

2016

Conquest

Johnson Cancer Research Center



K a n s a s S t a t e U n i v e r s i t y

95 percent of donated funds goes directly to K-State cancer research while 5 percent is used to advance the university.

\$500,000 or more is awarded each year to support cancer research and education.

100 faculty researchers are fighting cancer in 18 departments of five colleges.

Cancer Research and Education Advisory Council

Brent Benkelman, D.D.S.
Manhattan, KS

James Haymaker, MBA
Key West, FL

Ken Jennison
Salina, KS

Dave Lewis
Manhattan, KS

Jack Ryan
Manhattan, KS

Albert Perry, M.S.
Potomac, MD

Emeritus

Ed Petrik, M.D.
Topeka, KS

Edie Dahlsten
Lindsborg, KS

Mary Jo Heyka, R.N.
Manhattan, KS

Clif Jones, M.D.
Topeka, KS

Beverly Lueers
Topeka, KS

Bill Snyder
Manhattan, KS

Lynn Wagner
Scottsdale, AZ

Former Kansas Governor
John Carlin
Manhattan, KS

James & Cybil Ronen
St. John, KS

Hank Doering, M.D.
Manhattan, KS

Mike & Elaine Jacobson, Ph.D.s
Ft. Worth, TX

Robert Kinders, Ph.D.
Walkersville, MD

Harvey McCarter
Fairview, TX

Lorene Oppy
Manhattan, KS

Nancy Wolfe
Monument, CO

Clay Harvey, M.D.
Topeka, KS

William Stamey, Ph.D.
Manhattan, KS

Sandy Regier
Overland Park, KS



The fight starts here!

From nanoparticles and stem cells to antioxidants and drug discovery, Kansas State University faculty are conducting the basic and translational cancer research that leads to new treatments and cures, as well as training tomorrow's scientists and medical professionals. To support the Johnson Cancer Research Center's vision to conquer cancer in our time, simply

use the enclosed envelope to send your gift, or donate online at www.found.ksu.edu/cancer. With your help, we make a difference! To learn more about how you can support K-State cancer research and education, contact Shelley Carver at **800-432-1578** or shelleyc@found.ksu.edu.

Table of contents

Making cancer sick	2
A common enemy	3
Getting real	5
Undergraduate research opportunities create scientific foundation, new generation of cancer fighters	6
K-State alumni fellow, national cancer institute researcher helps develop future scientists	7
A drive to beat cancer	8
Gilda's Club Grand Rapids spends a day with Dr. Waddle	inside back cover



Welcome to the 2016 *Conquest* magazine. 2015 was another banner year, and here we showcase people who make the outstanding cancer research at K-State possible. With these stories, we present several aspects of the Johnson Cancer Research Center that are important to its overall success.

- **The faculty researchers:** The center now has 100 affiliated faculty scientists in 18 departments of five colleges doing research to improve our understanding of cancer. In this year's *Conquest*, we feature Stefan Rothenburg, biology; Susan Sun, grain science and industry; Annelise Nguyen, diagnostic medicine and pathobiology; and Raelene Wouda, clinical sciences. These scientists are nationally recognized for taking innovative approaches to advance our fight against cancer.
- **The student researchers:** In this issue, we feature Adam Schieferecke, an outstanding junior in microbiology recently nominated for the national Goldwater Scholarship competition. Besides studying viruses, he is also active in the K-State Cancer Fighters student organization, which supports the cancer research center through volunteerism, advocacy and fundraising.
- **The advisory council:** The center's advisory council is intentionally diverse, including scientists, health care professionals, business people and media representatives. We introduce you to Robert Kinders, a National Cancer Institute laboratory director and K-State alumnus who has provided excellent counsel to us through the years and is helping generate a new 10-year plan for the future of the center.
- **Friends of the center:** None of this could happen without the generous people who provide financial support. This year we feature Les and Sandy Regier, who have been hosting an annual golf tournament in memory of their son, Rob, for 19 years. These dear friends of our center have worked hard to raise more than \$270,000!

