THE UNIVERSITY OF KANSAS
CANCER CENTER

To: Chairman Les Donovan
Members of the Senate Assessment and Taxation Committee

From: Roy Jensen, MD - Director, The University of Kansas Cancer Center

Re: Senate Bill 233

Chairman Donovan and Members of the Committee,

Thank you for the opportunity to present testimony to the committee regarding the impact of a tobacco tax in Kansas. I am Dr. Roy Jensen, Director at The University of Kansas Cancer Center. Today I have an opportunity to draw attention to a very worrisome trend in Kansas: one that needs attention and cannot be pushed aside. Cancer is currently the leading causing of death in our state and kills 5,460 Kansans each year. While this statistic may be common knowledge, the following statistic is not. By 2030, 1 in every 4 Kansans will be 65 or older. With cancer especially common in this age group, we are looking at a 45 percent increase in the number of cancer diagnoses in this state if we do nothing. This is an epidemic that we have to deal with now. It is an issue that The University of Kansas Cancer Center has looked at closely as we prepare our application for National Cancer Institute (NCI) comprehensive cancer center designation, and I am here today to share the health impact of tobacco on Kansas and how increasing the tax on tobacco is a critical step in improving the health of our state.

Kansas Tobacco Facts

- Tobacco is the number one cause of preventable death in Kansas
- 10.2 percent of high school students smoke
- Kansas ranks in the top 15 in the use of other tobacco products among high school students
- 20.0 percent of Kansas adults smoke, compared to the national average of 17.8 percent
- 4,400 Kansans die yearly from the effects of smoking and 2,900 youth become smokers
- $825 is paid per household, annually, in smoking related costs
- Smoking and other tobacco products costs Kansas $1.12 billion in health care costs every year, including $237 million in Medicaid payments alone

Why does tobacco matter to us?

Tobacco prevention and smoking cessation is a significant piece of the Cancer Center's pursuit of comprehensive cancer center status. In Kansas alone, 20 percent of the population uses tobacco. Research shows that 31 percent of all cancers could be eradicated if people no longer smoked. As part of our education and prevention focus for comprehensive designation, we will focus on educating the public on the dangers of tobacco use. It is our goal to see a minimum of a 20 percent decrease in the use of tobacco over the next 15 years. In addition to education and prevention, implementing a tobacco tax is a proven way to reduce tobacco use in our state. By increasing the tobacco tax $1.50 Kansas would see:

- 20.3 percent reduction in youth smoking
- 25,400 youth would not become addicted, adult smokers
- 25,800 adult smokers would quit
- 14,900 premature smoking-caused deaths would be prevented
- $3.3 million in Medicaid program state savings over the next 5 years

A $1.50 tobacco tax increase would impact the health of Kansans significantly and show the state's commitment to making meaningful reductions in tobacco use: Two actions that would reflect positively on the cancer center's application for comprehensive cancer status.

In addition, a $1.50 tobacco tax increase would bring the state just under $72 million in needed revenue, with almost $9.0 million in additional revenue when the tax on other tobacco products is increased from the current 10 percent of wholesale to 25 percent of wholesale. This would provide for a significant and relatively stable source of revenue to the state at a time of budget challenges. The increased tobacco tax would also provide a reliable source of revenue to fund the line item in the state budget for the Cancer Center. The contribution the State of Kansas makes toward the Cancer Center is an important part of our journey to achieve comprehensive cancer center designation. A decrease in funding would reflect negatively on our application and put our application for comprehensive cancer center status at risk.

How does designation as an NCI Comprehensive Cancer Center benefit Kansas?

Since 2007, the State of Kansas and the legislature have been key supporters of the pursuit of NCI designation. Based on the state's initial investment of $5.0 million, the Cancer Center has been able to leverage the investment by the state 14 to 1 for $527

million in total investment in the NCI initiative from 2007-2013. The total regional impact of NCI designation is as follows:

- $1.08 billion in total financial economic impact
- 2,088 total jobs created

The Cancer Center anticipates an additional $750 million in total investment from 2014-2018 which is estimated to impact the region as follows:

