Materials for Medical Devices

New materials have played a crucial role in the advancement of medical devices. For example, the introduction of titanium alloys provided a high strength basis for internal fixation (skeletal repair) and artificial joints including knees, shoulders, and hips. High strength polymers like PEEK have also revolutionized medicine by providing tendon and ligament anchors for repairs that are compatible with MRI-based imaging techniques used to track patient recovery and learn about the healing process. Future implant materials will provide structural support, but also help to enhance the biology of healing either by promoting minimally invasive procedures, circumventing tissue damage during placement, and even holding and releasing therapeutic agents. Although classical biomaterials aimed to help support local anatomy, future materials will aim to provide construct strengths that exceed the natural anatomy. Georgia Tech is a leader in many biomaterials research areas, including bone and soft tissue implants in orthopedics. This includes everything from basic biomaterials research on new materials and fundamental interactions between bare and treated biomaterials and commercialization of implants. For example, the startup company MedShape was spun out from Georgia Tech in 2007. MedShape has cleared four product lines through the FDA and performed over 5,000 successful surgeries on patients worldwide. Georgia Tech is committed to both basic biomaterials research and the translation of this research into marketplace.