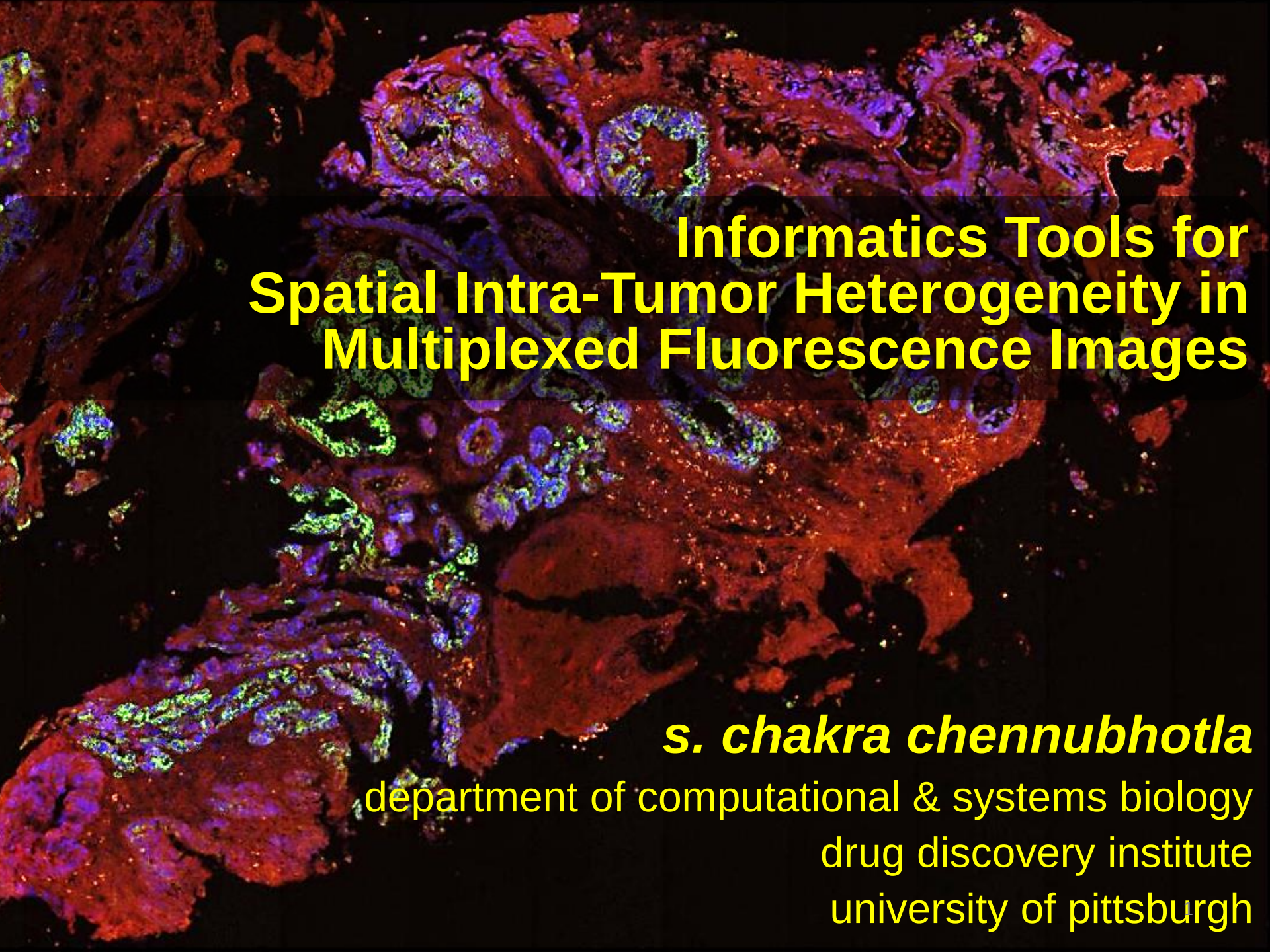




Informatics Tools for Spatial Intra-Tumor Heterogeneity in Multiplexed Fluorescence Images

