protocols.io

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We are still developing and optimizing this protocol

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🌐 Automatic labeling tissue and cell of human skin

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DISCLAIMER

This is first upload from TMC - Johns Hopkins. Not intended for actual usage.

ABSTRACT

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Tissue biopsy collection

1   After punch/excisional biopsy from a operating room (OR), place the skin tissue into a tissue container prefilled with buffered formalin for 12-24 hours at room temperature (RT)

2   Discard formalin, rinse with PBS, refill PBS, and leave the tissue in PBS for 1 minute

3   Take tissue out on a large Petri dish and measure the tissue size

4   Label a slotted cassette with a pencil with tissue ID and place the tissue in the cassette

5   Put cassette with the tissue back into the tissue container filled with PBS

Paraffin embedding

6   Dehydrate tissue by submerging cassettes into ethanol at increasing concentrations from 70% to 99%.

7   Embed cassette paraffin at 60 deg C and store at room temperature

Tissue sectioning

8   Section tissue and place on water bath to expand

9   Place expanded tissue section on a Superfrost Plus microscope slide

Tissue scanning

10   Scan unstained microscope slide at 40X magnification using Hamamatsu nanozoomer S210

Converting image format from ndpi to ome.tiff

11   Use openslide library in python along with pyvips library to load whole slide image file in proprietary format (ndpi) from Hamamatsu and save as ome.tiff along with metadata.

Applying semantic segmentation model in MATLAB

12   Load the ome.tiff image using bioformat library for MATLAB and generate tiles to input into a deep learning model to semantically segment 11 different skin tissue compartments.