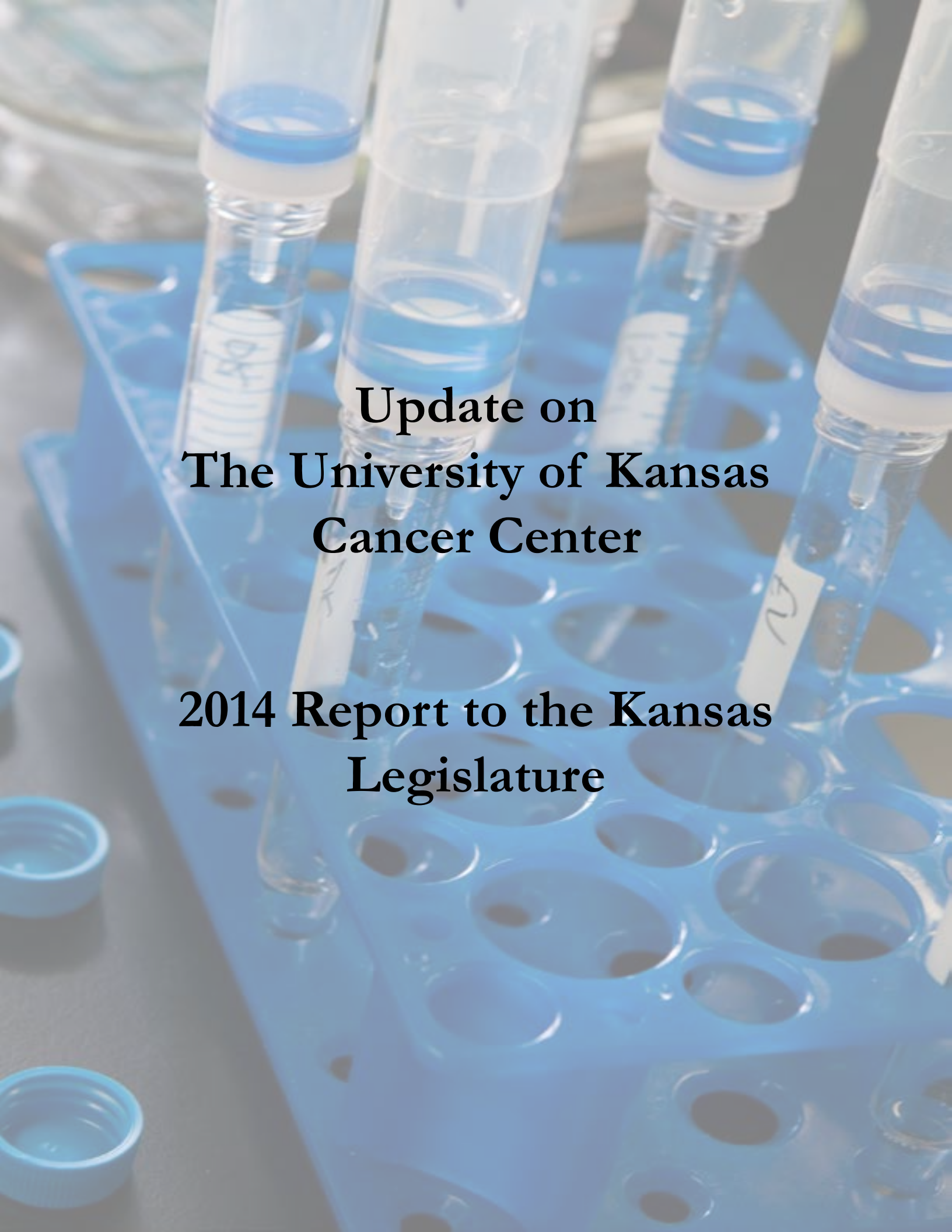
- $1.54 billion in financial economic impact
- 1,584 new, Kansas jobs

Overall, between 2007 and 2018, the Cancer Center's total economic impact of investments in cancer research totals $2.62 billion and 3,762 jobs, with an average salary of $68,000 compared to the average Kansas salary of $40,000.

What do we know about sustainability of revenue and cross border sales?

Higher cigarette taxes are a reliable source of revenue to help balance budgets and fund critical health care and other services. In addition, higher cigarette taxes save money by reducing tobacco-related health care costs. Tobacco costs every Kansas household $825 per year – another cost that will decline with reduced tobacco use. Every state that has significantly increased its cigarette tax has enjoyed substantial increases in revenue, even while reducing smoking. Put simply, after a cigarette tax increase, the revenue gains on each cigarette pack sold far outweigh the revenue losses from declines in total cigarette sales. After the 55 cent increase in 2002-2003, Kansas per pack sales declined by 52.8 million packs (from 2001-2004 adults smokers decreased 49,000). But because Kansas was receiving 55 cents more a pack, annual revenue still increased by $76 million.

