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Adipose depot innervation: whole mount staining, imaging, quantification V.2

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1 Works for me dx.doi.org/10.17504/protocols.io.brs2m6ge

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ABSTRACT

Abstract

Little is known about the diversity and function of adipose tissue nerves due, in part, to the inability to effectively visualize the various nerve subtypes residing within these tissues. The tools currently available for researchers to image and quantify adipose tissue innervation are limited and dependent on optical clearing techniques and light sheet microscopy. Here we present a method of tissue processing that uses a method of mechanically compressing tissue to decrease tissue thickness in the z-axis by expanding it in the x and y-axes whilst leaving cells intact. This has been combined with autofluorescence quenching techniques to permit imaging of intact whole tissues on both widefield and confocal microscopes and a complementary means to perform whole tissue neurite density quantification. We have included examples of how this technique can be used to further our current knowledge of adipose-nerve communication by characterizing the nerves, nerve-subtypes, and neurovascular interactions within the inguinal subcutaneous white adipose tissue in mice.

THIS PROTOCOL ACCOMPANIES THE FOLLOWING PUBLICATION

Blaszkiewicz M, Willows JW, Dubois AL, et al. (2019) Neuropathy and neural plasticity in the subcutaneous white adipose depot. PLoS ONE 14(9): e0221766. https://doi.org/10.1371/journal.pone.0221766
Willows JW, Blaszkiewicz M, Lamore A, et al. (2019) Visualization and Analysis of Whole Depot Adipose Tissue Innervation (pre-print) bioRxiv 788885; https://www.biorxiv.org/content/10.1101/788885v1

ATTACHMENTS

1 Whole Mount scWAT Isolation.pdf
2 Whole Mount Adipose Immunostaining.pdf
3 Confocal Imaging of Whole Mount Adipose Tissue.pdf
4 Whole Mount Isolectin Staining of Adipose Protocol.pdf

DOI

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PROTOCOL CITATION

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MANUSCRIPT CITATION please remember to cite the following publication along with this protocol

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KEYWORDS

white adipose tissue (WAT), adipose innervation, adipose neuropathy, aging, obesity, diabetes, metabolic health, exercise, cold, peripheral neuropathy, diabetic peripheral neuropathy, DPN

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