CCR – Impromptu Seminar

Thursday, July 4th 2024, 15:00 PM

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Mapping Plasma Cell Distribution and Characteristics in Gnotobiotic Mice

The small intestine plays a crucial role in immune surveillance, constantly exposed to many antigens derived from food and commensal bacteria. This protection is mainly accomplished by the secretion of immunoglobulins (Igs) that bind bacteria and regulate their composition and abundance. Igs are produced by plasma cells, terminally differentiated B cells that differentiated in Peyer's patches and migrated to the gut lamina propria. There are different plasma cell categories, depending on the antibody isotype they are producing (e.g. IgA, IgG, IgM,…). In the gut, most plasma cells are producing IgA in its dimeric form, which is needed for a successful transcytosis through epithelial cells to the lumen. Depending on the gut content, different antigens are presented in the Peyer's patches, affecting the dynamics and specificities of generated plasma cells. Related to that, it was reported that factors influencing the intestinal niche, such as food intake, might affect plasma cell localization in the gut. However, these findings are not supported by any strong evidence and whether plasma cell localization can fluctuate, and which factors are involved remains largely elusive.

Therefore, my master's thesis ims to investigate the potential effect of microbial compositions on the localization and phenotype of IgA-producing plasma cells in the small intestine of mice. This will be accomplished by analyzing small intestine samples of four different colonization settings: germ-free, oligo-mouse-microbiota 12 (OMM12), OMM19, and specific pathogen-free. The project is subdivided into two main parts: a laboratory part where we will use multiplex immunostaining to stain plasma cells on gut tissue sect ions with an already established panel of nine markers, and a bioinformatic part for creating different pipelines for the post-processing of fluorescent images, an effective cell segmentation, and the analysis of extracted spatial and phenotypic features of plasma cells.

Venue: CCR Container, Borschkegasse 8a
Time: July 4th 2024, 15:00 PM
Host: Thomas Vogl

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