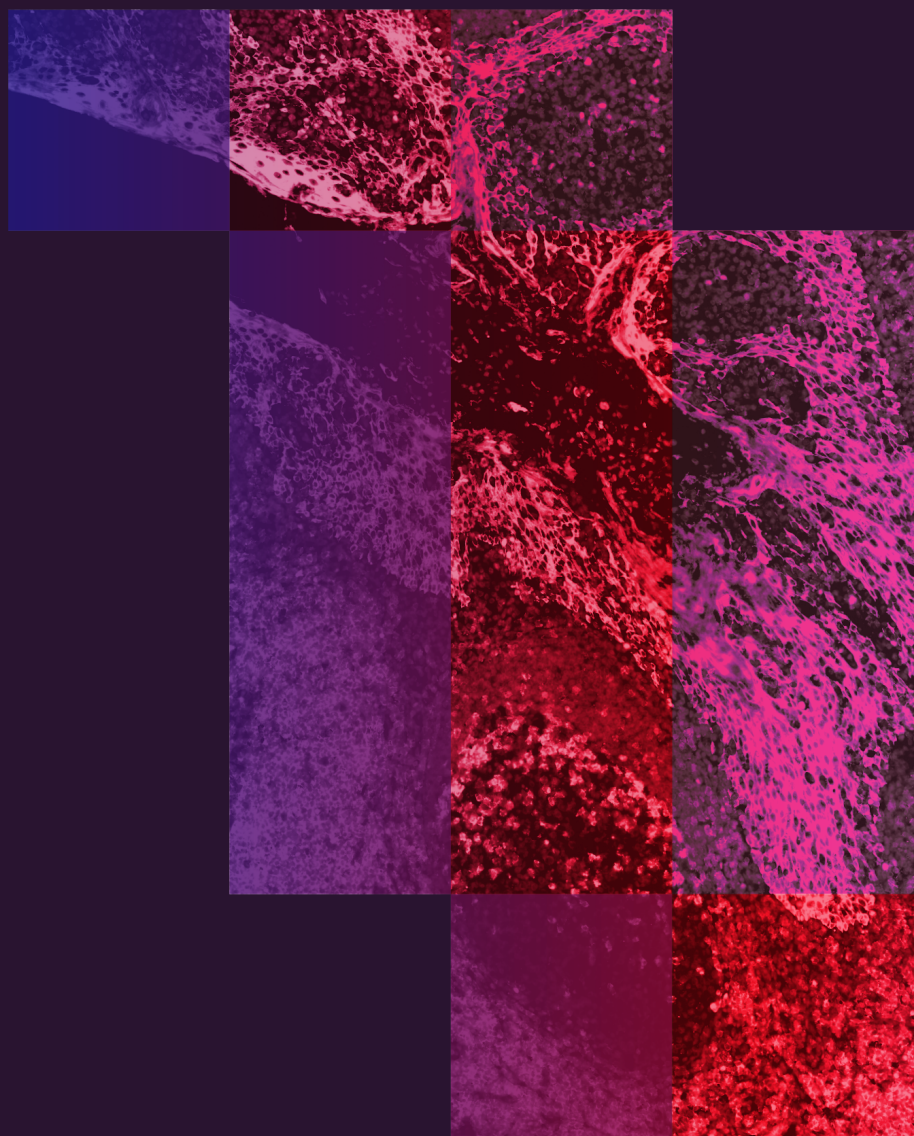


AI Pathology and Spatial Biomarker Solutions for Clinical Trials and Diagnostics

Enabling a new wave
of diagnostics for ADCs,
multi-specifics, and IO
combinations

