

Histomics-powered biomarker discovery

→ December 8th, 2024



95% of cancer
drugs in clinical
trials **fail**

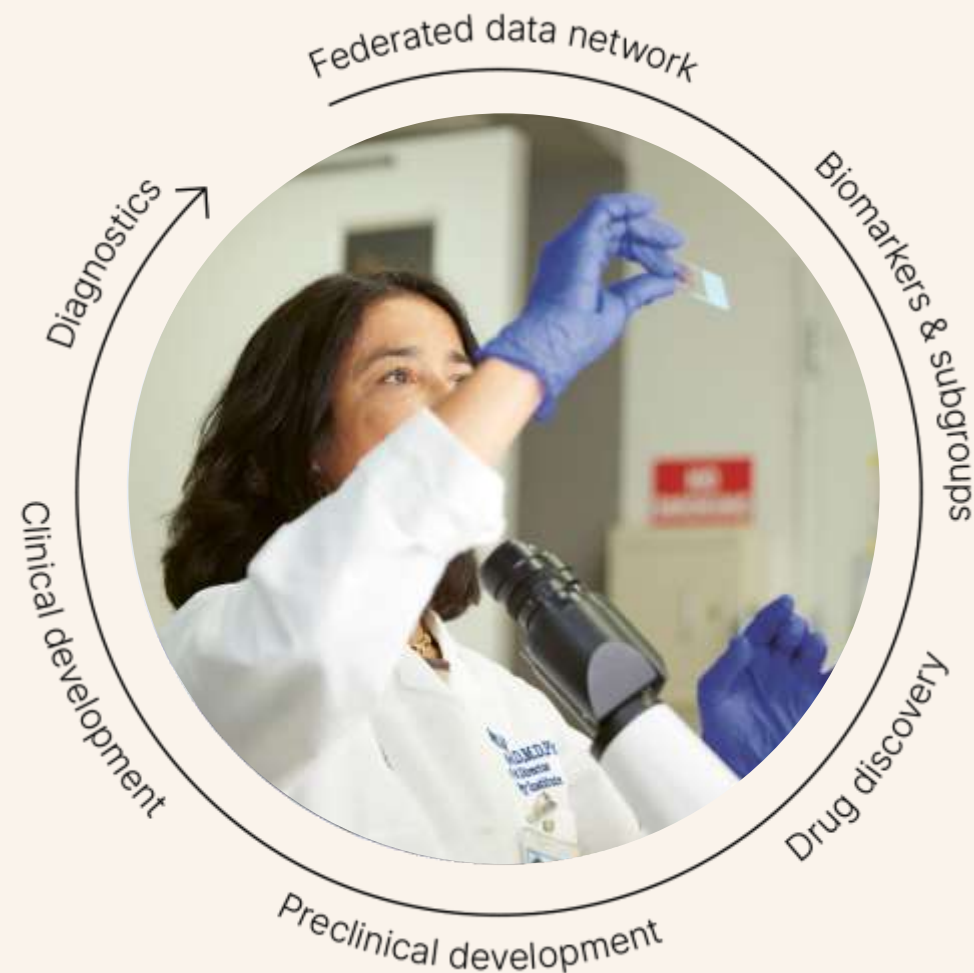




We are Owkin

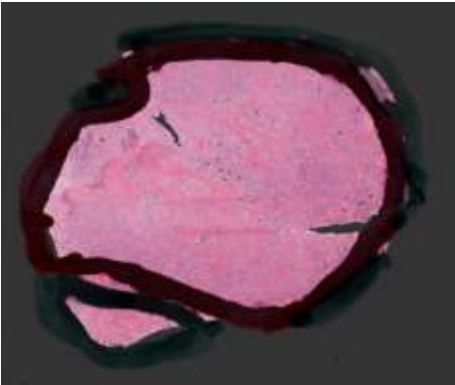
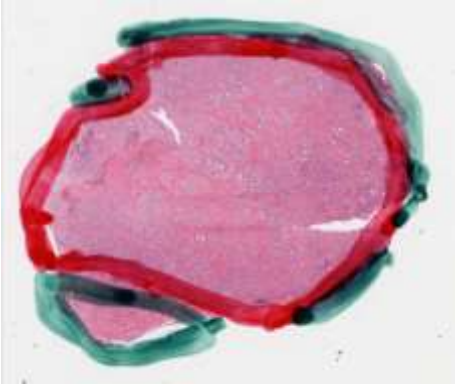
We are a full stack TechBio

By understanding complex biology through AI, we identify new treatments, de-risk and accelerate clinical trials and build diagnostic tools.



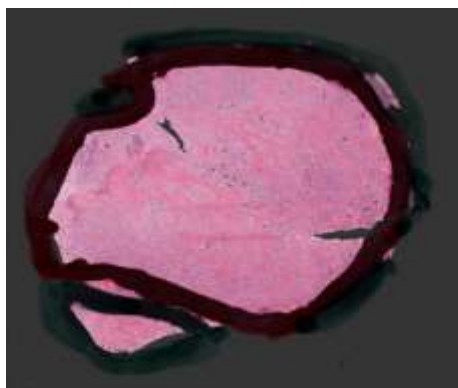
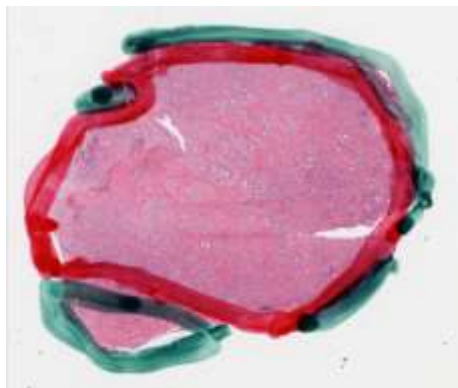


