CODA: 3D tissue reconstruction pipeline | HuBMAP | JHU-TMC V.2

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Human BioMolecular Atlas Program (HuBMAP) Method Development Community

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ABSTRACT

CODA pipeline with 6 parts

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A.M. Braxton, A.L. Kiemen, M.P. Grahn, A. Forjaz, J. Parksong, J.M. Babu, J. Lai, L. Zheng, N. Niknafs, L. Jiang, H. Cheng, Q. Song, R. Reichel, S. Graham, A.I. Damanakis, C.G. Fischer, S. Mou, C. Metz, J. Granger, X.-D. Liu, N. Bachmann, Y. Zhu, Y.Z. Liu, C. Almagro-Pérez, A.C. Jiang, J. Yoo, B. Kim, S. Du, E. Foster, J.Y. Hsu, P.A. Rivera, L.C. Chu, D. Liu, E.K. Fishman, A. Yuille, N.J. Roberts, E.D. Thompson, R.B. Scharpf, T.C. Cornish, Y. Jiao, R. Karchin, R.H. Hruban, P.-H. Wu, D. Wirtz, and L.D. Wood, “3D genomic mapping reveals multifocality of human pancreatic precancers”, Nature (2024)

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We use this protocol and it's working

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Setting up CODA environment and preparing sample dataset

1 dx.doi.org/10.17504/protocols.io.q26g71rpkgwz/v1

Calculate registration on low-resolution tissue images

2 dx.doi.org/10.17504/protocols.io.kxygxym3dl8j/v1

Deep learning multi-labelling of tissue structures using training on manual…

3 dx.doi.org/10.17504/protocols.io.81wgbz1x3gpk/v1

Register the deep learning labelled images and Construct 3D tissue matrix

4 dx.doi.org/10.17504/protocols.io.yxmvme7eog3p/v1

Nuclear coordinate generation

5 dx.doi.org/10.17504/protocols.io.dm6gpz8z8lzp/v1

Register the nuclear coordinates and Construct 3D cell matrix

6 dx.doi.org/10.17504/protocols.io.n2bvjnrnxgk5/v1