

Innovation and Commercialization



Microrobot for Diagnosis and Evaluation of Tissue Properties in Confined Spaces

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INVENTORS: Dr. Panos S Shiakolas, Shashank Kumat, Samson Adejokun

TECHNOLOGY NEED

Human Bladder is an important organ of the excretory system. In United States alone about 34% of the male population and about 45% of the female population suffer from Urinary Inconsistency (UI) which means uncontrolled leakage of urine and overactive bladder due to elasticity dysfunction (where the elasticity of the bladder wall is lost). So it is very important to identify the biochemical properties of the human bladder tissue which helps in detection of abnormalities in the bladder. The current technology endoscopy method consists of a rigid and flexible cystoscope, but the problem is that the diameter of it is about 7mm and needs anesthesia during cystoscopy which causes severe pain. So, there is a need for a technology that is comfortable to the patient and also reliable in bladder tissue diagnosis.

INVENTION DESCRIPTION/SOLUTION

We have designed a lab prototype of a device that can be inserted into the urethra (tube that connects urinary bladder to urinary meatus) to the bladder without any need of general anesthesia which makes it easier for the patient reducing pain and discomfort. This device is 3mm in diameter. There is a force sensor connected to the tip of the device which helps in reading the reaction force (it is the force acting in the opposite direction after the sensor head has engaged with the tissue). After gathering the data (reaction forces), they can be used to access the properties of the bladder tissue (elasticity) and also provide information where the elasticity of the tissue could be used to relate it with possible diseased tissue, which can be used for the treatment. Alongside, the device can also be used to evaluate the properties of other internal organs by inserting through orifices.

APPLICATIONS

- Patients with bladder elasticity dysfunction
- Cystoscopy

KEY BENEFITS

- Non-invasive process (skin is not broken and body cavities not probed beyond normal means)
- Reduced pain and discomfort to the patient.
- Process is done remotely and is automated making orientation precise.
- Positioning and orientation capabilities to completely engage with bladder wall
- Sensor is easy to attach and detach from the device
- Can be used for evaluating other internal organs too

STAGE OF DEVELOPMENT

Laboratory Prototype

INTELLECTUAL PROPERTY STATUS

PCT Patent Pending



About the Inventors:

Panos S Shiakolas

Shashank Kumat

Samson Adejokun

Contact information

For licensing, please contact
Josmalen Ramos

(License Associate)

j.ramos@uta.edu

innovation@uta.edu

P: 817.272.6269

Our mailing Address:

**Innovation and
Commercialization**

701 S Nedderman drive,
Suite 350, Arlington, TX
76019

Connect with us:

