

## Plenary Lecture Abstract

**Host-microbe interactions in the gut-liver axis****Hiroshi Kiyono**

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The digestive tract is continuously exposed to infinite beneficial and harmful antigens including commensal and pathogenic microbe via the large surface of mucosal epithelium. The intestinal mucosa is thus equipped with multi-complexed but harmonized biological components including epithelial-mesenchymal cells, mucosal immunocompetent cells and commensal microbiota, which form "Gut Multi-ecological system (GME)" for the establishment of beneficial symbiotic condition as well as cooperative defense force. As an example, our study identified that commensal bacteria, *Alcaligenes* species can create "intra-tissue co-habitation niche" in the inside of Peyer's patches (PPs), an example of commanding tissue for the induction and regulation of a balanced mucosal immunity. These intra-tissue commensal bacteria (ICB) enter PPs via M cells located in the follicle associated epithelium and newly identified Aifi-1 plays a critical role for the M cell transcytosis of commensal bacteria. Innate lymphoid cells (ILCs) type3 have been shown to play critical role by the cooperative interaction with epithelial cells for the creation of intra-tissue co-habitation niche. Further, ILC3s have been shown to regulate epithelial cell glycosylation for the creation of healthy gut microbiota and providing protective barrier against gut pathogens. These results suggested that the GME system is a key element of creation and regulation of healthy environment of the intestinal tract for the balancing act between elimination and symbiosis.