

## Tonsillitis and Killer T<sub>FH</sub> Cells

Researchers at the La Jolla Institute for Immunology (LJI) have discovered a novel type of germinal center follicular helper T cell (GC T<sub>FH</sub> cells) that express granzyme B upon stimulation with the *Streptococcus pyogenes* superantigen streptococcal pyrogenic exotoxin A (SpeA), present in strains causing strep throat. Since these cells have cytolytic activity, this new cell type has been dubbed “killer T<sub>FH</sub> cells.” These killer T<sub>FH</sub> cells develop aberrantly as a result of *S. pyogenes* immunomodulation of the tonsil, whereby children with repeated infections develop smaller GCs, inadequate *S. pyogenes* GC responses, and reduced ability to produce opsonizing *S. pyogenes* antibodies.

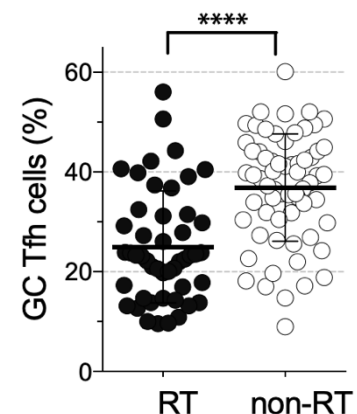
Approximately 500,000 tonsillectomies occur every year in the USA. Most young people who have their tonsils removed have the surgery because of recurrent strep infections or sleep apnea. However, it is not known why recurrent strep infection occurs in some individuals. Understanding the immunological basis for these infections will improve our ability to treat recurrent strep infections and tonsillitis in the future. Furthermore, since T<sub>FH</sub> are important for neutralizing antibody responses, a better understanding of human T<sub>FH</sub> could lead to more effective vaccination strategies in general, providing a great benefit to the world population.

Researchers at LJI have observed a central role for *S. pyogenes* SpeA in recurrent tonsillitis leading to the need for tonsillectomy. As such, they have developed a novel way to determine if a patient is at risk of recurrent tonsillitis by measuring the amount of killer T<sub>FH</sub> cells. They also reason that a vaccine composition of SpeA/SpeA peptide may be a viable treatment for recurrent tonsillitis. Lastly, they propose that cell therapy with killer T<sub>FH</sub> cells may be a viable way to treat recurrent tonsillitis.

### ADVANTAGES:

- Identifies novel cell type involved in recurrent tonsillitis as well as autoimmune diseases
- Provides a way to predict if a patient is at risk for recurrent tonsillitis
- Shows that SpeA is a novel tonsillitis vaccine antigen

### *A Novel Cell Population Involved in Recurrent Tonsillitis and a Novel Tonsillitis Vaccine Antigen*



*Tonsils with recurrent tonsillitis (RT) have significantly fewer GC T<sub>FH</sub> cells*