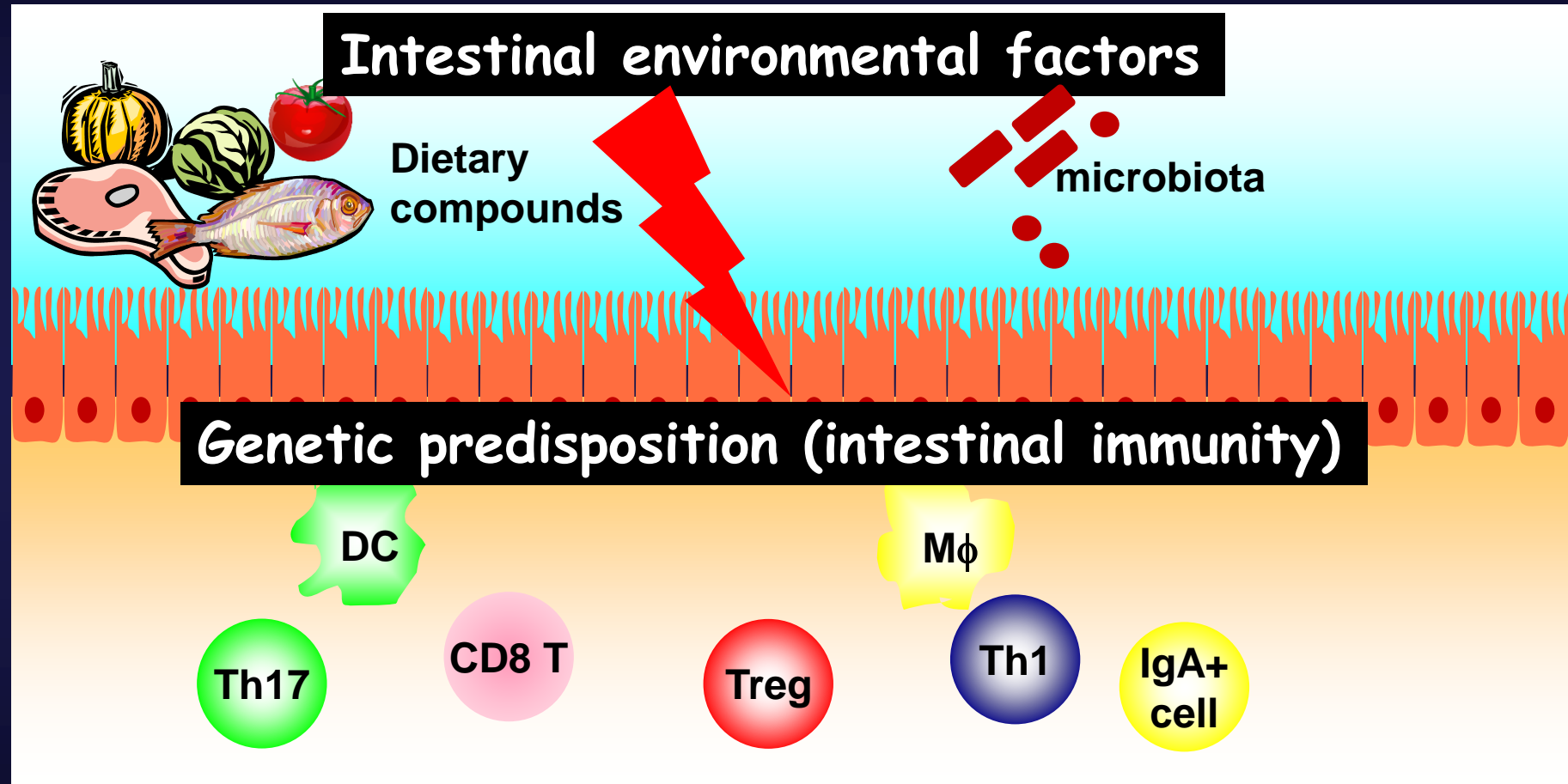


Regulation of mucosal immune responses by intestinal microbiota

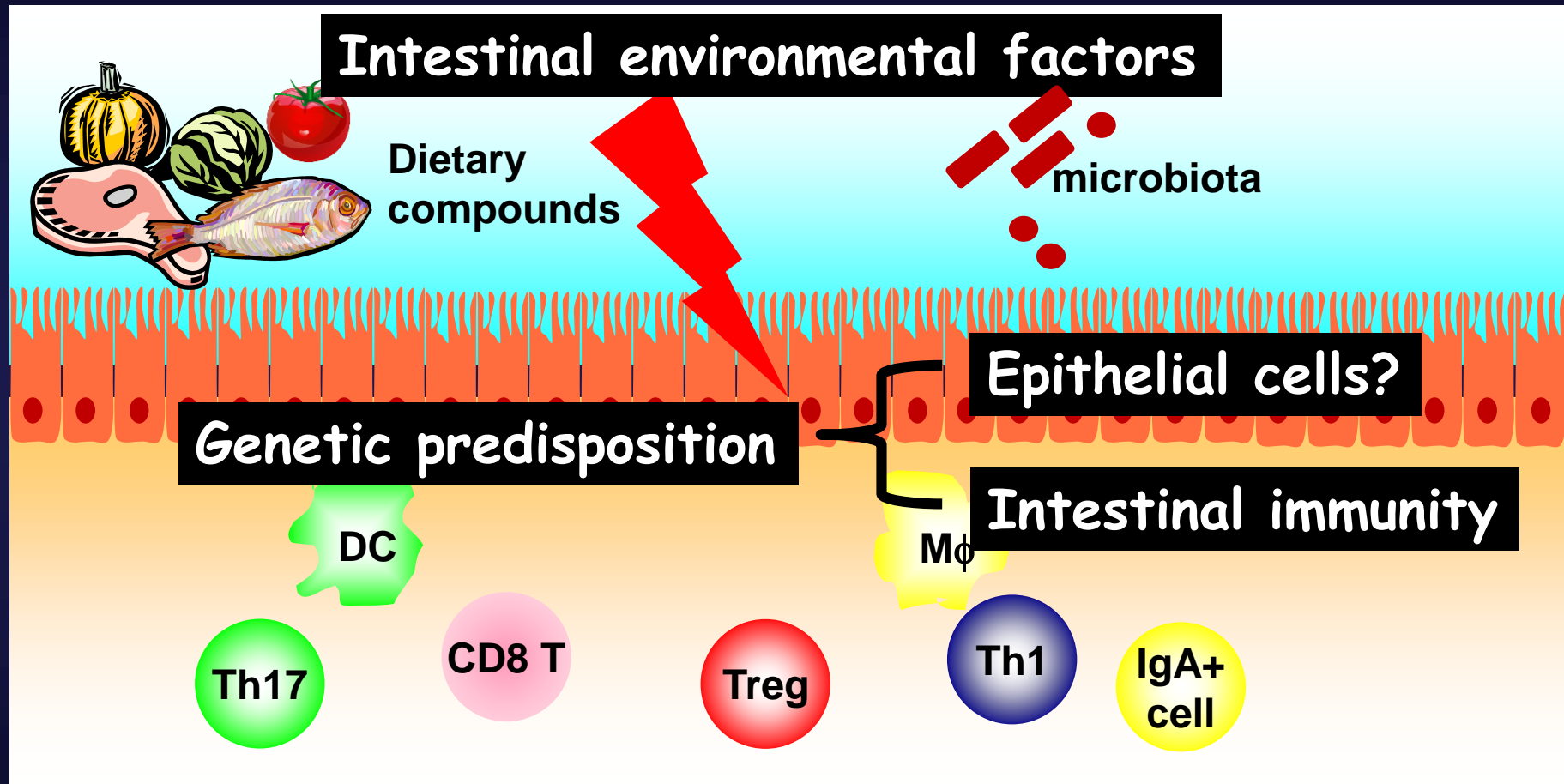
Kiyoshi Takeda

Department of Microbiology and Immunology
Graduate School of Medicine
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Osaka University