The university's Innovation and Inspiration Campaign is raising \$1 billion to help advance K-State toward becoming a Top 50 public research university. As you consider how you want to make a difference, you may find it appealing that supporting the Johnson Cancer Research Center not only helps advance cancer research and treatment in general, but also the investigations and training of many K-State faculty and student scientists in a wide variety of disciplines.

Before I close, I'd like to inform you that I am retiring as director of the Johnson Cancer Research Center in the near future. I have enjoyed working with people in all aspects of the position, and am proud of the gains we have made during my tenure. A national search is currently underway for an exceptional individual to lead the program. I am very confident this person will take the center to the next level in our fight against cancer.

We're very thankful to everyone who has contributed to the success of our center over the years, in all the aspects I've described above. Please read on to see how you've made a difference. We hope you'll be inspired to continue to help K-State fight cancer.

A handwritten signature in black ink that reads "Rob Denell". The signature is written in a cursive, flowing style.

Rob Denell / Director

1 Chalmers Hall, 1711 Claflin Rd., Kansas State University, Manhattan, KS 66506-3901

785.532.6705 | cancerresearch@k-state.edu | cancer.k-state.edu

 [facebook.com/KStateCancerResearch](https://www.facebook.com/KStateCancerResearch) |  twitter.com/KStateCancerRes



Our cancer research support for Division of Biology faculty has resulted in

**more than
50 times**

as much in
extramural funding.

Making cancer sick

K-State researcher uses viruses to kill cancer cells

By Stephanie Jacques

Stefan Rothenburg, assistant professor in the Division of Biology at Kansas State University, is researching cancer-killing viruses.

"The idea is that these viruses, called oncolytic viruses, can be used like a bloodhound," Rothenburg said. "They can sniff out and attack cancer cells but leave healthy human cells alone."

Rothenburg's research, funded by an Innovative Research Award from the university's Johnson Cancer Research Center, is modifying myxoma virus, which is deadly to rabbits but doesn't establish active infections in humans. The virus has been effective in preclinical trials at attacking some forms of human cancer, but not all.

"Our hypothesis is that some human cancer forms are resistant against myxoma virus because they have a high expression of a protein called Protein Kinase R, or PKR," Rothenburg said. "So if we find a way to inhibit PKR in the cancer cells more effectively, we might generate myxoma viruses that are more effective against these cancer forms."

PKR, found in most vertebrate cells as a first line of immune defense, shuts down protein translation of virus-infected cells. Rothenburg said cancer cells have this capability, too, which may provide a weakness. According to Rothenburg, viruses have evolved inhibitors of PKR that block the cell's PKR defenses.

"Cancer cells' antiviral defense pathways are pretty messed up," Rothenburg said. "They have alterations of normal immune pathways — which can enable them to grow faster and become cancer or provide resistance to chemotherapy — but we can use this as an Achilles' heel by introducing viruses that can only destroy or replicate in cancer cells."

Rothenburg and his lab group found that myxoma virus contains an inhibitor that effectively targets PKR from rabbits but not from other mammals, including humans. According to Rothenburg, this might actually limit the use of myxoma virus against human cancer forms that exhibit high PKR activity. The lab members identified proteins

from other, non-human pathogenic poxviruses that effectively inhibit human PKR. They are inserting some of these inhibitors into the myxoma virus genome and testing the modified viruses against several forms of human cancer to determine the effectiveness.

"The idea is if we have this modified myxoma virus, it can kill these cancer cells that exhibit high PKR activity," Rothenburg said. "We think that the myxoma virus is a promising oncolytic virus to modify because it is not a human pathogen and even in human cells that don't have PKR, the virus can replicate — but not to very high levels."

Modifying viruses to kill cancer was not Rothenburg's original research plan. A small observation during some basic research led to his current research, which he owes to the support of the Johnson Cancer Research Center and hard-working students in his lab.

"Many times undirected, noncommittal basic research leads to the most important discoveries and the most important medical progress," Rothenburg said. "One of the strengths of the Johnson Cancer Research Center is that it broadly funds cancer-related basic research."

