TISSUEGNOSTICS

PRECISION THAT INSPIRES



SOFTWARE SUITE 8.x

WHAT'S NEW

TISSUEFAXS + STRATAQUEST

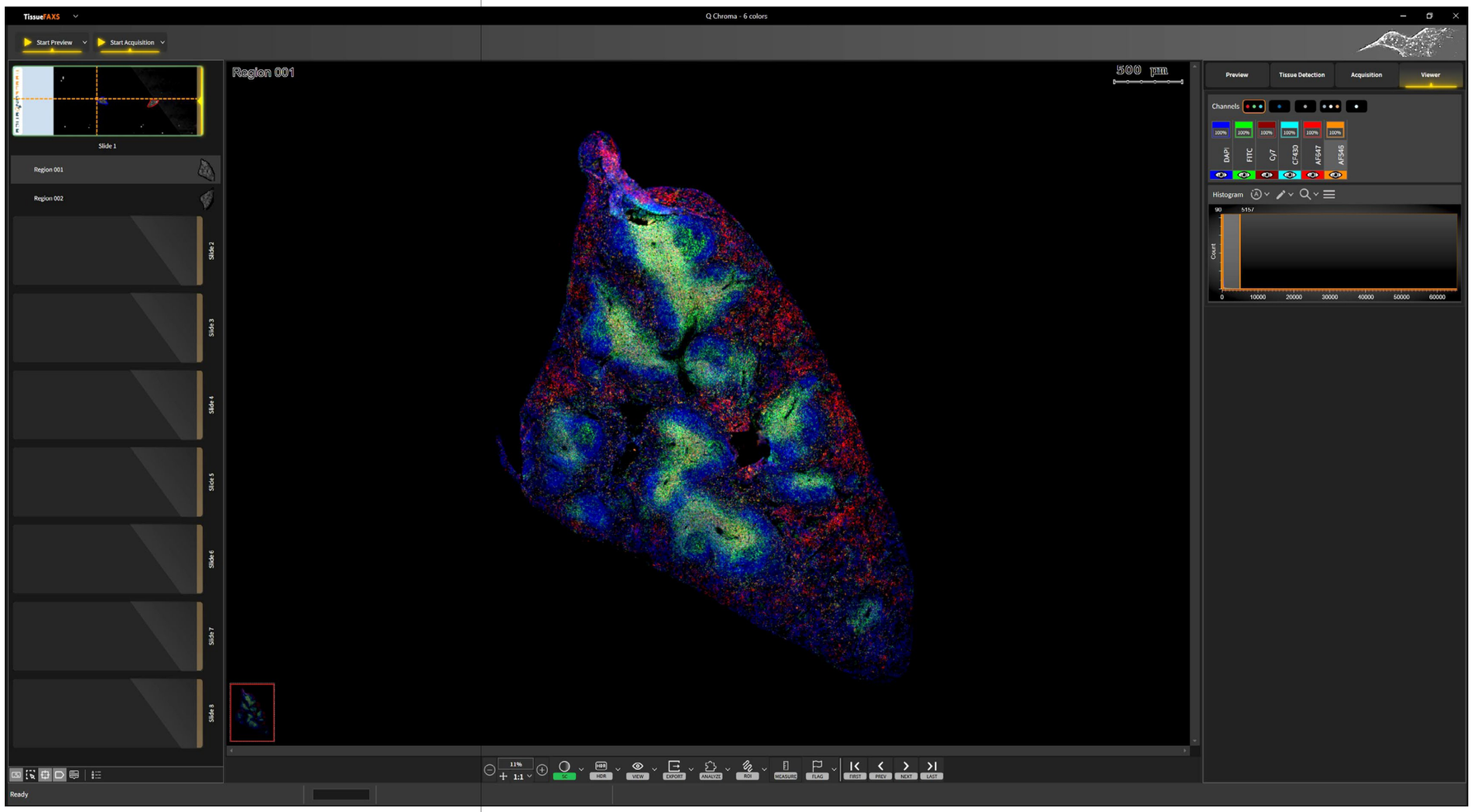
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01 NEW USER INTERFACE

TissueFAXS 8.x introduces a simplified main window and a redesigned experiment browser. Images, slide information and acquisition controls are easier to locate, while a cleaner Image Viewer groups related functions into an optimized toolbar.

Workflow tabs organize preview, tissue detection, acquisition and viewing in a logical sequence. Settings are presented where they are needed, helping new and experienced users move more confidently through each scanning step. The revised slide loader and experiment browser make slide status and region navigation easier to manage.

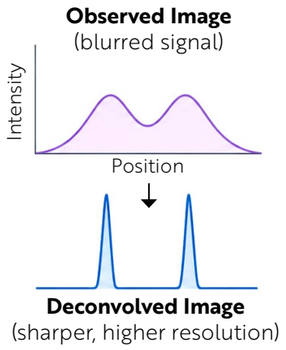
- **Simplified Layout**: Quick access to images, slide information, and acquisition controls.
- **Experiment Browser**: Clearer navigation of experiments, slides, and regions.
- **Optimized Image Viewer**: Related imaging tools are grouped for easier operation.
- **Workflow Tabs**: Move logically through preview, tissue detection, acquisition, and viewing.
- **Contextual Settings:** Relevant controls are available directly within each workflow step.