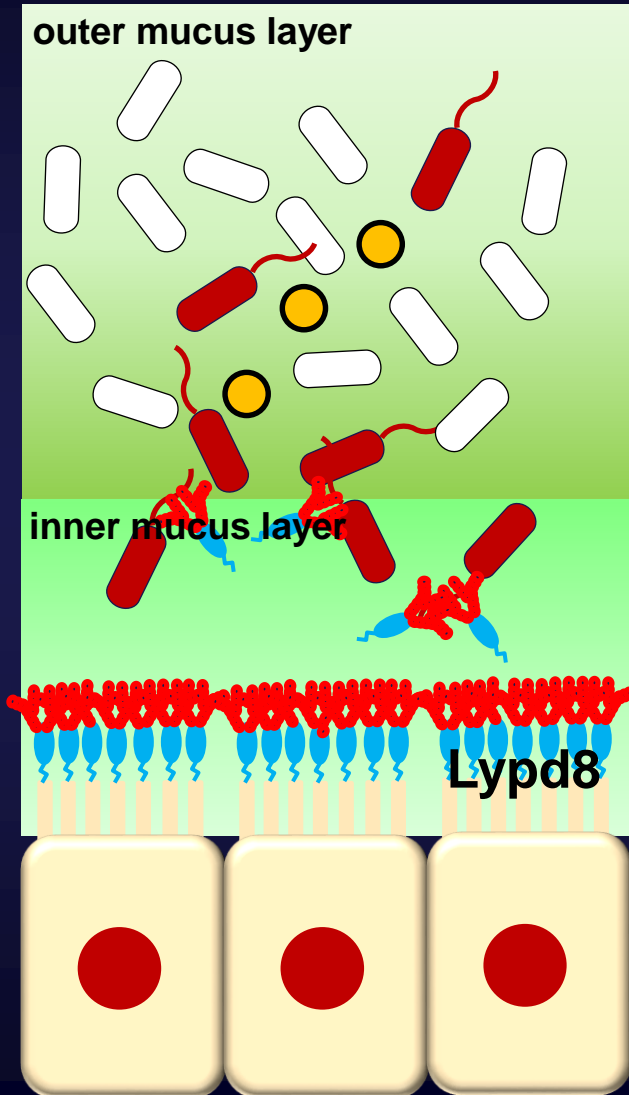
Pathogenesis of inflammatory bowel diseases (IBD)



Pathogenesis of inflammatory bowel diseases (IBD)



Lypd8 is essential for segregation of microbiota and epithelial layers in the colon



Lypd8 is expressed on the uppermost layer of colonic epithelia, and secreted into the lumen