The initial funding by the Johnson Cancer Research Center enabled him to collect preliminary data and seek more funding from national agencies, like the \$1.85 million grant he received from the National Institutes of Health in June 2015. In addition, the students in Rothenburg's lab, whom he calls the motor of his lab, received 11 awards from the cancer research center.

The center's support of Chen Peng, a doctoral student in microbiology, and Adam Schieferecke, junior in microbiology, has been instrumental in the development and success of the myxoma virus project.

"The students in my lab perform the actual research," Rothenburg said. "I would not be able to do all this without students. Also, I think it is very important to give the new generation of researchers, physicians or other health-related professionals a good education in research and a scientific foundation for their future careers."

A common enemy

Veterinarian uses clinical trials to fight cancer in animals, humans

By Jennifer Tidball

Raelene Wouda's passion for improving cancer treatment starts with our four-legged friends.

Wouda, Kansas State University assistant professor of clinical sciences, conducts clinical trials investigating the treatment of cancer in dogs, cats and other companion animals.

The clinical veterinary oncologist helps our pets fight cancer while also studying important topics, such as improved diagnostic testing and monitoring approaches and innovative treatment options, including anti-cancer vaccines, t-cell transfer, combination chemotherapy and nanoparticle drug formulations.

"Although surgery, radiation therapy, chemotherapy and, more recently, immunotherapy have improved patient outcomes, many cancers still do not have a long-term cure," Wouda said. "These clinical trials are a crucial step."

In her first year at Kansas State University, Wouda has been using Johnson Cancer Research Center funding to help build a clinical trial program at the College of Veterinary Medicine's Veterinary Health Center.

But Wouda's research benefits humans, too. Many cancers in animals — especially dogs — are similar to those in humans, which means that the diagnosis, monitoring, treatment and response to treatment are also similar.

"Any research that we do in our patients has the potential to provide important information for how the disease can be better diagnosed, monitored and treated in human patients," Wouda said. "That's what I would like to do with

our research. I would like to continue to improve outcomes for our veterinary patients and, by extension, help human cancer patients."

Companion animals offer several research advantages. Wouda's clinical trial program focuses primarily on dogs because of the similarities between their cancers and human cancers, such as osteosarcoma, melanoma, lung cancer and urogenital cancers. Osteosarcoma, for example, is both clinically and genetically almost identical in dogs and pediatric human patients.

Dogs also live in our environments and are exposed to the same environmental factors. Additionally, because dogs age faster than humans — one dog year is equivalent to seven human years — their diseases progress faster,

too, which is a practical advantage for evaluating a treatment's efficacy, Wouda said.

"We get clinical answers more rapidly in dogs," Wouda said. "The benefit of a therapeutic option becomes obvious quicker in dogs compared to people, and because of this we can save research and development organizations money, but more importantly, time and resources."

When pet owners bring their dogs, cats, horses and other animals to the Veterinary Health Center for treatment, the Oncology Service can offer groundbreaking new treatments often at a lower cost to pet owners. The Oncology Service includes Wouda; Mary Lynn Higginbotham, associate professor of clinical sciences, and another Johnson Cancer Research Center affiliate; their graduate students; and oncology technicians.

The Oncology Service's current clinical trials cover important treatment topics, such as anti-cancer vaccines, drug dosages, novel drug uses, nanoparticle drugs and adoptive T-cell transfer.

Animal clinical trials are structured similarly to human clinical trials and are tightly regulated and overseen. Wouda and Higginbotham work with referring veterinarians to conduct the clinical trials and work with human medicine researchers to discuss how the research can best be applied to humans.

"For many pet owners, cancer is a terminal diagnosis for their pets," Wouda said. "These studies provide owners an opportunity to try a cutting-edge therapy for their pets at a reasonable price. Plus, owners participating in these clinical trials are happy to know they are helping to achieve better treatments and outcomes for other pets in the future."

Wouda also has received previous and current funding from the American College of Veterinary Internal Medicine Foundation, the Mark Derrick Canine research fund, the Kansas IDeA Network of Biomedical Research Excellence and Zoetis Animal Health.



\$2,613,862 has been invested in promising cancer studies since 2003. But \$4,216,428 was requested.