The statement that an increase in the tax will drive Kansans over the border to make purchases is simply inaccurate. Data collected around Kansas and Missouri tobacco revenue shows that in 2003, when Kansas last increased its tobacco tax, Missouri's per pack sales declined by .7 percent. Twelve months prior to implementation, Missouri sold 603 million packs, while twelve months after implementation, Missouri sold 598 million packs, indicating that there was not an increase in their per pack sales.



Update on The University of Kansas Cancer Center

2014 Report to the Kansas Legislature

The University of Kansas Cancer Center operates as a matrix organization that includes The University of Kansas Medical Center's campuses in Kansas City, Kan., Wichita and Salina; The University of Kansas in Lawrence and its School of Pharmacy; The University of Kansas Hospital; and the Midwest Cancer Alliance (MCA). As the nation's 67th recipient of National Cancer Institute designation, we continue to focus on ending the burden of cancer in the Heartland by expanding access to laboratory discoveries and promising new therapies, enabling patients to receive leading-edge care much closer to home.

Together, we are working toward a world without cancer.

Our 2014 update for the Legislature contains highlights of KU Cancer Center's successes, economic impact, clinical trial achievements and goals for obtaining comprehensive cancer center designation in 2017. Sections include:

- Why Cancer Research Matters
- History of the State Investment in the KU Cancer Center
- Economic Impact and Jobs Creation from Pursuit of NCI Designation
- Our Accomplishments for 2014, 2013, 2012
- New Research Endeavors in 2014
- The Role of Clinical Trials in Cancer Research
- Overview of the Midwest Cancer Alliance
- The Road to Achieving NCI-designated Comprehensive Cancer Center Status

WHY CANCER RESEARCH MATTERS

By 2030, cancer cases are predicted to increase by as much as 45%.

The University of Kansas Cancer Center is a cancer center designated by the National Cancer Institute.

Increased competitiveness & ability to obtain grant funding translates to more discoveries & treatment options to care for future cancer patients.

Promising cancer research leading directly to **improved care & treatment** is taking place right here in our community.

Impact of NCI Designation

NCI designation recognizes leadership in

- Cutting-edge treatment options
- Community Education
- Translation of discovery clinical trials
- Research Innovation

Quality

State-of-the-art phase I clinical trials

Newly renovated research labs house **115** cancer researchers.

Pace of Discovery

Move research discoveries to treatment faster

< 2 years (vs. **6** to **10** national average)

82 NEW clinical trials since obtaining NCI designation.

Increased Research Participation

500 people in population health trials

Clinical trials participation **↑26%** from 2012 to 2013

More Funding = More Studies

published papers rose to **430**

Research funding has grown to **$50.9** billion

In the last two years, researchers have been awarded:

121 NCI-funded studies

$78.7 million in outside funding

THE PROMISE OF DISCOVERY. THE POWER OF CARE.

kucancercenter.org/research

THE UNIVERSITY OF KANSAS CANCER CENTER
913-588-4755

NCI·CC
A Cancer Center Designated by the National Cancer Institute

History of State Investment

The state of Kansas and the legislature have been key supporters of the pursuit of National Cancer Institute (NCI) designation since 2007. The state investment of $5 million annually was the "first money in" and enabled the cancer center to recruit and support scientific leadership including Roy A. Jensen, M.D., build the Midwest Cancer Alliance collaboration network and support the cancer clinical trials office. Dr. Jensen and his team have been able to leverage the investment by the state 14 to 1 for $527 million in total investment in the NCI initiative from 2007-2013.