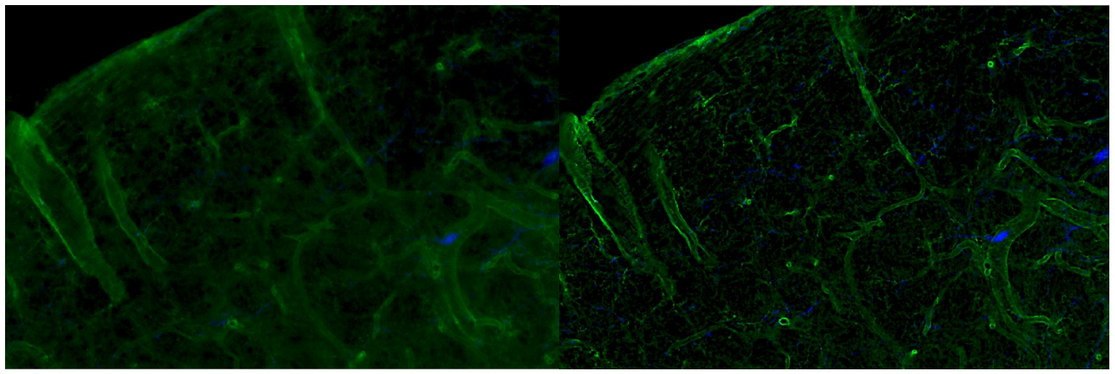


02 2D/3D DECONVOLUTION

Deconvolution uses point spread function (PSF) modeling to computationally reduce optical blur in 2D images and 3D Z-stacks. This improves the visibility of fine structures and helps separate features that may otherwise appear blurred or overlapping.

The resulting image provides a clearer basis for visual interpretation and subsequent quantitative analysis.

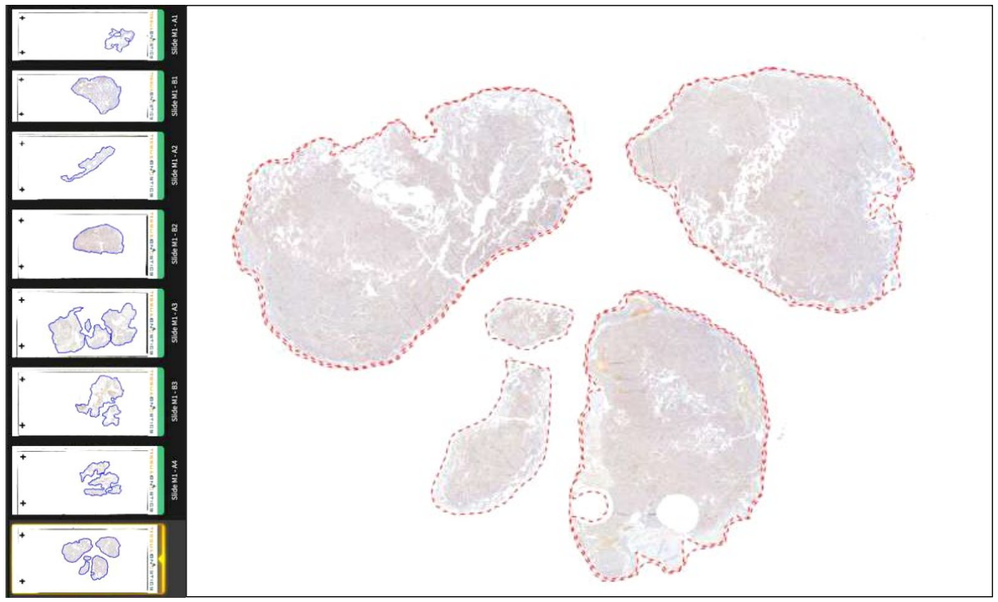




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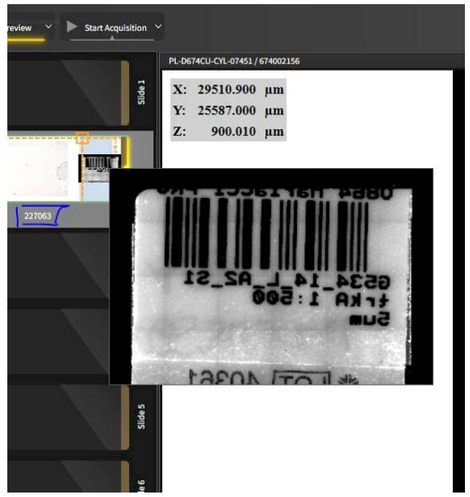
03 INTELLIGENT TISSUE DETECTION

The new deep neural network (DNN) tissue detection provides more accurate, reliable identification of tissue areas, in addition to threshold-based detection. This AI-powered feature enhances scanning precision and reduces manual intervention, particularly beneficial for high-throughput or complex sample analysis.



04 SIMPLIFIED LABEL IMAGING

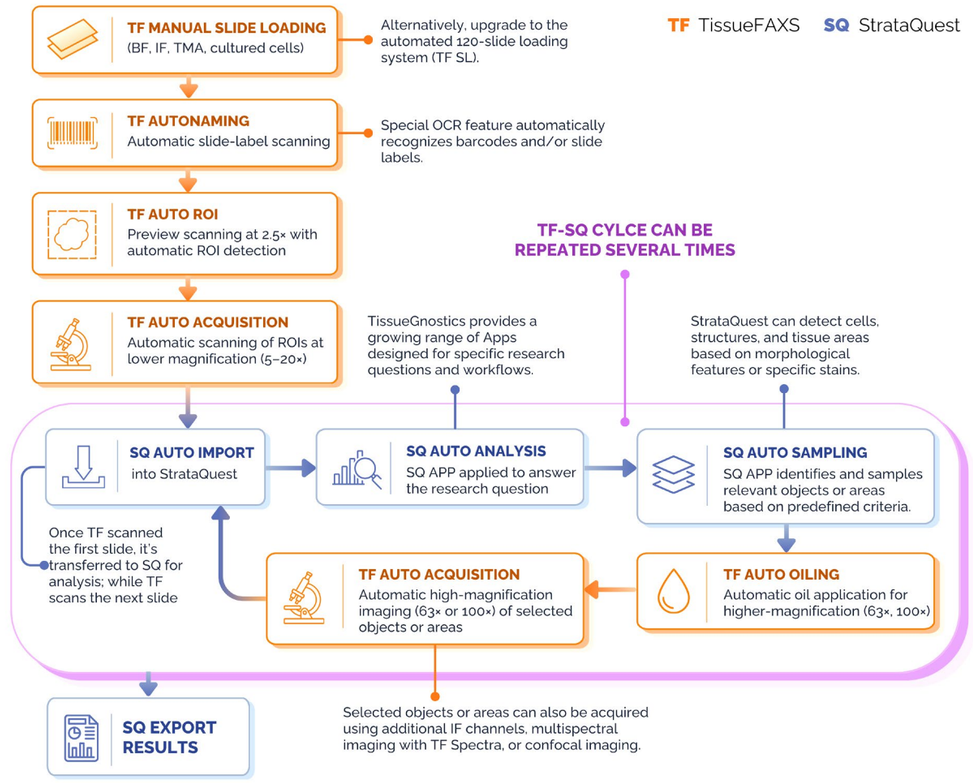
Slide label imaging has been simplified by eliminating the need for a dedicated label camera. TissueFAXS 8 enables label capture using the system's existing camera, reducing hardware requirements. With guidance for optimal lighting and new options to export label data alongside images, label management is now more integrated and accessible.

