

ADVANCING CANCER PREVENTION, DIAGNOSIS & TREATMENT

BY MARCIA HANCOCK LOCKE '95,
JOHNSON CANCER RESEARCH CENTER

National Science Foundation

CAMPUS CLOSE-UP

Dynamic duo goes after brain cancer



K-State Communications and Marketing

Above: K-State professors Stefan Bossmann (left), chemistry, and Deryl Troyer '70, '72, '85, anatomy and physiology, are applying their expertise in nanotechnology, stem cells and other areas to develop several cancer diagnostic and treatment approaches.

At top: This computer image shows a glioma, which is a tumor that originates in the brain.

Continued success and new research projects draw the spotlight back to the work of Kansas State University professors Deryl Troyer '70, '72, '85 and Stefan Bossmann. The collaboration between Troyer in anatomy and physiology and Bossmann in chemistry exemplifies the interdisciplinary interactions possible at K-State. Combining their expertise in nanotechnology and stem cell research has had groundbreaking results. Several awards from the center helped get this team's cancer research going. Recently, thanks to a special major gift, the center was able to help advance a promising cancer-detection blood test project.

DETECTING CANCER EARLY:

Troyer and Bossmann's ongoing work developing a simple, early-stage cancer detection blood test has reached a new level. The National Natural Science Foundation of China (equivalent to the U.S. National Science Foundation) is providing funding and collaborators to analyze blood samples from 10,000 Chinese individuals, who will then be followed to determine the predictive value of this procedure. The results will be evaluated by K-State statistics department head Gary Gadbury.

KILLING CANCER CELLS:

Recently, Troyer and Bossmann also received a \$1.8 million award from the NSF to develop a magnetic resonance imaging (MRI) spectrometer that will be used to, among other things, heat and kill cancer cells in the body while providing live, high-definition images of the heat's effects. This coincides with another project of

theirs: exploring the treatment of tumors by delivering iron nanoparticles to them as cargo inside stem cells that naturally migrate to tumors, and then heating the nanoparticles with magnetism to the point of killing the stem cells and the cancer cells.

TACKLING BRAIN CANCER:

The scientists have developed a promising new NSF-supported approach to treating brain tumors. It is the subject of an NSF video viewable at cancer.k-state.edu. Anti-cancer drugs introduced into the blood normally can't reach the brain because they are blocked by a blood-brain barrier. However, the patient's own white blood cells can cross this barrier, and Troyer and Bossmann are using them to ferry new chemical constructs that will release chemotherapeutic agents at the tumor. This video was among only 30 that the NSF used to negotiate its budget with Congress. The scientists anticipate human clinical trials in the next few years.



Photos by K-State Communications and Marketing

Brian Lindshield '03, assistant professor of human nutrition, is studying the prostate cancer-fighting abilities of two drugs and a dietary supplement.

Alumnus fights prostate cancer in lab

Once an undergraduate student cancer researcher with the Johnson Cancer Research Center, Brian Lindshield '03 now is an assistant professor of human nutrition at K-State, investigating ways to prevent and treat prostate cancer. More specifically, he is analyzing the prostate cancer-fighting abilities of two drugs and a dietary supplement called saw palmetto. An award from the center for new laboratory equipment, something that is often not supported by other funding sources, helped advance his research.

Looking at the effectiveness of the drugs finasteride and dutasteride to either treat or prevent prostate cancer, Lindshield's team found

that the most effective use of either was the use of dutasteride as a therapeutic drug. Although both drugs can lower the risk of developing prostate cancer, for those men who do develop it, the drugs increase the risk of its progression to a high-grade stage. But Lindshield's research found that dutasteride did offer some benefit as a treatment.

Saw palmetto is a palm tree-like shrub from which a popular dietary supplement for prostate health is made. Lindshield has analyzed the fatty acid and phytosterol content of different saw palmetto supplements and next will study the effect of supplements containing different amounts of fatty acids and phytosterols on prostate cancer risk.

HOW TO HELP

The Johnson Cancer Research Center's efforts to advance K-State cancer research depend solely on private donations. Large or small, all gifts make a difference and stay at K-State — 95 percent going directly to cancer research and 5 percent to advance the university. To find out how you can join K-State's fight against cancer, visit cancer.k-state.edu.

SPORTS ANNOUNCER JOINS THE FIGHT

K-Staters know him for his booming voice exclaiming, "Gooooood for a Wildcat touchdoowwn!" and other announcements at K-State football and men's basketball games. But Dave Lewis has many roles. This former radio announcer is a wedding and party disc jockey, event emcee and entertainer, as well as a Riley County commissioner and, most importantly, father of two children.



Dave Lewis

Lewis also is a supporter of the Johnson Cancer Research Center and a member of its advisory council. Using his knack for entertaining, he and some of his friends have thrown three Pink & Purple Polyester Parties, raising \$15,000 for the center.

