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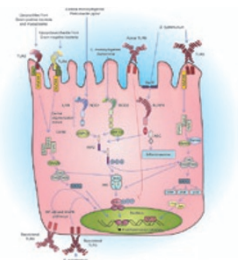
## From symbiosis to dysbiosis

In a Commentary, Eyal Raz integrates observations related to gut physiology, microbiology, and immunology to describe how food intake can alter the microbial populations that constitute our commensal flora. [See page 4](#)

## Autophagy and Paneth cell differentiation

Thad Stappenbeck describes recent studies linking the process of autophagy to the development and function of Paneth cells in the small intestine, and comments on their potential implication for susceptibility to inflammatory bowel disease.

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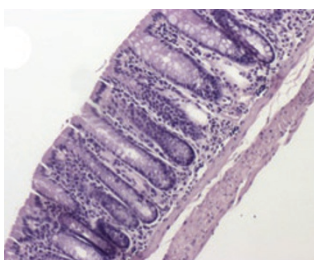
## ER stress and inflammation

Art Kaser and Rick Blumberg discuss the newly identified role of the unfolded protein response and endoplasmic reticulum stress in intestinal inflammation, emphasizing its relationship to the survival and function of Paneth, epithelial, and goblet cells. [See page 11](#)

## Pattern recognition in mucosal tissues

Ed Lavelle and colleagues provide a broad-ranging review of the role of pattern-recognition molecules (Toll-like receptors, nucleotide-binding domain and leucine-rich repeat containing receptors, and retinoic acid-inducible gene I-like receptors) in mucosal innate immunity and homeostasis.

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## TLRs, PAR<sub>2</sub>, and influenza

Quan Nhu and colleagues have uncovered novel signaling interactions between proteinase-activated receptor 2 and Toll-like receptors, which are present on mucosal epithelial cells, and they demonstrate the potential role for these receptors in regulating immune pathology in influenza infection.

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## Antimicrobial effects of CCL6

Knut Kotarsky and colleagues describe a novel, directly antimicrobial role for the chemokine CCL6, which was found to be highly expressed in the mucosal epithelium. [See page 40](#)

## *L. lactis* expressing anti-TNF

To overcome the limitations of systemic anti-tumor necrosis factor (TNF) therapy, Klass Vandenberg and colleagues have engineered a strain of *Lactococcus lactis* to express an engineered anti-TNF antibody that delivers the therapeutic molecule directly to the gut and is effective in an animal model of disease. [See page 49](#)

## Vaginal immunization induces antibodies to HIV

Martin Cranage and colleagues describe how repeated vaginal immunization with a gel formulation of HIV envelope glycoprotein can induce local antibody titers in the genital tract—an important site of virus entry. [See page 57](#)

## Common colds and asthma

In this study by Yury Bochkov and colleagues, profiling of epithelial cells exposed to rhinovirus reveals differences in transcriptional regulation in asthmatics. These differences may help shed light on which pathways drive the inflammatory response and subsequent repair and remodeling activity in asthma patients following viral infection. [See page 69](#)

## PD-1 control of iNKT cells

In a mouse model of asthma, Omid Akbari and colleagues demonstrated opposing degrees of inflammation and airway hyperreactivity in mice deficient in programmed death ligand 1 (PD-L1) or PD-L2, ligands of the inhibitory receptor PD-1. The authors' data suggest that PD-L2 expressed by dendritic cells in the lung is crucial in preventing activation of and interleukin-4 production by invariant natural killer T cells in this model. [See page 81](#)