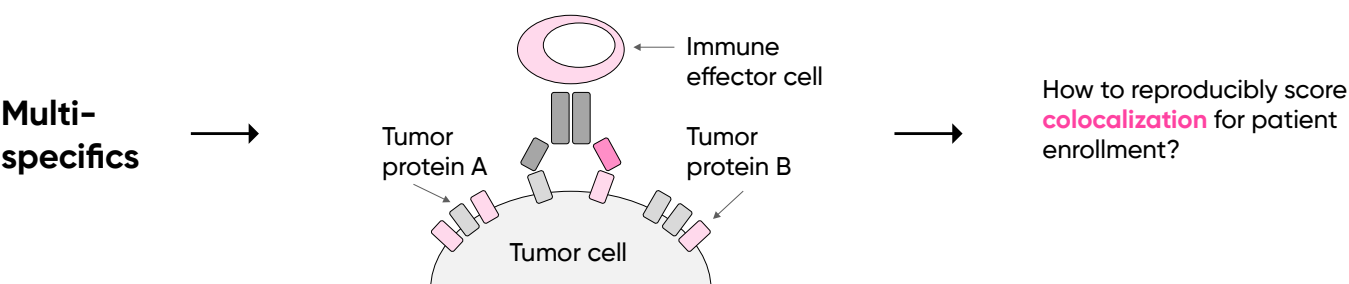
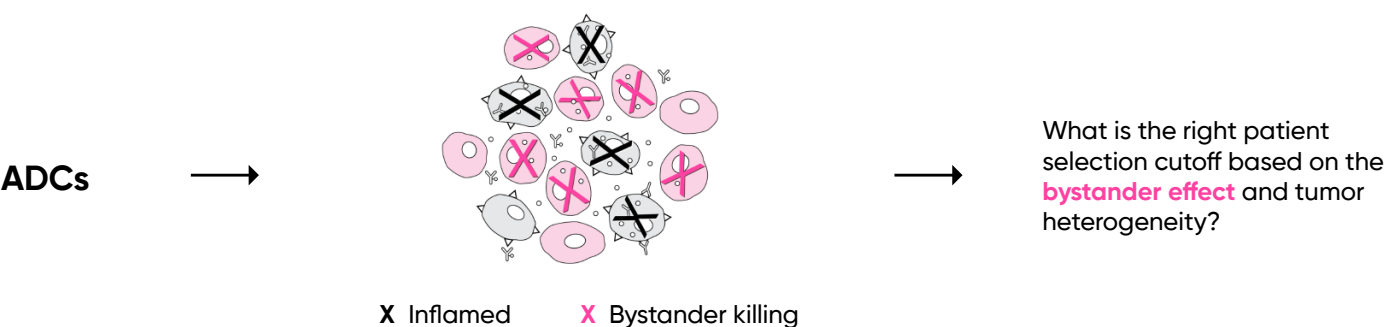
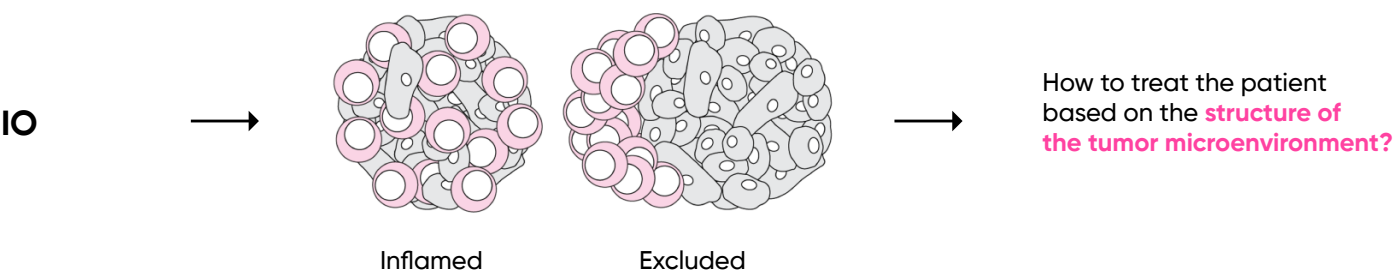


nucleai

Next-Gen Therapeutics Need Next-Gen Diagnostics

The mechanism of action (MOA) of the **next generation of protein-directed therapeutics** require a new generation of biomarker assays that rely on **spatial scoring and multiplex detection**.

