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Bordetella pertussis T Cell Epitopes and Megapools

Researchers in the Sette lab at the La Jolla Institute for Immunology (LJI) have designed experimentally-defined CD4+ *Bordetella pertussis* (BP) epitopes that can be used to easily and rapidly detect and quantify BP-specific T cells with high sensitivity in vaccinated cohorts, irrespective of the nature of their childhood BP vaccine immunization.

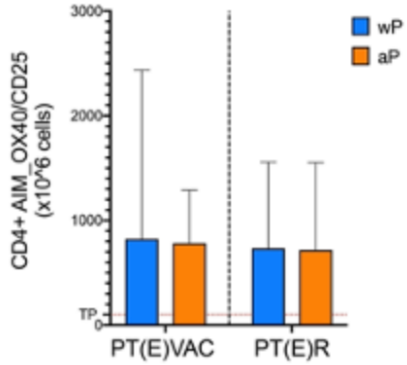
BP, the causative agent of whooping cough, infects human hosts' lungs and upper airways. The recent increase in cases of whooping cough in the US suggests that the currently administered BP acellular (aP) vaccine, which replaced a whole-cell (wP) vaccine in the early 1990s, might have limitations in the quality and effectiveness of protection.

Recently, researchers in the Sette lab have performed the first full genome screening of human T cell reactivity to BP to identify novel targets and provide knowledge towards the direction of a new and improved BP vaccine design. Importantly, they have identified 19 antigens with reactivity as prominent or even more immunodominant than the aP vaccine antigens. This discovery enabled the unique opportunity to generate epitope pools to characterize and discriminate responses specific to aP vaccine antigens from other immunodominant and immunogenic BP antigens not contained in aP vaccines. The newly developed BP human T cell epitope pools can be further used to measure T cell responses against BP colonization in naturally-infected and clinically-diagnosed acute or convalescent cohorts. The use of this tool and the identification of novel immunogenic targets could also prove crucial in the design of vaccines for superior control of BP infection and induction of long-lasting protection.

ADVANTAGES:

- **Epitope pools useful for detection and quantification of BP-specific T cell response**
- **Novel antigens useful to provide knowledge towards an improved BP vaccine**

Novel Bordetella pertussis *antigens and T cell epitopes for the design and characterization of a new BP vaccine*



Experimentally defined epitope pools (PT(E)VAC and PT(E)R detect BP-specific responses in vaccinated subjects primed with aP or wP vaccines in childhood

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