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Self-Nonself discrimination and the role of Costimulation and Anergy

The problem of self-nonsel self discrimination is a long standing problem in immunology. So far, it has been unclear whether T cells can perform perfect and efficient self-nonsel self discrimination, in populations with arbitrary diversity. I will discuss a mechanism that allows performing perfect self-nonsel self discrimination if both positive and negative repertoire education processes are used, and furthermore if costimulation and anergy mechanisms are afterwards considered during cellular activation. These results provide compelling evidence that the main driving force shaping the adaptive immune could be the ability to perform prompt and accurate self-nonsel self discrimination. They also provide insights on the possible role of positive selection, costimulation and anergy in the adaptive immune system.