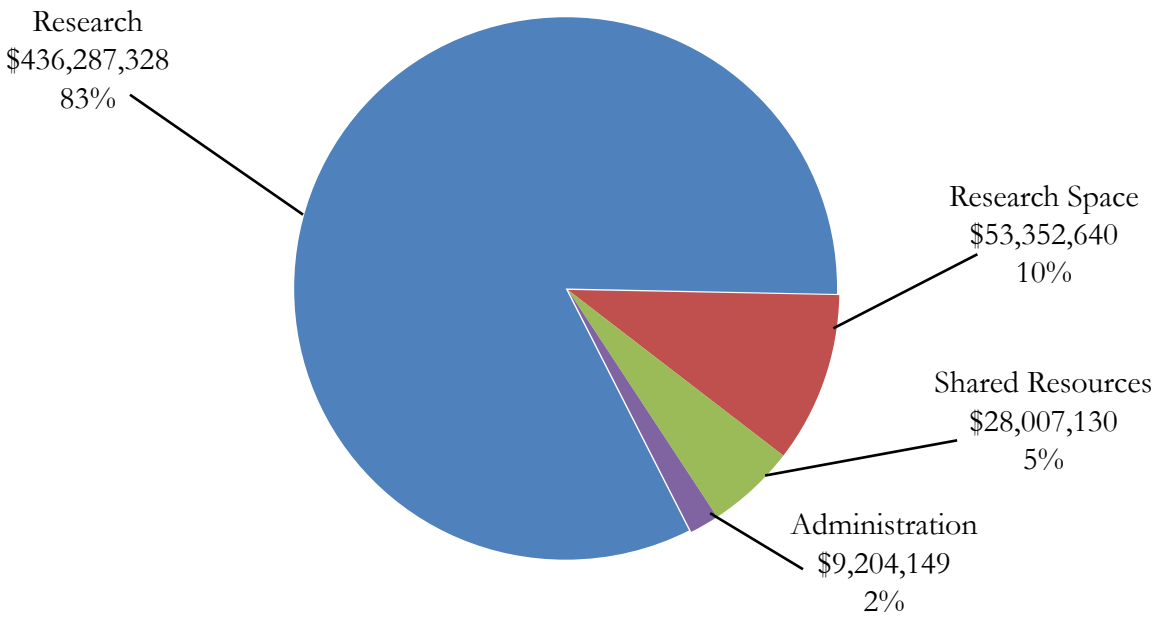
Table 1: Total Cancer Center Investment 2007-2013

Funding Sources	Actuals 2007-2013	%
Extramural/Federal Funding	$285,686,929	54%
University	$66,936,851	13%
Kansas Bioscience Authority	$47,194,678	9%
State of Kansas Support		
State/Legislative Support (5 years)	$23,800,000	4%
Department of Commerce (3 years)	$15,000,000	3%
Private Philanthropy	$35,978,206	7%
Johnson County Education & Research Triangle	$29,868,009	6%
KU Hospital	$14,500,000	3%
Shared Resource Revenue	$2,229,001	<1%
Federal Earmark	$3,057,573	<1%
Midwest Cancer Alliance	$2,600,000	<1%
Total	**$526,851,247**	**100%**

14:1 total investment per state dollar

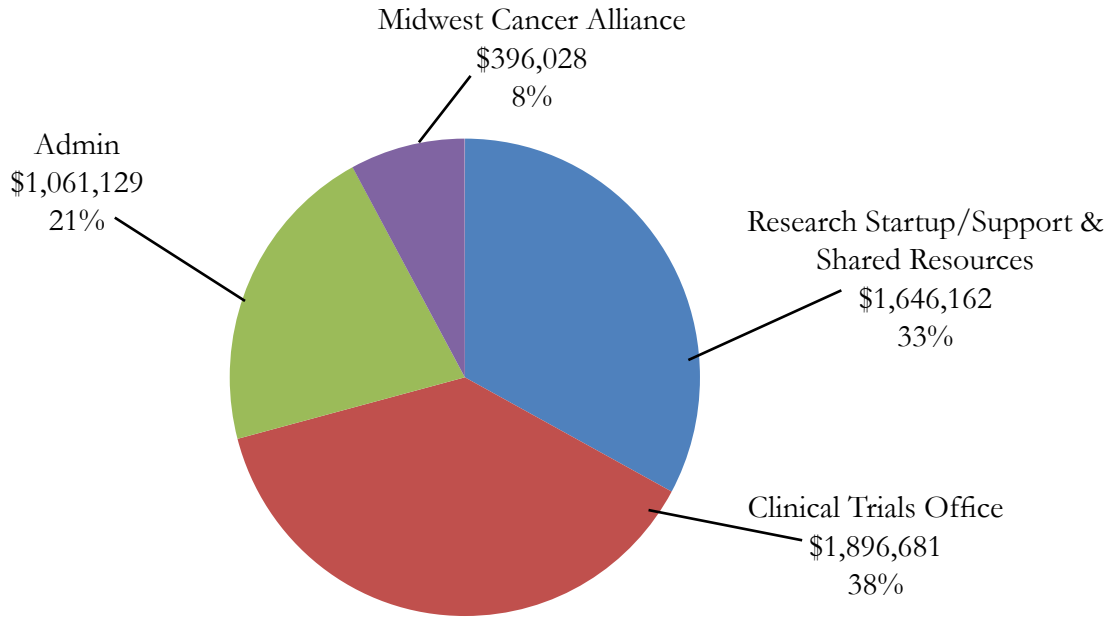
Nearly all of the $527 million in investment has been focused on advancing cancer research through strategic faculty recruitments, creating state-of-the-art research space and building shared resources.

