



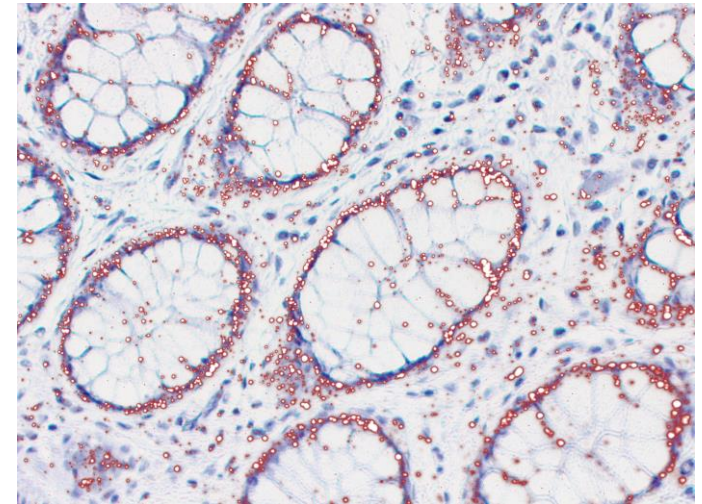
LUMITO

Tissue Diagnostics of the Future

Upconversion nanoparticles as a tool for tissue evaluation



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Lumito

Company background

- Spin-off from a research group lead by LU Professor Stefan Andersson-Engels
- Current business model adopted in 2017
- Novel imaging technology designed for digital pathology
- Moving from research to commercial phase

Tissue diagnostics – increasing number of tests

- 10% annual increase
- Aging population
- Individualised treatment
- Companion diagnostics
- Pathology resources limited

Figure 01: Global Tissue Diagnostic Market Size (US\$ Mn) Forecast, 2014–2024



Key Insights

- ❑ The global Tissue Diagnostic market was valued at US\$ 3,570.0 Mn in 2015 and is projected to reach US\$ 8,021.6 Mn by 2024 at a CAGR of 9.5% from 2016 to 2024
- ❑ North America was the major market for Tissue Diagnostic in 2015 due to the growing population, increasing incidence of cancer and rapid technological advancements are expected to drive the tissue diagnostic market during the forecast period

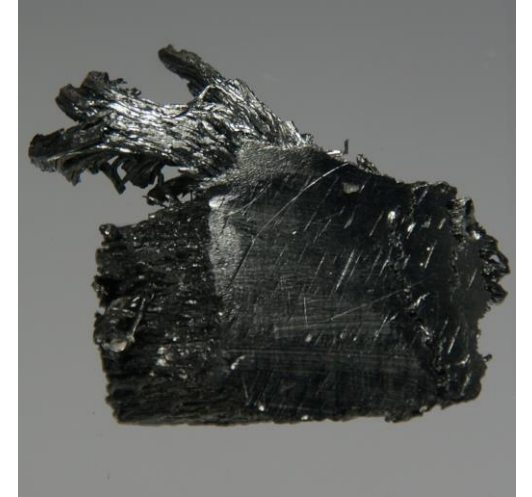
Novel Imaging Technology

- Technology based on upconversion nanoparticles (UCNPs)
- Improved IHC diagnostics
- Clinical and research solutions
- Two product system – WSI Scanner and Reagent Kit