Tissue detection

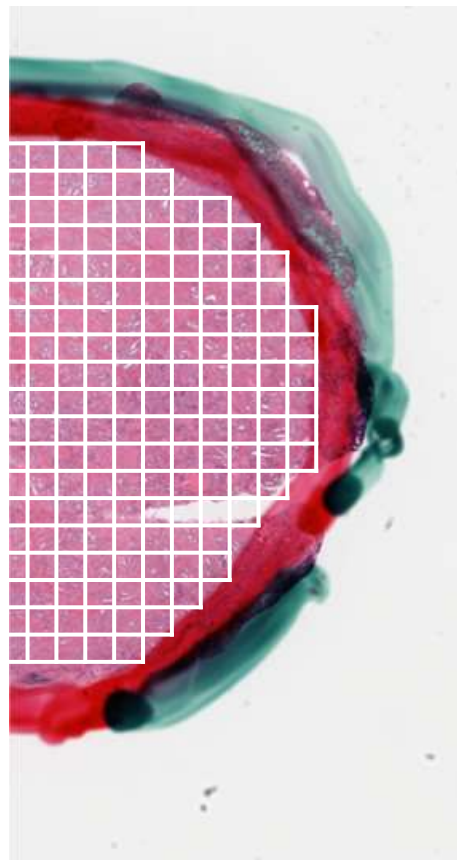




Tissue detection

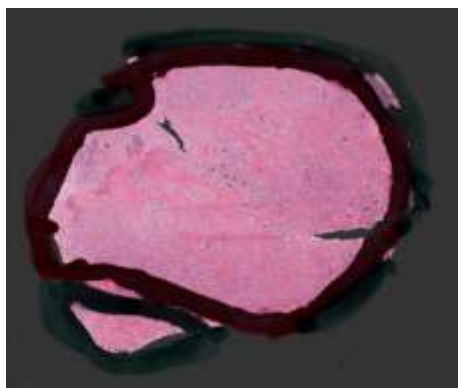
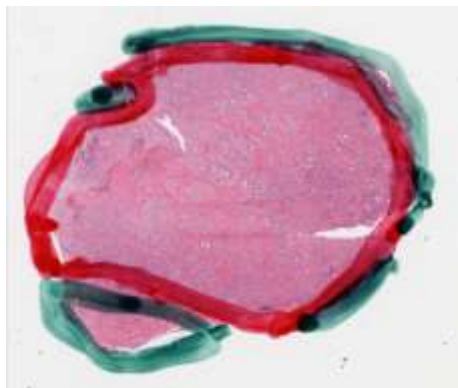


Tiling & Normalisation

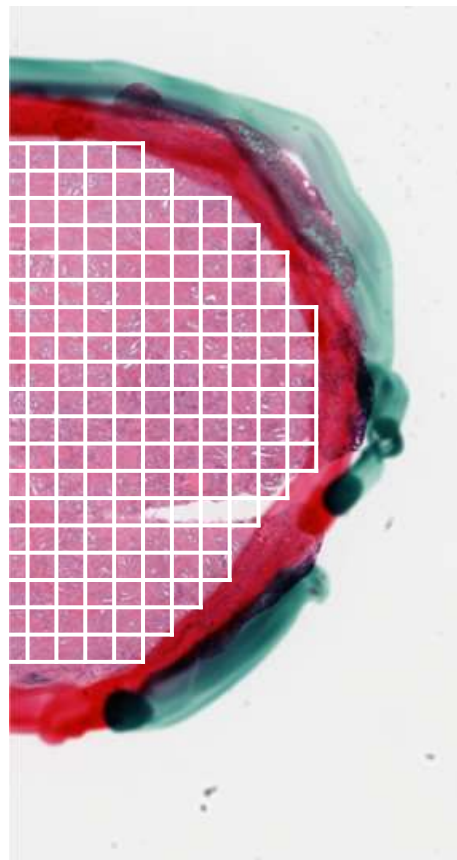




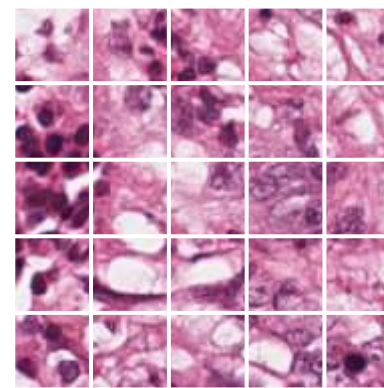
Tissue detection



Tiling & Normalisation

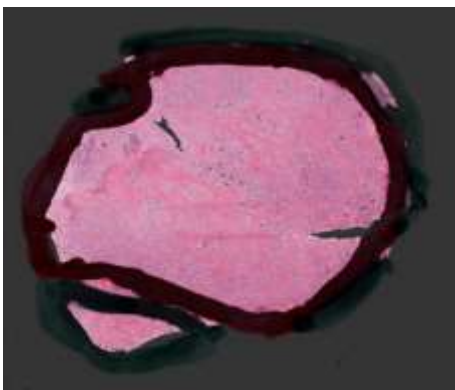
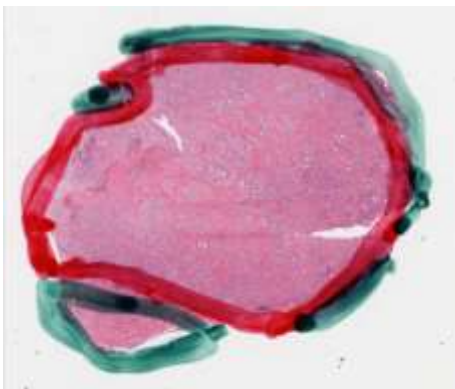


Feature extraction

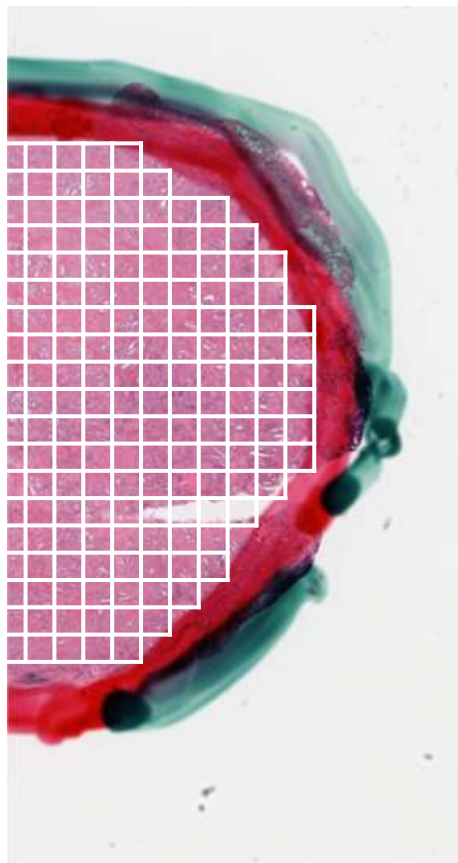


1.4	0.1	4.0	1.3	2.2
4.3	2.4	3.7	1.8	4.2
3.8	2.9	1.0	0.8	0.4
2.8	1.7	2.8	0.2	2.7
1.5	1.6	0.4	1.2	3.2