Chart A: Expenditures by Category, 2007 - 2013



The Department of Commerce grant funds for FY14 were invested as shown in chart B below:

Chart B: FY14 $5M Spending by Category



Research Startup/Support & Shared Resources: Direct support for cancer researchers, their laboratories and shared resources to support all cancer center members.

Clinical Trials Office: This state-of-the-art facility delivers promising new drugs from the lab to the clinic and offers new options to community physicians and their patients who may have exhausted treatment options elsewhere. Also houses lab facilities on site for proper specimen management, which is vital to cancer research.

Administration: Supports cancer center leadership and operating infrastructure.

Midwest Cancer Alliance: Links KU Cancer Center research and services with member hospitals, medical professionals and their patients so the latest cancer research and care can be found close to home.

Economic Impact of Investments in Cancer Research

Total Regional Economic Impact	Actuals 2007-2013	Projected 2014-2018	Total
Total Financial Economic Impact	$1,084M	$1,540M	$2.62B
Total Jobs Created	2,088	1,584	3,672

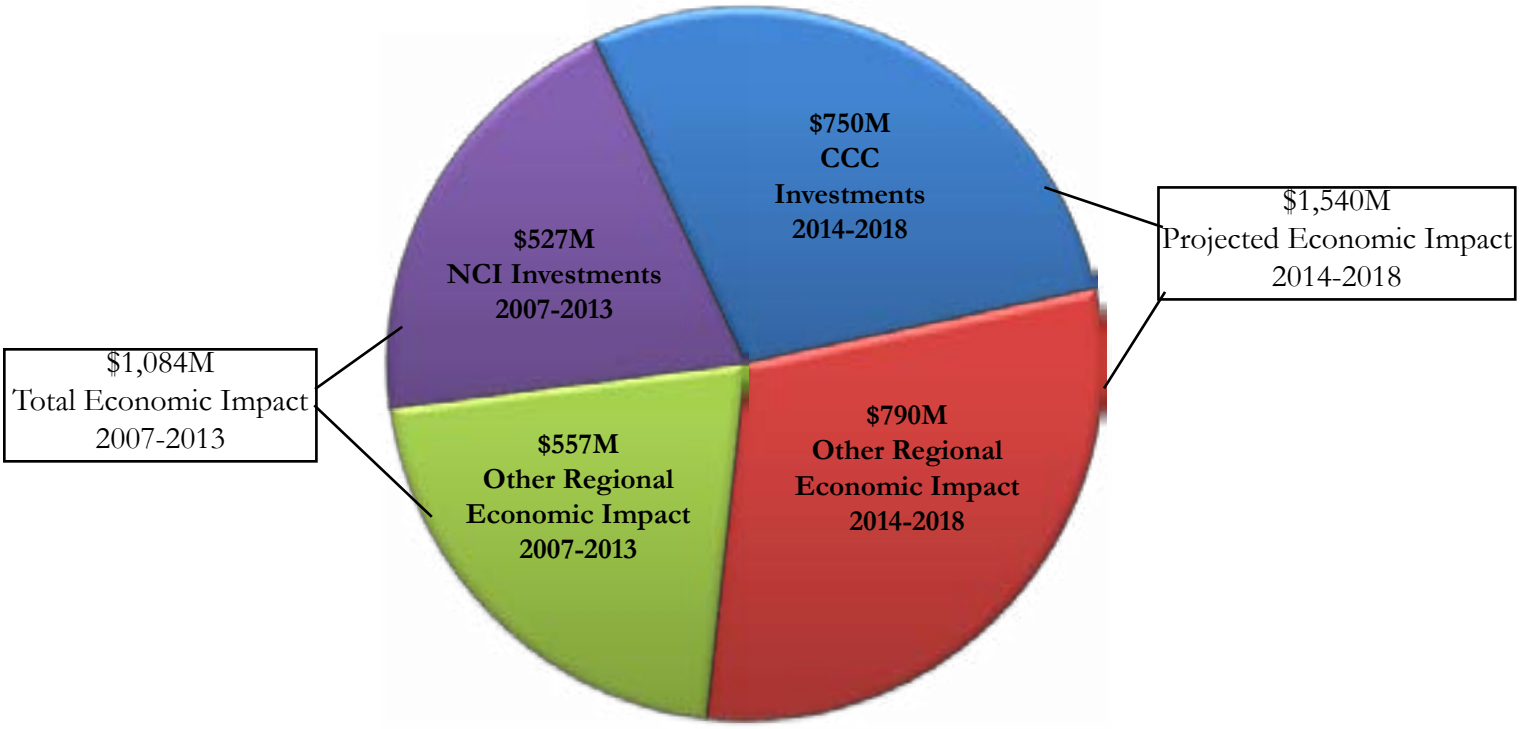
Looking at total economic impact since the state investment began in 2007, the $527 million total investment in NCI pursuit from 2007-2013 has resulted in:

