Title: The role of barrier function, autophagy, and cytokines in maintaining intestinal homeostasis

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Abstract:
Intestinal homeostasis is maintained through the interplay of the intestinal mucosa, local and systemic immune factors, and the microbial content of the gut. The cellular processes of autophagy, endoplasmic reticulum stress, the unfolded protein response and regulation of reactive oxygen species production are required to maintain a balance between pro-inflammatory responses against potential pathogens and a tolerogenic response towards commensal bacteria. Intestinally active cytokines regulate innate immune pathways and cellular pathways within the gut mucosa. Disruption of these processes, or alterations in the cytokine milieu, can result in an improper response to the commensal gut microbial community leading to inappropriate inflammation characteristic of conditions such as inflammatory bowel disease.

Keywords:
mucosal immunity, autophagy, intestinal homeostasis, barrier function, innate immune pathways, gut cytokines

Abbreviations:
IEC – intestinal epithelial cell
TJ – tight junctions
IBD – inflammatory bowel disease
ER – endoplasmic reticulum
UPR – unfolded protein response
CD – Crohn's disease
IL - Interleukin
NOD2 – nucleotide-binding oligomerization domain–containing protein 2
TLR – Toll-like Receptor
TNF – tumor necrosis factor
IFN – Interferon
PERK - pancreatic ER eIF2α kinase