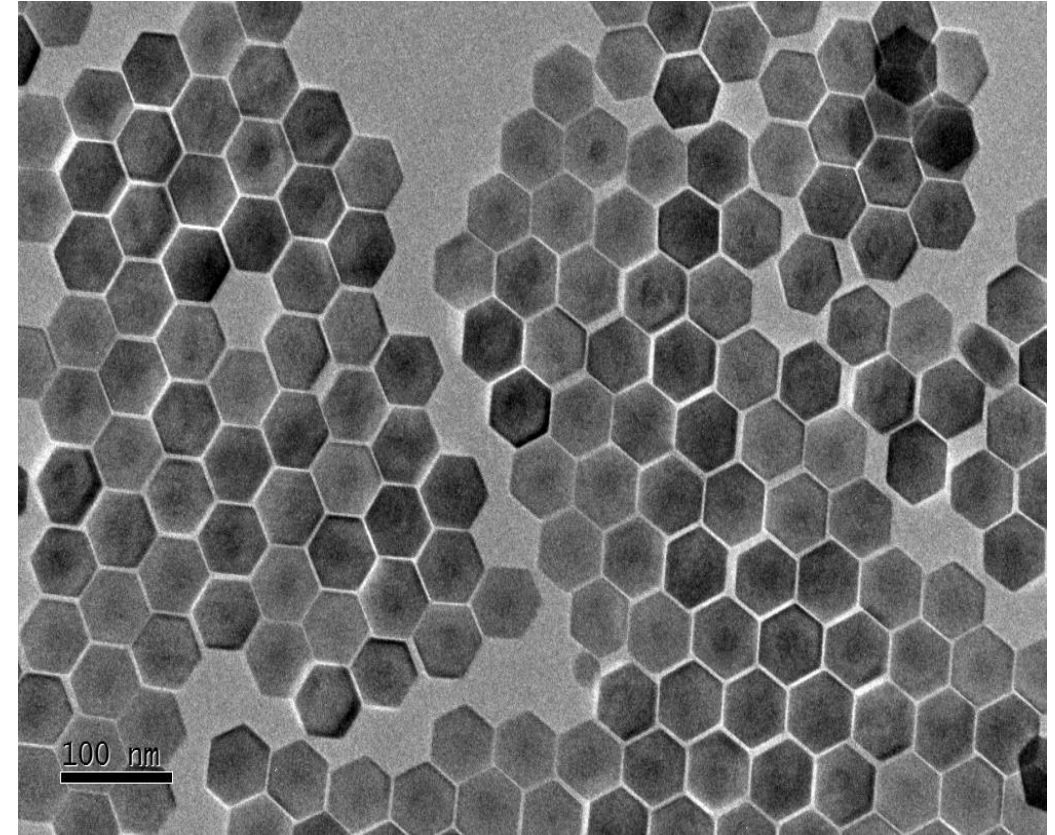
Upconversion nanoparticles advantages

- Rare earth minerals based particles
- Erbium and Thulium most common
- Anti-stokes effect – 2 low energy photons absorbed and 1 high energy photon emitted



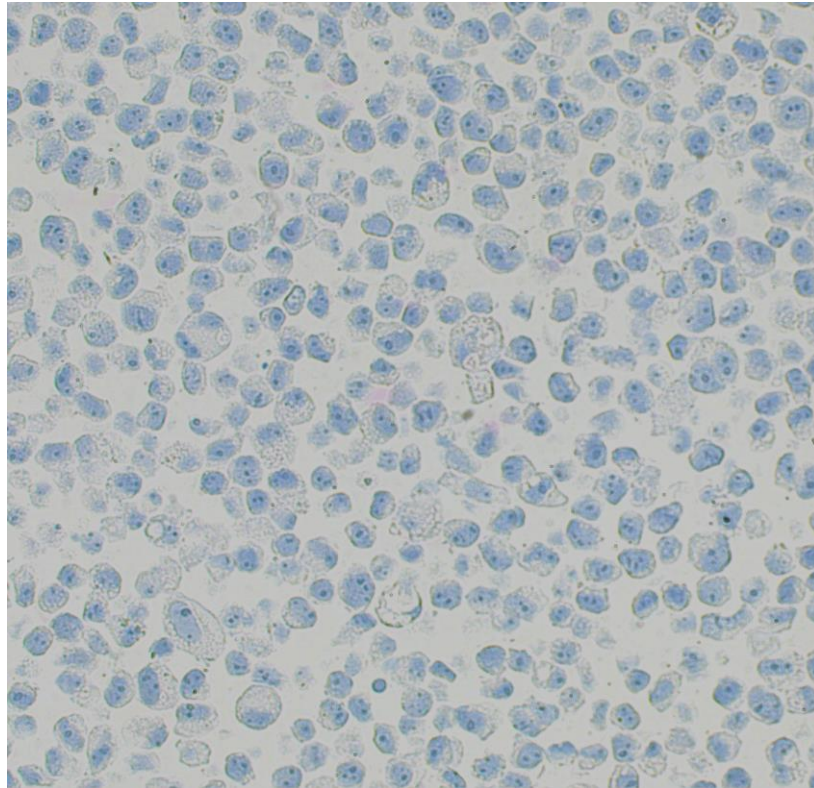
Upconversion nanoparticles advantages

- Upconversion (Anti-Stokes)
- Combination with counterstaining (H&E)
- Potential for multiplexing
- Narrow emission range
- Quantification
- Stable nano-crystals
- No photobleaching
- IHC-like workflow
- Low signal to noise ratio