\$115,530 supported laboratory equipment purchases in 2015.
But hundreds of thousands of dollars are needed.

Getting real

K-State researchers collaborate to make tumor research more realistic

By Megan Saunders

A jelly-like biomaterial and scientific collaboration may result in more effective breast cancer treatment.

Two Kansas State University researchers have combined their specialties to grow cancer cells in a more realistic, 3-D environment. Xiuzhi Susan Sun, university distinguished professor of grain science, created PepGel, short for peptide hydrogel, a protein-based biomaterial for growing cell cultures. Thu Annelise Nguyen, associate professor of toxicology, is using the PepGel to grow breast cancer cells into 3-D tumors for a better and more effective approach in anti-cancer drug testing.

In 2002, Sun began working on the jelly-like substance that would become PepGel. Peptide forms hydrogel at pH 12, which did not allow cell growth.

"We designed a peptide that would form a hydrogel at a neutral pH at room temperature," Sun said. "Annelise needed a more advanced cell culture system that would allow the cells to grow in a complex environment beyond the traditional 2-D cell culture, so our collaboration was an opportunity to test the initial materials."

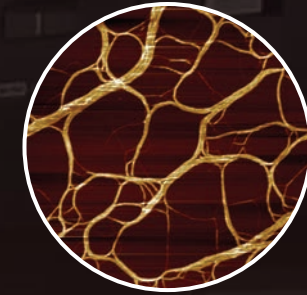
After some trial and error, the researchers and their team of students were successful in growing cancer cells in PepGel. Nguyen said the process worked because they focused on the functionality of the PepGel.

"With PepGel, you can grow cancer cells in a 3-D culture instead of flat on a petri dish," Nguyen said. "The immediate impact of this new technology is the use in testing anti-cancer drugs. For instance, an anti-cancer drug can target cancer cells in a more realistic 3-D tumor instead of a uniform, flat cell culture."

Nguyen said common characteristics of cancer formation include the ability to grow independently, avoidance of growth inhibition, evasion of cell death, unlimited replication, sustained development of new blood vessels and metastasis or spreading.

"We are evaluating the functionality of a 3-D breast tumor by understanding its characteristics," she said. "Subsequently, the PepGel allows us to determine the efficacy of anti-cancer drugs in a 3-D tumor culture and provides greater insight into how these characteristics are regulated."

Now, Nguyen can grow more complex tumors with multiple cell types, mimicking the actual tumor in the body. No other existing model provides this type of complexity in a 3-D culture.



"We can save lives through more realistic research," she said. "The PepGel environment gives us answers to really relevant questions. We have a better idea of how a drug will work on multiple cell types."

Sun added that the PepGel research also could accelerate the drug discovery process. Currently, tumors are harvested from a patient, cut into smaller tissues and then grown in a model. This process can take up to three months, not including the wait for drug-testing results.

With a 3-D model, it is possible to develop individual treatment protocol that is not only quicker, but also more effective.

"Two patients may have similar cancer tumors, but their response to a particular drug may be very different," said Sun. "If you can test the power of a particular drug, you can garner information to not just kill the tumor, but also on any potential side effects. A drug might kill the cancer but be intolerable to a patient."

Nguyen said another benefit to the PepGel is that the cells can be recovered alive without using chemicals or enzymes to disrupt them. In earlier methods, the cancer cells were fixed and killed in the petri dish, allowing researchers to study only one point in time and situation. PepGel allows the cells to stay alive and be removed for further study.

"Previously, we've used commercially available biomaterials already on the market," Nguyen said. "They're very expensive, and you can't retrieve the cells for further study. PepGel allows me to continue studying the cells it contains."

The project has been funded through a small business grant from the National Science Foundation's Small Business Technology Transfer program, as well as a seed grant from the Johnson Cancer Research Center. The researchers used cancer cells that already existed in Nguyen's lab in Mosier Hall.

"We will continue testing for more cells and different types of cancers," said Nguyen. "It started with one question: Can a cancer cell grow and thrive in this material? Now, we know the answer is 'yes.'"

Nguyen and Sun's research was published in March 2013 in Plos One, a biomedical journal.

