

CONQUERING CANCER

From Dr. Rob Denell, director, Johnson Cancer Research Center

Like many of you and your loved ones, my wife and I are cancer survivors. We are a testament that research has made marked headway in fighting cancer. But much remains to be accomplished. The

Johnson Cancer Research Center is devoted to conquering cancer in our time by supporting faculty research, student training and public outreach. I hope you'll join my colleagues and me in making Kansas State University a leader in the fight.

Currently, 77 K-State faculty members conduct cancer research in 16 departments of five colleges, with very diverse specializations. Many are studying cell and molecular biology in order to better understand tumor initiation, progression and

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generation of cancer researchers. Our Cancer Research Award program annually funds mentored laboratory experiences for 50 undergraduate students, such as Kristina Bigelow, featured below.

metastasis, while others are focused on prevention through diet, exercise and smoking cessation. Still others are pursuing new approaches to diagnosis and treatment.

Featured here are biochemist Anna Zolkiewska, who studies a protein prominent in breast cancer, and the interdisciplinary team led by Stefan Bossmann and Deryl Troyer, which is developing easier cancer diagnostics and innovative treatments using nanotechnology.

Our center also fosters the next

We can conquer cancer ... but only with your help. Our programs are funded solely by private donations. You can feel good about investing in excellent cancer research while also helping K-State. We apply all donated funds directly to our programs, not overhead. And because most of those dollars are spent in Kansas, the state's economy is positively impacted by our work. As you read on, you'll learn why 14-year-old Mason Wolfe chooses to support our center.

Cancer Research Awards fund lab experiences for 50 undergrads

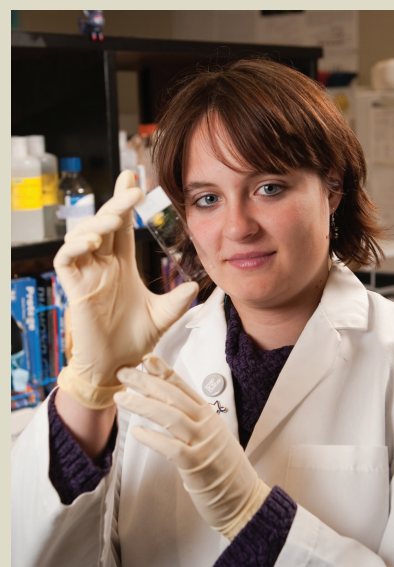
Constant, new research is needed to find cures for hundreds of cancers. To address the need for future cancer researchers and encourage students to consider such careers, we offer the Cancer Research Award (CRA) program, which funds mentored laboratory research experiences for 50 undergraduate students a year.

Two-time CRA winner Kristina Bigelow, a senior in biology and chemistry from Moran, Kan., is studying cell communication to find a compound to treat colon cancer. She has been a member of Dr. Annelise Nguyen's lab in diagnostic medicine/pathobiology since she was a freshman and considers the experience to be very valuable.

"I get to do graduate-level research ... and work in a lab with professionals," she said. "I learn things most students don't come across until pursuing their master's degrees."

The center has helped put Bigelow in an excellent position for what she hopes is her next step — earning an M.D./Ph.D. degree from the University of Kansas School of Medicine. She said she hopes to treat cancer patients and do research, to be "in the background and the foreground."

CRA students conduct semester-long research projects and get \$1,000 awards. Another \$1,000 per student is given to their faculty mentors to cover the research expenses.



K-State Communications and Marketing

Kristina Bigelow, senior in biology, Moran, Kan., is studying cell communication to find a compound to treat colon cancer.

FIGHTING BREAST CANCER

Center's biochemist studies ADAMs family

Johnson Cancer Research Center biochemist Anna Zolkiewska studies the ADAMs family. Not the television family of twisted misfits, but a family of twisted, potentially dangerous genes.

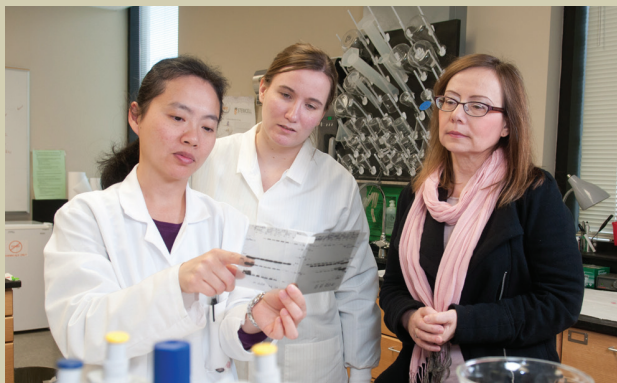
ADAM stands for A Disintegrin and Metalloprotease, and ADAMs are proteins on the cell surface that help cells communicate with their environment. They are prominent players in many cancers including breast, colon and prostate cancers.