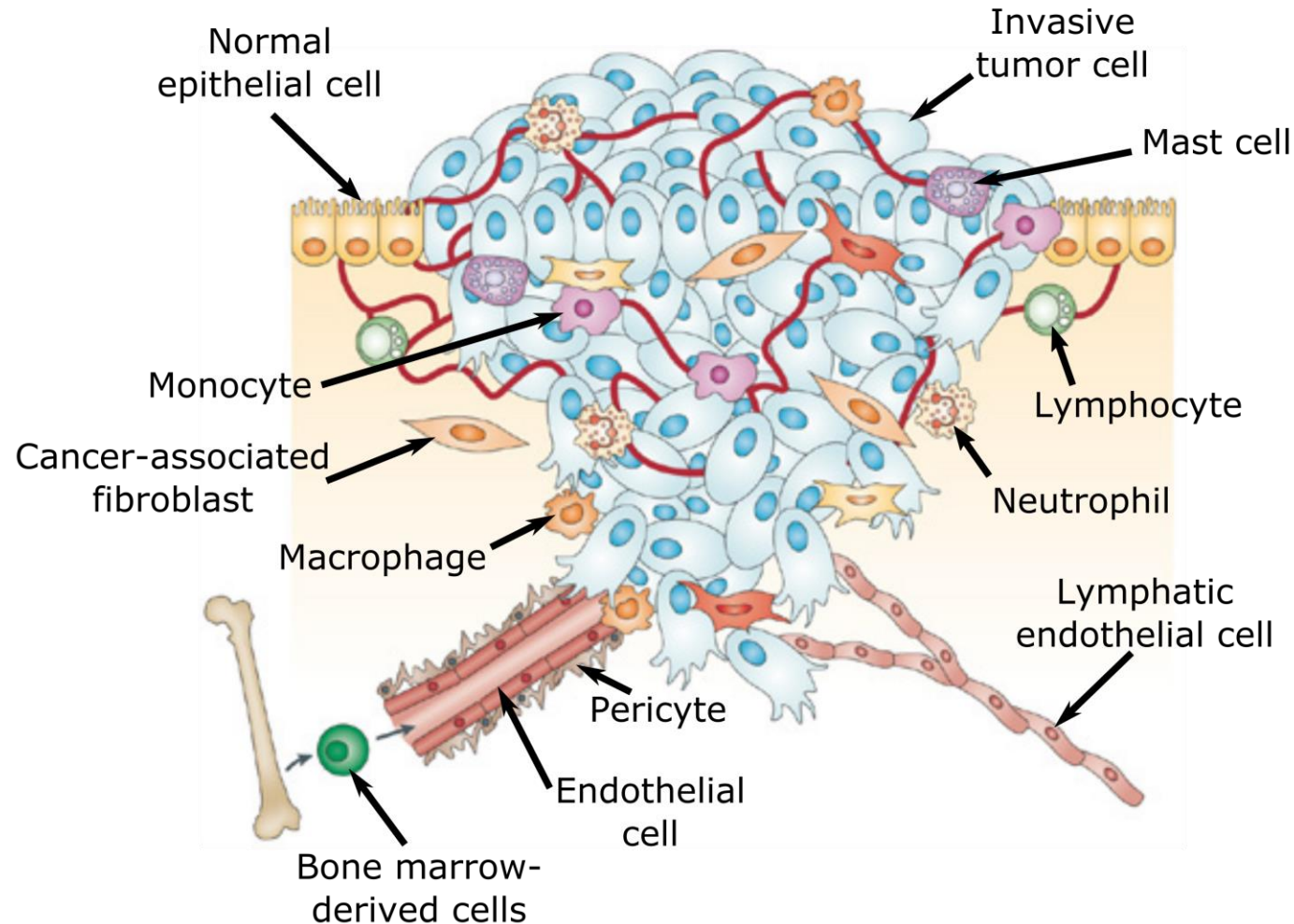
s. chakra chennubhotla

department of computational & systems biology

drug discovery institute

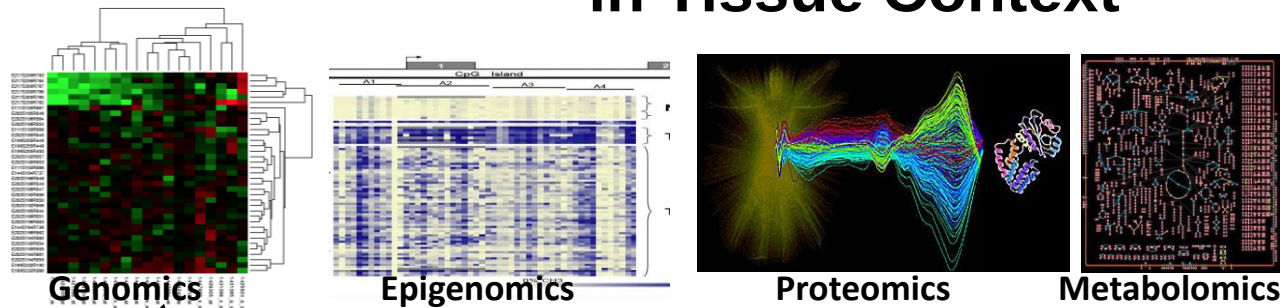
university of pittsburgh

Intra-Tumor Spatial Heterogeneity Complicates Accurate Diagnosis/Prognosis

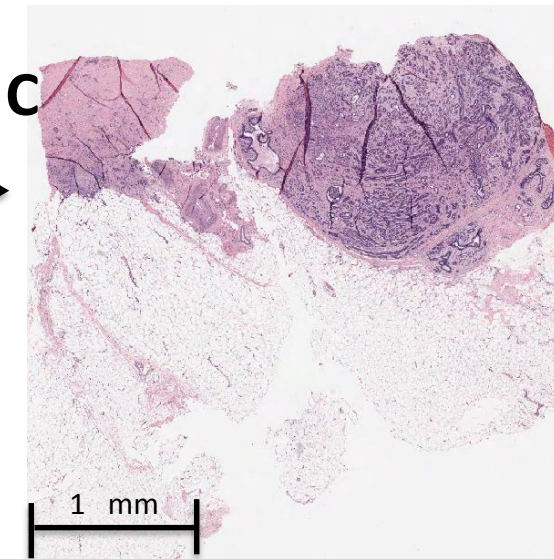
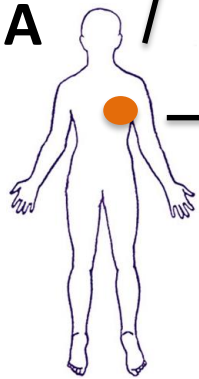


