Public Abstract

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Title:THE EFFECTS OF TOLL-LIKE RECEPTOR LIGAND-ACTIVATED DENDRITIC CELLS ON HUMAN CD4+ T CELL RESPONSES

Dendritic cells (DCs) play an important role as a link between innate immunity, an immediate but less specific immune response by detecting infection and inducing inflammation as a first line of defense, and adaptive immunity, a more specific later immune response by activating T cells to initiate adaptive immunity that helps eliminate the infection-causing agents. A type of T cells called CD4+ T cells, become T helper (Th) cells when activated, and there are three types of Th cells; anti-viral Th1 cells, anti-parasitic Th2 cells and anti-bacterial Th17 cells. DCs upon detecting infection, instruct CD4+ T cells to become Th1, Th2 or Th17 cells to provide appropriate immune responses depending on the type of infection. Toll-like receptor (TLR) ligands are natural or synthesized components of infection-causing agents. Since they are only parts of the infection-causing agents, DCs stimulated with TLR ligands can promote CD4+ T cells to become Th1, Th2 or Th17 cells, depending on the TLR ligands used, without actually causing infection. In this study, human DCs were activated with various Toll-like receptor (TLR) ligands derived from or mimicking infections with bacteria and viruses, to determine the ability of these different TLR ligand-activated DCs to induce CD4+ T cells to become certain Th cells. TLR1/2, TLR4, TLR5 and TLR7/8 ligand-activated DCs induce relatively balanced Th1/Th2/Th17 responses, whereas TLR3 ligand-activated DCs induce highly skewed Th1 responses. These results provide a framework for the use of TLR ligands in tailoring T cell responses in vaccines and other immunotherapeutic approaches for allergies and autoimmune diseases.