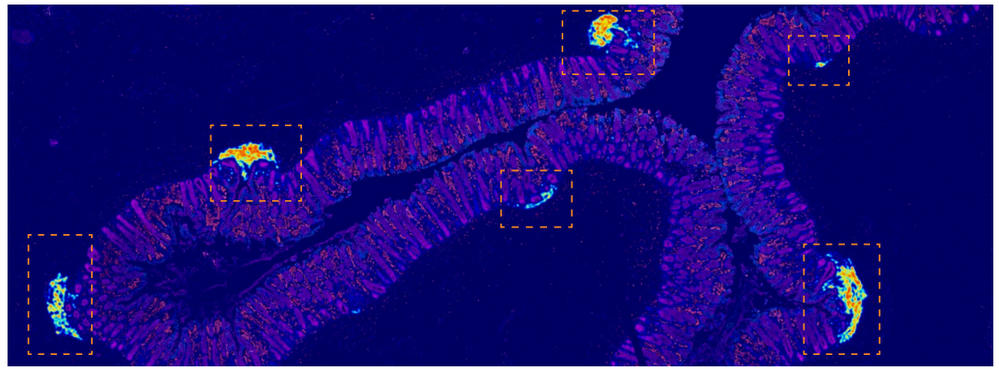


05 CYTOMETRIC FEEDBACK SCANNING

New Cytometric Feedback Scanning creates a dynamic feedback loop between TissueFAXS and StrataQuest. TissueFAXS acquires the sample, StrataQuest identifies relevant objects or regions, and the selected areas are automatically sent back for targeted re-acquisition.

Re-imaging can use different magnifications, channels, or imaging modalities, including spectral and confocal imaging. The newly acquired data can then be analyzed again, and the TissueFAXS–StrataQuest cycle can be repeated as required.

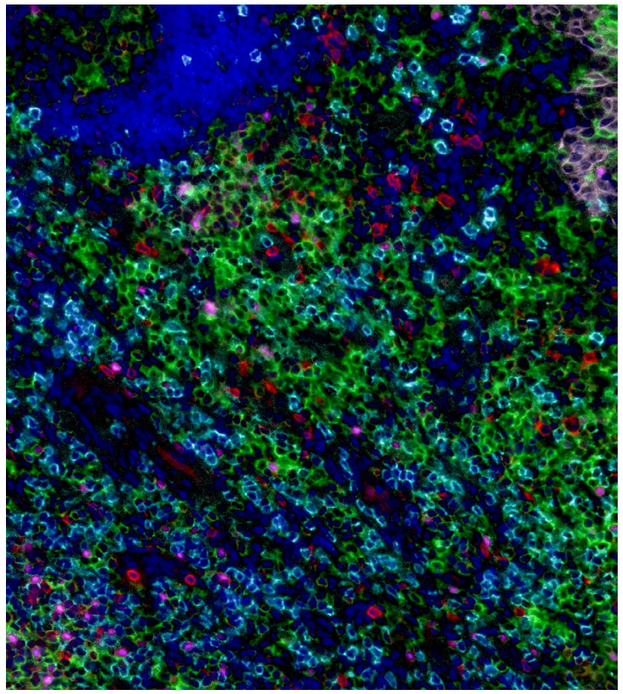




06 NEW GENERATION SPECTRAL UNMIXING

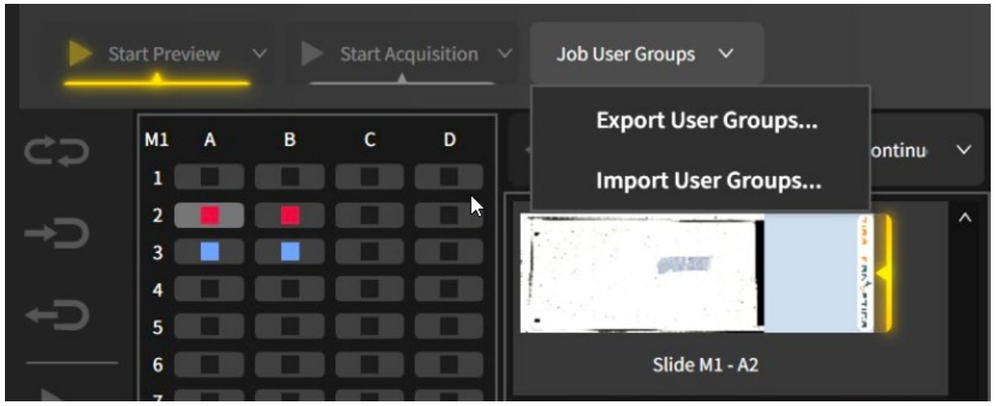
The new spectral unmixing workflow improves the separation of overlapping fluorescence signals, supporting reliable analysis even in high-plex experiments. Unmixed marker intensities remain synchronized with the original image data, allowing results to be reviewed and quantified within the same workflow.

The example shows the detection results obtained with the new spectral unmixing.



