

Gut response to fluid flow

October 27 2017, by Anne Meyer

Flow of fluids through the gut, such as milk from an infant's diet, generates a shear stress on cells lining the intestine. Ken Lau, Ph.D., and colleagues have demonstrated that microvilli – finger-like membrane protrusions – are capable of sensing shear forces and subsequently drive an intracellular response called autophagy.

Autophagy is a natural process that degrades and recycles cellular components in order to restore nutrient balance. Autophagy also plays a role in transport, secretion, and microbial clearance. Defects in autophagy can contribute to [intestinal diseases](#) such as [inflammatory bowel disease](#).

The investigators report that mechanical stimulation of microvilli by fluid flow triggers components of the autophagy pathway and large vacuole formation in intestinal epithelial cell cultures.

The findings, reported in *Molecular Biology of the Cell*, provide the first evidence that microvilli possess mechanosensing ability and implicate a novel link between fluid flow [shear stress](#) and the autophagy pathway. This work also sheds light on how the infant gut senses contents and avoids disease.

More information: Sun Wook Kim et al. Shear stress induces non-canonical autophagic flux in intestinal epithelial monolayers, *Molecular Biology of the Cell* (2017). [DOI: 10.1091/mbc.E17-01-0021](https://doi.org/10.1091/mbc.E17-01-0021)

Provided by Vanderbilt University

Citation: Gut response to fluid flow (2017, October 27) retrieved 25 April 2024 from <https://medicalxpress.com/news/2017-10-gut-response-fluid.html>

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