



Technology Transfer Opportunity

Quantitative image analysis at a subcellular level

OPPORTUNITY:

Novel image analysis system for IHC-based quantitation at a subcellular compartmental level

Description of Technology:

This novel, fully automated image analysis system uses a non-supervised approach for the accurate quantification of nuclear, cytoplasmic and membranous biomarkers.

Value Proposition:

Manual interpretation of the vast amount of immunohistochemical data produced in routine clinical investigations and, in research settings, using tissue microarrays is prone to subjective errors and is a bottleneck in high-throughput evaluation of patient tissue samples.

To overcome these problems the described image analysis system uses a fully automated method which is able to learn and interpret the morphological features and oncological patterns of each patient sample individually. This approach thus requires no supervision, manual interpretation or prior knowledge of the morphological features of specific tumour cells.

The technology has been successfully applied to immunohistochemically (IHC) stained tissue samples from hundreds of breast, lung, bladder, melanoma and ovarian cancer patients. The automated analysis and interpretation of these samples proved to be accurate. In addition, this method allowed for optimisation of the biomarker detection threshold resulting in increased sensitivity.

The described method has several distinct advantages, it is: -

- Fully automated and less time consuming.

- Standardised and not prone to subjective errors or variation of manual sample interpretation.
- Easy to use even by non-pathologists.
- A sensitive and versatile tool which can be adapted for a variety of diagnostic applications.

The potential applications for this novel image analysis system include:

- Systematic validation of biomarkers via high-throughput analysis.
- Quantification of prognostic and predictive biomarkers.

Market:

Biotech industry, Pharmaceutical industry, Diagnostic and Biomarker industry

Inventors:

Prof William Gallagher, Dr Donal Brennan and Mr Elton Rexhepaj, UCD School of Biomolecular & Biomedical Science.

Status:

The technology has been validated using a cohort of >1,000 breast cancer patient tissue samples, as well as several hundred specimens from a wide variety of other cancer types. An Irish priority patent application S2007/0882 was filed on 4th December 2007 and has been progressed to PCT stage.

Opportunity Sought:

Available for licensing and/or collaborative research on biomarker validation.

Licensing Contact:

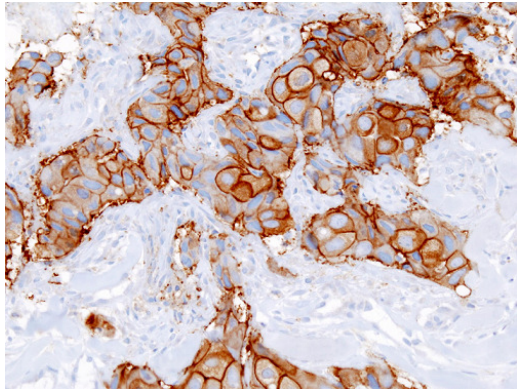
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Example of membranous biomarker assessed by IHC in a breast tissue sample

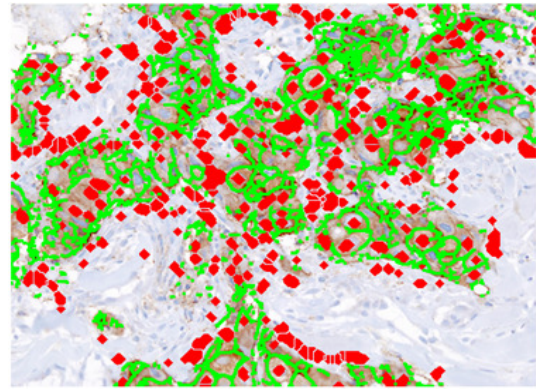
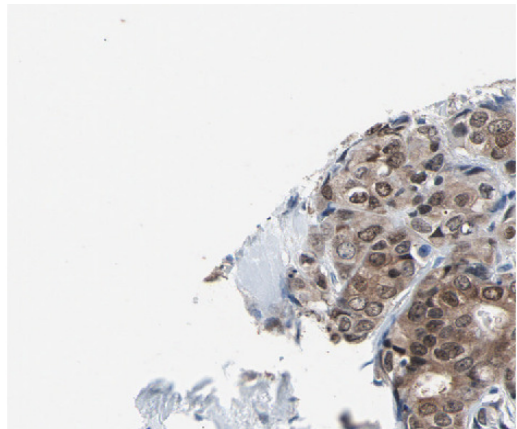


Image analysis output (RED = tumour cell nuclei, membranous expression = GREEN)



Example of cytoplasmic biomarker assessed by IHC in a breast tissue sample

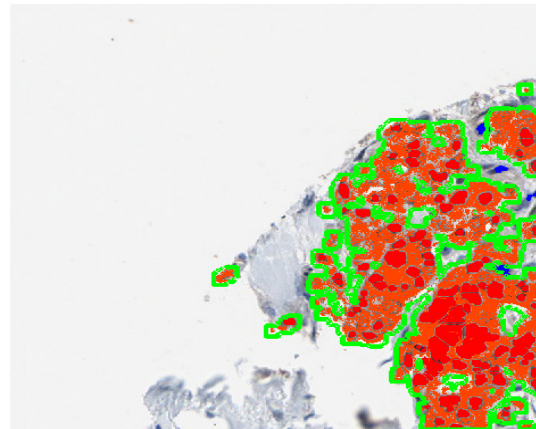
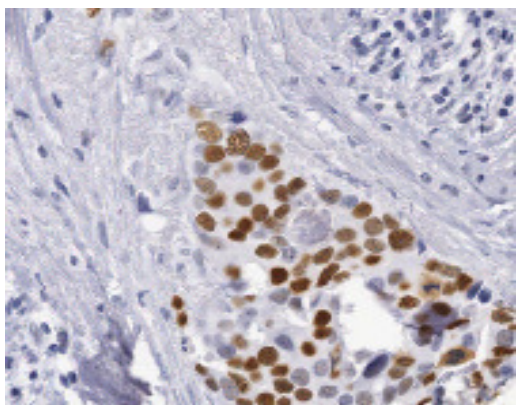


Image analysis output (RED = tumour cell nuclei, cytoplasmic expression = ORANGE)



Example of nuclear biomarker assessed by IHC in a breast tissue sample

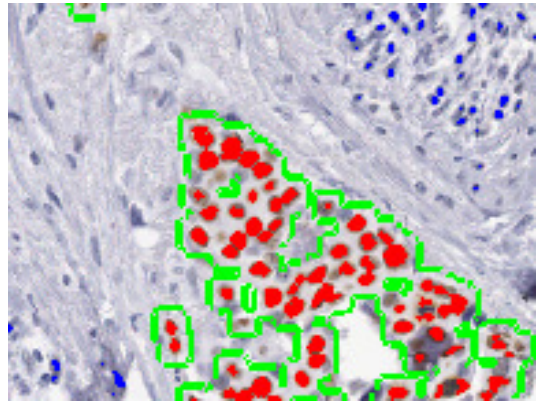


Image analysis output (RED = Positive tumour cell nuclei, BLUE = Negative tumour cell nuclei)