

# Cartilage research offers hope for halting damage earlier

**H**ow do you make new cartilage more like old cartilage, so the two are compatible and work together to restore function in a damaged joint?

That’s one of the questions facing two scientists conducting research supported by The Campbell Foundation in the promising field of cartilage regeneration and repair.

Dr. Karen Hasty is the George Thomas Wilhelm Professor in Orthopaedics and chief researcher for the UT-Campbell Clinic Department of Orthopaedic Surgery. Dr. Jinsong Huang is an instructor in the Department. The two scientists are studying ways to make the body bind to new cartilage cells generated in the laboratory, then inserted where cartilage has been damaged.

“Our research focuses on cartilage integration,” Dr. Hasty said. “We want to learn how to make the cartilage tissue that we implant more like the original, and smoothly join the two together. If the two don’t fit correctly, the new cartilage will loosen and deteriorate.”

Repeated use or trauma to a joint can result in damage to cartilage, the slick, water-rich tissue located between bones that permits smooth movement of joints. Cartilage does not regenerate in the body. Over time, damaged cartilage is lost, causing pain, osteoarthritis, and limited function in affected joints.



Tissue engineers have become adept at growing new cartilage cells in the laboratory. Surgeons can then clear away damaged tissue and insert the new cells, Dr. Huang said. Problems can arise, however, when the newly-generated cartilage that is inserted must integrate with existing cartilage in the joint.

“We are working on ways to make the two more compatible,” Dr. Huang said. “For example, new cartilage is slick, so we are using enzymes to roughen the surface of old cartilage and make it more adherent. Once the cartilage is rough, we are experimenting with a “Bio-Glue” made from collagen molecules mixed with cartilage cells, which gives us a living interface between the two types of cartilage.”

Dr. Fred Azar, a Campbell Clinic surgeon specializing in Sports Medicine, has performed several types of cartilage restoration procedures.

“Cartilage repair offers hope for the future, especially in dealing with osteoarthritis,” Dr. Hasty said. “Osteoarthritis often means the cartilage is gone, and there’s only bone on bone. We hope to see a day when an early diagnostic test can detect damage before the patient begins to hurt. If the damage can be repaired early, patients may be able to avoid a lot of pain today as well as joint replacement tomorrow.”

## CAMPBELL CLINICAL RESEARCHERS ARE LEARNING FROM ACTUAL CASES

**S**ome Campbell Clinic surgeons specializing in Sports Medicine are supervising clinical research trials that enable them to study and evaluate certain conditions and outcomes over time. Residents are assisting in the studies. Among the clinical trials currently underway are the following:

### **Non-Operative Treatment of Tibial Stress Fractures in Female Athletes. Research by Dr. Barry Phillips and resident Jeremy Swymn.**

In this study, Dr. Phillips is evaluating the non-

operative treatment of tibial stress fractures with anterior cortical defects as diagnosed by x-ray in female athletes. The end point of treatment for injuries of this type is to enable the patient to return to his or her previous level of play pain-free. Currently, the recommended treatment for stress fractures with anterior cortical defects in male and female athletes is intramedullary nailing. However, if only bone scan evidence of stress fracture is present, then non-operative treatment is recommended.



Dr. Karen Hasty, left, and Dr. Jinsong Huang check the progress of cultured cartilage cells for an experiment they are conducting related to the integration of new and old cells following a cartilage transplant.

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—DR. KAREN HASTY

**OCD Lesions, a study conducted by Dr. Fred Azar with Matthew Busbee, resident.**

Subjects participating in this study have undergone conservative and operative treatment for Osteochondritis Dissecans lesions of the knee. The purpose of the study is to assess post-operative objective and subjective outcomes, including healing, pain, range of motion and patient satisfaction. There is no clearly-defined treatment for OCD Lesions. The treatment options include conservative management, drilling and/or pinning, chondrocyte transfer and Osteochondral Autograft Transplantation (OATs).

**Sports Hernias in the NBA. Research by Dr. Fred Azar, with resident Jack Conley.**

The most common sports hernia patients in the literature are soccer, ice hockey, American football, and Australian Rules football players. The purpose of this research is to retrospectively review cases of sports hernias in the National Basketball Association, which has not been studied exclusively, and to report results. In a literature review, only two NBA players were mentioned in a series of 157 operative patients. Groin pain represented 2.2% of injuries of NBA players in a 10-year retrospective review of the National Basketball Trainers Association database.