07 IMPROVED MULTI-USER WORKFLOWS

Multi-user slide-loader jobs can be organized into groups, with user-specific access and clearer assignment of slides. This helps shared facilities handle multiple research groups within the same operational environment while keeping outputs organized.



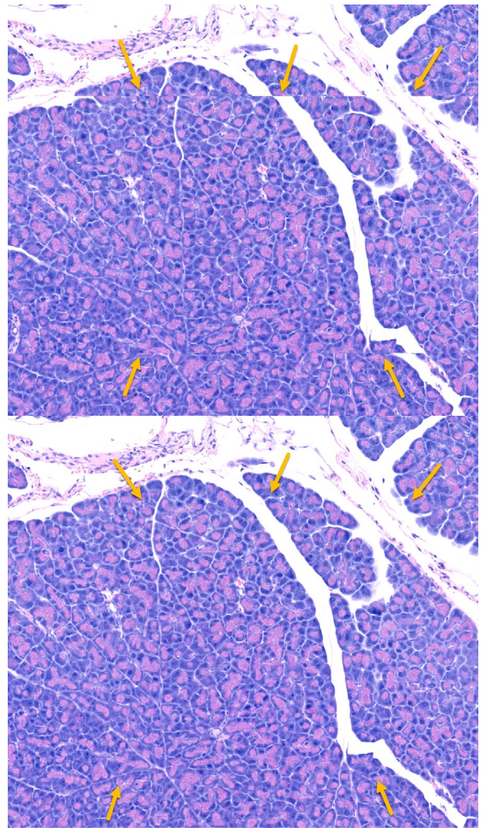
08 NEW STITCHING ALGORITHM

LARGE-AREA IMAGING UNDER IMPERFECT ACQUISITION CONDITIONS

The new dynamic stitching algorithm automatically corrects field-of-view misalignment caused by hardware shifts or cumulative stage errors. Intelligent blending reduces visible transitions between neighboring FOVs, producing smoother and more consistent large-area images.

This is especially useful for large samples and regions containing scattered tissue sections, where stitching errors can otherwise become more apparent.

The example shows the improvement achieved with dynamic stitching. To clearly demonstrate the correction, the sample was intentionally acquired with camera misalignment.



ADDITIONAL IMPROVEMENTS INCLUDE

- **DNN Image Focus Validator:** Automatically detect out-of-focus brightfield images using a trained deep learning model.
- **Virtual 3D Viewer**: Explore Z-stacks with additional X- and Y-axis views for better visualization of tissue structures.
- **Enhanced Scanning**: Benefit from better double-sized slides support, full-resolution slide previews, and seamless switching between configurations without restarting TissueFAXS.
- **Improved Export:** Export slide labels and Z-stacks to Imaris for 3D reconstruction.
- **Bio-Formats Integration**: New image format designed for Bio-Formats compatibility, for easier integration with external analysis tools. Compressed images are stored in a single file per region.

NEXT CHAPTER: STRATAQUEST 8.x

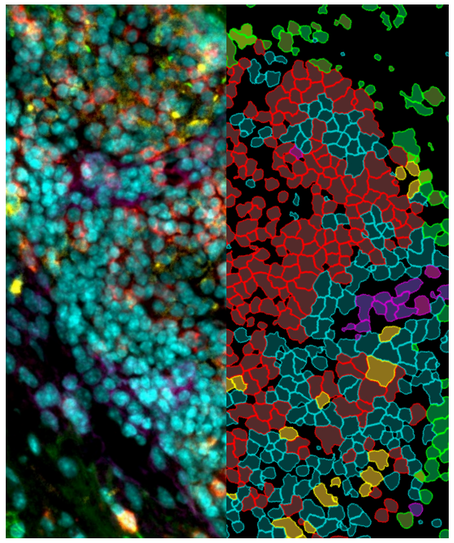
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01 PHENOTYPES AND INTERACTIONS

PHENOTYPING WORKFLOW

The phenotyping workflow in StrataQuest 8.0 has been improved to make it easier than ever to define, visualize, and analyze subpopulations of interest within complex tissue environments.

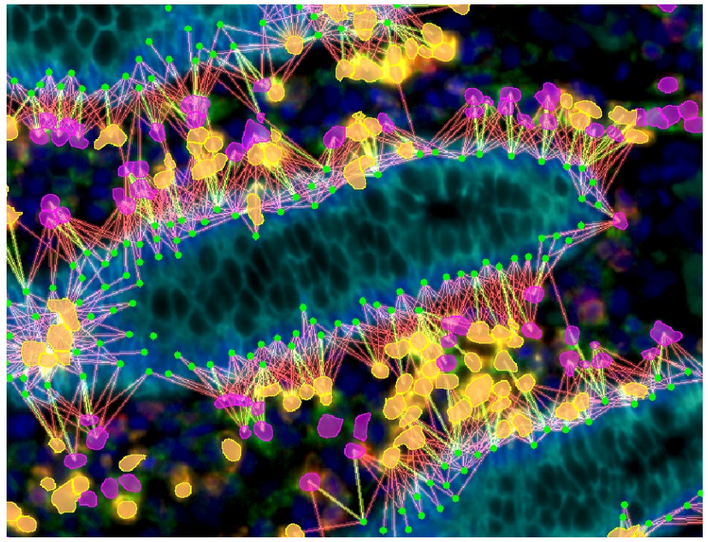
- Easily define complex cell phenotypes using **boolean marker logic** (e.g., $CD4^{+}PD1^{+}$ but $CD8^{-}$).
- Apply logical gating and explore phenotype distribution in individual samples or across entire datasets.
- Visualize these populations across the platform's full range of **diagrams**—including, with the 8.0 upgrade, **t-SNE, UMAP, SONG, 3D diagrams,** and **violin plots**.



