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A protocol for computerized quantitative analysis of nerve fibers, mast cells, enteric glial cells and the proximity of mast cells to the nerve fibers in 3D Images of human sigmoid mucosal biopsies

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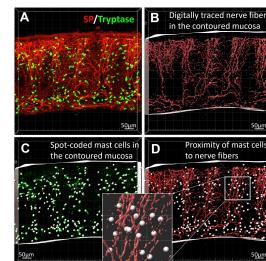
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Protocol status: Working

We use this protocol and it's working

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Abstract

This protocol describes a step-by-step computational workflow that we developed by adapting Imaris 9.7-9.9 Surfaces Rendering Technology (<https://imaris.oxinst.com/products/imaris-for-neuroscientists>) to perform the quantitative analysis of nerve fibers, enteric glial and immune cells in 3D images of human sigmoid mucosal biopsies, as well as to assess the proximity of mast cells to the nerve fibers which cannot be easily portrayed and precisely measured with 2D images. The volumes of surface-masked nerve fibers and enteric glial cells, the numbers of spotted mast cells and the shortest distances of the centers of each individual spot to the surfaces of nerve fibers in 3D images were automatically computed and plotted correspondently with Imaris 9.7-9.9. This computerized protocol not only reduces the biases due to observer/examiner judgment and overcomes limitations of 2D images, but also is much faster than measuring manually and allows us to quantitate a larger number of samples, increasing statistical accuracy. The parameters created in this protocol also provide efficient reference for us to apply the New AI Machine Learning Segmentation implemented into Imaris 10.1 recently for our quantitative analysis of large datasets. The study using this protocol is relevant to the underlying peripheral mechanisms of visceral pain in irritable bowel syndrome.

Attachments



DOCX

[A protocol for quant...](#)

626KB

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