Large amounts of ADAM12, a gene in the ADAM family, are found in cancer stem cells, which are highly resistant to chemotherapy and radiation, and can often cause cancer to resurface years after successful treatment.

"There are a whole variety of cells in a tumor. Some are not as dangerous, and some are tremendously vicious, and those are

the cancer stem cells," Zolkiewska said. "They are responsible for fueling tumor growth and regrowth. We're researching how to detect and kill them, and stop them from regrowing."

Zolkiewska gets breast cancer tumor tissue from the University of Kansas Medical Center and cultivates the cells in the lab. She then investigates ways to limit their growth and isolate and kill them selectively. Such therapies can take many years to get beyond the lab and to patients, because they are



Dr. Anna Zolkiewska (right) says, "We're researching how to detect and kill them (cancer stem cells), and stop them from regrowing." Also shown are Dr. Hui Li (left) and doctoral student Sara Duhacke Muggy.

very toxic.

"The challenge is to find treatments that will be less toxic," she said. "Basic research scientists like us can contribute to this because we can help with estimations and predictions about how toxic those treatments would be."

Professors aim for earlier detection, safer treatment

A regular clinical exam may soon include a quick urine or blood sample analysis to see if cancer is present in the body. In

SEE ALSO:

Researchers use nanoparticles to target tumors.

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many cases, the earlier a cancer is detected, the more successful the treatment.

Johnson Cancer Research Center professors Stefan Bossmann, chemistry, and Deryl Troyer, DVM, anatomy and physiology, are developing such a cancer detection method using nanotechnology (nanometer = one billionth of a meter).



Stefan Bossmann



Deryl Troyer

Having successfully tested samples from dogs, they are now testing samples from people who have breast, lung and pancreatic cancer.

This method's use of cell-based detection has faster, more accurate results than similar methods being explored elsewhere. Also,

this method could be tweaked for use in monitoring cancer, rapidly determining whether a whole tumor has been removed.

The team is also working on a cancer treatment that uses iron/iron oxide nanoparticles to overheat or bore holes through a tumor to kill it. The particles are taken up by stem cells, cloaking them from the body's defenses and making them bait for the tumor. Once taken in by the tumor, an alternating magnetic field is applied, which causes the particles to produce friction heat, dissolving the tumor cells without harming surrounding healthy tissue.



Pink Power Luncheon raises cancer awareness

One hundred fifty women were treated to lunch while they heard about breast cancer risk reduction and resources at the Pink Power Luncheon on Oct. 14.

The Johnson Cancer Research Center joined forces with Komen for the Cure again to present this second annual breast cancer awareness luncheon, which offered a guest speaker, educational materials and souvenir goody bags.

Aribel León-Lynn '92, a breast cancer survivor and K-State alumna from Manhattan, Kan., gave a presentation titled "Breast Cancer Survivor Footprints: An Artful Journey," in which she talked about discovering painting while going through treatment at age 34, and displayed her paintings and poetic commentaries.



The Johnson Cancer Research Center offered the second annual Pink Power Luncheon on Oct. 14.

Did you know?

77 K-State faculty researchers are fighting cancer and training tomorrow's scientists and medical professionals.



For more information about the Johnson Cancer Research Center, visit www.cancer.k-state.edu.

Mason's Wish: Hope in a cure

Mason Wolfe was just 9 years old when her father was diagnosed with lung cancer in 2007. Feeling powerless and wanting to help, she started selling scented candles to raise money to



find a cure. She didn't want other kids to feel the sadness and fear associated with having a parent diagnosed with a life-threatening disease.

"It's better than doing nothing, and we could be helping somebody," Mason said.

After great success, she made her first \$11,000 donation to the Johnson Cancer Research Center in 2009. She was excited to support Kansas State University, the alma mater of both her parents, Fred '93 and Nancy '90 Wolfe.

Two years and another \$47,000 later, she now has an official charity called Mason's Wish, additional fundraising products, and honors from a Denver television station and Ringling Bros. and Barnum & Bailey. In 2010, she spoke at the Johnson center's Cancer Research Award Banquet, where she presented the first Mason's Wish Award.



After her father was diagnosed with lung cancer in 2007, Mason Wolfe (far right) started selling scented candles as a fundraiser to find a cure. Also pictured are (from left) Chase, Morgan, Nancy and Fred Wolfe.