Lypd8 binds to flagella, and suppress motile activity of commensal bacteria

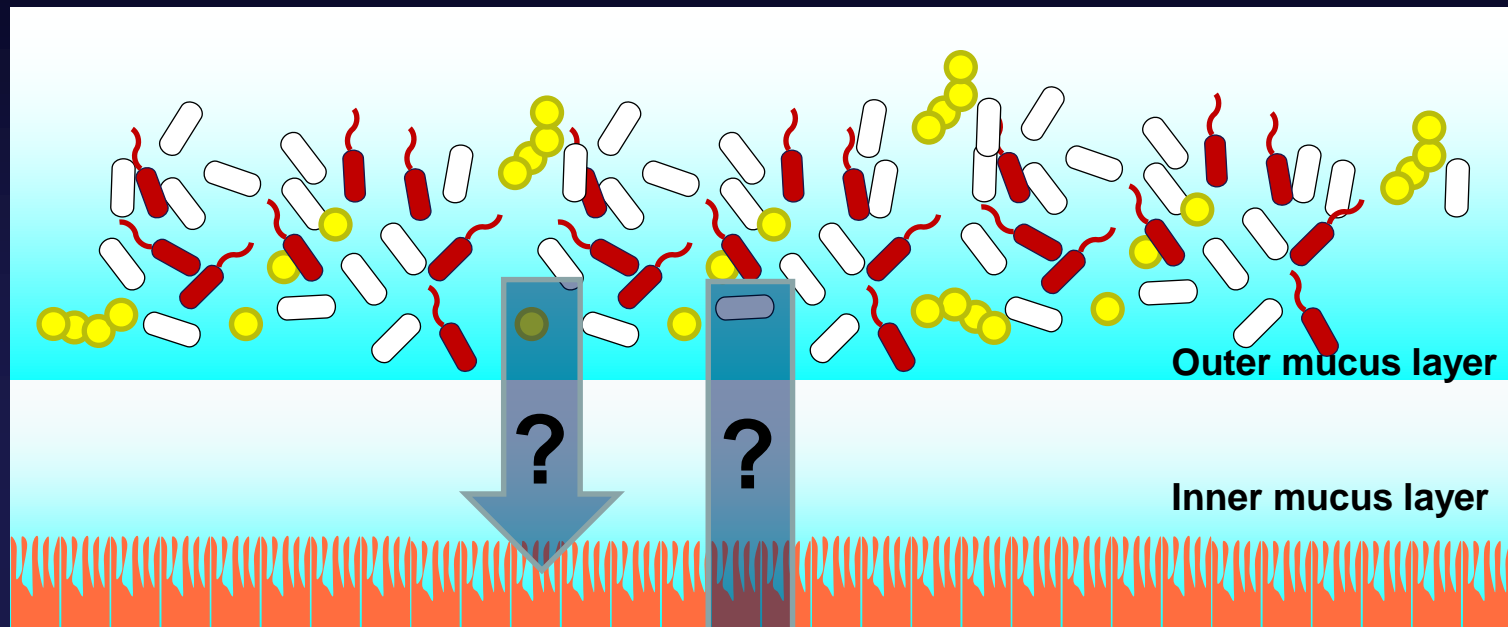
In the absence of Lypd8, highly motile flagellated bacteria invade into the epithelia, which increase the risk of intestinal inflammation