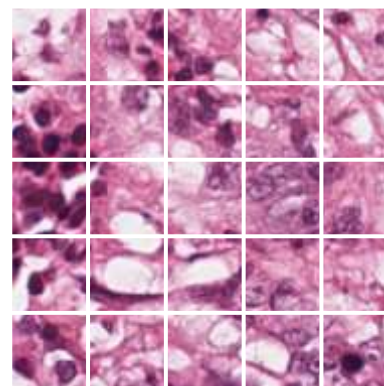
Tissue detection



Tiling & Normalisation

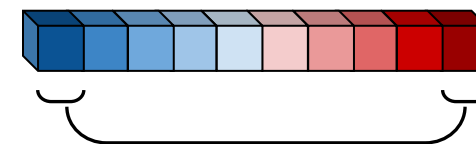
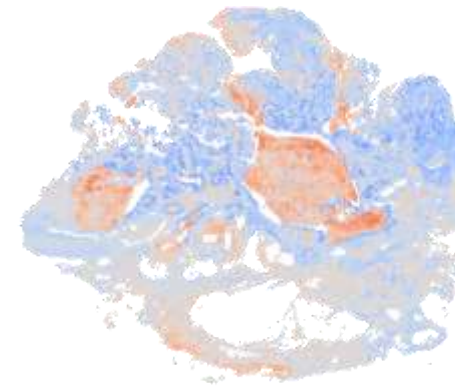


Feature extraction



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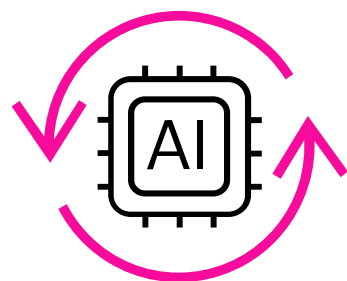
Model predictions