PHENOTYPE INTERACTION ENGINE

The newly introduced Phenotype Interaction Engine adds the ability to **quantify spatial proximity** between two phenotypes. Select two cell types, define a spatial threshold (e.g., within 30 µm), and the software calculates interaction frequencies across the dataset—visually and numerically. Scattergrams and histogram-like plots make it easy to interpret interaction density and range, providing **insights into tissue architecture**, immune infiltration patterns, tumor–stroma interfaces and many more.

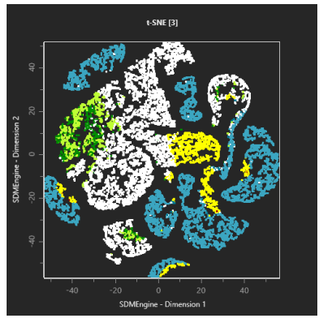
This toolset is especially valuable for **immuno-oncology, tissue profiling,** and anyone investigating the **microenvironmental context of cells**.

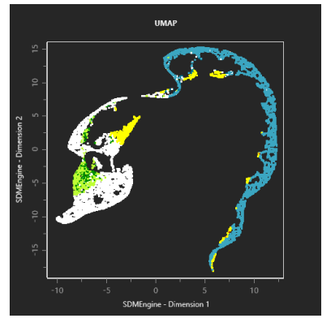


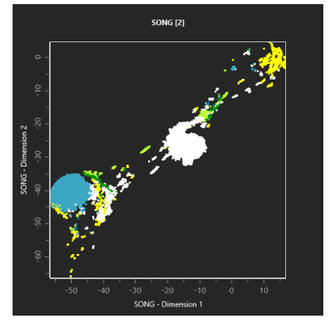
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02 DATA MINING TOOLS

StrataQuest 8.0 introduces a powerful suite of **data mining and visualization tools** designed to help researchers extract deeper insights from high-dimensional image-based data. Advanced dimensionality reduction methods such as **t-distributed Stochastic Neighbor Embedding (t-SNE)**, **Uniform Manifold Approximation and Projection (UMAP)**, and **SONG (Self-Organizing Nebulous Growths)** are now natively supported. These algorithms allow users to transform complex, multivariable datasets into intuitive 2D plots, helping to uncover **hidden relationships** and **phenotypic clustering** based on features like staining intensity, morphology, and size.

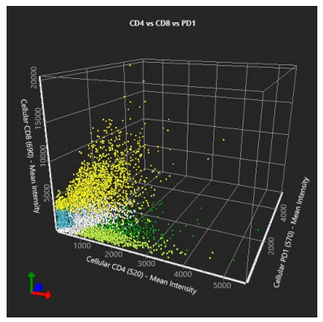


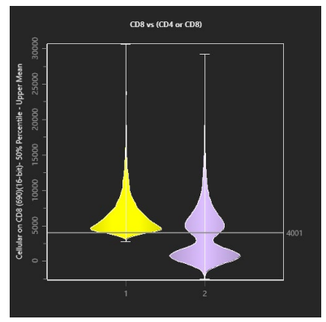


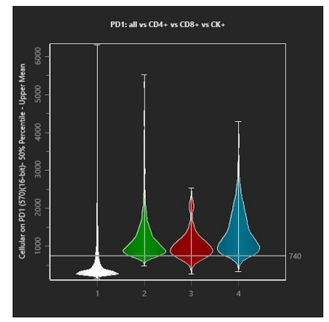


ADDITIONAL DIAGRAMS

In addition, **3D diagrams** now provide a powerful way to visualize the distribution of three phenotypes simultaneously along X, Y, and Z axes—ideal for exploring co-expression patterns and relationships between multiple markers. **Violin plots** have also been introduced, offering a statistical view of marker expression variability within and across cell populations, combining the readability of box plots with distribution detail. Together, these tools empower users to **see structure in complexity** and make more informed, data-driven conclusions.



