



**Mathew T. Mathew, PhD**

Cedric W. Blazer Endowed Professor in Biomedical Science  
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Dr. Mathew's major research focus is in the area of simulation of human artificial joints, biomechanics and tribocorrosion of implanted biomaterials used in dentistry and orthopedics. Biomedical implants are increasingly used to assist the patients with disability and bring comfort and continue their healthy physical activities. The main objective of his research is to increase the longevity of implants, determine the biocompatibility and stability of the implants using an interdisciplinary approach. Similarly, durability and performance of dental implants are limited because of the harsh oral environment due to constantly varying pH and biofilm growth based on the food habits and oral hygiene of the subject. By using the concept of synergism between wear and corrosion (tribocorrosion), Dr. Mathew seeks to understand the degradation mechanisms in implants and provide solutions to prevent the failure and/or early prediction of the failure processes. Dr. Mathew and his group are also actively involved in developing new diagnostic tools for detecting implant derived circulating metal ions in the blood of patients who received metal implants. He is leading the [Regenerative Medicine and Disability Research lab](#), within the Department of Biomedical science at UIC School of Medicine at Rockford.

Dr. Mathew also holds a faculty appointment at the [College of Dentistry](#) and [Department of Bioengineering](#), University of Illinois Chicago and [Department of Orthopedic Surgery](#), Rush University Medical Center Chicago. Dr. Mathew developed graduate level courses for MS in Medical Biotechnology ([MBT](#)) students and Bioengineering PhD students. His research is supported by NIH, NSF and research foundations. He is the Editor-in- chief of the [Journal of Bio and Tribocorrosion](#) by Springer and was an instrumental in initiating an international research institute called "[Institute of Biomaterials, Tribocorrosion and Nanomedicine](#)" (IBTN), which is a joint venture between University of Illinois (UIC) and UNESP, Brazil.

**Title: Failure mechanisms in Total Joint Replacements: New Research Directions**