Sarah Abduljabbar, Class 2025

Campus: Round Rock Clinical Campus, Round Rock TX
Research Area: Magnesium Alloy Porous Textiles as Biodegradable Implants
Mentor: Tim Weihs Ph.D.

Sarah Abduljabbar is a member of the Class of 2025 at Texas A&M School of Medicine. She is conducting research under the guidance of Tim Weihs, Ph.D., who is a professor of material science and engineering at Johns Hopkins University in Baltimore, Maryland. Their goal is to co-author a publication in a peer-reviewed journal article on corrosion data of magnesium alloy textiles as biofegradable implants. Magnesium (Mg) alloys are strong candidate materials due to their biocompatible, osteoconductive, biodegradable, and mechanical properties as they have strengths and stiffnesses similar to those of bone. Compared with other metallic implants, Mg-based alloys offer minimal stress shielding, and the ability to dissolve safely in the body. These implants are of great interest in biomedical research as they can eliminate the need for secondary surgeries to remove implants which decreases the cost of treatment, the risk to the patient, and possible discomfort from a permanent implant. The goal of our research is to design, fabricate, and characterize biodegradable 3D porous textiles for craniofacial defects, biliary stents, and sternal fixtures, and we do so by weaving and braiding with magnesium alloy wires such as ZX10 and WE43. We will study the corrosion behavior of these structures in vitro under static and cyclic loading conditions, characterizing average corrosion rates and pitting factors. We will also dip-coat some of these structures to tune their corrosion rate so as to match the timeline for a specific application. Corrosion results obtained for weaves, braids, and wires will be presented.