WSI-level
prediction

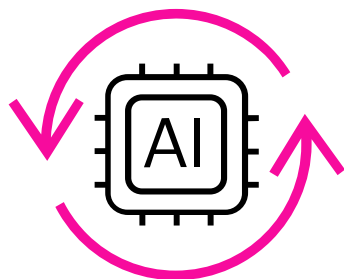


Train Model

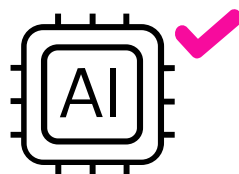




Train Model

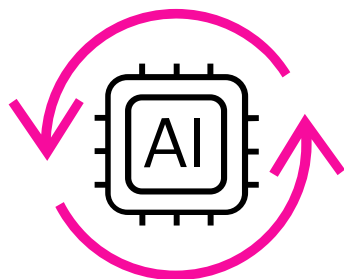


Validate Model

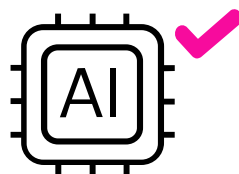




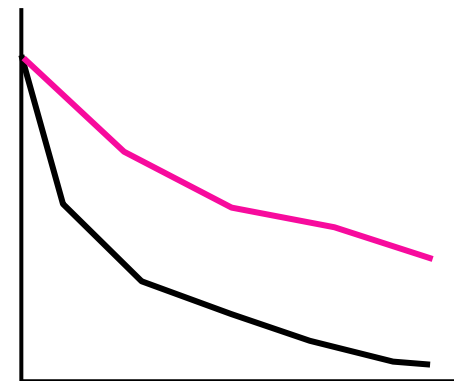
Train Model



Validate Model



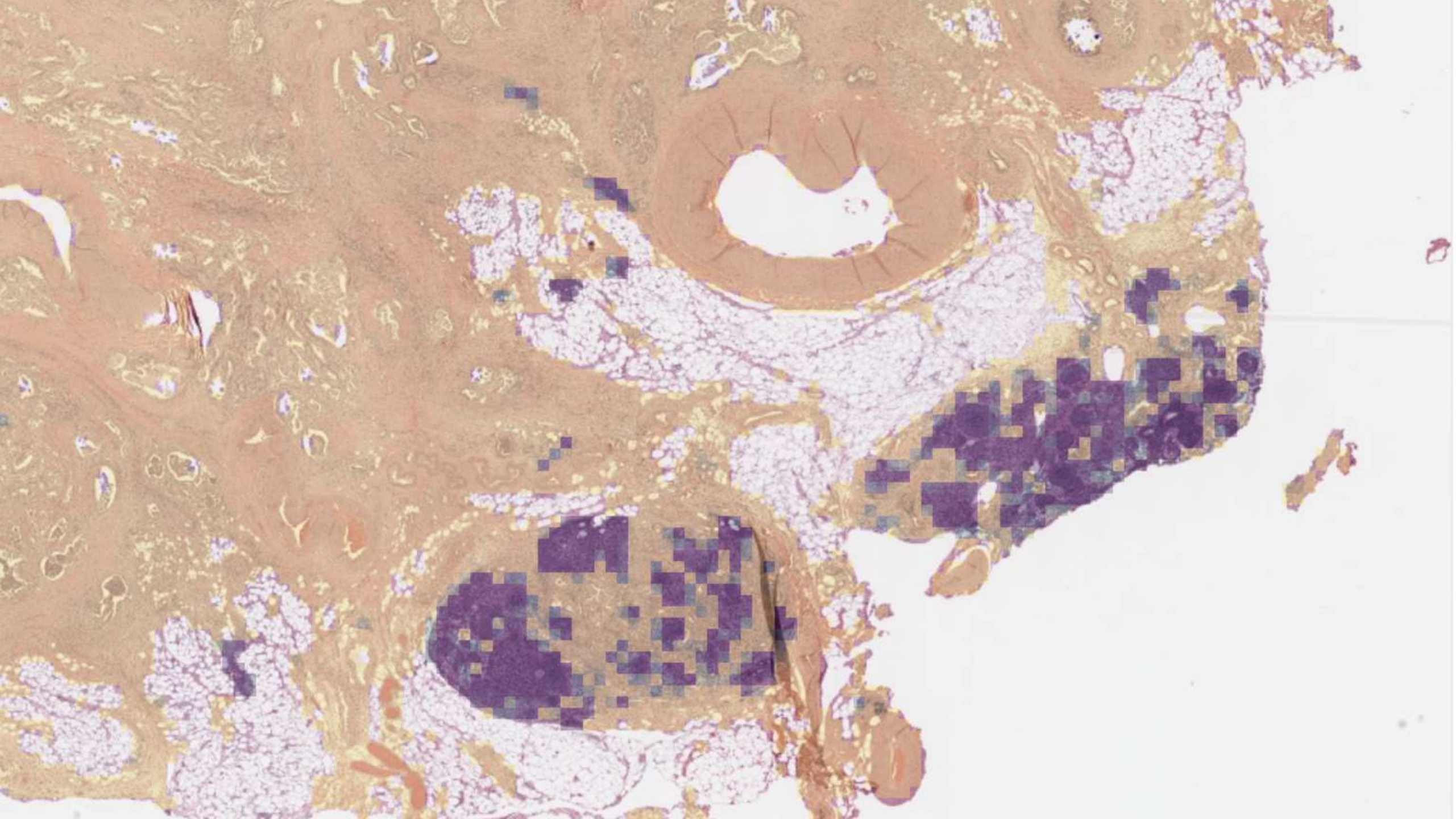
Assess Biomarker

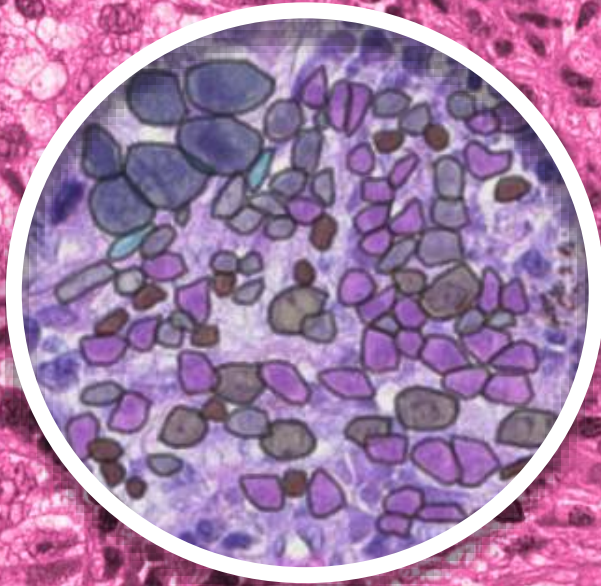




Why?



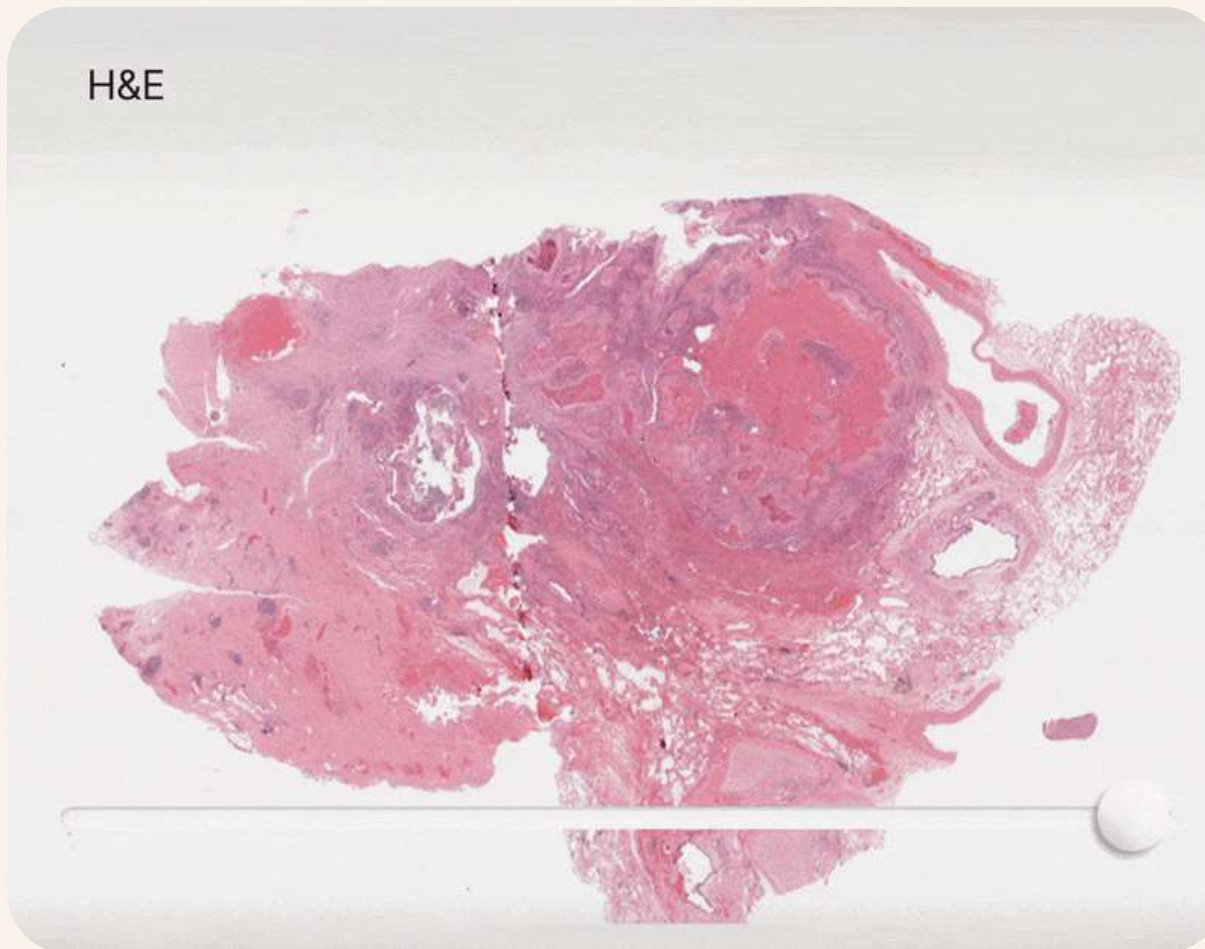




- 38 plasmocytes
- 16 lymphocytes
- 9 macrophages
- 6 tumor cells
- 2 fibroblasts

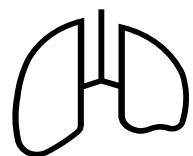


H&E





Mesothelioma



Localization of tumor cells
and stroma

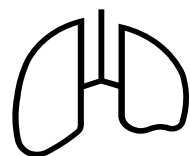
Inflammation

Cellular diversity

Vascularization



Mesothelioma



Localization of tumor cells
and stroma

Inflammation

Cellular diversity

Vascularization

nature
medicine

GIST



Cytoplasmic
vacuolization

Low cellular density

Mitoses

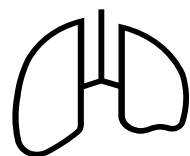
Cellular density

Necrosis

npj | precision
oncology



Mesothelioma



Localization of tumor cells
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Inflammation

