Technology Development & Commercialization
UNIVERSITY HEALTH NETWORK
Toronto General Hospital • Princess Margaret Hospital • Toronto Western Hospital

Fluorescence Quantification for Image Guided Surgery

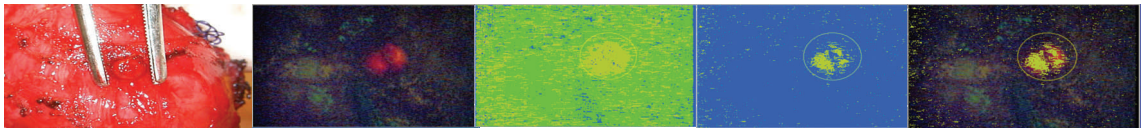
Overview of Technology:

Investigators at the University Health Network have recently developed a novel low-cost method and device that can measure the signals originating from a fluorescent biomarker in a patient and display them in a quantitative real-time, high resolution format.

Healthy tissue preservation is of the utmost importance when performing re-sectioning procedures– especially in the brain and eye. Presently, the practice of using fluorescent biomarkers in combination with 'image-guided surgery' is based only on qualitative validations. As a result, tissues fluorescing at any intensity are surgically removed. However, it has been shown that strong and weak fluorescent signals have different implications pathologically. By providing surgeons with solid quantitative information in addition to qualitative data, this invention has the potential to drastically improve not only clinical decision making but also diagnostic accuracy.

This quantitative technique is based on sound biophotonic principles, and is supported by both in-vivo and ex-vivo testing. Quantitative information from this technology has additional advantages because it eliminates inter-observer variations, provides a linear response to biomarker concentration, minimizes not only the effect of tissue-to-detector geometry but also optical tissue properties and reduces the influence of auto fluorescence from cells. The technology is compatible with microscopes, macroscopes, confocals, endoscopes, bronchoscopes and laparoscopes. The clinical feasibility of this technology has been successfully demonstrated in patients undergoing prostatectomy during clinical trials at the University Health Network and for brain gliomas at the Dartmouth Medical School.

This system is currently in clinical trials and is available for exclusive licensing.



Sample images of a human prostate capsule in the stages of quantitative image processing

Related Publications:

Bogaards, A. *et al*. “Fluorescence image-guided brain tumour resection with adjuvant metronomic photodynamic therapy: pre-clinical model and technology development.” *Photochem Photobiol Sci*. **4(5)**, 438-42 (2005)

Bogaards, A. *et al.* “Increased brain tumor resection using fluorescence image guidance in a preclinical model.” *Lasers Surg Med*. **35(3)**,181-90 (2004)

Patent:

PCT/CA2007/001581 (US12/440,327 and Canadian - National Phase Entry - Filed Sept 6 2007)

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