- Total economic impact of $1,084 million
- $527 million direct investment in NCI pursuit
- $557 million in other regional impact

We anticipate an additional $750 million in investment from 2014-2018 which is estimated to drive:

- Total economic impact of $1,540 million
- $750 million direct investment in comprehensive cancer center (CCC) pursuit
- $790 million in other regional impact

Chart C: Total Economic Impact of Investments in Cancer Research 2007-2018: $2.62 billion



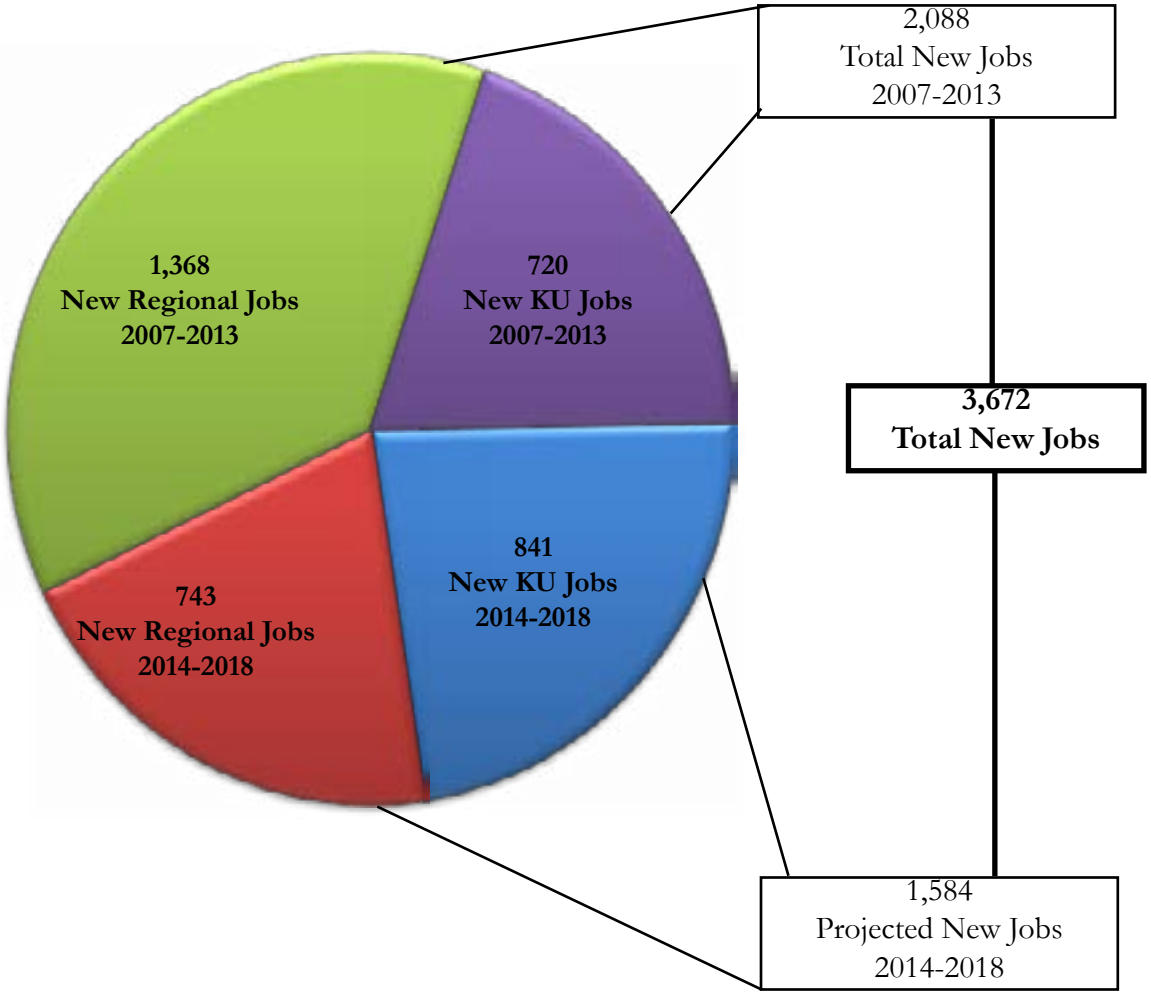
Jobs Creation

• Looking at job creation since 2007, the $527M total investment in NCI pursuit from 2007-2013 has resulted in 2,088 new regional jobs: 720 incremental jobs at KU and 1,368 incremental regional jobs.

• We estimate an additional $750M in investment from 2014-2018 will drive another 1,584 new regional jobs: 841 incremental jobs at KU and 743 incremental regional jobs.

• For the full 11-year period, we project a total of 3,672 new jobs created from the investments in NCI pursuit.

Chart D: New Jobs Created in the Region
2007-2018: 3,672



Since receiving NCI designation in 2012, The University of Kansas Cancer Center has made great strides in working towards a world without cancer. Below are our major milestones and accomplishments for the last three years:

2014

•A repurposed drug typically used to treat ovarian cancer saw positive results for patients with advanced peritoneal cancers during a Phase I clinical trial at The University of Kansas Cancer Center. The drug, known under the brand name Nanotax, was developed by Lawrence-based CritiTech, and the drug-testing and Phase I clinical trial were conduced by KU Cancer Center researchers, led by Stephen Williamson, M.D., medical director of Cancer Clinical Trials.

•Qi Chen, Ph.D., member of the KU Cancer Centers's Drug Discovery, Delivery and Experimental Therapeutics program and her team determined that high doses of vitamin C, administered in an IV with traditional chemotherapy, helped kill cancer cells while reducing the toxic effects of chemotherapy for some patients.