Undergraduate research opportunities create scientific foundation, new generation of cancer fighters

By Stephanie Jacques



Adam Schieferecke, junior in microbiology and biochemistry from Bennington, Kansas, chose Kansas State University because of the university's emphasis on undergraduate research, which is proving to be a mutualistic relationship.

As a freshman, he started working in the lab of Stefan Rothenburg, assistant professor in the Division of Biology, and received his first of three undergraduate Cancer Research Awards from the university's Johnson Cancer Research Center. The Cancer Research Award program offers faculty-mentored research experiences and \$1,000 awards for up to 50 students per year, plus \$1,000 per student for the faculty mentors to cover research expenses.

"It has been a tremendous opportunity to work in Dr. Rothenburg's lab," Schieferecke said. "My experiences in the lab will leave

me well-prepared to pursue a successful and rewarding career as a scientist. I've built

presentation skills, learned how to conduct independent research and worked on a project directed at making an alternative therapy for cancer."

While working in a functioning lab gives

Schieferecke research experience, the student assistance also helps grow the university's research programs, including Rothenburg's most recent project. Schieferecke and Chen Peng, a doctoral student in the lab who also mentors Schieferecke, are testing the cancer-killing effectiveness of a modified strain of

myxoma virus. They are measuring how well the virus can replicate in and kill different breast cancer cell lines.

Rothenburg said the Cancer Research Award gives him manpower in the lab and provides valuable experience to undergraduates so they don't have to spend their time outside of class working a job that doesn't contribute directly to their education.

"The scholarship allows the students to spend more time in the lab," Rothenburg said. "This award can give a K-State student a competitive edge. This is the kind of thing that makes a difference in the application and success of the student."

Schieferecke says the research awards helped him generate data that he has used to apply for additional awards such as the national Barry M. Goldwater Scholarship. Schieferecke is one of the university's 2016 nominees. In addition, he has received 16 academic, philanthropic and research-related awards since that initial award from the cancer research center, including a Kansas-INBRE Top Poster Presentation Award two years in a row.

Schieferecke also is the president of the Microbiology Club and an active member of the K-State Cancer Fighters, a student organization that assists the center with fundraisers and other activities.

Schieferecke is the club's science writer, a position he initiated to increase scientific literacy and cancer awareness among the public.

"I've become really passionate about cancer research," Schieferecke said. "If it were not for that funding source from the cancer research center and Dr. Rothenburg's mentorship, I may have ended up taking my research in an entirely different direction. They helped me figure out that I was passionate about doing cancer research, and that is what has driven me to work so hard."

We invest up to **\$100,000** per year to train 50 undergraduates to do scientific research.

K-State alumni fellow, national cancer institute researcher helps develop future scientists

By Marcia Locke

Robert "Bob" Kinders is helping both his alma mater and his nation fight cancer. The National Cancer Institute laboratory director is still very active with Kansas State University 35 years after attending.

Kinders landed at Kansas State University while working on his doctorate under the direction of Terry C. Johnson, the namesake of the university's Johnson Cancer Research Center. Both were at Northwestern University School of Medicine in Chicago until Johnson left to be the head of K-State's Division of Biology in 1977.

At K-State, the two of them worked on cell growth signaling in cancer. Kinders remembers Johnson giving his graduate students terse words of advice at their long Tuesday night lab meetings that always lasted past midnight.

"Terry would tell us, 'To be successful here, make yourself indispensable,'" Kinders said. "He would rebuke a laggard student with, 'It's your career.' But there's one quote that really sums up his graduate teaching philosophy: 'What is the question?' This emphasis on precisely framing a question is at the heart of scientific investigation."

Kinders received his doctorate in biology in 1980, the same year Johnson and colleagues established the cancer research center.

After completing postdoctoral training at K-State and the University of Washington School of Medicine, Kinders worked extensively in the medical devices industry and in pharmaceutical development, including at Abbott Laboratories, C.R. Bard and CuraGen.

