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🌐 Multimodal imaging pipeline for molecular and cellular characterization of Liver tissue - HuBMAP TTD-Columbia/PSU

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Abstract

We have developed a workflow to assess the spatial organization of liver tissue with regard to its cellular and metabolic heterogeneity at tissue and single cell level resolution - by performing multimodal imaging on consecutive tissue sections using H&E staining, DESI, $(H_2O)_n$-GCIB-SIMS, C60-SIMS, and RNAscope.

This document provides the collection of protocols within the multimodal imaging workflow implemented by Columbia University/Pennsylvania State University Transformative Technology Development Center as a part of Human Biomolecular Atlas Program (HuBMAP, NIH).

Troubleshooting

1   Acquire human tissue blocks.
dx.doi.org/10.17504/protocols.io.rm7vzy5wrlx1/v1

2   Prepare tissue sections for multimodal imaging on appropriate substrates.
dx.doi.org/10.17504/protocols.io.e6nvwjmjzlmk/v1

3   H&E staining is performed using standard protocol.

4   DESI-IMS is performed as described here.
dx.doi.org/10.17504/protocols.io.ewov1nze7gr2/v1

5     $(H_2O)_n$-GCIB-SIMS-IMS is performed as described here.
dx.doi.org/10.17504/protocols.io.81wgbyynovpk/v1

6   C60-SIMS for multiplexed antibody staining is performed as described here.
dx.doi.org/10.17504/protocols.io.b5qmq5u6

7   RNAScope imaging is performed as described here.
dx.doi.org/10.17504/protocols.io.kqdg3p3e7l25/v1