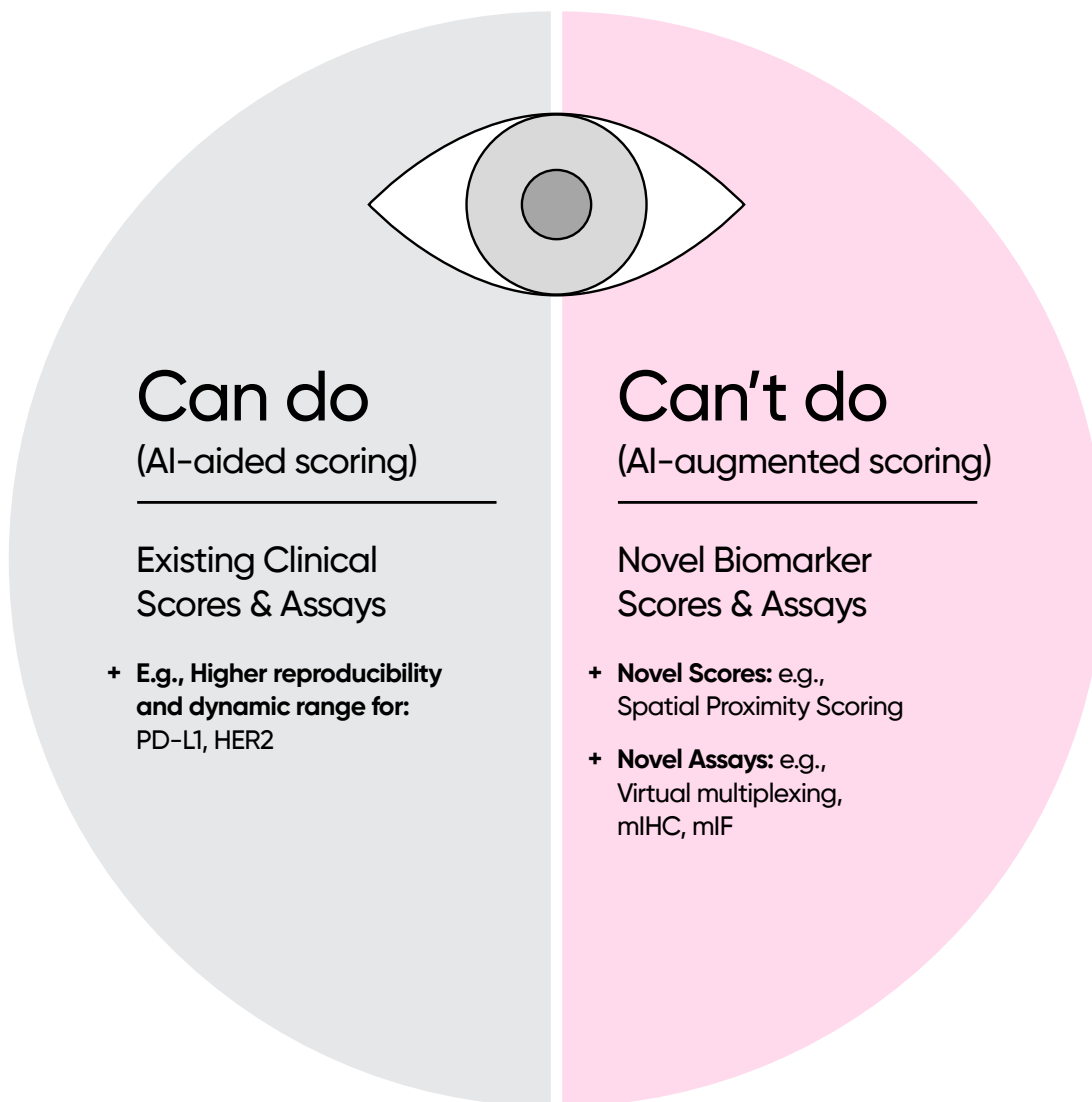
The biomarker strategy for next-gen treatments should reflect the complex MOA of the drugs.



How AI Enables Next-Gen Trial & CDx Assays

AI-powered scoring can be categorized into **aiding** what the pathologist can do today, for better accuracy and reproducibility and **augmenting** what the pathologist can't do at scale, such as spatial proximity scoring and multiplex detection.