•Ed Ellerbeck, M.D., M.P.H., co-leader of the KU Cancer Centers's Cancer Control and Population Health Program, received $1.5 million from the Patient-Centered Outcomes Research Institute (PCORI) for a trial that will examine the effectiveness of long-term nicotine replacement therapy for patients with chronic obstructive pulmonary disease (COPD).

•Snigdha Banerjee, Ph.D., and Sushanta Banerjee, Ph.D., are studying how the protein CCN1 signals tumor angiogenesis in pancreatic cancer. Understanding how tumors grow can lead to better targeted therapies. Their research, funded by a Merit Review Award grant from the Department of Veteran Affairs, suggests that creating a drug that silences CCN1 could slow down or even stop pancreatic cancer tumors from growing.

•Finding the genes responsible for chemotherapy-resistance is what Jeremy Chien, Ph.D., member of the KU Caner Center's Cancer Biology Program, is looking to do with an innovative system that draws inspiration from the early days of cancer gene research. Two grants from the Department of Defense and the American Cancer Society will bolster his research into finding out why ovarian cancer becomes resistant to conventional chemotherapy.

2013

•The Blood and Marrow Transplant program at KU Cancer Center marked a number of major milestones. A record 303 BMT patients received transplants in 2013, up 31.7 percent from 2012. The total reflected a 700 percent increase over the past six years, making the program one of the nation's 10 largest BMT programs.

•The University of Kansas Cancer Center's Cancer Control and Population Health program was awarded a new $2.7 million, five-year NCI grant. Won Choi, Ph.D., will lead the way in launching an Internet-based program to both prevent American Indian tribal college students from becoming addicted to smoking and to help current smokers quit.

