



Technology Description

Dr. Koch's research team has led the technical development of methods for assessing soft tissue pathology near total joint replacements. In his previous industrial career, Dr. Koch invented the multi-spectral MRI technology that is at the core of total joint clinical diagnostics. In his academic role, he has continued to develop acquisition and analysis technology in partnership with clinical collaborators at the Hospital for Special Surgery (HSS) in NYC. Over the past several years, Dr. Koch's team has developed an array of processing tools that can automate advanced detection and tracking of degenerative tissue damage near total hip replacements.

knowledge changing life

Market

One in every one-hundred American adults has an artificial hip joint. Hip replacement (HR) is generally considered to be an extremely successful procedure with excellent outcomes. However, given enough time, all HR devices have eventual failure modes due to degeneration of biological constructs. As a result, over 100,000 revisions of primary HR are projected to occur each year within the United States by 2030. Revision procedures currently have very high failure and morbidity rates, due to the progression of soft tissue that often develops silently before symptoms occur. The technology developed by Dr. Koch's laboratory has the potential to enable routine monitoring in order to better stage revision procedures and improve long term hip replacement outcomes.

IP

In partnership with the HSS, MCW has filed two key patents based on this technology

Quantification of metal particle debris near total hip replacements:
<https://patents.google.com/patent/US10638949B2/>

Automatic detection of soft-tissue reactions near total hip replacements;
<https://patents.google.com/patent/US20200410674A1>

Status

In partnership with clinical collaborators at HSS, Dr. Koch's team has developed a) tools for quantification of metal particle disease and b) automatic detection of soft tissue abnormalities on MRI.

Currently, Dr. Koch's team is looking to expand these basic capabilities to allow for advanced anomaly detection and classification near hip replacements.

Dr. Koch is seeking partners to facilitate a federal SBIR/STTR submission to fund the completion these engineering efforts.

Monitoring of Total Hip Replacements: Koch Laboratory For More Information: kpboggs@mcw.edu