SIgN Immunology Seminar



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Identification of factors in the diet that influence on the activation of retinal dehydrogenase in CD103⁺LPDCs.

Host
Dr Alicia Wong/
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Date
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Time
2pm – 3pm

Venue
SIgN Seminar
Room
Immunos
Building
Level 4
Biopolis

Mononuclear phagocytes (MPs), such as monocytes, monocyte-derived cells and macrophages, are the key immune cells that regulate function of lymphoid populations of immune cells by delivering self or foreign antigens in either steady state or inflammatory state. Intestinal MPs acquire the distinct roles by its constant exposure to commensal microbiota, pathogens, and food antigens. However, it is not elucidated yet how commensal microbiota and dietary antigens influence on the development of intestinal MPs and how these cells are involved in establishing and maintaining intestinal homeostasis. To investigate this, we established the unique system that experimental mice are free from commensal microbiota (germ-free (GF mice)) and free from solid food diet (antigen-free (AF)). We examined the phenotypic differences of intestinal MPs from SPF, GF, and AF mice. We found that the number of CD103⁺DCs from AF mice is significantly lower than those from SFP and GF mice while the number of CD103⁺DCs is comparable between SPF and GF mice. When we further distinguished CD103⁺DCs with CD11b, there was more CD103⁺CD11b⁻ DCs in AF mice that is similar with those in neonatal GF and SPF mice, indicating that food antigens may be involved in DC differentiation. This phenotypic difference between groups was also closely related with their functional aspect. We found that RALDH2 gene expression as well as RALDH enzymatic activity in CD103⁺LPDC from AF mice was significantly decreased in comparison to those in CD103⁺LPDC from SPF and GF mice and the low level of RALDH activity in CD103⁺LPDC from AF mice was similar with CD103⁺LPDC from neonatal GF and SPF mice. One week after weaning of those mice recovered this enzyme activity and AF mice also rapidly recovered its activity by food antigen within one week, indicating that certain food components influenced on RALDH activity in CD103⁺LPDC. Defining the mechanisms how commensal microbiota and/or dietary antigens influence such a key immune cells in the gut will insight into the understanding of intestinal immunity.