In patients with ulcerative colitis, Lypd8 expression was severely reduced

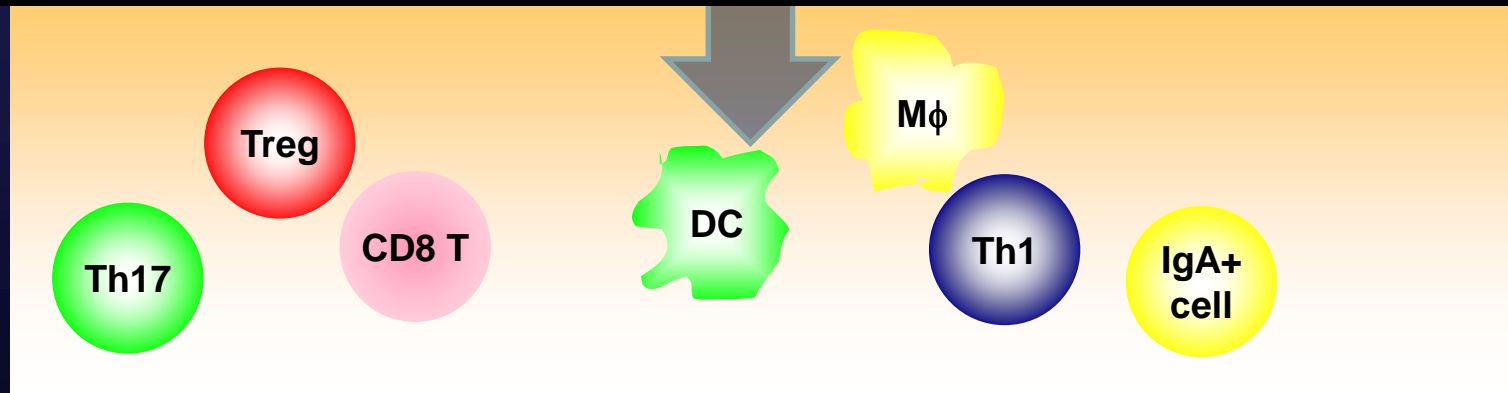


Ryu Okumura et al Nature 2016

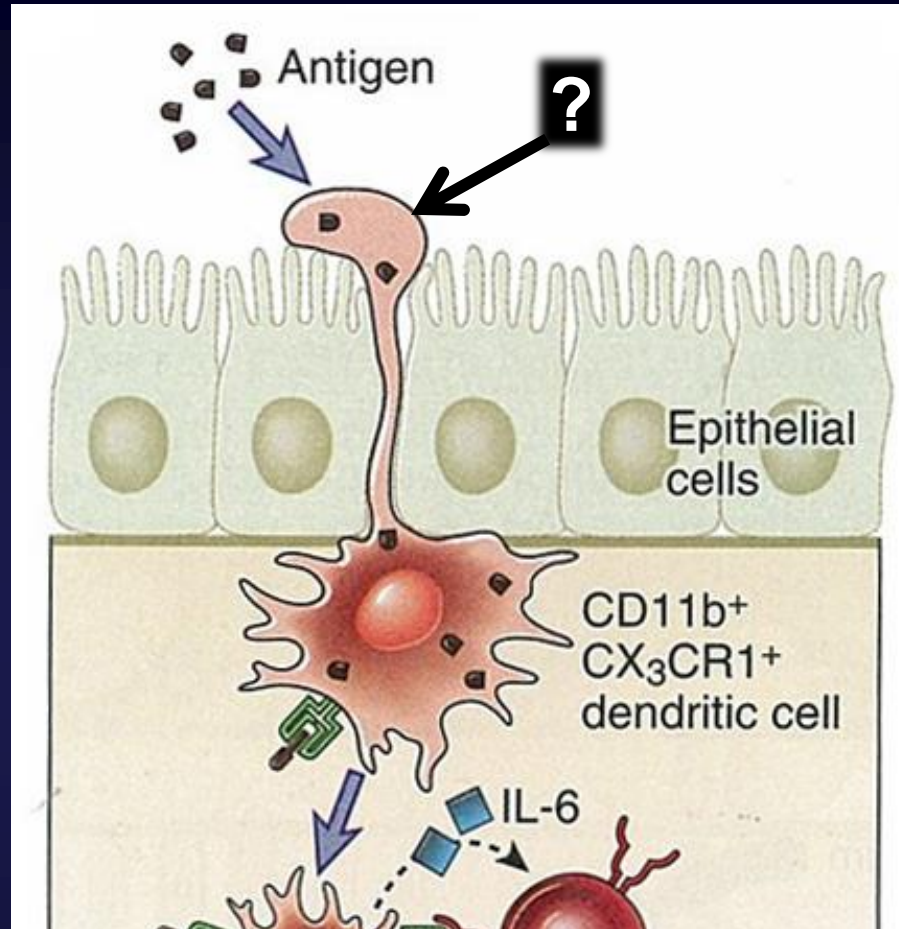
Intestinal microbiota is separated from the host



How intestinal microbiota influences the host cell functions?