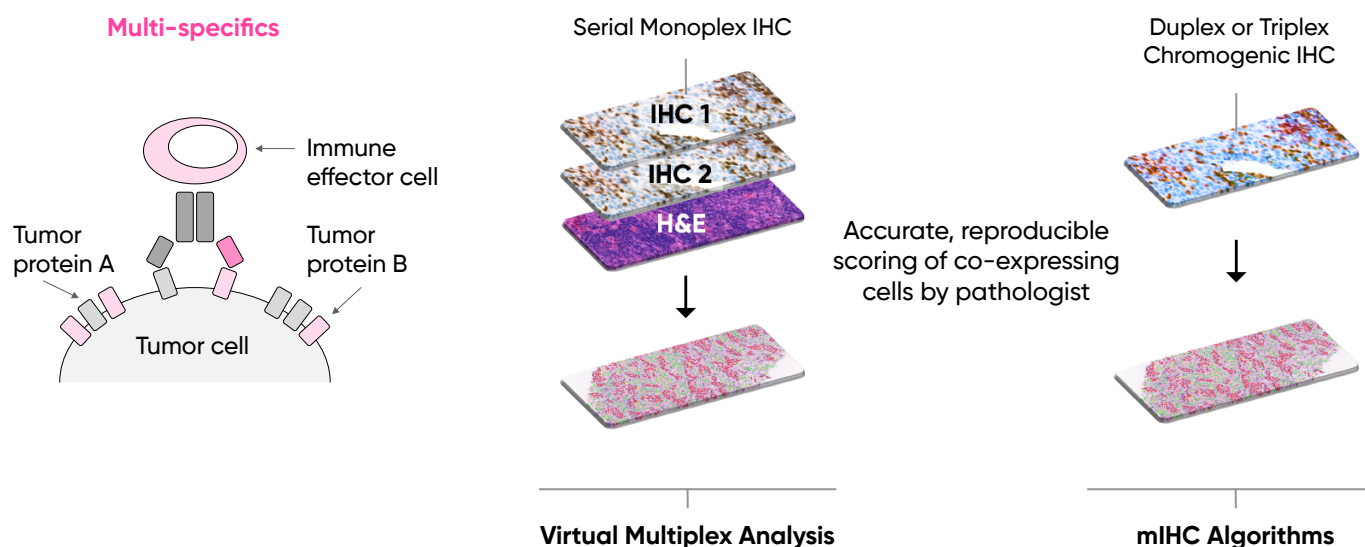
AI can aid and augment the capabilities of the human eye.



Case Study: First AI Pathology Solution Deployed for Prospective Trial Enrollment

Situation: A top drug developer needed to deploy an IHC assay for its Phase I trial, however, pathologists had trouble with manual scoring because it required accurate, reproducible quantification of cells co-expressing two tumor proteins.

AI-powered spatial scoring of co-expression and colocalization can optimize assay design and derisk multi-specific trials



Solution: Our patent-pending AI-powered IHC algorithm is currently deployed in the Phase 1 trial to enable pathologists to accurately score co-expressing cells.

During the feasibility study, we also helped the client decide whether to use two monoplex assays or a single duplex assay for detecting co-expression.

