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IMAGING

A novel technique for imaging enteric ganglia

Full-field optical coherence microscopy (FFOCM) is a novel imaging technique that has shown potential in a recent study for visualizing enteric ganglia.

New techniques are constantly being developed to enable noninvasive imaging of the enteric nervous system (ENS) as an alternative to intestinal biopsies. Optical coherence tomography (OCT) yields depth-resolved images of tissue architecture, but has low resolution. "FFOCM is similar to OCT," explains Allan Goldstein, corresponding author, "but it captures a thin optical section with very high lateral and transverse resolution."

Goldstein and colleagues aimed to demonstrate that FFOCM could be used to image the ENS. Thus, they used FFOCM to image the gastrointestinal tracts of wild-type mice and a mouse model of Hirschsprung disease. The results show that FFOCM can be used to image the myenteric plexus of the stomach, small intestine and colon.

The researchers also wanted to perform precise quantitative analysis of myenteric ganglia. "We confirmed the neuronal identity of the visualized cells by performing co-localized FFOCM and immunofluorescence staining," explains Goldstein. "Importantly, there was excellent interobserver agreement on the density of myenteric neurons identified." FFOCM also revealed a decrease in ganglia density in the mouse model of Hirschsprung disease.

The authors believe that FFOCM has the potential to provide reliable morphological and quantitative assessment of the ENS *in vivo*. "This capability for live imaging will be a major step towards improving characterization of the human ENS, and the diagnosis of enteric neuropathies," concludes Goldstein.

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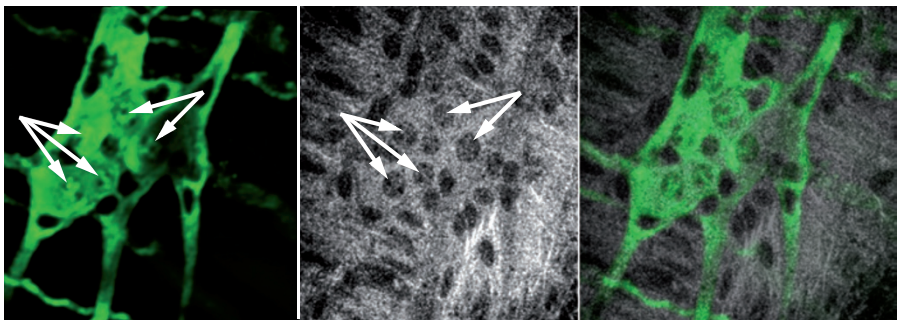

Immunohistochemistry (left panel) and full-field optical coherence microscopy (middle panel) yield similar images of enteric ganglia, as demonstrated by an image overlay of the two techniques (right panel). Courtesy of A. Goldstein.

Original article Coron, E. *et al.* Full-field optical coherence microscopy is a novel technique for imaging enteric ganglia in the gastrointestinal tract. *Neurogastroenterol. Motil.* doi:10.1111/nmo.12035