Intestinal CX₃CR1⁺ cells extend their dendrites into the lumen



Naoki Morita



Eiji Umemoto



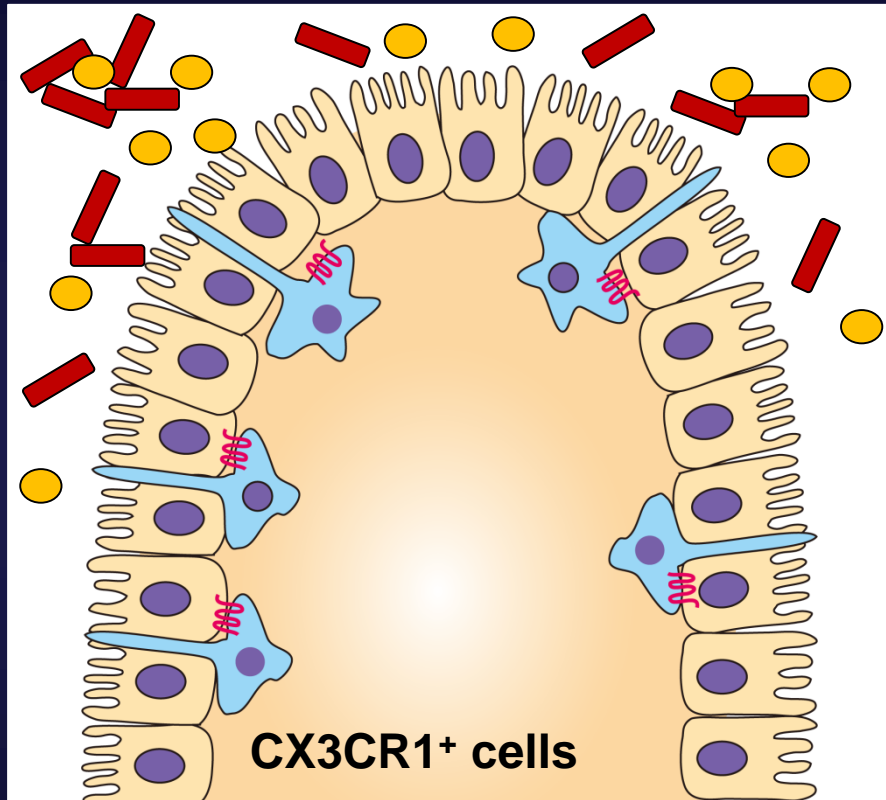
Bacterial metabolites mediate
dendrite protrusion of intestinal CX₃CR1⁺ cells?



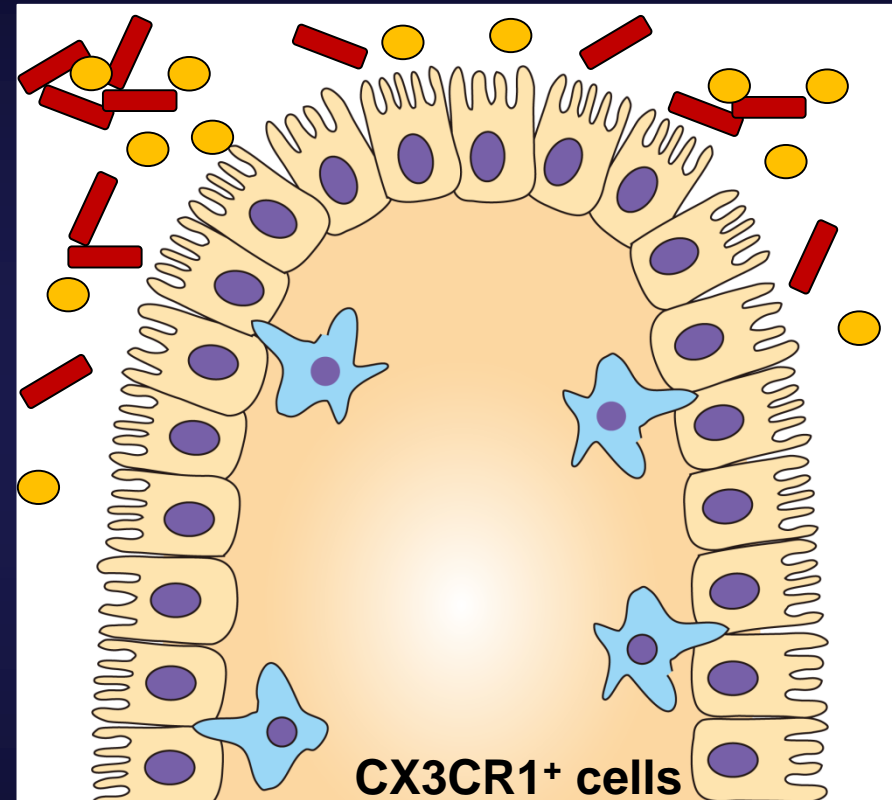
Cellular and Molecular Immunology (Elsevier)

Dendrite protrusion of CX₃CR1⁺ cells in the small intestine was dependent on microbiota and Gpr31