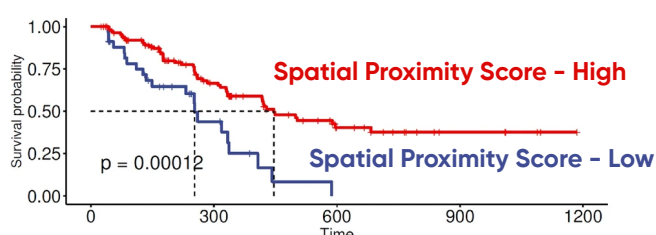


Case Study: MOA-based Biomarker Development and Patient Stratification

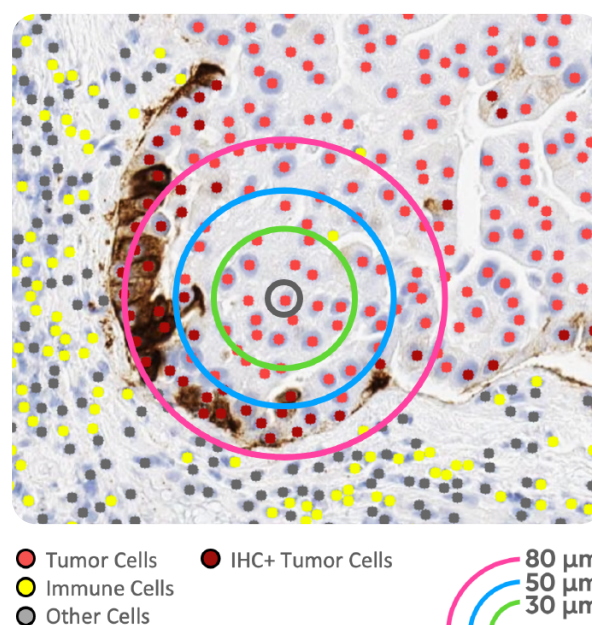
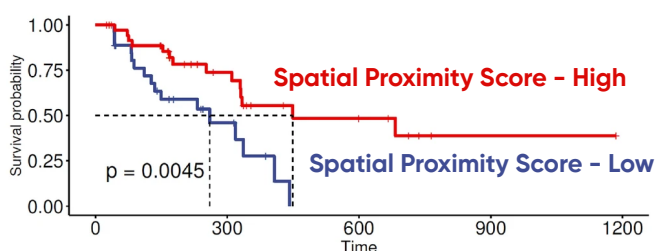
Situation: Current clinical guidelines for HER2 IHC scoring do not account for the bystander effect of certain ADCs, such as trastuzumab deruxtecan (T-DXd), which kill not only target-positive tumor cells but also target-negative tumor cells in the vicinity.

AI-powered spatial proximity scoring quantifies the bystander effect and enables better patient selection for ADCs.

All patients



HER2 negative patients



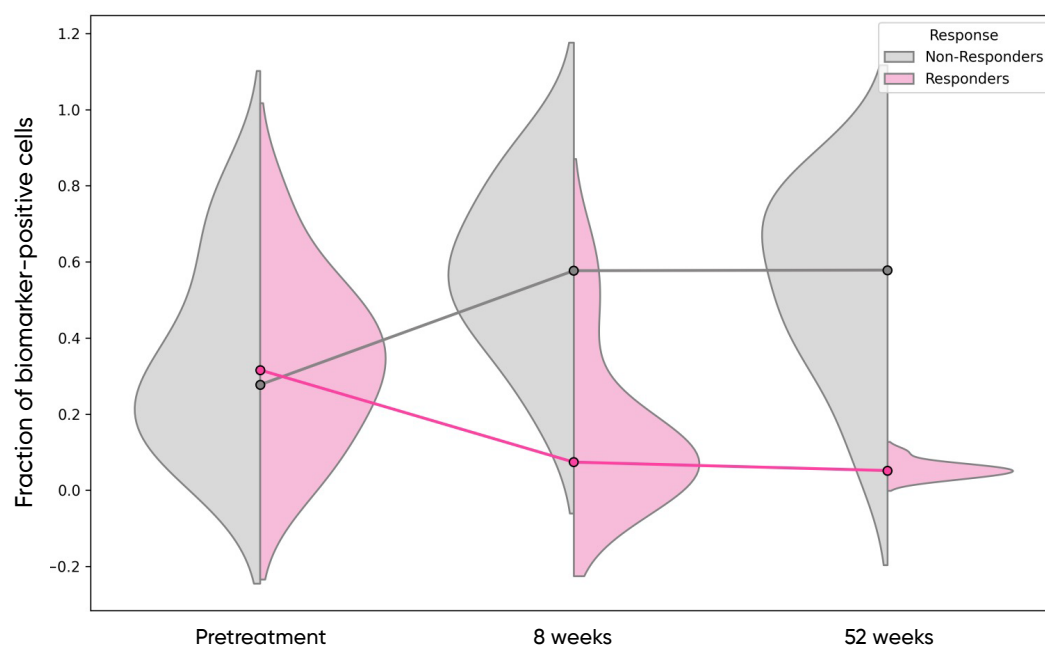
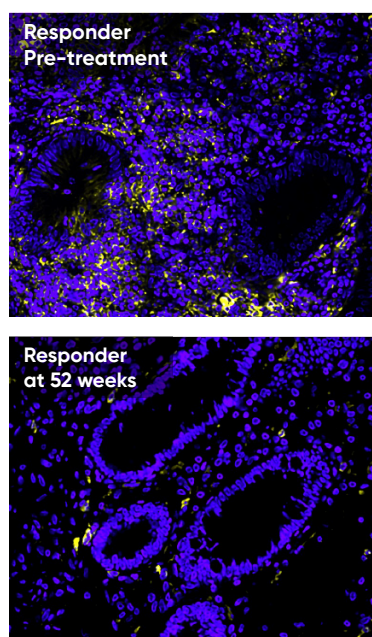
Solution: AI-powered spatial proximity scoring, developed by AstraZeneca & Daiichi Sankyo to quantify the bystander effect *in situ*, predicted progression-free survival across all breast cancer patients enrolled in a Phase 1 trial, including the HER2 negative sub-group.

