ImmunoTools *special* Award 2014

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The effect of feeding lactobacilli on murine immune cell subsets – delineating the effect of probiotics on different immune-cell subsets

In recent years it has become evident that the gut microbiota has a major impact on the development and homeostasis of the immune system, both locally in the gut as well as systemically. We have previously shown that human infants colonized at an early age with lactobacilli are less likely to develop allergic disease and in rodents, lactobacilli have been shown to have beneficial effects in experimental models of colitis and asthma. It is thus clear, that the composition of the gut microbiota not only affects the gut locally, but also at more distant parts of the body like the lung. There are some indications that early life exposures are especially important in the maturation of the immune system and it has even been proposed that during the first phase of our lives, we have a unique ability for immunomodulation. In this way, it has been shown that being exposed to a larger number and variety of innocuous microbes during these first months of life seems protective against developing allergic symptoms later in life. The underlying mechanism behind this immunomodulation is poorly understood as well as the role played by lactobacilli in these processes. A thorough understanding of these observed effects has yet to be achieved; which bacterial species offer the best protection on a certain genetic background, their proper dose and the time-window that the individual is susceptible for such a therapy. A more complete knowledge of the effects of different bacterial species on the different components of the immune system is crucial for such an understanding.

The purpose of this study is to determine the effects of feeding mice lactobacilli on immune-cell subpopulations, and their ex vivo capacity in different body compartments. Despite being an active area of research, a more holistic approach on the effect of lactobacilli feeding on gut immune function where the immune-cells are monitored from the gut/gut associated lymphoid tissue and into the different organs i.e. spleen is lacking. We intend to evaluate both the proportion of different immune cells in different tissues as well as their ex vivo stimulatory capacity. We will pay particular attention to tracing these effects from the local gut and gut associated tissue, to more distal parts of the body, e.g. blood, spleen and lungs. Furthermore, we will evaluate this in both recently weaned mice as well as adult individuals.

Mice will be assigned to receive supplements containing either lactobacillus reuteri or placebo for two weeks. After feeding, small intestinal tissue, spleen and select

lymphoid tissue will be harvested and stained for the different immune cell subtypes. If awarded the ImmunoTools special award we will be given a valuable opportunity to screen for a larger variety of markers in pilot studies as well as to optimize different panel compositions. Attention will be paid to both the innate- and adaptive arms of the immune system, e.g. macrophages, dendritic cells, granulocytes, B- and T-cells, as well as the γδ T-cells, NK-cells and NK-T cells. T-cell activation and subset differentiation will also be assessed. After harvesting, cells from the different locations will also be stimulated ex vivo in order to determine further subset differentiation of the cells.

ImmunoTools *special* AWARD for

Dagbjört Petursdottir includes 15 reagents

FITC - conjugated anti-mouse CD3e, CD19, CD45R, CD49d, αβ TCR,

PE - conjugated anti-mouse CD25, CD45RC, Gr-1, γ/δ TCR,

PerCP - conjugated anti-mouse CD4,

APC - conjugated anti-mouse CD8a, CD11b, CD45, CD62L, NK-cells

DETAILS more AWARDS