Cellular diversity

Vascularization

nature
medicine

GIST



Cytoplasmic
vacuolization

Low cellular density

Mitoses

Cellular density

Necrosis

npj | precision
oncology

TNBRCA



TILs

Hemorrhage

Necrosis

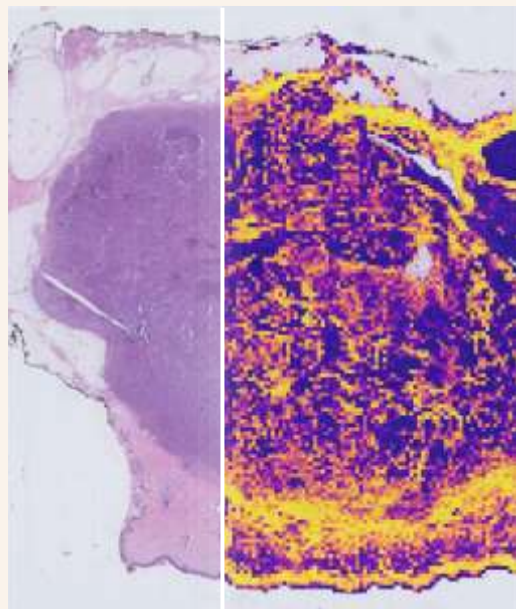
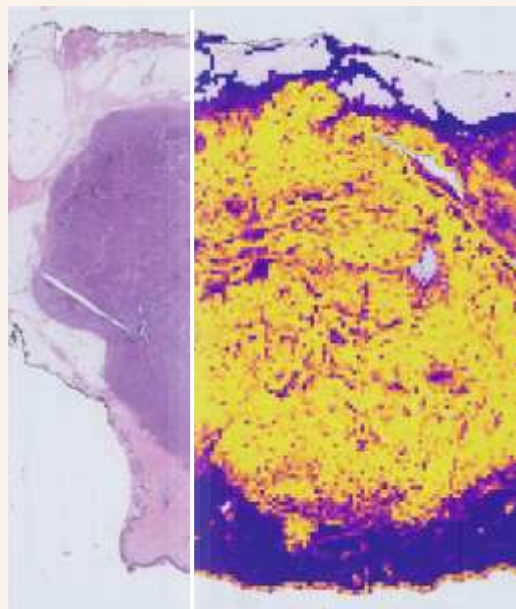
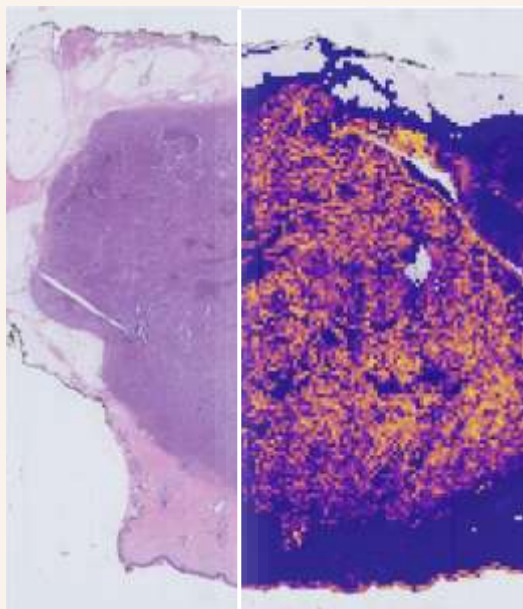
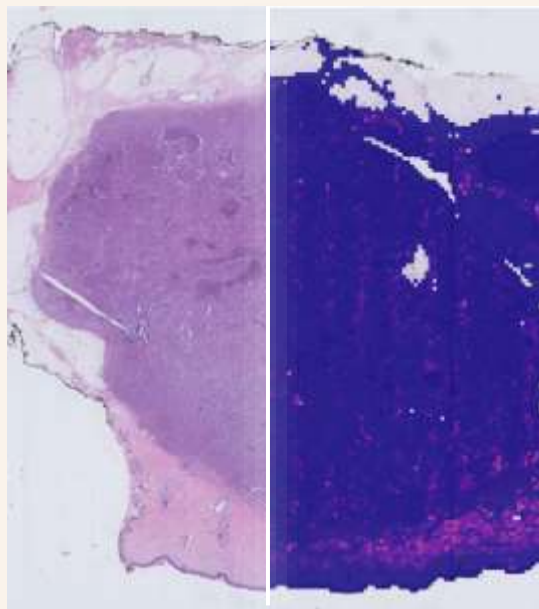
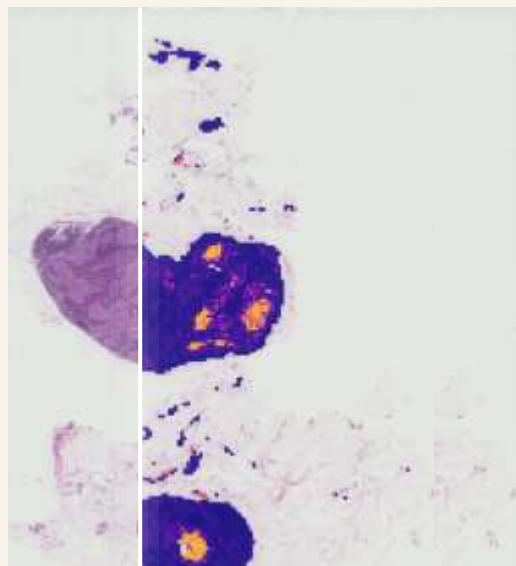
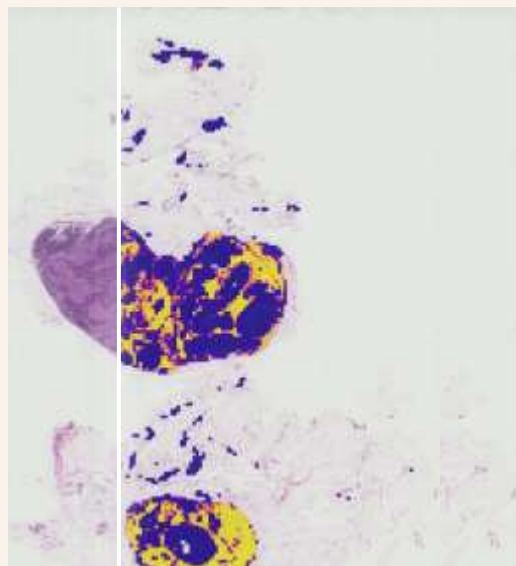
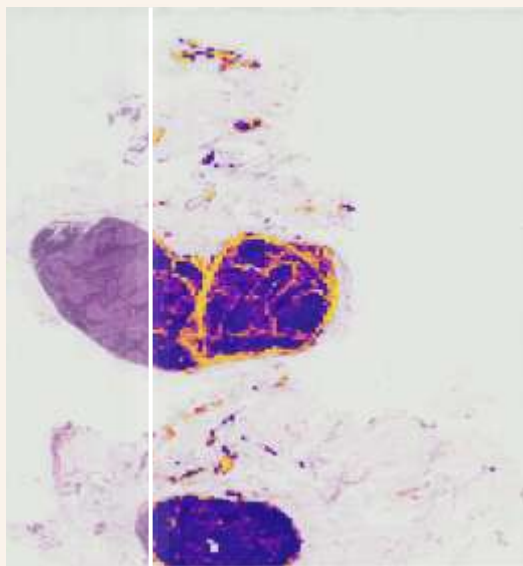
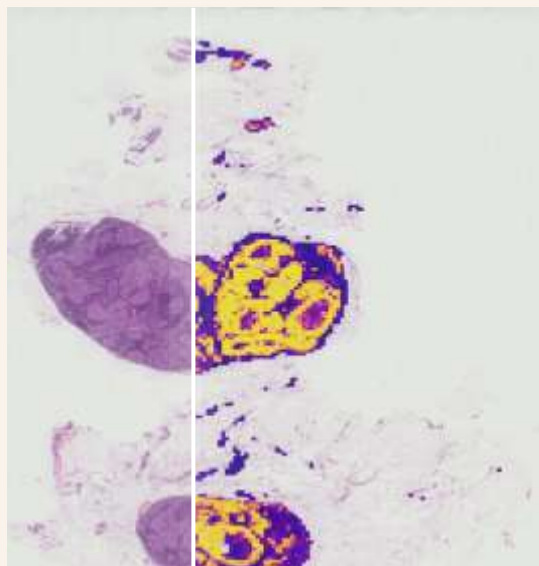
Apocrine & non-cohesive
tumor cells