NOTE: Nuclei wasn't involved in this study, but similar case studies are available upon request.
Kapil, Ansh et al. Scientific reports vol. 14, 1 12129. 27 May. 2024

Case Study: Biomarker Discovery for Drug Co-Positioning

Situation: A top drug developer was facing analysis and assay optimization hurdles when using multiplex immunofluorescence (mIF) data to discover a biomarker signature that could co-position two drugs within the same therapeutic area.

AI-powered spatial analysis identified a novel biomarker that could optimize patient selection for drugs with complementary MOA.



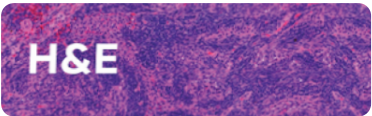
Solution: We helped the biopharma partner identify a novel spatial biomarker that predicted long-term response (defined at 52 weeks), as early 8 weeks after treatment. Adding the biomarker to pathological evaluation at week 8 could inform the decision to switch potential long-term non-responders to another treatment.



Nucleai's AI-powered Solutions for Trials & Diagnostics

Partner with us to develop a next-gen biomarker and diagnostic strategy to advance your drug development programs.

1 Ingest Digitized Images



2 AI-Powered Spatial Analysis

Image Quality Control
(artifacts, etc.)

Tissue Area Segmentation
(tumor, stroma, necrosis, TME, etc.)

Cell Classification (tumor, fibroblasts, lymphocytes, IHC+/-, etc.)

Standard Clinical Scores
(TPS, CPS, H-score, HER2, co-expression)

Quantitative Spatial Features
(cell arrangements, neighborhoods, densities, etc.)

3 Inform Drug Development Decisions

 **Enrich data and discover biomarkers**

 **Optimize biomarker strategies**

 **Understand mechanisms of action and resistance**

 **Inform patient selection and clinical decision-making**

Supporting

10+ Cancer Indications	20+ IHC Markers
1K+ Spatial Features	5 Multiplex IF Platforms

Across

20+ Pharmas	6+ Cancer Centers
5+ Diagnostic Labs + CROs	

Compliance



About Us —

Nucleai is an AI-powered digital pathology and spatial biomarker company dedicated to transforming drug development and clinical treatment decisions.

As the first in the world to deploy an AI pathology algorithm for prospective trial enrollment, Nucleai provides pharmaceutical companies with actionable insights that enhance their biomarker and diagnostic strategies for next-generation therapeutics, including antibody-drug conjugates (ADCs), multispecifics, and novel IO drugs. Based in Israel and Chicago, Nucleai is revolutionizing personalized medicine and advancing healthcare.

For more information, please visit www.nucleai.ai.

nucleai