Today, Kinders directs the Pharmacodynamics Section, or PADIS, at Frederick National Laboratory, part of the Clinical Biomarkers Program in the National Cancer Institute's Division of Cancer Treatment and Diagnosis. The PADIS lab is charged with development and validation of assays to measure the effects, at the molecular level, of new, targeted anticancer agents in patients enrolled in first-in-man clinical trials at the National Cancer Institute's Clinical Center.

According to Kinders, the current success rate for anticancer agents entering clinical trials is no more than 5 percent. His research program is focused on improving that by developing advanced, robust assays of targeted drug action in patient specimens, including biopsies and circulating tumor cells, in order to either confirm or disprove the proposed mechanism of the investigational agent in early stage clinical trials.



\$1,333,500

has been invested in undergraduate research training since 1980.

Additionally, the program helps determine the most effective methods of combining new anticancer drugs with drugs already in use. His team also establishes new technologies for specimen analysis. They measure, by fluorescence imaging, effects on multiple drug-targeted proteins in patient biopsies and monitor drug treatment effects in circulating tumor cells.

Currently, his laboratory supports 40 clinical trials employing more than a dozen experimental drugs throughout the United States.

Kinders has been awarded 11 patents and has led or contributed to the development of 10 cancer diagnostic assays, two FDA-cleared drugs used in patients and three anticancer agents currently in late stage clinical trials.

Kinders has been an active member of Kansas State University's Cancer Research and Education Advisory Council since 1990. He said Johnson invited him because of his experience in applying research to patient diagnosis and treatment.

"I've stayed involved all these years because I believe in the center's strong emphasis on providing undergraduate students direct laboratory experience in basic research related to cancer," Kinders said. "This experience is literally priceless and is unique among public universities."

Serving on the center's advisory council is not all Kinders does to help develop future scientists. In recent years, he has hosted two K-State undergraduate students as summer interns in his lab. Kristina Bigelow, featured in the 2012 "Conquest," and John Hirt learned laboratory methods employed in determining drug mechanisms, and participated in weekly clinical trials and laboratory research conferences with clinical investigators at the National Cancer Institute, Kinders said.

In 2015, Kinders was selected as one of two alumni fellows for the College of Arts & Sciences. The K-State Alumni Association's Alumni Fellows Program recognizes alumni who have distinguished themselves in their careers.

K-State also is where Kinders met his wife of 35 years, Patricia Fogli Kinders, a registered nurse and a 1980 graduate in life sciences. They have one daughter, Christina Michalowski.

A drive to beat cancer

Rob Regier Memorial Golf Tournament honors son, supports Johnson Cancer Research Center

By Taylor Manges

When Les and Sandy Regier talk about the “best-kept secret” in Manhattan, they are referring to the Johnson Cancer Research Center at Kansas State University.

The Regiers became aware of the cancer research center after they lost their son Rob, a 1988 K-State graduate in pre-dentistry, to cancer in 1992. They wanted to raise money for cancer research and, as K-State alumni themselves, they felt the Johnson Cancer Research Center was the perfect fit.

They started the Rob Regier Memorial Golf Tournament in 1998 to raise funds for the center in memory of Rob.

“The tournament was the personal connection we were looking for,” Les Regier said. “To have an opportunity to raise money in honor of our son, and knowing that all of that money goes back to K-State for cancer research and scholarships, is a wonderful feeling.”

The tournament began with some of Rob’s friends from Sigma Phi Epsilon fraternity who wanted to get together and play golf.

“It was more of a camaraderie thing, passing the hat with the money raised going to a scholarship,” Les Regier said. “Since then, the tournament has raised \$270,610 for the Johnson Cancer Research Center. We are very proud to be able to support the center’s amazing contributions toward miraculous kinds of cancer treatments.”

Although both the Regiers are retired, they have not slowed down. They are the force behind the tournament. This year they will host the 19th event. While Sandy Regier stays busy organizing the tournament’s evening banquet, Les Regier enjoys planning the golf competition.

Participants of the annual tournament have become familiar faces to the family, and the Regiers can almost name them all year to year. When not participating in the tournament, Les Regier enjoys being out on the golf course, shaking hands with the players and thanking them for their participation.

