infection and tumorigenesis. We further obtained novel insights into the unconventional presentation of peptides that allows us to design altered peptide ligands with novel functions. The structural basis and functional consequences of both lipid and peptide antigen recognition by the immune system will be discussed.

Biography

Dirk M Zajonc is an Associate Professor at La Jolla Institute for Allergy and Immunology. He is experienced Associate Professor in Structural Immunology with an interest in characterizing immune responses toward microbial pathogens. He is skilled in Protein Chemistry, including antibodies and recombinant protein production and characterization, molecular biology, biophysics and structural biology. He has strong interest in the interplay between microbial infection, as well as cancer with the immune system. He has published articles in various journals.

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