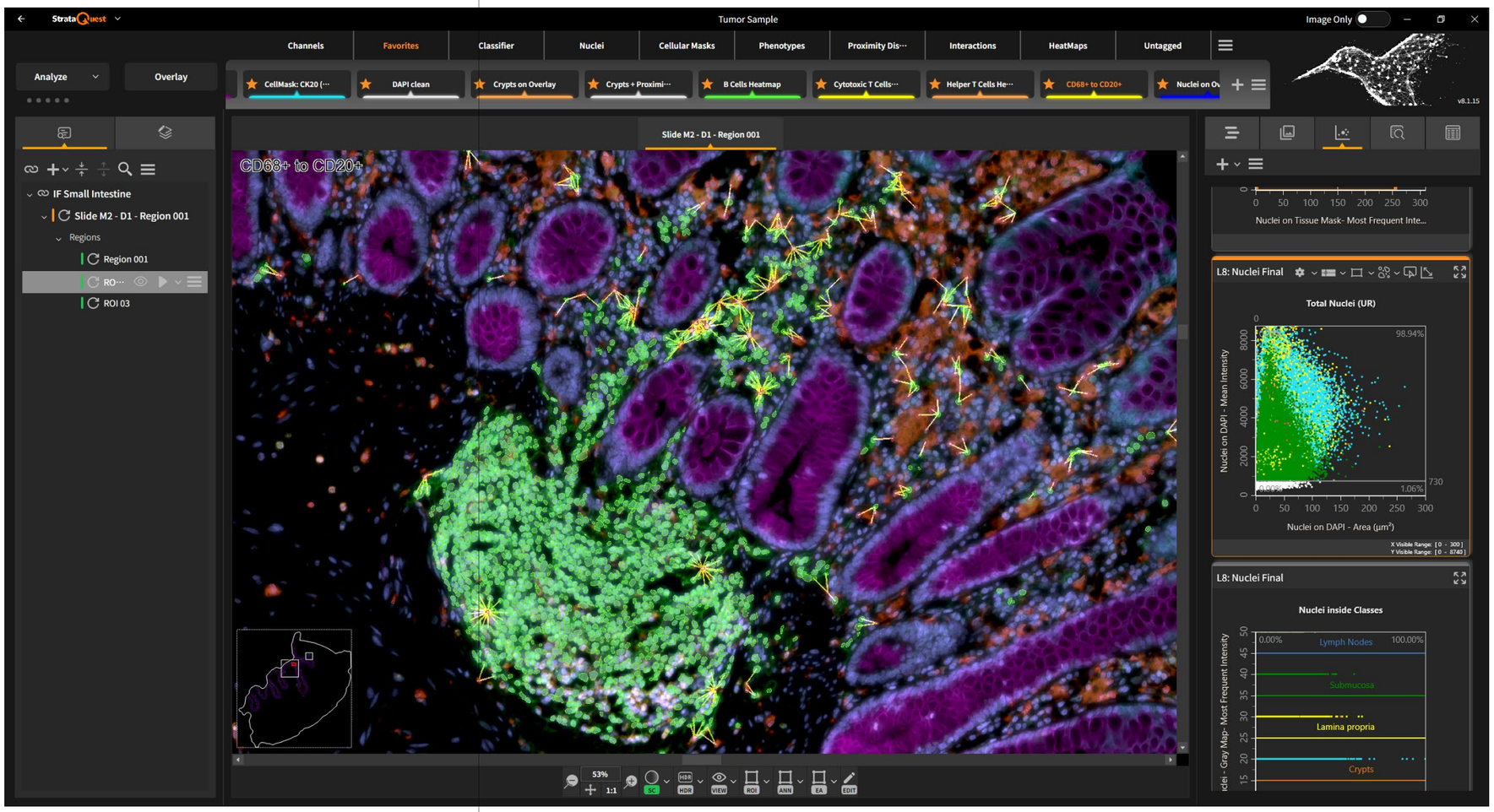




03 NEW USER EXPERIENCE

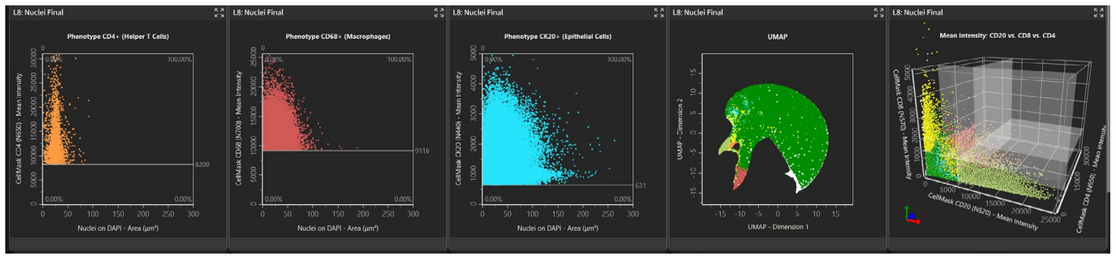
StrataQuest 8.0 features a comprehensive UI and workflow redesign, built to streamline navigation and reduce cognitive load—whether you're running quick evaluations or deep explorations.

- **Simplified Layout:** The new main window layout is optimized for fast access, with flexible docking areas, resizable panels, and smooth operation on a single display.
- **Layer Editor**: Easily manage your analysis pipelines and analysis settings with an optimized layer editor.
- **Image & Category Toolbar**: Quick access to images/image masks and image categories for seamless verification of data.
- **Raw Data & Object Inspector:** Access and inspect your data with greater clarity and ease.
- **Customizable Workspace**: Rearrange, hide, or float items to create a personalized workspace tailored to your needs.



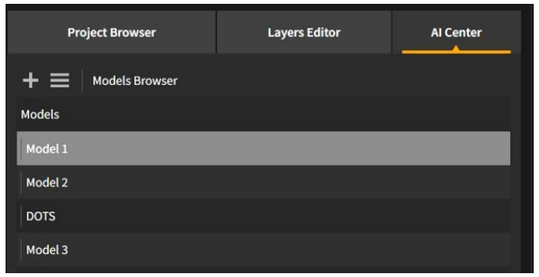
ADDITIONAL IMPROVEMENTS

- **Improved Import Function**: Simplified import of virtual slides from various experiment types and better slide display during import.
- **New Project Database**: Navigate projects faster with a preview of key details like markers, slides, and thumbnails, all in one place.
- **Bio-Formats Integration**: Streamline the process of importing different file types



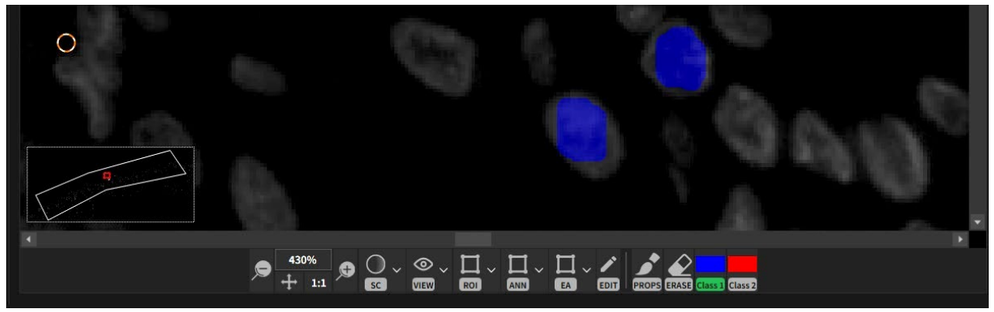
04 AI CENTER

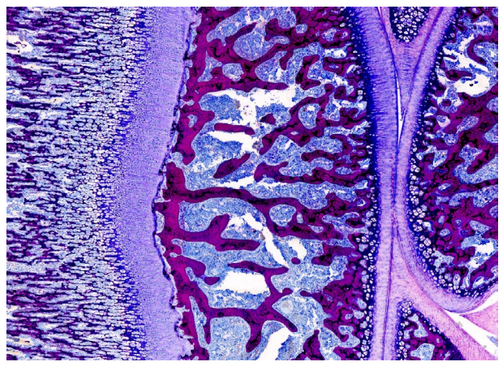
The new AI Center introduces a platform for training, management and storage of deep learning and machine learning models within the StrataQuest. This tool allows users to quickly create powerful AI models using their own annotated data, without needing to switch between multiple tools.