Continuum of H&E, IHC and Multiplexed/Hyperplexed IF Computational Pathology Tools to Address Heterogeneity in Tissue Context

B

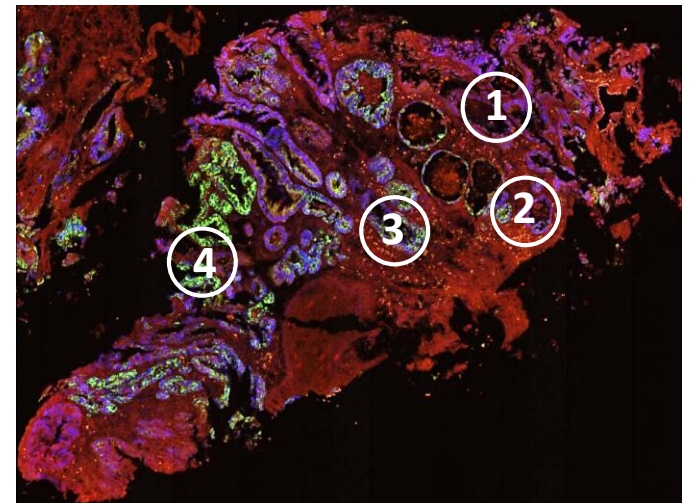
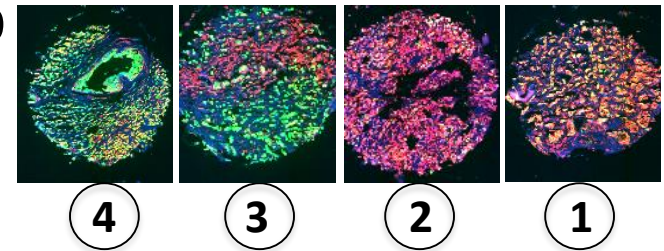


A



H&E stained whole tissue section
from FFPE tumor sample

D

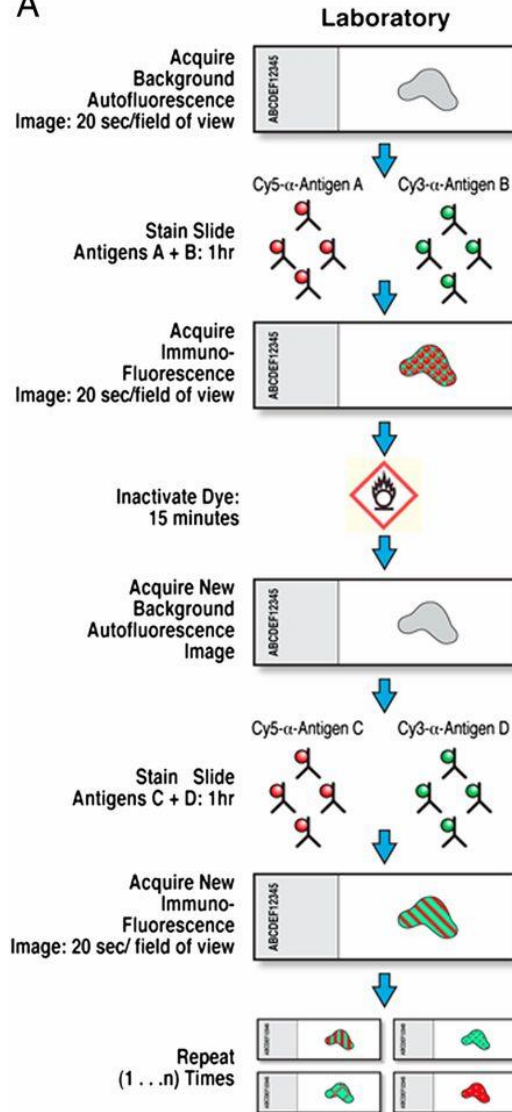


Multi to hyperplexed fluorescence imaging of whole₃
section for higher spatial resolution and tissue context