“We’ve had some very generous supporters and sponsors over the years, including the tournament’s premier sponsor Grand Mère Development, owned by Mary Vanier, and we are very appreciative of everyone’s encouragement,” he said.

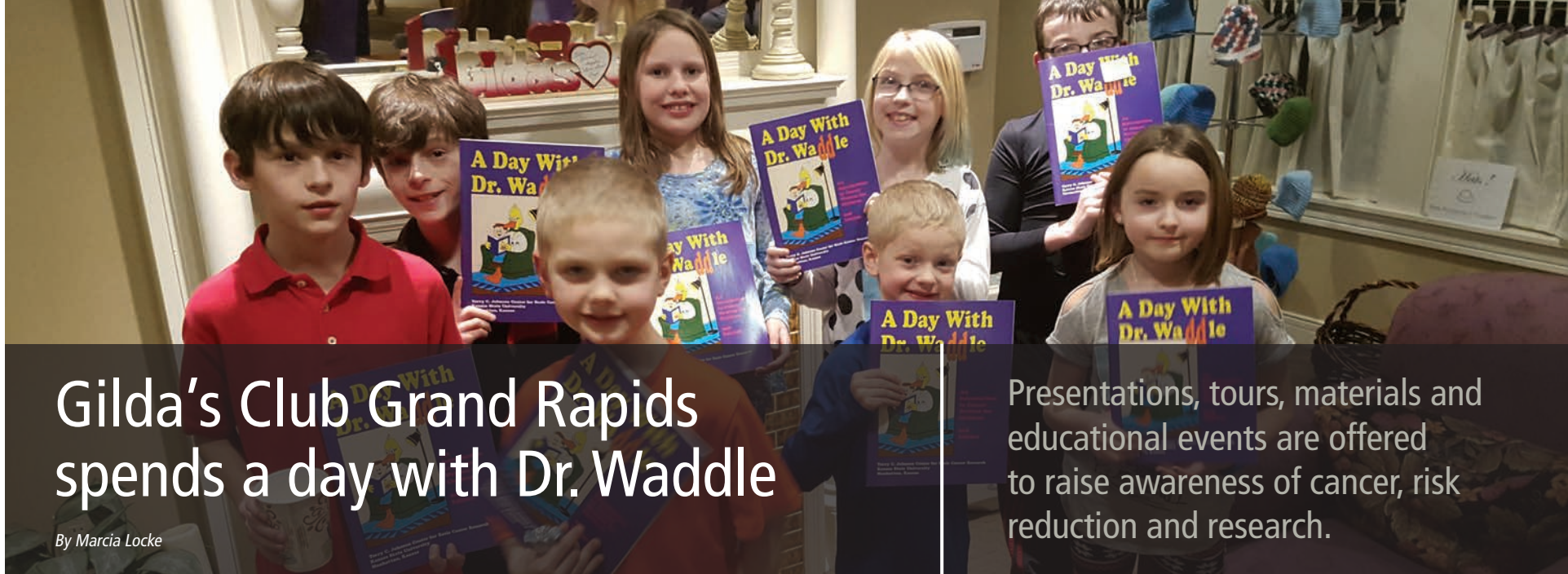
The Regiers spend time traveling to Arizona from their home in Overland Park but still show their purple pride through family traditions and attending athletic events. Having always shared their love of K-State with their twin boys, they now have another special reason to visit Manhattan.

“It’s a gratifying feeling to know that something that started with us was passed onto our boys, and then on to Ryann, our granddaughter, who is now a sophomore at K-State,” Les Regier said. “We are happy to really get to enjoy all that K-State has to offer.”

The Rob Regier Memorial Golf Tournament will take place Oct. 7 at Colbert Hills Golf Course in Manhattan. Players and sponsors are welcome. Information is at cancer.k-state.edu/newsevents/regier.html.



Programs to advance K-State cancer research and education are made possible by private donations.



Gilda's Club Grand Rapids spends a day with Dr. Waddle

By Marcia Locke

Presentations, tours, materials and educational events are offered to raise awareness of cancer, risk reduction and research.

