



Digital Pathology Quantitative Immunohistochemistry Software

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Quantifying Gene Expression Patterns at the Protein Level using Immunohistochemistry

Applying digital pathology to immunohistochemistry offers an enhanced method to quantify gene expression at the protein level. The Quantitative Immunohistochemistry Software has the ability to perform complex analyses of the expression patterns of multiple genes in tissues, specifically cancer tissues. After analyzing expression patterns, the software quantifies the protein signal of the digitized slide images. Although gene expression profiling can be quantified using RNA, the use of immunohistochemistry offers a more promising approach because it preserves the physical components of the tissue.

Enhanced Immunohistochemistry and Digital Pathology

Before the development of the Quantitative Immunohistochemistry Software, immunohistochemistry could only be studied using qualitative methods of molecular profiling. This software provides a new method to **quantify** gene expression using immunohistochemistry.

By spatially registering the antibody stained sections, generating a grid of squares, and obtaining the immunohistochemistry staining intensities, the software produces the Immunohistochemistry Map. The program combines the individual Immunohistochemistry Maps to generate the final composite image, the Immunohistochemistry Signature Map. The Immunohistochemistry Signature Map displays the compiled intensities of immunohistochemistry staining, allowing the intensities to be measured quantitatively. Before the development of the Quantitative Immunohistochemistry Software pathologists could only prepare subjective, semi-quantitative data using immunohistochemistry. The Quantitative Immunohistochemistry Software overcomes a key hurdle, enabling the use of immunohistochemistry to assess and quantify gene expression patterns in histologic samples.

Tool for Validation of Microarray-based Gene Expression Profiling Data

The Quantitative Immunohistochemistry Software can validate biomarker signatures at the protein level, which have been identified using microarray-based gene expression profiling studies. Immunohistochemical methods for biomarker quantitation are easily applied to routine clinical laboratory studies. The results provide sufficient prognostic value to drive clinical decision making and are widely accepted by pathology labs. By using the Quantitative Immunohistochemistry Software to monitor molecular signatures and characterize tumors, pathologists are able to improve their diagnosis and prognosis of cancer.

FEATURES AND BENEFITS OF IMMUNOHISTOCHEMISTRY SOFTWARE

Technology ID

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Category

Life Sciences/Health IT
Life Sciences/Human Health
Software & IT/Algorithms
Software & IT/Databases
Software & IT/Health IT
Software & IT/Simulation & Modeling

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- Less expensive and easier; no additional samples needed. Studies can be done on the same tissue sections used in other routines.
- Fast; results can be processed within the same day they were ordered.
- Historical research; can be used to quantify archives of tissues and digital images
- Provides quantitative data
- Produces automated gene expression profiling at the protein level; utilizes standard immunohistochemistry techniques and a widely available whole slide imaging platform.
- A state of the art technique for cancer diagnosis/ prognosis; enhances the use of immunohistochemistry and digital pathology.

Researchers

Greg Metzger, PhD

Associate Professor, Department of Radiology

[External Link](http://www.radiology.umn.edu) (www.radiology.umn.edu)

Stephen Schmechel, MD

Steve Dankbar, *Radiology Department*