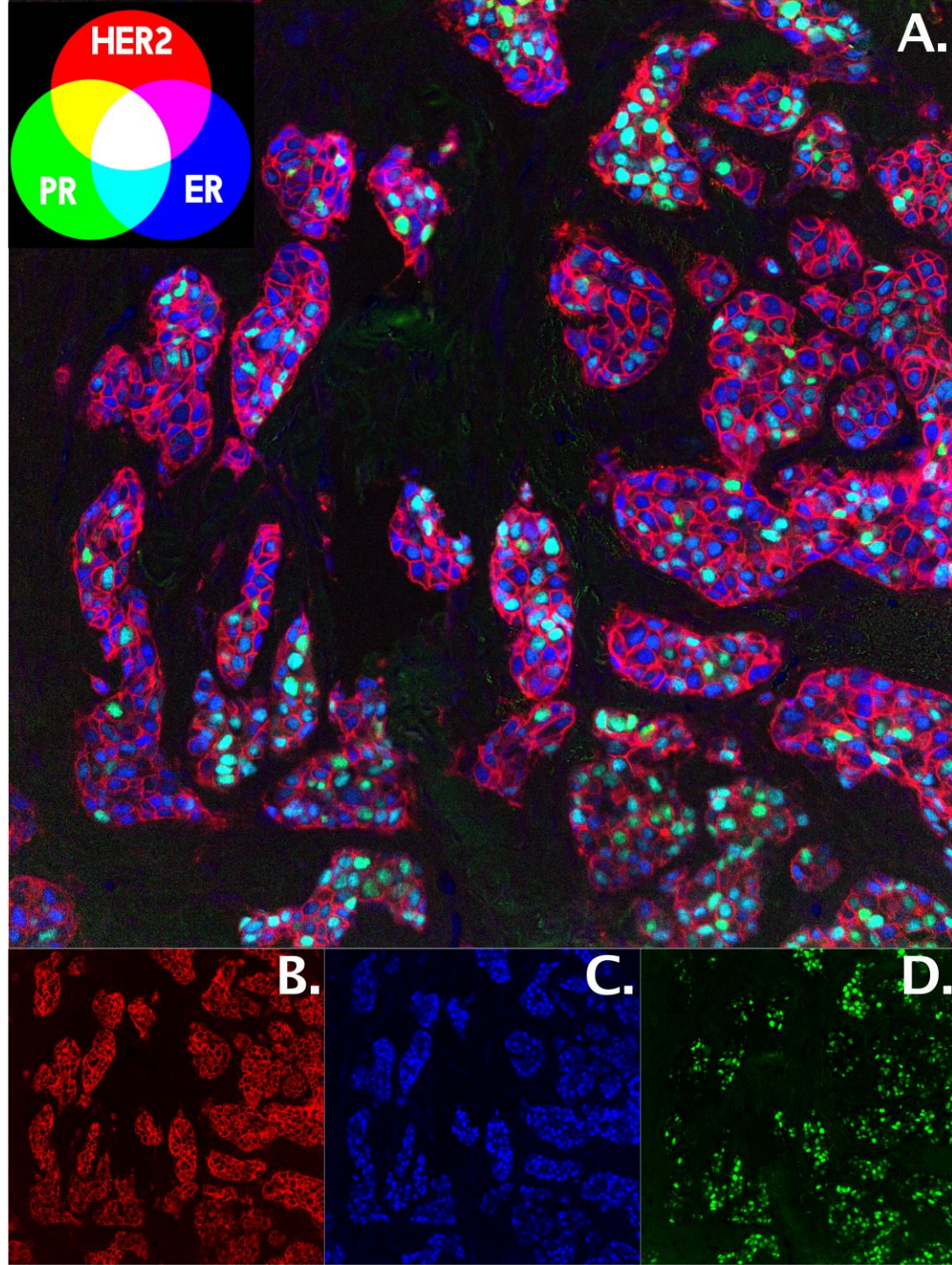
Multiplexed IF

- **9 biomarkers**
- **Up to 60Ab**
- **Multiple FISH**

A



Gerdes et al. PNAS 2013;110:11982-11987



Spatial Intra–Tumor Heterogeneity

1. Quantitate spatial intra-tumoral heterogeneity (ITH)
 - Quadratic entropy, Shannon index, Pointwise Mutual Information and others
2. Test spatial ITH metrics for correlation with tumor stage, grade and clinical outcome
3. Interaction with multiplexed/hyperplexed IF images and visualize spatial ITH

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