It's hard to explain cancer to children. Many of us barely understand it ourselves. When a family member, friend or classmate gets sick, children can tell something is wrong, but nobody will — or can — tell them what's going on.

Dr. Waddle can help.

Dr. Waddle is a duck who happens to be a scientist. He is the main character of the activity book, "A Day With Dr. Waddle," written by the staff of the Johnson Cancer Research Center at Kansas State University to help adults explain cancer to children. Since its publication in 1988, it has helped many families, teachers, hospitals and more.

Aided by child psychologists and teachers, the staff created "A Day With Dr. Waddle" in response to a second-grade teacher who was frustrated because she couldn't find materials to help explain cancer to her students, two of whom were facing cancer in their families and seemed distraught. The book is geared toward 7-year-olds, but it is informative for people of all ages.

Readers spend a day with Dr. Waddle, touring his laboratory and learning about science, microscopes and cells. Dr. Waddle explains that normal cells are well-behaved like a class of respectful students, and that cancerous cells misbehave and act weird. He

discusses cancer treatments, explains that cancer is not contagious, and ends the lesson with good health habits to follow. Along the way are activities to engage children as they learn this challenging subject matter.

Recently, children at Gilda's Club Grand Rapids got to meet Dr. Waddle. Gilda's Club, named for comedian Gilda Radner, who died from ovarian cancer at age 42 in 1989, is a free program and is a community for children and adults who have been affected by cancer or experienced the death of a loved one from any cause.

"People gather here to learn and share their experiences ... and a few laughs along the way," said Jacqueline Scherer, a licensed clinical social worker with Gilda's Club.

Scherer coordinates a special program for kids called Kids Talk Group. All groups are led by licensed clinical professionals and use curriculum-based activities, discussion and playtime to support children who are on a cancer journey.

The Kids Talk Group recently used "A Day With Dr. Waddle" to explore learning through reading, creating, and the emotional benefits of coloring, Scherer said. Afterward, they created their own coloring books about cancer, incorporating their own journey and experiences.

When asked how her coloring book will help other kids, 9-year-old Libby said, "It will help them learn things about cancer so they know more about a cancer journey, so they won't be more scared."

Ten-year-old twins Frank and Theo said, "If they are struggling or get too overwhelmed, this coloring book will help them relax and think of new ideas."

Seven-year-old Lauren said that "A Day With Dr. Waddle" "will help children relax if a family member or they have cancer." Six-year-old Ethan said, "Dr. Waddle looks cool." And 10-year-old Becca said, "Reading Dr. Waddle relaxes me. I'm excited to color it."

The cancer research center does not profit off "A Day With Dr. Waddle." It charges only enough to cover expenses — \$3 per book, which includes free shipping in most cases. The books can be ordered directly from the center by submitting the order form on its website, cancer.k-state.edu.

Cancer Research Departments

College of Arts & Sciences

Biochemistry and Molecular Biophysics

Biology

Chemistry

Physics

College of Agriculture

Grain Science and Industry

Horticulture

Plant Pathology

College of Engineering

Biological and Agricultural Engineering

Chemical Engineering

Electrical and Computer Engineering

Engineering Extension

College of Human Ecology

Apparel, Textiles and Interior Design

Food, Nutrition, Dietetics and Health

Kinesiology

College of Veterinary Medicine

Anatomy and Physiology

Clinical Sciences

Diagnostic Medicine/Pathobiology

Veterinary Diagnostic Laboratory

Notice of Nondiscrimination

Kansas State University is committed to nondiscrimination on the basis of race, color, ethnic or national origin, sex, sexual orientation, gender identity, religion, age, ancestry, disability, military status, veteran status, or other non-merit reasons, in admissions, educational programs or activities and employment, including employment of disabled veterans and veterans of the Vietnam Era, as required by applicable laws and regulations. Responsibility for coordination of compliance efforts and receipt of inquiries concerning Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, and the Americans With Disabilities Act of 1990, has been delegated to the Director of Affirmative Action, Kansas State University, 214 Anderson Hall, Manhattan, KS 66506-0124, (Phone) 785-532-6220; (TTY) 785-532-4807.