Osteoarthritis (OA) is a complex heterogeneous disorder characterized by anatomic, molecular, and physiologic alterations of synovial joints. Currently, OA is the most common cause of arthritis, affecting over 250 million people globally. According to the Centers for Disease Control and Prevention, OA afflicts approximately 30 million people in the United States alone. It is the number one leading cause of work disability and directly results in billions of dollars of lost earnings annually. Moreover, recent research suggests that by the year 2030, OA will affect 1 out of 4 people’s lives, resulting in an ever-increasing burden on the health care system.

Articular cartilage damage, progressive joint destruction, and a reduction in the ability to perform physical activity characterize OA’s effects. Contemporary OA management focuses on mitigating functional disability by employing exercise, weight loss, medications, supportive braces, and surgery. Despite these available treatment strategies, no reliable disease-modifying strategy prevents the progression of articular cartilage damage associated with end-stage OA. Examining OA’s complex pathophysiology along a translational spectrum may be a fundamental approach to improving how to preserve cartilage tissue structure and maintain joint function in orthopedic surgery.

Herein, this work addresses the current knowledge gap by focusing on improving cartilage health in OA’s two main phenotypes encountered in orthopedic surgery: post-traumatic and age-associated. Specifically, exploring the participatory roles of the subchondral bone in the development of cartilage damage after injury, the effects of varying osteochondral size on chondrocyte viability in cartilage transplantation, and enhancing the activation of mesenchymal stem cells for cartilage repair in the aging patient.

Articular Cartilage Restoration: From Preservation to Rejuvenation

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University of Wisconsin–Madison

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ABOUT the SPEAKER

Dr. Walczak is an orthopedic surgeon and research scientist who specializes in sports medicine and joint restoration. He is board certified in orthopedic surgery and dual fellowship trained in sports medicine and joint reconstruction. In addition to his clinical interests, he maintains an active research lab studying translational therapeutics for healthy aging and working towards discovering innovative biologic treatments for orthopedic disease, including minimally invasive surgical techniques and stem cells for tissue repair. He is a team physician for the University of Wisconsin Athletic Department and provides orthopedic coverage for Badger men’s hockey. His special interests include minimally invasive surgical procedures of the hip, knee, and shoulder, therapeutic biologics for regenerative medicine, and cartilage restoration.

Monday, October 4 at noon
1003 Engineering Centers (Tong Auditorium)