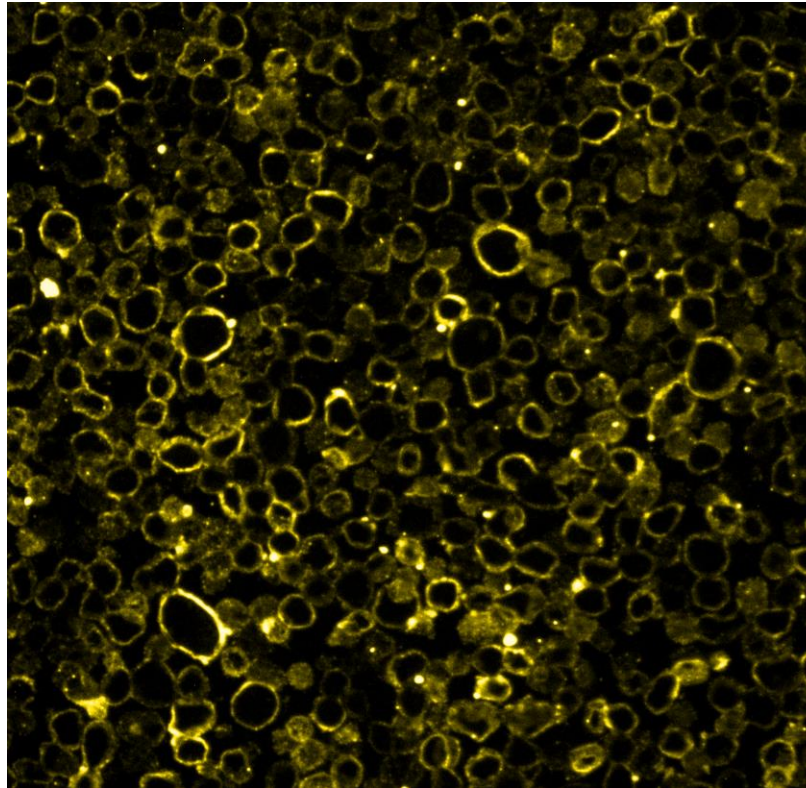


Labelling of Cancer Markers in tissue

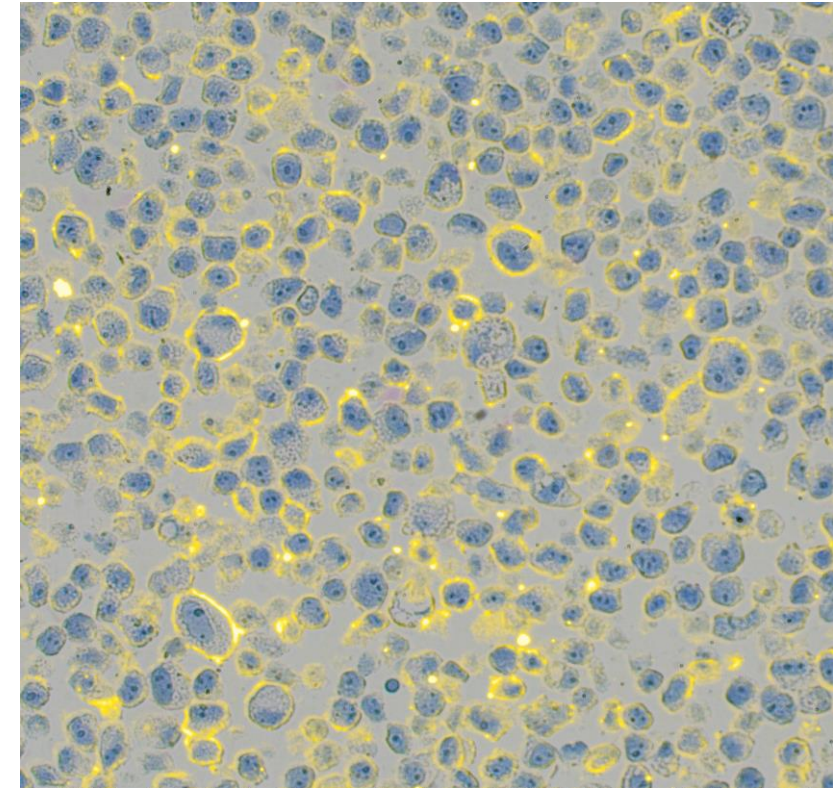
BT-474 Hematoxylin



BT-474 Her2 UCNP

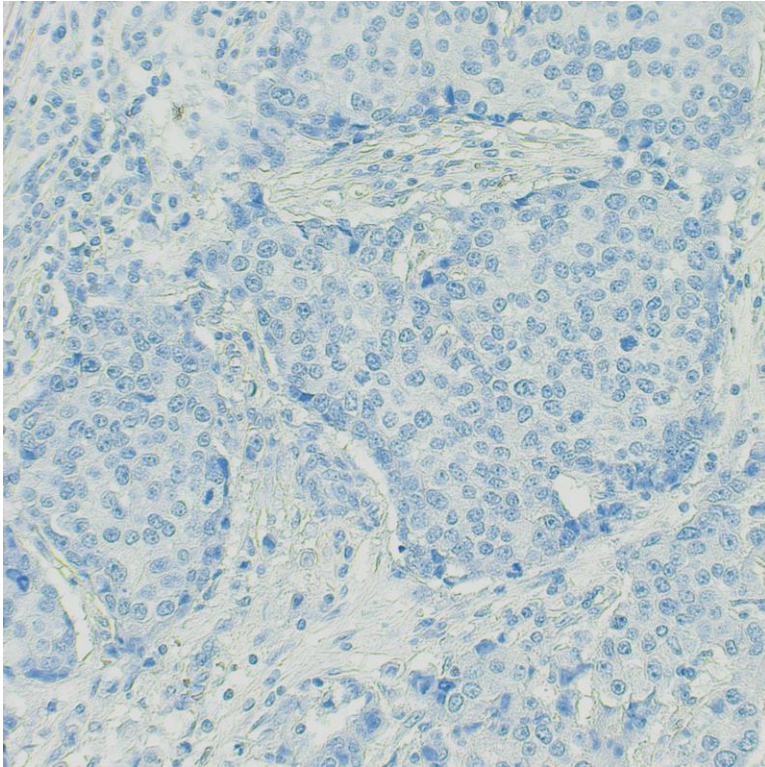


