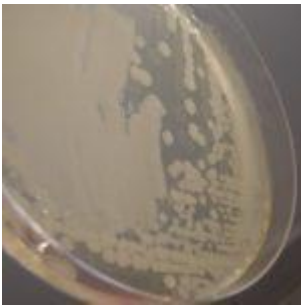


Harmless  $\gamma\delta$  T cells associated with *Corynebacterium* sp. can be harmful during immune dysregulation



Culture of *Corynebacterium* 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.

*Corynebacterium 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 *Corynebacterium sp.* and T cell function. Where increased proportions of IL-17+ $\gamma\delta$  T cells that express low levels of T cell receptor (TCR) (IL-17+ $\gamma\delta$ TCR<sup>low</sup>) were preferentially observed in the presence of *Corynebacterium accolens* compared with microbial sp.: *E.coli*, *C.albicans*, *S.epidemidis*.

Riduara *et al.*, showed that IL-17+ $\gamma\delta$ TCR<sup>low</sup> T cells detected in the presence of *C.accolens* were predominantly V $\gamma$ 4+, 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+ $\gamma\delta$ TCR<sup>low</sup> is generally associated with *Corynebacterium sp.* Riduara *et al.*, inoculated 9 different *Corynebacterium sp.* onto the skin of wild type mice. Surprisingly, they observed high proportions of IL-17+ $\gamma\delta$ TCR<sup>low</sup> with all screened *Corynebacterium sp.* except *C. amycolatum*, a rare *Corynebacterium* species that does not have mycolic acids. This suggested that mycolic acid from *Corynebacterium sp.* is responsible for induction of IL-17+ $\gamma\delta$ TCR<sup>low</sup> T cells. To confirm this, they showed that no V $\gamma$ 4+IL-17+ $\gamma\delta$ TCR<sup>low</sup> T cells were induced in the presence of mycolic acid-deficient *C.accolens* ( $\Delta$ 503). Additionally, V $\gamma$ 4+IL-17+ $\gamma\delta$ TCR<sup>low</sup> T cells were not responsive to heat killed *C.accolens* nor dendritic cells loaded with lipoarabinomannans, molecules also present on the outer surface of *Corynebacteria*. This confirmed that the presence of the metabolite, mycolic acid, is required for induction of V $\gamma$ 4+IL-17+ $\gamma\delta$ TCR<sup>low</sup>.

Finally, researchers also showed that though *Corynebacterium* sp. in healthy mice is not associated with inflammation. V $\gamma$ 4+IL-17+ $\gamma$  $\delta$ TCR<sup>low</sup> T cells primed by *Corynebacterium* 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

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