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Innate immune regulation of T-helper (Th) cell homeostasis in the intestine

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Intestinal mucosa is a large reservoir of Th cells in our body, where Th cell differentiation is balanced. The maintenance of this balance in Th cell subtypes is crucial for immune homeostasis and a biased proportion of Th subtype results in development of chronic inflammatory diseases. The maintenance of Th cells in intestinal mucosa largely involves luminal bacteria which constantly interact with local innate immune cells of the host. Recent discoveries revealed that many immune disorders involve this host bacterial interaction in intestinal mucosa. On the other hand, most immune disorders are associated with abnormal Th cell activation. Now, what is still missing in our knowledge is the link between intestinal bacteria and abnormal T cell activation. We have sought to determine the role of innate immunity in the regulation of Th cell homeostasis in the intestine because innate immunity directly responds to bacteria and has the ability to promote Th cell differentiations. We put a special emphasis on TRIF (TIR domain containing adapter inducing interferon- β) signaling as it signals in response to Gram negative bacteria and is known to play an important role in antigen specific Th cell differentiation. We found that absence of TRIF skews Th cells to Th17 subtype and leads to aberrant Th cell plasticity. It also results in increased generation of central memory T cells and follicular helper (Tfh) cells. Since TRIF signaling can be selectively manipulated, targeting TRIF may provide a variety of opportunities to treat immunological diseases and establish more effective vaccine strategies.

Biography

Masayuki Fukata is a Physician Scientist in the field of Gastroenterology and Mucosal Immunology. He has obtained his MD and PhD from the Jikei University School of Medicine in Tokyo, Japan and he was certified by Educational Commission for Foreign Medical Graduates (ECFMG) in the US. He was trained in Clinical Gastroenterology at the Jikei University Hospital and completed Postdoctoral training at the Cedars-Sinai Medical Center in LA as well as Mount Sinai School of Medicine in NY. He is currently a Faculty at the division of Gastroenterology at Cedars-Sinai and Assistant Professor of Medicine at the University of California, Los Angeles.

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