

# The Office of Technology Management

UNIVERSITY OF TEXAS  ARLINGTON

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## Micro- and nano-device for cartilage injury detection and treatment

INVENTORS: Drs. Liping Tang, Joseph Borrelli & Jun Zhou

### TECHNOLOGY NEED:

The impact of arthritis on individuals is significant. Arthritis is a joint disorder featuring inflammation and causing pain, aching, stiffness, and swelling in or around the joints. Generally early symptoms of arthritis goes unnoticed for years, hence delays in diagnosing people with arthritis leads to unnecessary disability causing enormously serious consequences. Currently there is no quick tool to detect early cartilage injury at a cellular level. Standard treatments for arthritis such as physical exercises and oral non-steroidal anti-inflammatory drugs (NSAIDs) often causes corticosteroid side effects making them ineffective in reducing discomfort and many such symptoms. The failure of these treatments necessitates surgery which typically involves debridement, reconstruction and replacement of worn-out joint surfaces with artificial implants, which often fail to restore full function of the articular cartilage joints.

### INVENTION DESCRIPTION/SOLUTION

The Researchers at UT Arlington have designed novel probes to detect injured, damaged or diseased cartilage by intra-articular injection of imaging probes in **less than 15 minutes**. The device most effectively diagnoses early stage (small injury) of arthritis by minimizing cell internalizations. Biodegradable micro/nano sized scaffolds target activated/injured/or apoptotic cartilage cells and release biomolecules to promote autologous stem cell response, leading to cartilage regeneration.

### KEY BENEFITS

- Diagnose arthritis by intra-articular injection of **imaging probes**.
- **Biodegradable** micro- or nano sized scaffolds including other probes.
- Quick detection via Visualization (<15 minutes).
- Detect injured, damaged or diseased cartilage.
- Probes for detecting arthritis caused by mechanical or compression trauma.
- Reduce inflammatory cells and effectively replenish cartilage tissue at defect site.
- Probes to diagnose early stage of arthritis for **small injury** (1 mm+)
- Probes designed for **minimal cell internalization** (>200 nm) ensuring accuracy in diagnosis.

### APPLICATIONS

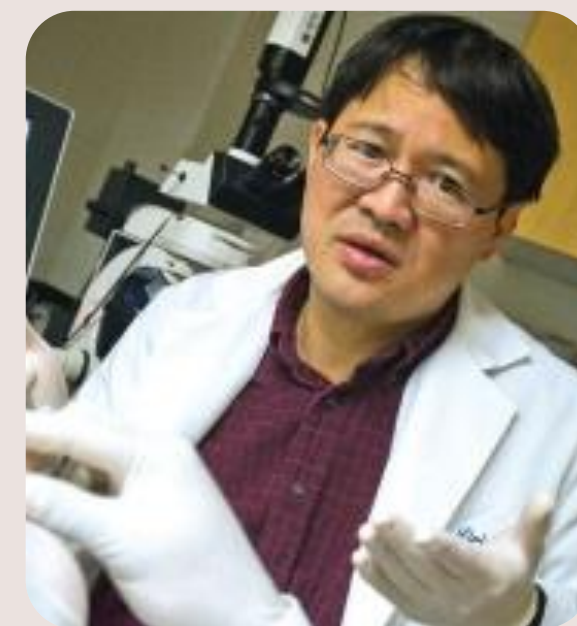
Diagnosis and treatment of cartilage injury

### STAGE OF DEVELOPMENT

Synthesized and tested

### INTELLECTUAL PROPERTY STATUS

PCT application filed



### Contact information

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