BT-474 H&E UCNP

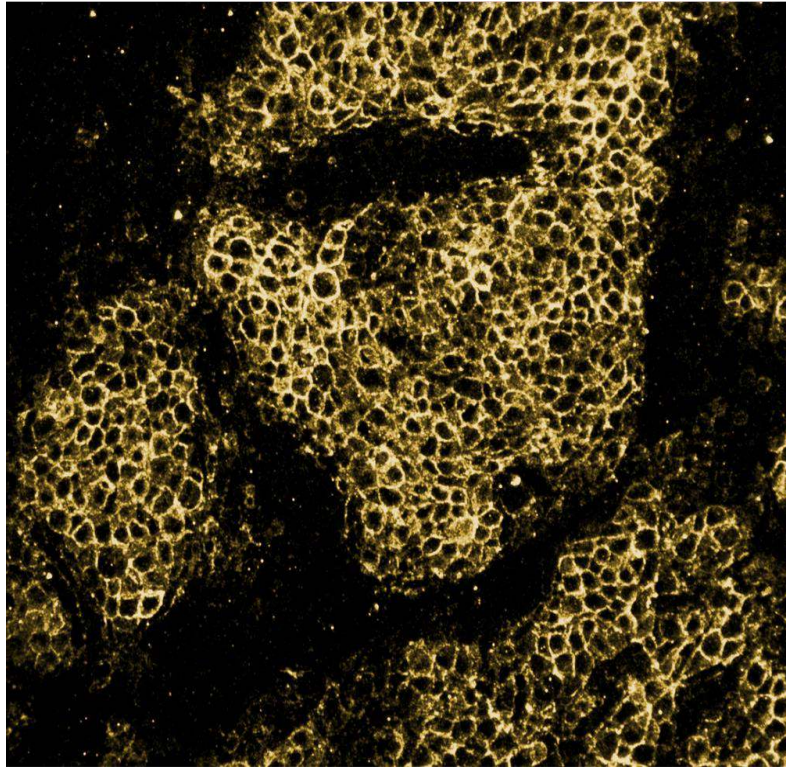


Labelling of Cancer Markers in tissue

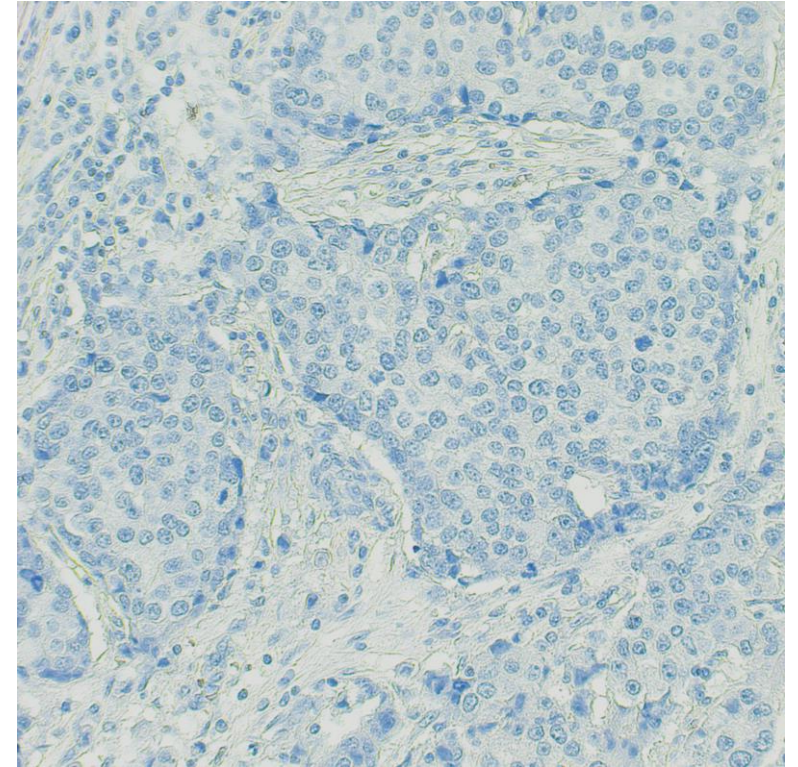
Breast tissue Hematoxylin



Breast tissue UCNP HER2

