Developing effective treatments and therapies requires an in-depth understanding of underlying disease mechanisms and biological responses, so it’s critical that you see everything your tissue sample has to show you. But to get a complete picture can be challenging with so many complex biological interactions occurring simultaneously. That’s what makes having a streamlined workflow a powerful solution. The Phenoptics™ workflow – multiplex immunohistochemistry staining solutions, multiplex spectral imaging systems, and advanced image-analysis software – enables a more comprehensive and specific view and analysis of biological interactions across a digital slide. From the cellular level to the macroscopic tissue architecture, using a streamlined workflow.

Better quantification of cellular interactions, immune cells, and disease mechanisms are in play, and help researchers discover biomarkers that may eventually lead to better subpopulation stratification methodologies. Simply put, that means a better understanding of biology that drives disease. And isn’t that the goal we’re all striving for?

We take understanding to the next level
Want to test the Phenoptics workflow before bringing the capability in house? Let our expert research team generate the results for you. We follow a detailed staining protocol when working with your precious samples: Antibody specificity is first confirmed via monoplex with positive controls. Then the multiplex panel is tested with the same positive controls, with study samples that you provide – so you’re confident the protocol works for you. Confirmation of performance levels, including multiplex staining independence and noninterference are then agreed upon. Analysis begins with multispectral imaging providing quantitative spectral unmixing of each fluorophore signal and tissue autofluorescence, followed by tissue segmentation and cell phenotyping. This complete workflow enables new depths of understanding that cannot be achieved with standard chromogenic monoplex or duplex IHC methods.
Combining a powerful multispectral imaging system with multiplex IHC staining, and image analysis with inform™ software, the Vectra Polaris workflow enables you to identify cellular phenotypes, assess their functional states, and measure spatial relationships. It’s a workflow that enables better understanding of the complex interplay between cells and the tissue architecture. Let’s get started . . .

The nine colors of discovery

Opal Multiplex IHC kits enable multiple results accessible to anyone who works with standard immunohistochemistry, permitting enhanced visualization and understanding of complex cellular interactions. With Opal, you can select antibodies for simultaneous IHC detection based on performance rather than price. Opal kits are optimized for reliable spectral sensing and simultaneous measurement of three to eight IHC targets, plus a nuclear stain.

Opal enables you to:
• Measure three to eight tissue biomarkers simultaneously
• Use the best primary antibodies, regardless of species — with no cross reactivity
• Identify multiple cell phenotypes while retaining spatial and morphological context that is lost with bulk measurements and flow cytometry
• Get more information from precious and scarce samples

With our Opal Automation BOND™ and Vectra Polaris™ platforms, our system algorithms automatically identify IHC-stained tissues using machine learning algorithms. Because you retain spatial cellular context, you get more information from your precious samples. Because you retain spatial cellular context, you get more information from your precious samples.

Reveal complex biology in a single tissue section

For a deeper understanding of diseases, you need faster, better visualization and identification of disease biomarkers. And accelerating the pace of that understanding is the whole idea behind Phenoptics™ imaging software. Our patented multispectral imaging engine, enables the separation and quantification of up to nine colors in situ, in FFPE tissue sections, and TMAs. Proprietary unmixing algorithms enable you to capture the multiple interactions occurring between cells because we’ve carefully unwrapped each color from one another; while also isolating autofluorescence into its own color channel so you can easily exclude it from your digital slide analysis. That means you have confidence in accurately quantifying the interactions that are really occurring in the biology.

Monte Carlo Phenotypic Validation Workflows:
• Compact system ideal for use with multiplex imaging or for assay development to free up a higher throughput system such as Vectra Polaris
• Easier for easy visual checking as you go
• Automated brightfield and multi-channel fluorescence helps to nine-color capabilities
• Phenoptics™ whole slide server for digital imaging provides context for identification of regions of interest within a digital pathology workflow

Vectra 3 Automated Quantitative Pathology Imaging System:
• Direct and measure variable wavelength expressed and overlapping biomarkers within a single H&E, IHC, or IF tissue section and in TMAs
• Automatic identification of specific tissue types using integrated inForm® analysis software
• Flexible data analysis, compatible with many image analysis software platforms

Our patented inform™ image analysis software allows you to accurately visualize, analyze, and quantify biomarkers in situ in solid tissue. Its powerful analyzing engine, enables the separation and quantification of up to nine colors in all tissues and cellular compartments that cannot be identified by the naked eye. Automated, trainable algorithms permit detection and quantification of tissue and phenotyping of immune and other cells. Combined with detection of signal spatial analysis algorithms in inform™ and complex phenotypic analysis reporting tools, phenotypical™ allows you to perform the high-throughput analysis algorithms that give you the confidence to discover indicators of disease and uncover relationships between specific cell types and across the entire digital slide. Additional benefits include:
• Pathology views™ renders immunofluorescence images as silenced blue or dark and hue, brightness providing views more familiar to the pathologist
• Powerful training algorithms enable identification and separation of variably expressing and overlapping signals from background autofluorescence
• Enables per-cell analysis of H&E, IHC, IF, and IHC/IF in FFPE tissue sections and TMAs
• Artificial intelligence cell segmentation using machine learning algorithms
• Automated detection and segmentation of specific tissue types through pattern recognition algorithms
• Adaptive Cell Segmentation reliably identifies individual cell types in densely packed, complex morphologies regardless of staining technique and background levels
• Simplified whole-slide multiplex imaging workflow enables analysis across the whole slide, removing selection bias

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ANALYZE AND UNDERSTAND

Discovery comes with seeing cell-to-cell interactions

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ANALYZE AND UNDERSTAND

Discover what exquisite, high-resolution images can show you and what powerful image analysis can find for you. Discover how you can make the impossible possible. Discover what you’ve always wanted to know, but never knew you could. Discover what you’ve always wanted to do, but never knew how. That’s what we call phenotypical™. It’s an entirely new way of looking at samples. It’s the power of our inform™ software and the magic of multi-color, multi-channel detection. For more information, contact your local Vector Labs rep or visit vectorlabs.com.