Dr. Alec Beekley, assisted by Dr. Jim Sebesta, performing a femoral artery repair at the 31st Combat Support Hospital, Ibn Sina Hospital, in the International (formerly Green) Zone of Baghdad, Iraq.

Beekley's Combat Experience Informs Research and Protocols at Home and Abroad

Associate Professor Alec Beekley, MD, joined the Division of Acute Care Surgery in July 2010. As both a trauma surgeon and a bariatric surgeon, he will now apply the experience he gained during multiple tours of duty in Iraq and Afghanistan, where he served as Lieutenant Colonel in the U.S. Army Medical Corps and was awarded a Bronze Star.

The challenge was to collect meaningful clinical data for every case, given how quickly soldiers were being treated

Dr. Beekley completed his residency at Madigan Army Medical Center in Ft. Lewis, Washington. From November 2002 through March 2003, he served as staff surgeon for the 102nd Forward Surgical Team stationed in Afghanistan. In April 2004 he deployed with the 912th Forward Surgical Team to Al Mussayib, Iraq, and then volunteered to stay another six months at the 31st Combat Support Hospital (CSH) in Baghdad when the insurgency was growing. During Operation Phantom Fury (November and December 2004) he experienced one of the war's highest monthly caseloads: some one thousand casualties, which he and his team treated around the clock.

It was during this first deployment to Iraq that Dr. Beekley witnessed that a significant number of the casualties were arriving to the hospital trauma bay not having been treated with tourniquets. He believed that, in some cases, tourniquets would have saved lives. This experience made Dr. Beekley an expert on tourniquet use in injury to the extremities, and he created one of the war's first datasets on tourniquet use which has since been cited in dozens of publications reexamining the protocol for tourniquet use in combat triage.

Dr. Beekley also helped develop a trauma database and registry for the joint theater. "There were many 'grass-roots' researchers collecting data as casualties were coming in," Dr. Beekley explains. "In most cases, these researchers were interested in a specific topic, such as vascular injuries. The challenge was to collect meaningful clinical data for every case, given how quickly soldiers were being treated."

Based upon Dr. Beekley's findings, Colonel John Holcomb, who headed the Army's Institute for Surgical Research, recommended to the Surgeon General that the Army provide some 400,000 modular tourniquets that soldiers could carry in an individual first aid kit (IFAK).

During the troop surge in 2007, Dr. Beekley was again deployed to Iraq as Director of the Deployed Combat Casualty Research Team. There he continued to direct research in multiple areas of combat casualty care including the use of fresh whole blood (rather than stored platelets and plasma) in resuscitation. He recalls distinctly the dramatic effect of fresh whole blood on a soldier in critical condition, who was quickly stabilized when he was transfused with 22 units donated by his fellow soldiers. This and similar observations by others at the 31st CSH prompted a reexamination of the entire blood transfusion protocol, which historically called for fresh whole blood infusions only once supplies of stored platelets and plasma had been exhausted.

Dr. Beekley is honored to have played a role in these areas of surgical research. "I think of medical research as a process," he says. "Everyone can't publish the breakthrough findings, but every little piece contributes to the overall advancement of knowledge."

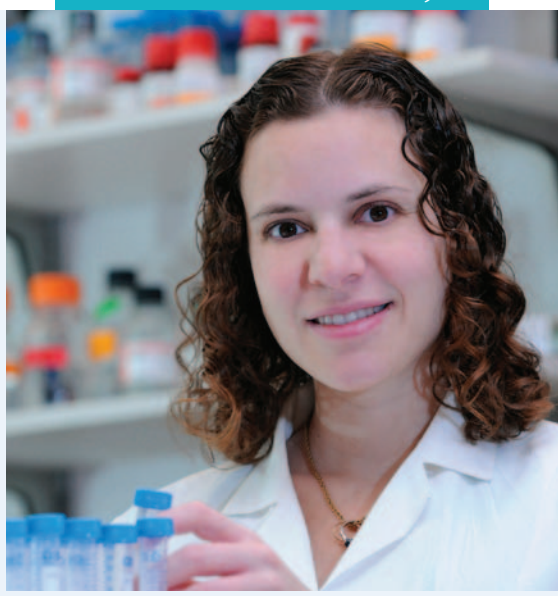
The Department of Surgery is grateful to benefit from Dr. Beekley's unique and valuable experience gained during his service to our nation.

Dr. Goldberg Spends Research Year Targeting Breast Cancer

Four years into her Jefferson residency, Allison Goldberg, MD, is spending a productive year in the lab of Kimmel Cancer Center researcher Michael Lisanti, MD, PhD. Over the past decade, Dr. Lisanti, the Margaret Q. Landenberger Professor in Breast Cancer Research and Chair of Stem Cell Biology and Regenerative Medicine at Jefferson, has been the 13th most-cited biochemist and biologist in the scientific literature.

Most of Dr. Lisanti's research redefines the long-held Warburg Effect hypothesis, which postulated that a change in cellular metabolism—that is, an increased level of glycolysis (the conversion of glucose into energy)—causes cancer. Since 2009 Dr. Lisanti has researched what he calls the Reverse Warburg Effect, proposing that glycolysis occurs in stromal fibroblasts (connective tissue cells) near the tumor and not in the tumor cells themselves. This significantly impacts our understanding of how tumors develop.

Dr. Goldberg is working with animal models to alter the glucose-making pathways of the fibroblasts, to evaluate if those alterations affect the size and weight of tumors from triple negative forms of breast cancer. Triple negative breast cancers are so named because they lack the three crucial receptors to which today's



most successful molecularly targeted drugs attach. She is also genetically manipulating fibroblasts, to turn on and off autophagy (cell self-digestion). "We are hoping this research will lead to new targeted drug therapies," says Dr. Goldberg.

Dr. Lisanti notes that having a surgical resident in his lab is a great asset. "Dr. Goldberg is a gifted surgeon who helps us see our work in new, more clinically relevant ways," he says.

Dr. Goldberg reflects, "In the OR, every step is scripted and rehearsed. There is no margin for error. In the lab, I'm free to pursue an idea and just see what happens. It's been refreshing and rewarding," she says. Dr. Goldberg is expecting twins in June and will return to her clinical responsibilities later this summer.