

Innovation and Commercialization



Multiple Biomarkers Imaging for High Specificity

Tech ID: UTA 16-56

INVENTOR: Baohong Yuan

TECHNOLOGY NEED

Cancer stem cells (CSCs) are life-threatening tumor cells which function as seeds of malignant tumor and can self-renew. They remain in a silent state and are unaffected by conventional tumor therapies thereby causing cancer relapses and metastasis. Therefore, identifying and imaging these cells before, during and after a surgery/therapy becomes highly important to prevent their regrowth. Currently available imaging modalities are limited by their spatial resolution, sensitivity, specificity and their lack of multiplex imaging capabilities. Therefore, there is a need for a technology that overcomes these drawbacks thus providing opportunities to treat CSCs before they move to blood vessels and cause metastasis.

INVENTION DESCRIPTION/SOLUTION

A novel multi-color molecular imaging technology “near infrared (NIR) ultrasound-switchable fluorescence microscopy (USFM)” for CSC imaging via simultaneous imaging of multiple biomarkers (SIMB) has been developed. This system is based on the uniqueness of CSCs in providing multiple biomarkers. USFM focuses on this uniqueness to bring about high specificity and sensitivity in CSC imaging. It has multiplex imaging capability via multi-spectral fluorescence emissions to simultaneously image multiple biomarkers of CSCs to specifically differentiate CSCs from non-CSCs. Also, it has a high photon detection sensitivity and can exclusively differentiate signal photons from background noise photons. In addition, it can image as deep as centimeters with high resolutions enabling it to potentially image CSCs population in human breast, prostate, thyroid, skin, oral, colon, uterus etc.

APPLICATIONS

- Imaging spatial, temporal variations of CSCs
- Cancer diagnosis, prognosis, treatment evaluation

KEY BENEFITS

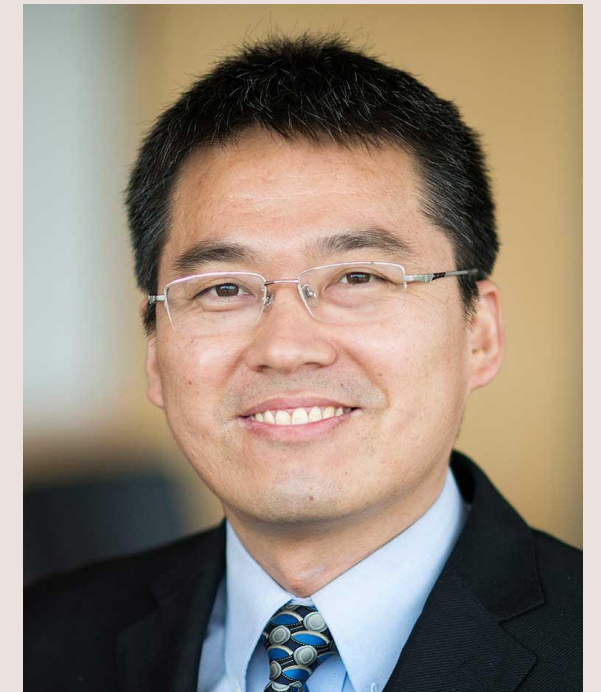
- Cost-efficient
- High resolution
- High sensitivity
- Multiplex imaging
- High specificity
- Non-ionized radiation

STAGE OF DEVELOPMENT

Prototyped & Animal tested

INTELLECTUAL PROPERTY STATUS

Patent Pending



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