

Glutamine administration modulates the homeostasis of immunity in mice with critical illness



Speaker:
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1st Lecture: Tuesday, October 26th 16.20 pm JST

(Google meet: meet.google.com/deh-wkzm-fab)

2nd Lecture: Monday, November 22nd 16.20 pm JST

(Google meet: meet.google.com/dhw-xrsy-wyj)

Aobayama Commons, Auditorium Susei Hall

Immuno-nutrition is a therapeutic approach in which pathologic alterations in innate and acquired immunity, secondary to acute surgical or medical conditions, are modulated by feeding formulas supplemented with specific nutrients (Ex: ω -3 polyunsaturated fatty acids, arginine, glutamine) via enteral or parenteral routes.

Glutamine (GLN), the most abundant free amino acid in circulation, has immunomodulatory properties and is considered an essential amino acid during catabolic conditions. Patients are administered GLN to increase their protein synthesis, modulate postsurgical immunosuppression and inflammatory responses, and improve the homeostasis of the host immune functions. GLN is shown to be beneficial in preventing damage of the mucosal structure and immune dysregulation.

Lymphocytes carrying T cell receptor (TCR) comprising γ and δ subunits are called $\gamma\delta$ T cells. These cells constitute a small proportion (1%–5%) of the lymphocytes in blood; substantial populations of $\gamma\delta$ T cells have been found in epithelial-rich tissues such as the lungs, skins, gut, and urinary tract that are most susceptible to infections. Although the function of $\gamma\delta$ T cells is incompletely understood, the regulatory function of $\gamma\delta$ T cells results in resolution of inflammation. The process is thought to be mediated through the production of cytokines, which would influence the movement and functions of key inflammatory effector cells such as neutrophils, macrophages, and natural killer cells.

My specific interest is to identify the metabolic regulatory pathways of $\gamma\delta$ T cells in the lungs and intestines. Our work suggests that GLN supplementation can be considered in the regimen of nutritional support in the treatment of critical patients with mucosal immune dysfunctions.