Eosinophilic granular
cytoplasm

Nucleoli

Fibrosis

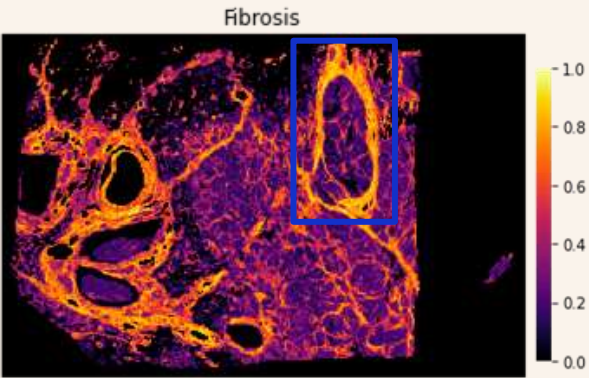
nature
medicine



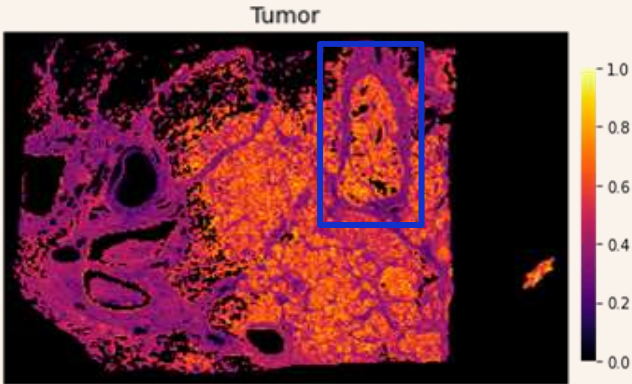


Fibrosis-induced immune exclusion

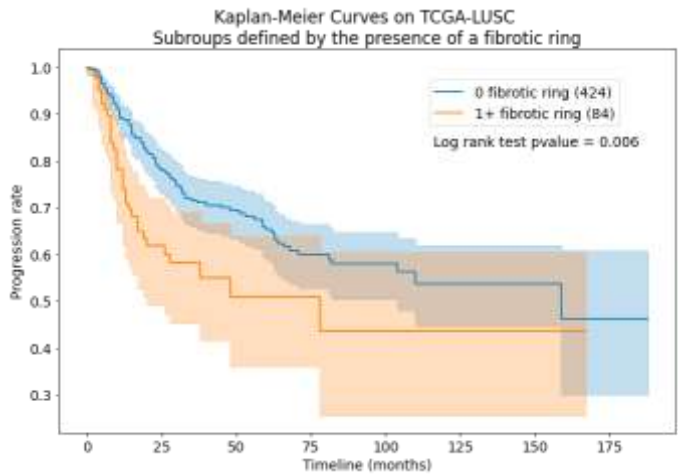
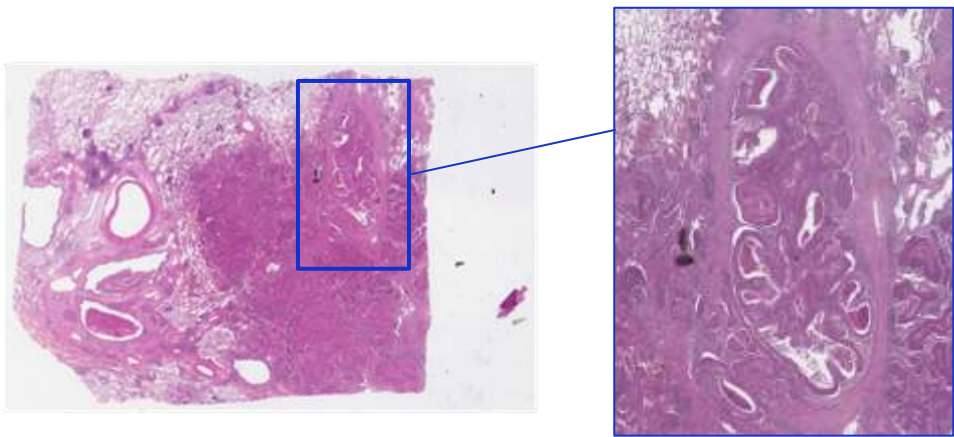
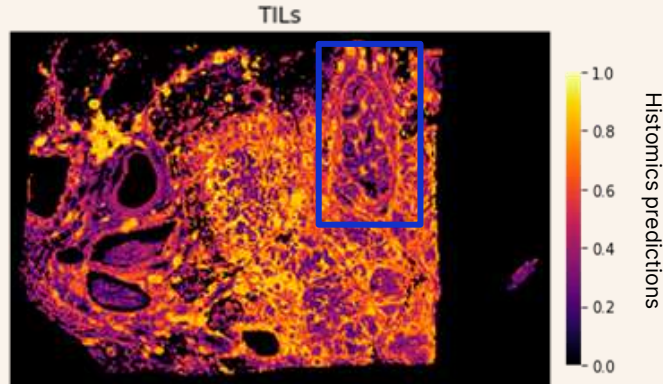
1 Identification of a fibrotic “ring”