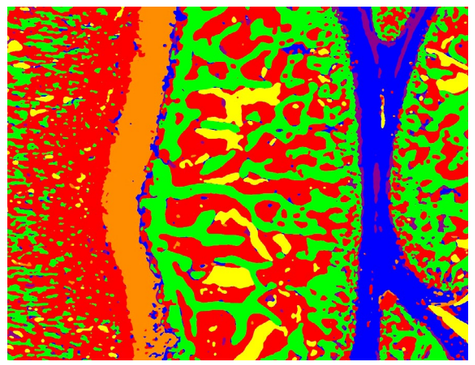


ANNOTATIONS AND MODEL TRAINING

- **Flexible Model Training**: Train either deep neural networks (DNNs) or classic machine learning algorithms.
- **Centralized Management**: Save and store all model versions in one place.
- **Segmentation & Detection**: Apply models for nuclei segmentation or object detection, depending on your experiment type.
- **Efficient Annotations**: Use an intuitive interface for annotating your data with thumbnail previews, and transfer annotations between models to save time.
- **Pretrained Options**: Start with pretrained models for pixel-based segmentation or object classification, and fine-tune them to match specific research goals.







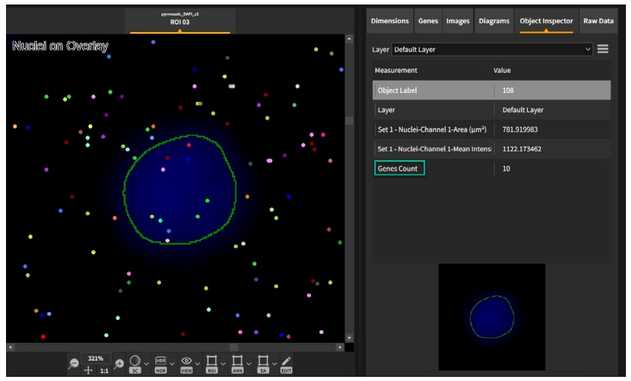
05 MULTIOMICS INTEGRATION

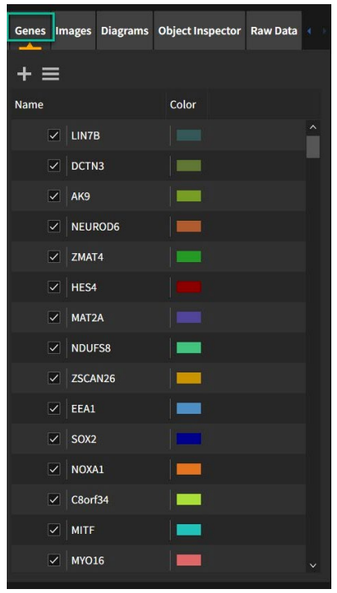
PLATFORM INTEGRATION

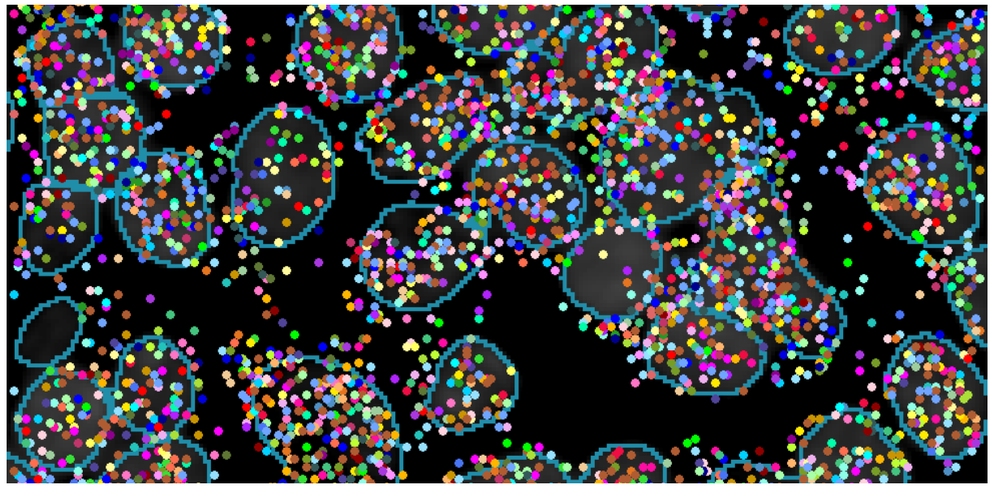
StrataQuest allows the import and analysis of different multiomics platforms **MERFISH (Vizgen)**, **10x Genomics** and **NanoString** experiments. Correlate spatial gene expression, proteins, and morphological features in a single platform by correlating omics results with image data and Strata- Quest analysis results.

ANALYSIS FEATURES

The new workflow provides a dedicated gene viewer for organizing genes and gene groups and comparing them directly with tissue imaging data. Gene detection is fully integrated with other StrataQuest modules—including nuclei segmentation and quantitative gene counting in detected objects — allowing for more comprehensive spatial and molecular analysis.



