Apr 22nd, 10:00 AM - 4:00 PM

Defining the Recognition of K^{bm3} and L^{d} by the Alloreactive 2C T Cell

Kevin S. Ratliff
Illinois Wesleyan University

R. Given Harper, Faculty Advisor
Illinois Wesleyan University

Larry R. Pease, Faculty Advisor
Mayo Graduate School

DEFINING THE RECOGNITION OF K^{bm3} AND L^d BY THE ALLOREACTIVE 2C T CELL

Kevin S. Ratliff and R. Given Harper*, Department of Biology,
IWU, and Larry R. Pease*, Department of Immunology,
Mayo Graduate School

In immunology, alloreactivity occurs when a single receptor, such as a T cell receptor, normally specific for a single molecule, recognizes more than one distinct molecule. The purpose of this project is to elucidate one of the possible mechanisms behind alloreactivity. A better understanding of allorecognition may help clarify the process of positive selection of T cell receptors during fetal development, in which the body eliminates T cells bearing receptors for its own molecules that could later lead to autoimmune diseases.

In this project we studied the alloreactive 2C T cell receptor (TCR), which recognizes products of two different alleles of the class I major histocompatibility complex, a cluster of genes that codes for the class I MHC cell surface proteins. Other studies have documented that the two alleles code for molecules that differ chemically from each other. Our data support other studies that suggest the presence of a different peptide bound in the class I MHC binding groove of each protein. This implies that the T cell receptor can recognize two MHC/peptide complexes that are very different from one another. We investigated this dual specificity using plasmid constructs (genetically altered pieces of DNA), which were transfected into murine (mouse) cells that expressed the protein with the intended mutation intact. While this project is still in progress, we have already completed the plasmid constructs, transfected the murine cells, and demonstrated the presence of different peptides for each of the two MHC molecules. We have also defined the conditions to be used for future chromium release assays to determine the effects of each mutation on recognition by the 2C T cells. It is expected that the T cell receptor must recognize separate epitopes (i.e. contact points) on each complex to allow for this dual specificity.