2 Contouring tumoral tissue

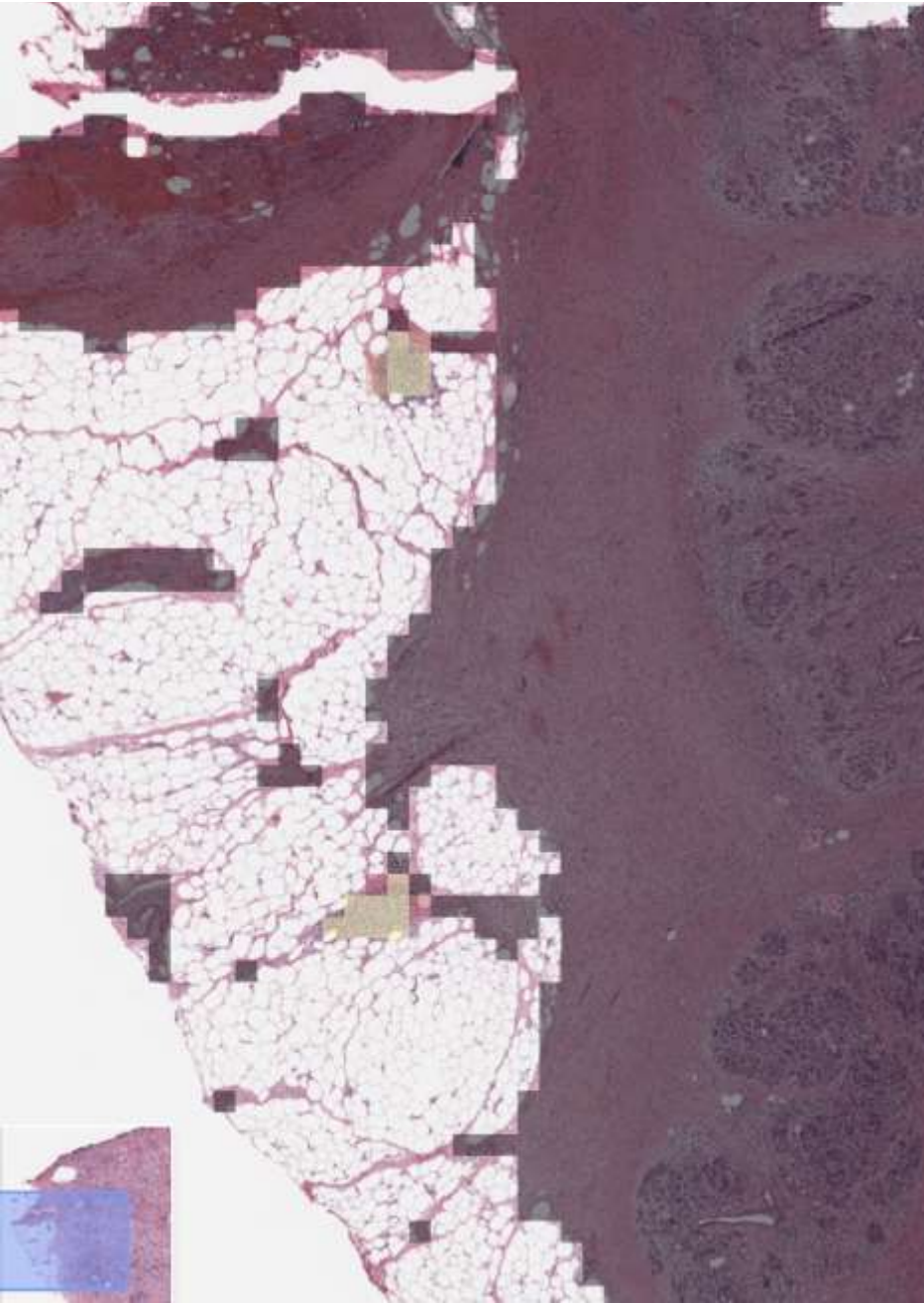


3 With low immune infiltration

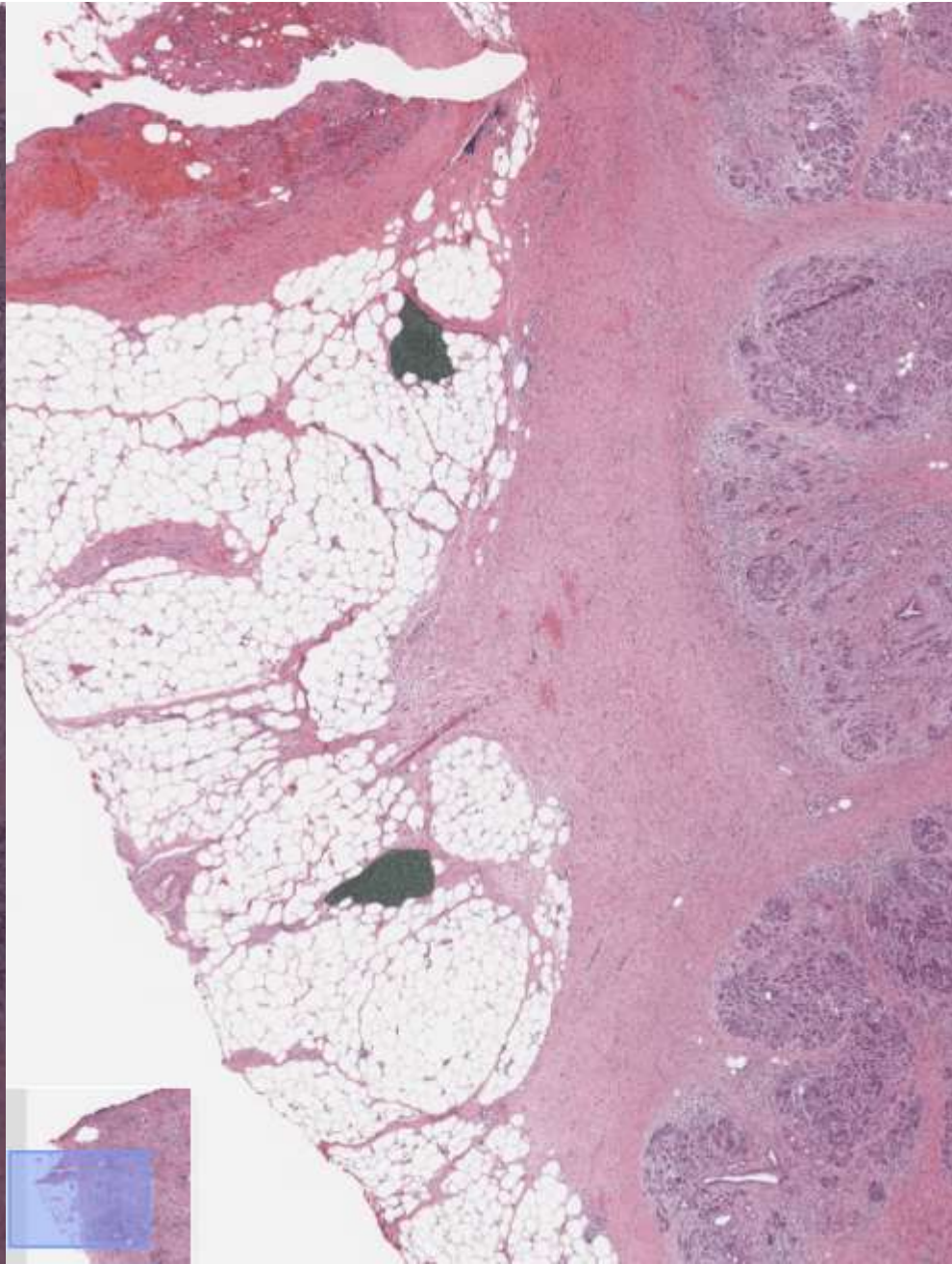


Prognostic biomarker on LUSC ?

TLS-RUO prediction heatmaps



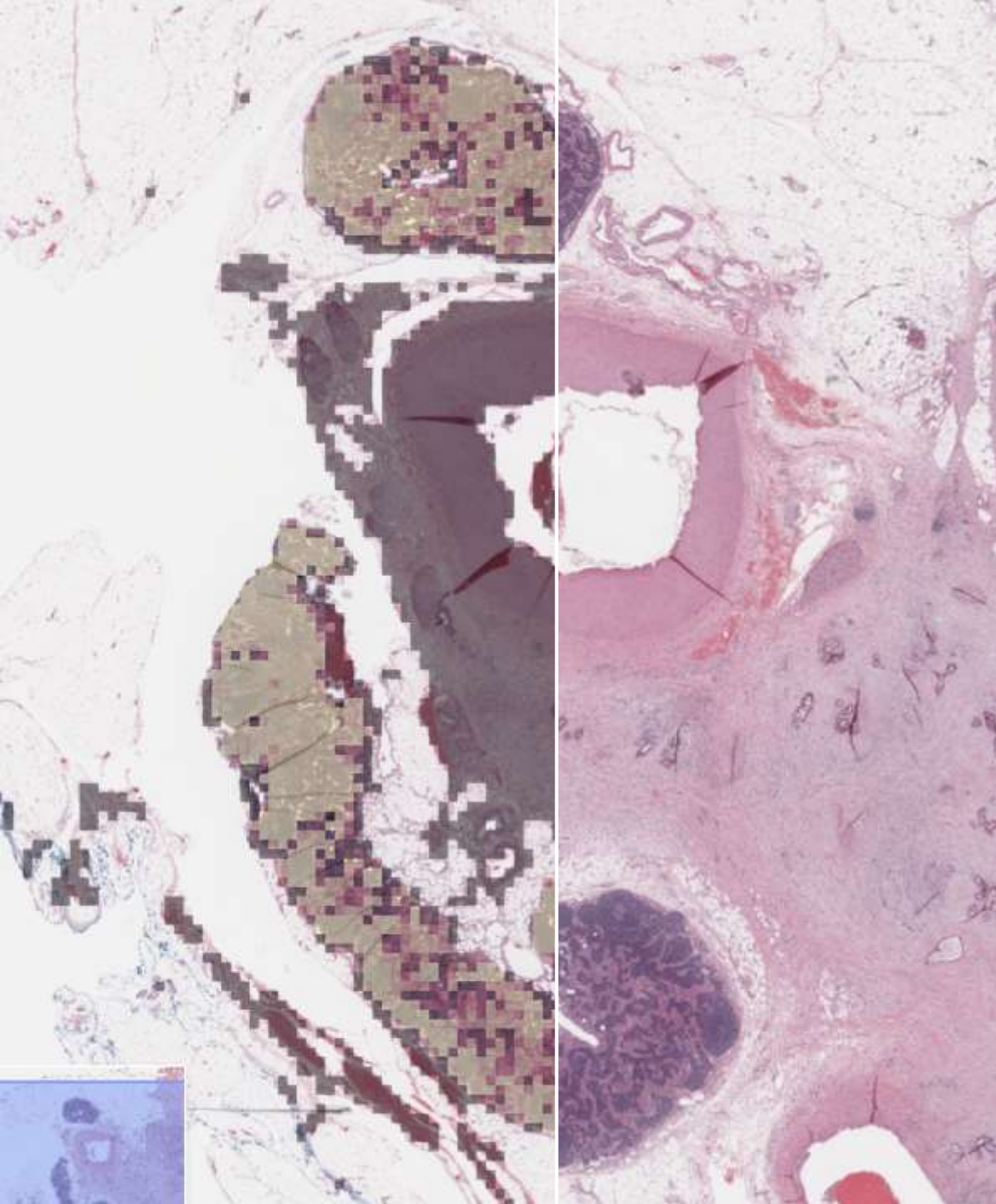
Pathologist annotations



Antoine Italiano MD, PhD

Institut Bergonié,
Bordeaux, France

“Today, we are working with Owkin to develop a deep learning model to identify TLS from routine histology slides. This work has the potential to better select patients who are more likely to benefit from immune checkpoint inhibitors.”



Owkin uses histomics to
translate **AI-driven**
biomarkers into
actionable biomarkers



Thank you



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New York, Boston, London, Paris, Nantes, Basel