SMaRT summer intern developing an iPhone App on Tribocorrosion Research

Andrew Hasse, an undergraduate student (computer science) from Northwestern University, was a 2016 SMaRT summer intern at the Regenerative Medicine and Disability Research lab and was mentored by Dr. M.T. Mathew, associate professor in the department of biomedical science at UICOM-R. He worked to develop an iPhone app on Tribocorrosion Research. The project was successful due to the valuable contributions from Dr. Divya Bijukumar and Dr. Dmitry Royhman, postdoc research associates, and Dr. Ramaswamy, professor and chair, department of biomedical sciences.

During the last ten years, there has been significant progress in the area of tribocorrosion research for biomedical implants, as it is one of the main causes of early failure and a dominating degradation mechanism. Tribocorrosion is characterized by synergistic interactions between mechanical and electrochemical degradation. Hip implants are at risk for tribocorrosion due to the constant motion of the hip and the presence of synovial fluid. As a result, the average life of a hip implant is 15 years with many failing earlier. Similar failures can be observed in dental implants, such as TMJ and dental implants. Even though tribocorrosion research is progressing in the orthopedic and dental community, there is little information available to clinicians, the biomedical industry, and the patient community about this critical phenomenon. As a result, many do not have a sufficient understanding of the tribocorrosion processes or even basic background information about what it is and how it affects the performance of biomedical implants.

Currently, smartphones are considered to be the most popular method of communication and an easy platform for spreading information. So the main goal of this project was to create an iPhone app that can provide clinicians (orthopedic and dental), patients, and implant manufacturers with basic knowledge in tribocorrosion focusing on orthopedic and dental implants.

The project also benefitted from the collaborative efforts with Ortho-Illinois at Rockford, the Department of Orthopedics, Rush University Medical Center at Chicago and UIC-College of Dentistry at Chicago. The project is sponsored by the Northern Illinois Community Foundation and DUCOM, Ltd.

Click here for more.