Jefferson Surgical Solutions

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On the Job

Changing Lives Through Research

In the Curtis Building laboratories, Drs. Jordan Winter, Jonathan Brody, and Suzan Lanza-Jacoby join forces to disrupt the energy supply of pancreatic cancer cells.

Dr. Lanza-Jacoby Secures Two-Year Grant from NIH National Cancer Institute

Team to study novel compound that blocks glucose transporter protein crucial to cancer cell growth

Jefferson researcher Susan Lanza-Jacoby, PhD, has been awarded a two-year grant by the National Institutes of Health (NIH) National Cancer Institute (NCI) to study the use of energy restriction mimetics to slow the progression of pancreatic cancer, reduce the incidence of pancreatic ductal adenocarcinoma and improve the survival rate. Dr. Jacoby formally initiated the project in September with Jonathan Brody, PhD, Director of Surgical Research and Co-director of the Jefferson Pancreas, Biliary and Related Cancer Center, and Jordan Winter, MD, FACS, Associate Professor, Sidney Kimmel Medical College at Thomas Jefferson University.

As Dr. Jacoby explains, cancer cells require a lot of glucose, or energy, to grow. Energy restriction mimetics is the process of limiting glucose to hinder cancer cell growth. In one of her previous studies, Dr. Jacoby found that cutting the caloric intake of mice by 25 percent reduced the number of animals who developed pancreatic cancer. For this new study, the team will test whether and to what extent a new compound, known as CG5, has the same effect. They are collaborating with the Ohio State University medicinal chemist, Dr. Ching-shih Chen, who developed the compound. While Jefferson's is the first study to focus on CG5 for pancreatic cancer, previous studies have found that the compound inhibits the growth of colorectal and prostate cancer cells in mice.

"By inhibiting glucose metabolism, the compound acts, in a sense, like food or calorie restriction," she says. "More specifically, CG5 inhibits the glucose transporter 1 protein, or GLUT1, which is necessary for glucose to get in the cell and be broken down into energy. The hope is that by inhibiting GLUT1, CG5 will 'starve' pancreatic tumors."

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This early-stage study will use transgenic mice in which every cell contains additional foreign DNA. This extra DNA enables researchers to study gene function or regulation and to model human diseases. Researchers will be analyzing whether and how much the compound inhibits carbohydrate metabolism and transport and utilization of glucose.

"We will see if we can inhibit the growth of what we call precursor cancerous lesions – advanced lesions in the pancreas that progress to pancreatic cancer," Dr. Brody explains. "We'll also be exploring how the compound affects the RNA binding protein, HuR, which we've been studying in our laboratory for a number of years.

"In other studies, we've found that inhibiting HuR makes pancreatic cancer cells more sensitive to chemotherapy. We hypothesize that the CG5 compound may also inhibit HuR, thereby yielding better chemotherapy outcomes."

Dr. Jacoby emphasizes that this is a very early-stage, mouse-model study, and it will take extensive research, including additional animal studies and a toxicity profile, to determine whether or not the CG5 compound can be safely used in humans.

"It's too soon to translate this for humans," she notes. "Ultimately, though, the goal is to develop a drug that will alter metabolism to reduce the incidence and progression of pancreatic cancer – without requiring people to slash their caloric intake."

On the Job

When Dr. Yeo left Johns Hopkins in October of 2005 to lead the Department of Surgery at Jefferson, he had big plans. Over the last ten years, the improvements have been dramatic across the board thanks to the support and contributions of five faculty members he selected to serve as vice chairs:

Jonathan Brody, PhD, Vice Chair for Research, supervises and facilitates research activities in the Department. To support and publicize research initiatives, Dr. Brody manages a pilot grant program for the surgical faculty, a research seminar series, and a bi-annual resident research symposium. He works with other faculty to strengthen the research infrastructure, encourage faculty interests, increase investigator initiated clinical trials, expand the departmental grant portfolio, and establish a clinically useful biobank.

Ernest Rosato, MD, Vice Chair for Clinical Affairs, is responsible for supervising many elements within the clinical domain including faculty roles, the maintenance of surgical outcomes, safety and volume. Dr. Rosato works closely with Dr. Yeo to develop strategies for clinical growth, faculty recruitment and retention, and program development within the Department and across Jefferson Health.

Karen Chojnacki, MD, Vice Chair for Education, is responsible for facilitating the educational mission of the Department, including overseeing the educational program for 40 surgical residents. In her role as Program Director, Dr. Chojnacki develops the resident lecture series, implements rotation and call schedules, manages resident recruitment, and maintains program compliance with the ACGME surgical residency requirements. Dr. Chojnacki and her education team work continuously to maintain the surgical residency's status as a top tier program. In conjunction with the Dean's office, she facilitates educational opportunities for faculty development including seminars and workshops on teaching methods.

Scott Cowan, MD, Vice Chair for Quality, is responsible for overseeing the development, implementation and tracking of quality and safety initiatives within the Department. As Surgeon Champion for the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP®) at Jefferson and Vice President of the Pennsylvania NSQIP Consortium, Dr. Cowan is establishing Jefferson as a leader in promoting surgical quality and safety. The Department's new Quality Based Initiative in Resident Training (QBIRT) program (led by surgical residents with Dr. Cowan's guidance) has already demonstrated a direct and significant positive impact on patient care.

Francesco Palazzo, MD, Vice Chair at Methodist, is responsible for all professional, administrative, and research activities within the Department of Surgery at Methodist Hospital in South Philadelphia. Dr. Palazzo continually assesses performance and elicits improvements to the care and services provided at Methodist. Under his leadership, two Methodist "white papers" have been completed. Dr. Palazzo also teaches third and fourth year students from Sidney Kimmel Medical College and Jefferson surgery residents during their Methodist Hospital rotation.

Jonathan Brody, PhD, Ernest Rosato, MD, Karen Chojnacki, MD, Charles Yeo, MD, Scott Cowan, MD, Francesco Palazzo, MD