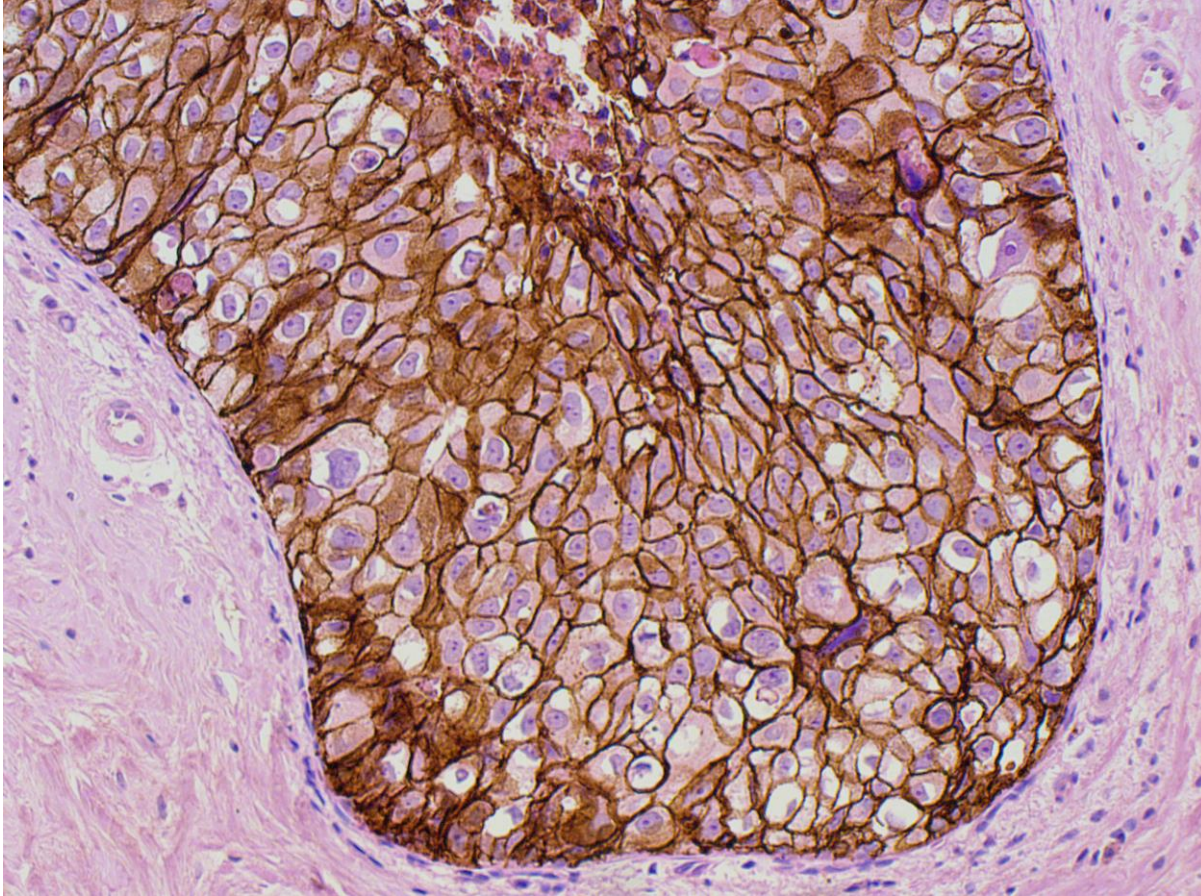


Breast tissue H and UCNP

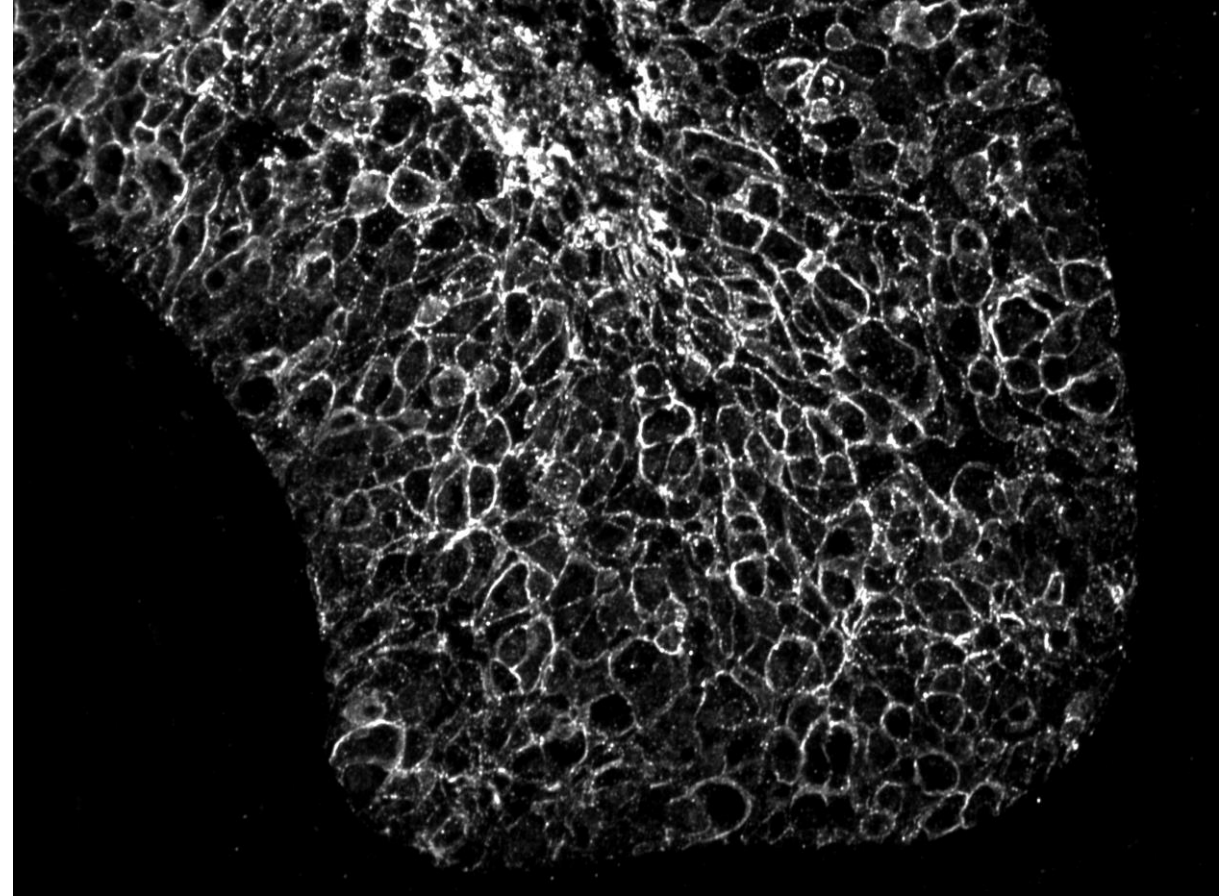


DAB vs UCNP staining

Breast cancer, HER2, DAB

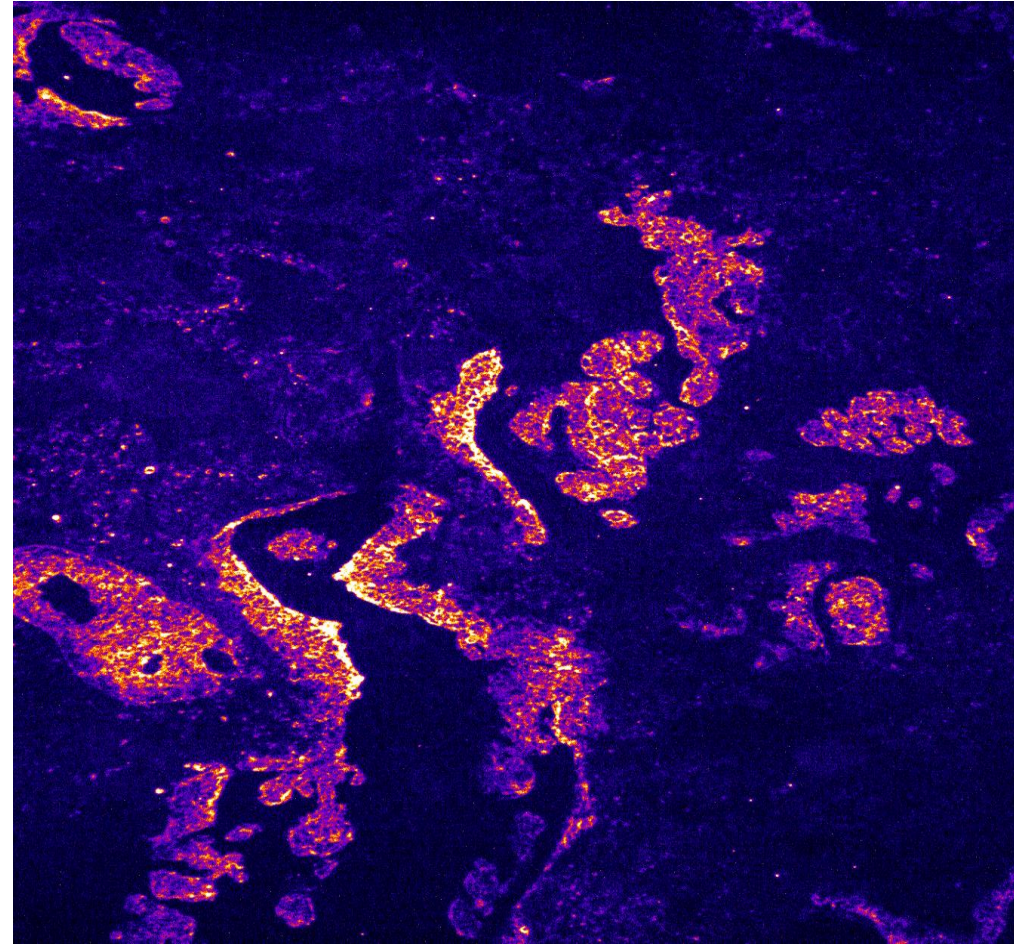


Breast cancer, HER2, UCNP



UNCP Labelling – Heatmap

5x Objective Her2





Summary Lumito

- Multiplexing with H&E is possible
- UCNP signal does not obscure cell morphology
- Utilises advantages of UCNPs
- Our scanner supports Bright-field and UCNP imaging
- Fully compatible with digital pathology

Thank you!

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