

# The Office of Technology Management

UNIVERSITY OF TEXAS  ARLINGTON

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## Domain Diffuse Optical Tomography Transrectal-Ultrasound (TRUS) for Enhanced Prostate Imaging

**INVENTOR: Hanli Liu**

### TECHNOLOGY NEED

It is well known that prostate cancer tends to develop in men over the age of fifty. Some prostate cancers grow slowly at low-risk, and some grow aggressively. Current clinical diagnosis relies on needle biopsy through transrectal-ultrasound (TRUS) guidance. However, TRUS serves only as a navigation tool to show prostate anatomy and hence biopsy samples are collected almost blindly without knowing whether the biopsy lesions are highly suspicious for cancer. As a result, the current cancer patients are often undertreated or over treated. While undertreatment can cause patients' lives, overtreatment can cause unnecessary impotence or incontinence or both. Therefore, there is a need for a diagnostic imaging technique that can accurately differentiate aggressive cancer lesions from low-risk cancer ones.

### INVENTION DESCRIPTION/SOLUTION

A new imaging technology that uses TRUS coupled with frequency-domain diffuse optical tomography (FD-DOT) for detection of aggressive prostate cancer has been developed. FD-DOT is an imaging cap that can be clipped onto the existing TRUS utility. It is an imaging system that will deliver and collect light at two different colors to and from the prostate gland, respectively, through the suspects' rectum by an endoscope like probe. The detected signals will be collected and analyzed to determine whether there are high-grade prostate cancer lesions hidden within the prostate. Studies have demonstrated that this new imaging technique can be used to achieve a diagnosis that is more accurate than current methods. The device allows for early detection of aggressive prostate cancer, reduction of unnecessary biopsy procedures, and improvement of a patients' quality of life.



Figure: Design and idea of DOT imaging cap

### APPLICATIONS

- Diagnosis and staging of aggressive prostate cancer
- Image guided biopsy

### KEY BENEFITS

- Portable device
- Quick adoption as the cap can be clipped to existing TRUS utility
- Reduction in unnecessary biopsy procedures
- Reduction of medical burden in healthcare systems
- Improvement of patients' quality of life

### STAGE OF DEVELOPMENT

Prototype

### INTELLECTUAL PROPERTY STATUS

Patents pending in

- USA
- Japan
- Europe
- Canada



**More about the Inventor:**  
[Hanli Liu](#)

### Contact information

For licensing, please contact  
Sharon Ngwenya, Ph.D.  
(Licensing Associate)

[sngwenya@uta.edu](mailto:sngwenya@uta.edu)

[otm@uta.edu](mailto: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:

