The Office of Technology Management

UNIVERSITY OF TEXAS ARLINGTON

Tech ID: UTA 16-50

Highly Specific Tissue Imaging

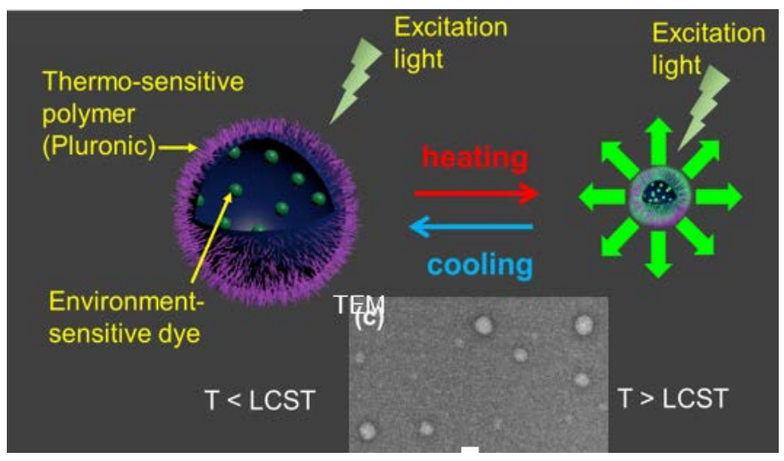
INVENTOR: Baohong Yuan

TECHNOLOGY NEED

Biomedical contrast agents are used to enhance tissue bio-targets that are naturally invisible or too weak to be detected. High specificity in imaging tissues requires a high ratio of signal from specifically bound to unbound contrast agents. Unfortunately, no technology can differentiate them in vivo. Conventional imaging technologies are time consuming, have limited specificity and suffer from non-specific binding. Therefore, there is a need for an improved technology that can image tissues with more specificity, accuracy, precision and sensitivity.

INVENTION DESCRIPTION/SOLUTION

An ultrasound-switchable fluorescence (USF) technology which uses an environment-sensitive near infrared (NIR) fluorescent dye encapsulated in a thermo-sensitive nanoparticle has been developed to address the specificity and non-specific binding issues of the conventional imaging technologies. The dye's fluorescence emission exhibits a switch-like function of the temperature. When focused ultrasound is applied on a tissue, its temperature at the focus increases above threshold temperature switching the fluorophores. The fluorophores emit light which is delivered centimeters deep via light scattering. These ultrasound-induced fluorescence photons are used as signal for imaging the tissue. USF has high resolution and high sensitivity in centimeters deep tissue and the capability to simultaneously image multiple targets (SIMT) via multi-color fluorescence imaging. Additionally, the system achieves high specificity as the photons are generated only from the region around the ultrasound focus, thus resulting in highly specific tissue imaging.



APPLICATIONS

- Cancer diagnosis, treatment evaluation and prognosis
- Angiogenesis evaluation

KEY BENEFITS

- High-resolution at centimeters depth
- High sensitivity
- High specificity
- Multiplex imaging via multi-colors
- Quantification of binding and detaching rates
- Insensitive to some non-specific binding
- Increased specificity to the bound contrast agents

STAGE OF DEVELOPMENT

Prototype

INTELLECTUAL PROPERTY STATUS

Provisional

RELATED TECHNOLOGY

- **UTA 11-28 Noninvasive imaging of Blood Pressure in the Microvasculature of the Retina**
- **UTA 16-27 Tissue thermometry via multi-color ultrasound-switchable fluorescence (MC-USF)**

More about the Inventor:
Baohong Yuan

Contact information
For licensing, please contact
Sharon Ngwenya, Ph.D.
(Licensing Associate)
sngwenya@uta.edu
otm@uta.edu
P: 817.272.1130

Our mailing Address:
The Office of Technology Management
701 S Nedderman drive,
Suite 350, Arlington, TX 76019

Connect with us: