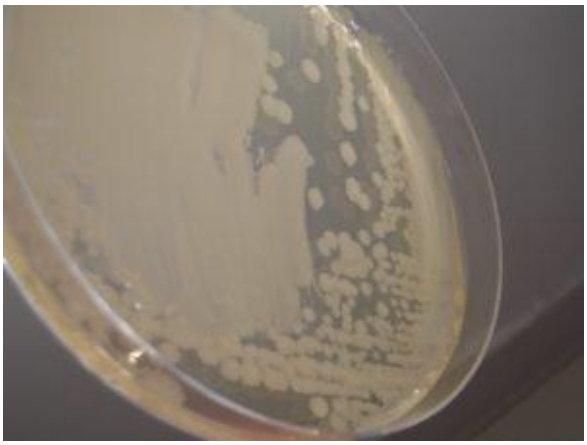
Harmless γδ T cells associated with Corynebacterium sp. can be harmful during immune dysregulation



Culture of *Corynbacterium* from the skin (culture de Corynebacterium sur GTS). Source Manurx27 (own work), Wikimedia Commons

The skin, one of the first lines of immunological defence, is colonised by diverse microbes which play a crucial role in the control of skin immunity. However, only a handful of these microbes have been directly linked to defined immunological processes, particularly under inflammatory conditions.

Research led by Yasmine Belkaid aimed to identify dominant microbe-derived metabolites that have immune modulatory capacity.

Corynebactrium sp. is one of the three most abundant bacterial genera on human skin, and is also abundantly found on mice. However, very little is known about their immunomodulatory effects. Researchers showed a direct relationship between *Corynebactrium sp.* and T cell function. Where increased proportions of IL-17+γδ T cells that express low levels of T cell receptor (TCR) (IL-17+γδTCR^{low}) were preferentially observed in the presence of *Corynebactrium accolens* compared with microbial sp.: *E.coli, C.albicans, S.epidemidis.*

Riduara *et al.*, showed that IL-17+γδTCR^{low} T cells detected in the presence of *C.accolens* were predominantly Vγ4+, CCR6+ expressing high transcript levels of CCR4 and T cell activation markers (OX40, PD-1 and STAT5). To determine if high levels of IL-17+γδTCR^{low} is generally associated with *Corynebactrium sp*. Riduara *et al.*, inoculated 9 different *Corynebactrium sp.* onto the skin of wild type mice. Surprisingly, they observed high proportions ofIL-17+γδTCR^{low} with all screened *Corynebactrium sp.* except *C. amycolatum*, a rare *Corynebactrium s*pecies that does not have mycolic acids. This suggested that mycolic acid from *Corynebactrium sp.* is responsible for induction of IL-17+γδTCR^{low} T cells. To confirm this, they showed that no Vγ4+IL-17+γδTCR^{low} T cells were induced in the presence of mycolic acid-deficient *C.accolens* (Δ503). Additionally, Vγ4+IL-17+γδTCR^{low} T cells were not responsive to heat killed *C.accolens* nor dendritic cells loaded with lipoarabinomannans, molecules also present on the outer surface of *Corynebactria*. This confirmed that the presence of the metabolit, mycolic acid, is required for induction of Vγ4+IL-17+γδTCR^{low}.

Finally, researchers also showed that though *Corynebactrium sp.* in healthy mice is not associated with inflammation.

Vγ4+IL-17+γδTCR^{low} T cells primed by *Corynebactriu*m sp. contribute to increased skin inflammatory pathology in mouse models of experimental psoriasis and obesity.

Journal Article: Ridaura *et al*., 2018. Contextual control of skin immunity and inflammation by *Corynebacterium.* Journal of Experimental Medicine

Article by Cheleka AM Mpande