ImmunoTools IT-Box-Cy55M-Award 2013

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The mechanism how Lactobacilli can modulate the immune response in the gut

Under normal condition, the fetus in the mother womb is sterile. Once it is born, the child will be colonized with gut microbiota. Besides a plethora of function, the commensal bacteria play a beneficial role in aiding the appropriate development of the immune system. Indeed exposure to microbes during early childhood is associated with protection from immune-mediated diseases such as asthma, allergy, and inflammatory bowel disease (IBD). Our group has shown that children that are colonized at an early age with the Lactobacilli are less likely to develop allergy later in life. To understand how lactobacilli mediate these effects, we have set up a model of primary murine gut epithelial cells and are mapping their responses to Lactobacilli and comparing these with responses to other bacterial strains. Our theory is that the interaction between Lactobacilli and the epithelium is a vital primary event for the cascade that subsequently leads to the altered immune function.

We have seen that cells stimulated with supernatants from Lactobacilli exhibit different chemokine and cytokine profiles compared with that seen by other stimuli. These include IL-6, RANTES, and IP-10. The secreted factors are likely to influence the immediate environment the subcellular space and the lamina propria, where they can affect the types and numbers of cells migrating into the tissue as well as affecting the activation status of the cells present in the tissue. Having IT-Box Cy55M, would enable us to determine the impact of these factors, both testing their potency individually and in a combination. We would measure the migration of different cells from both the lamina propria and the periphery towards different chemokine factors from IT-Box Cy55M and estimate whether they affect the functional capabilities of lamina propria cells. If awarded with the ImmunoTools Cy55M, we would be able to make an initial screen with the different factors, determining the most potent ones. Such an initial screen could be of very much help. Furthermore, we will investigate the influence of Lactobacilli on the function of subsets of Dendritic cells (DC), in particular the $CD103^{+}$DC, in the lamina propria. The $CD103^{+}$ DC are believed to have a major role in inducing gut homing effect on T cells. Previous works have shown injection of Flt3L into mice leads to dramatic increases in $CD103^{+}$ DCs subsets in lamina propria. The FLT3L from IT-Box Cy55M will be used to expand these subsets *in vivo*, to harvest and perform *in vitro* experiment.

ImmunoTools IT-Box-Cy55M for Yeneneh Haileselassie

includes 55 recombinant mouse cytokines

rm EGF, rm Eotaxin / CCL11, rm FGF-a / FGF-1, rm FGF-b / FGF-2, rm FGF-8, rm Flt3L / CD135, rm G-CSF, rm GM-CSF, rm GRO-a / CXCL1, rm GRO-b / CXCL2, rm IFNgamma, rm IL-1alpha, rm IL-1beta, rm IL-2, rmIL-3, rm IL-4, rm IL-5, rm IL-6, rm IL-7, rm IL-9,

rm IL-10, rm IL-11, rm IL-13, rm IL-15, rm IL-16, rm IL-17A, rm IL-17C, rm IL-17F, rm IL-19, rm IL-20, rm IL-21, rm IL-22, rm IL-25 / IL-17E, rm IL-27, rm IL-31, rm IL-33, rm IP-10 / CXCL10, rm LIF, rm MCP1 / CCL2, rm M-CSF, rm MIP-1α/ CCL3, rm MIP-1β / CCL4, rm MIP3α / CCL20, rm MIP3β / CCL19, rm NGF-beta, rm PDGF-AA, rm PDGF-BB, rm RANTES / CCL5, rm sCD40L / CD154, rm SCF, rm SDF-1α / CXCL12a, rm SDF-1β / CXCL12b, rm TNFα, rm TPO, rm VEGF DETAILS