Wild-type

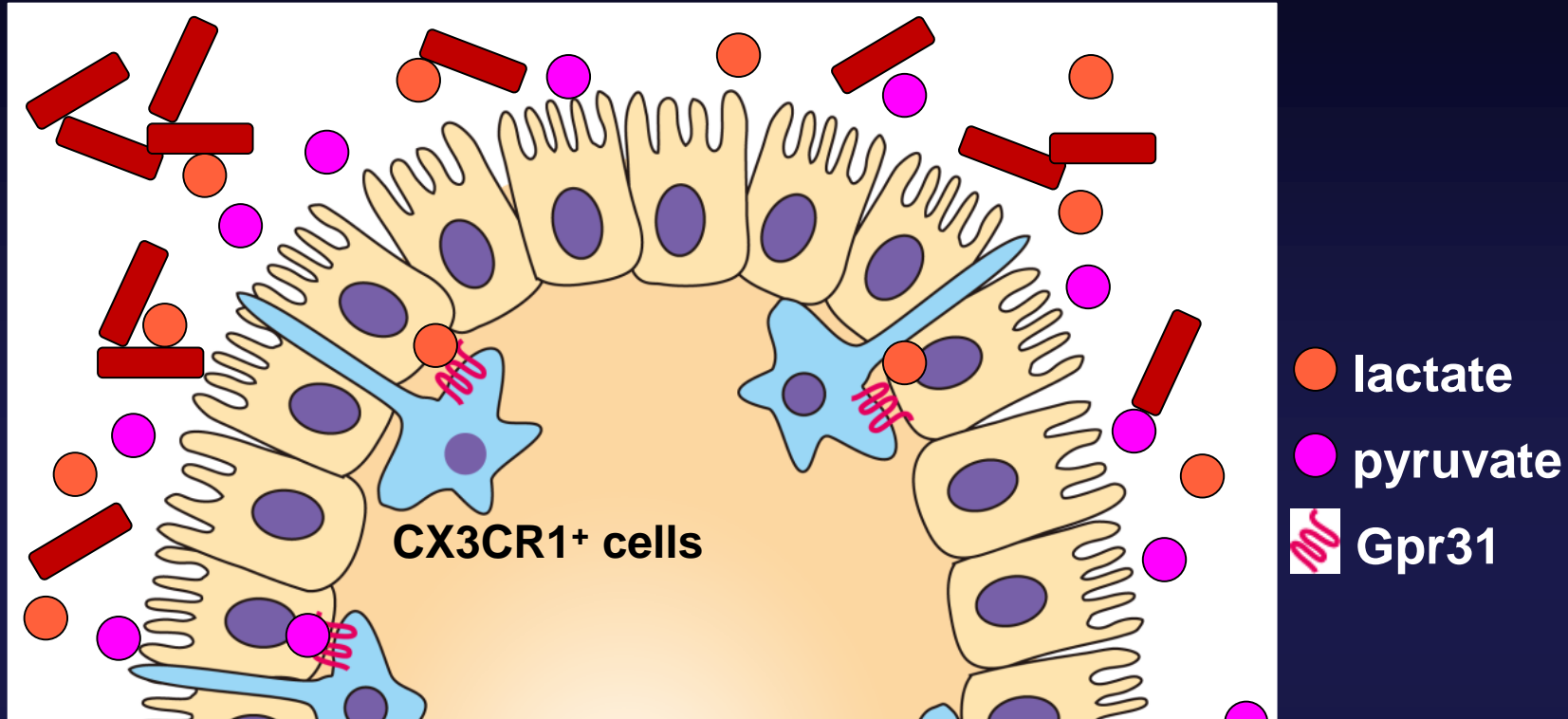


Gpr31 KO



Bacterial metabolite that activates Gpr31?

Summary



Lactate/pyruvate induce dendrite protrusion of CX₃CR1⁺ cells in the small intestine via Gpr31

The lactate/pyruvate-Gpr31 axis mediates the resistance to infection of enteric pathogens