Technology Commercialization Opportunity

Photoacoustic Imaging of Soft Tissue

Inventor(s):
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Technology Description:
Researchers at RIT and the University of Rochester have developed a low-cost imaging technology that can be used for screening and diagnostics of soft tissue cancers and can distinguish non-invasively malignant from benign tumors. This new imaging methodology takes C-scan images in the coronal plane of the subject tissue in real time based on the photoacoustic phenomenon. It takes advantage of the general fact that blood vessel concentration in tumors is different from that in healthy tissue and it is this difference the imaging diagnostic can visualize, giving doctors a more accurate way to distinguish tumors than current ultrasound imaging methods.

Photoacoustic imaging occurs when the region of interest is stimulated with laser light, resulting in ultrasound waves (photoacoustic effect) that is focused by a specially designed acoustic lens and captured by a specific 2D sensor array and subsequently displayed as a C-scan on a computer screen. The device itself is no larger than 1.5" x 1" x 1", about the size of a typical ultrasound transducer. A low power laser source and a computer monitor is all that is required in addition to the probe.

This new imaging modality provides a non-invasive way to distinguish between malignant and benign tumors, reducing unnecessary stress, pain and cost to the patient. It also provides a cost savings to health insurance companies and gives doctors more information for diagnosis.

Keywords: Photoacoustic imaging, cancer, medical imaging, ultrasound, acoustic lens, prostate cancer

Technology Readiness:
This novel technology is currently in the prototype stage. The prototypes have proven remarkable success with ex-vivo studies looking at thyroid and prostate cancer. These results have been recently published in journals such as International Conference on Biomedical Engineering, Journal of Ultrasound in Medicine, Journal of Clinical Imaging Science, and presented at RSNA 2012 and ARRS 2013. Currently the researchers are working towards developing an alpha prototype to move forward with pre-clinical and clinical trials.

Idea	Concept	Prototype	Alpha Version	Beta Version	Released

Intellectual Property (IP):
The technology was awarded US Patents 8,353,833 and 8,870,770. Patents are pending in Europe, India and China.

A companion patent entitled “Photoacoustic Imaging Using a Versatile Acoustic Lens” was filed on October 15, 2009 in the United States, Europe, India and China. (US Publication #20100298688)

Applications:
The researchers are currently focusing their efforts on prostate cancer. Clinicians say they badly need a way to distinguish tumors that would be deadly without treatment from those that would not. Not only can this imaging device be used to detect and diagnose cancers but it can also provide doctors a tool for prognosis and monitoring of drug response or tumor recurrence. There are additional secondary applications including thyroid cancer, breast cancer and skin cancer. The soft tissue diagnostic world market size currently represents a market size of $2 Billion USD.

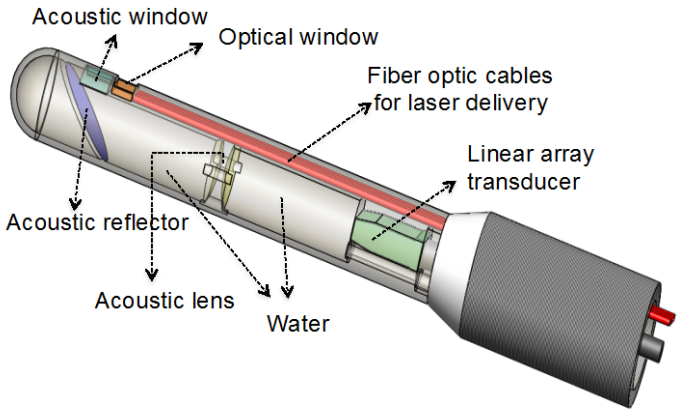

Figure 1: Photoacoustic Prostate Probe

Target Customers:
The end-user customer would be radiologists, urologists and other health care professionals that perform medical imaging.

Opportunity:
RIT, UR Ventures and the researchers are interested in working with parties who are qualified and interested in the commercialization of this revolutionary new medical imaging technology. Arrangement types include funding opportunities, licensing the technology to existing or new organizations or strategic partnerships with those who have expertise in the field.

Contact:
Those interested in learning more about this opportunity should contact:
Mr. William E. Bond, Director of Intellectual Property Management at RIT (585) 475-2986 or
Zubair Mirza, Sr Licensing Manager for Physical Sciences at UR Ventures (585) 276-6600.

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