Lewis' devotion to helping fight cancer is fueled by his desire to honor his late wife, Elena, who died from breast cancer in 2006. With his daughter in mind, he says he hopes no mother, wife, daughter, sister or friend will ever have to worry about breast cancer in the future. Lewis said he hopes to establish an endowed fund within a few years.

"I want to take every opportunity I can to assist in funding cancer research," Lewis said. "As an entertainer and not a scientist, this is my small way of helping pave the road toward a cure."

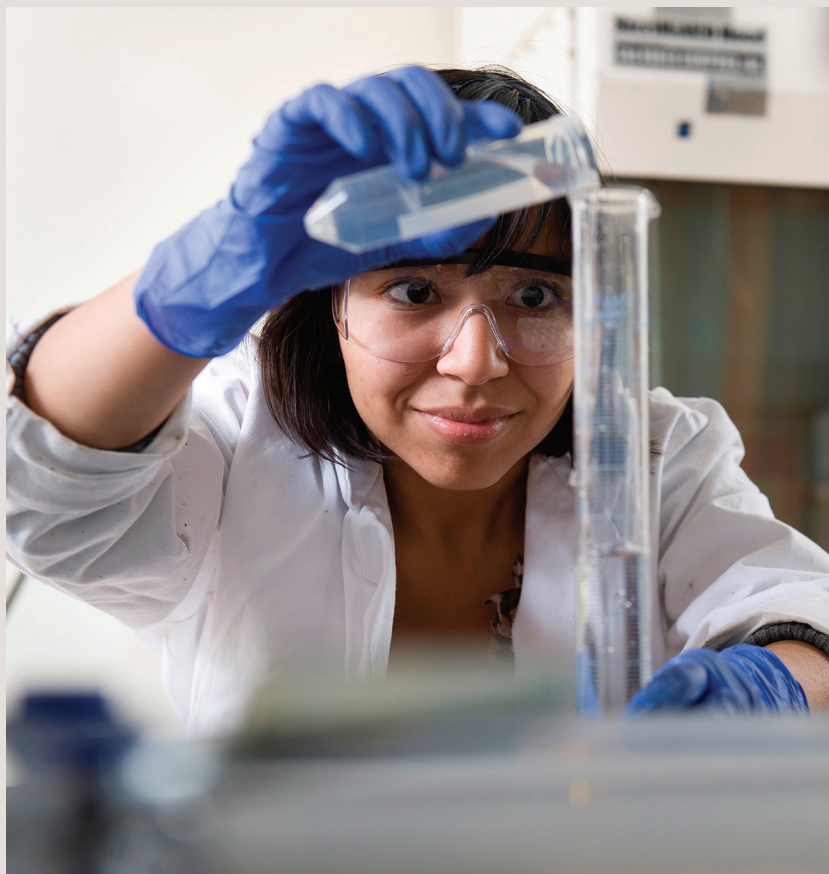
Research award program prepares future cancer scientists

What do you want to do with your future? This is a question undergraduate students must ask themselves, often with little knowledge of all the career possibilities out there. The Johnson Cancer Research Center encourages the scientists among them to consider cancer research and gives them the opportunity to explore it.

The Cancer Research Award program puts 50 students a year into laboratories, with faculty mentors to guide them through real research projects. The center awards them \$1,000 for their achievement and helps pay research expenses. Many of the students consider this training one of the most important activities of their undergraduate education, helping shape their career decisions and improve their chances for success.

Jenny Barriga '14, who recently earned a bachelor's degree in both chemistry and biochemistry and molecular biophysics, is a two-time awardee working with Stefan Bossmann, professor of chemistry. She helped him calibrate an early-cancer detection blood test that involves the use of a fluorescent dye to identify cancer-related enzymes. The dye could be useful for surgery, allowing surgeons to easily see where cancer has spread.

Barriga has completed two



Jenny Barriga '14, a two-time Cancer Research Award recipient who recently earned a bachelor's degree in both chemistry and biochemistry and molecular biophysics from K-State, plans to earn a doctorate in biophysics from Stanford University.

summer research internships at the National Cancer Institute. Most recently, she performed basic research on the sporulating bacterium *Bacillus subtilis*.

This summer, Barriga will return to NCI for a year to create a chemotherapeutic delivery method

that employs the spore.

Barriga then plans to earn a doctorate in biophysics from Stanford University. Eventually, this Barry M. Goldwater national scholar would like to be a principal investigator at a national laboratory. 🐾

FIGHTING FOR A CURE T-SHIRTS

The Johnson Cancer Research Center would like to thank all those who supported the Fighting for a Cure T-shirt campaign last year. T-shirts will be available again this fall. To preorder a shirt, email Marcia Locke at marcia@ksu.edu or call the Johnson Cancer Research Center at 785-532-6705. For more information, visit cancer.k-state.edu/newsevents/FightingForACureShirt.html



ALSO

Follow the Johnson Cancer Research Center on Twitter and Facebook:



@KStateCancerRes



/KStateCancerResearch