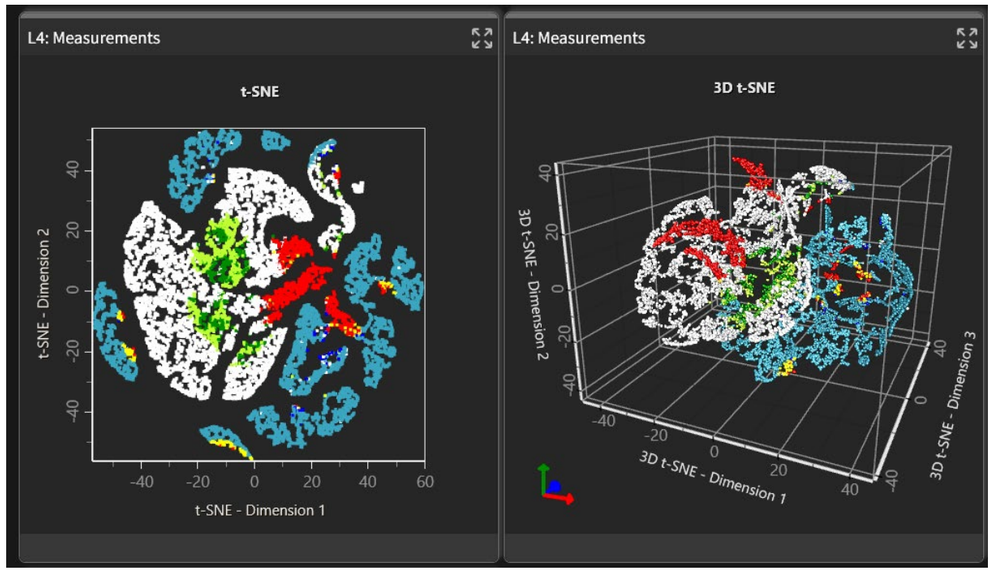




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06 ADVANCED VISUALIZATION

StrataQuest 8.1 extends the dimensionality reduction techniques introduced in 8.0—such as 2D t-SNE, UMAP, and SONG—by adding new 3D t-SNE plots with interactive rotation, zoom, and advanced color coding for clearer population clustering. These tools offer a more intuitive way to explore complex data.

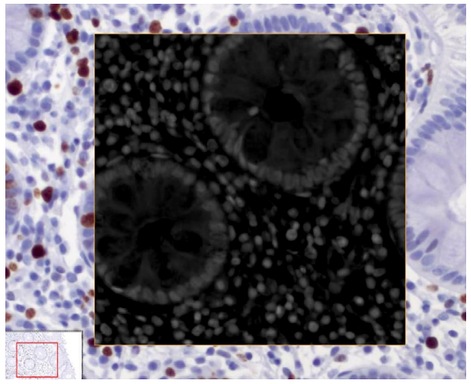


07 REAL-TIME ANALYSIS PREVIEW

The Real-Time Analysis Preview now covers more steps in the analysis workflow. The parameter adjustments appear instantly in a 512x512-pixel preview, minimizing trial and error, enhancing analysis accuracy, and speeding up workflows.

PREVIEW EXAMPLES

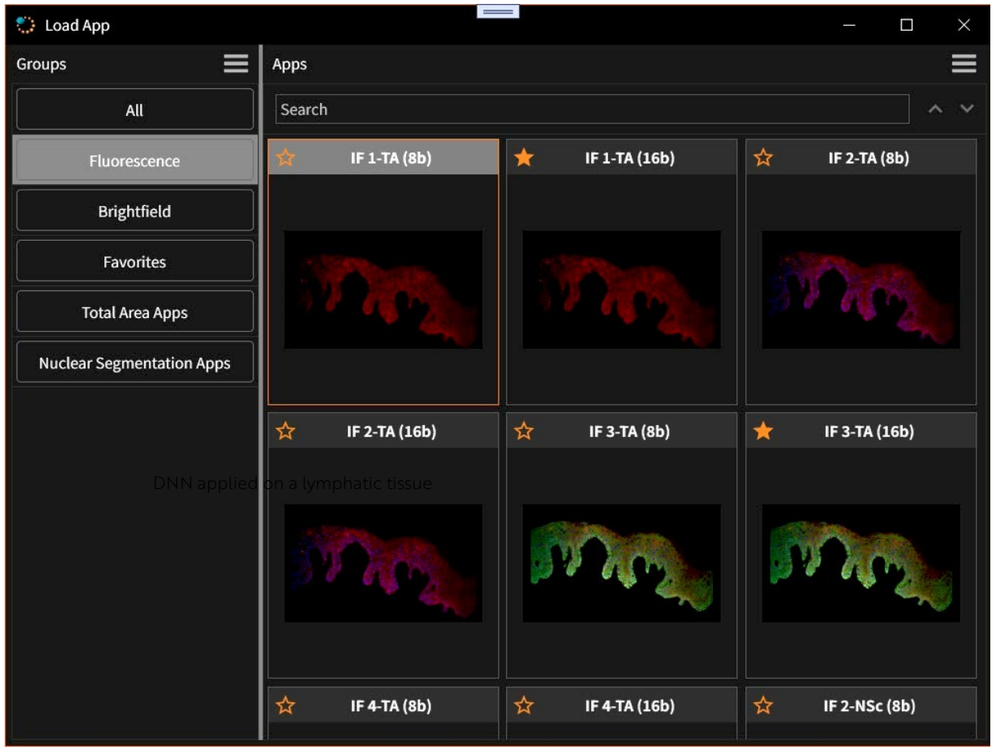
- Nuclear Segmentation
- Application of the Cellular Mask
- Color Separation in BF experiments
- Application of Preprocessing Filters
- and more



08 OPTIMIZED STANDARD APPLICATIONS

Streamlined workflows that are easy to apply and are utilized for straightforward applications such as co-expression analysis.

- **Up to 20 markers**: Adapt the number of channels to analyze (1-20) depending on your experiment type.
- **Experiment flexibility**: Choose between nuclei segmentation or area measurement as input for object identification.
- **Image Type**: The Apps can be applied for both 8 bit and 16bit experiments.
- **User-Friendly Management**: Easily manage these applications in a clear, intuitive interface.



IMPLEMENTATION

Suite 8.0 and 8.1 bring together acquisition, image quality, quantitative analysis and multimodal interpretation. From smarter slide scanning to AI-supported segmentation and spatial molecular insights, the software suite is designed to make complex workflows more accessible and results easier to explore.

For feature availability, supported hardware configurations and upgrade requirements, contact your TissueGnostics representative.