

A novel pathway for the delayed-type hypersensitivity directed against lipids

Masahiko Sugita

Institute for Virus Research, Kyoto University

The delayed-type hypersensitivity (DTH), or type IV allergy, is critical for many aspects of skin diseases, including contact dermatitis. It has been established that DTH occurs in response to protein-based allergens, but our recent study suggested that lipid components were able to elicit DTH responses in sensitized guinea pigs. Therefore, it is important to determine how DTH to lipids may differ from DTH to proteins and whether it may also occur in primates. Here, we show that a mycobacteria-derived glycolipid, glucose monomycolate (GMM), elicits DTH responses in bacillus Calmette-Guerin (BCG)-vaccinated guinea pigs. The GMM-elicited hypersensitivity was comparable with the classical DTH to purified protein derivative (PPD) in that the skin reaction was associated with local infiltration by mononuclear cells with a peak response at about 2 days. Nevertheless, the GMM-elicited DTH was dependent on CD1 function and highly skewed to the TH1-type cytokine response. Furthermore, a similar response was observed also in BCG-vaccinated rhesus macaque monkeys. Thus, these observations detect a novel pathway of DTH directed against lipid allergens.