•Nikki Cheng, Ph.D., was awarded a five-year RO1 grant from the NCI to investigate how ductal carcinoma in situ (DCIS) — the presence of abnormal cells inside a milk duct in the breast — can morph into full-blown invasive breast cancer, likely through CCR2 chemokine signaling.

•The KU Clinical Research Center's early-phase oncology program enrolled more than 150 patients in clinical trials since the program opened its doors two years prior.

•KU Cancer Center and the Department of Radiation Oncology earned a provisional full membership status in the Philadelphia-based Radiation Therapy Oncology Group (RTOG), funded by the National Cancer Institute.

2012

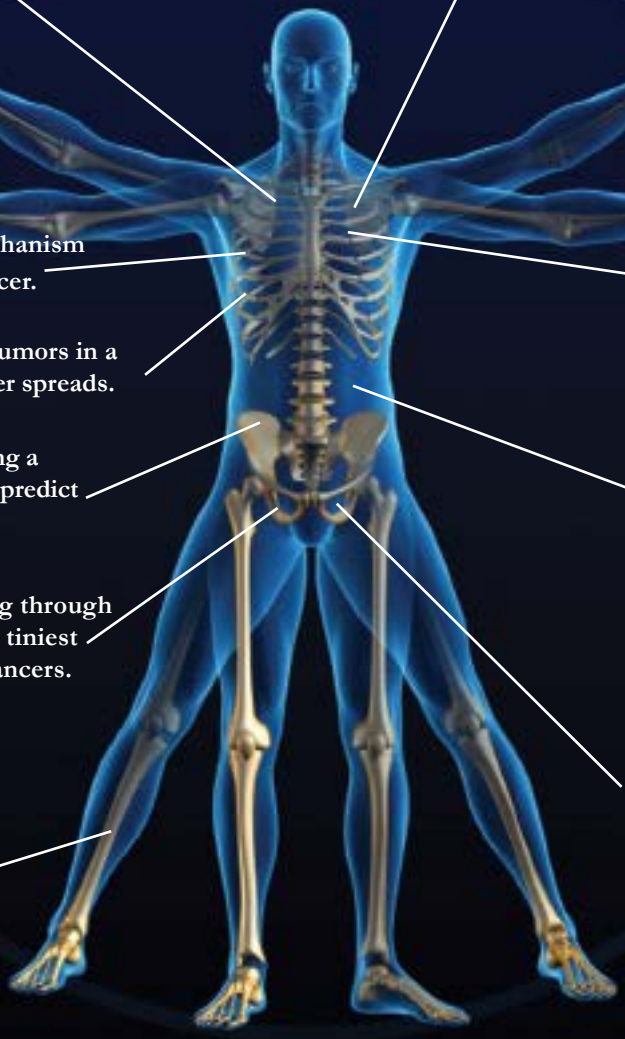
•The University of Kansas Clinical Research Center, a 82,400-square foot facility funded through the Hall Family Foundation and the Johnson Country Education Research Triangle, opened in Fairway, Kan. Patients in the region now have greatly expanded access to promising Phase I clinical trials.

•Twenty three peer reviewers from the National Cancer Institute spent a February day in Kansas City listening to scientific presentations and evaluating KU Cancer Centers's NCI grant application.

•National Cancer Advisory Board meets and recommends that KU Cancer Center's application be funded, resulting in National Cancer Institute designation in June 2012.

•NCI director Harold Varmus, M.D., visits the KU Cancer Center and delivers remarks at a packed forum, Understanding Cancer as Rare Diseases, at Stowers Institute for Medical Research.

The University of Kansas Cancer Center researchers were awarded millions of dollars in new grants to study cancers that affect the entire body. Here are some notable grants received in 2014.



Carol Fabian, M.D., is investigating whether omega-3 could help in preventing breast cancer and reducing inflammation.

Fariba Behbod, Pharm.D., Ph.D., is working to determine how and when a non-invasive type of breast cancer turns invasive.

Priyanka Sharma, M.D., is uncovering a mechanism that may drive triple-negative breast cancer.

Ed Ellerbeck, M.D., M.P.H. is studying long-term nicotine replacement therapy and how it may help COPD smokers quit.

Shrikant Anant, Ph.D., is growing "tumors in a dish" to learn more about how cancer spreads.

Devin Koestler, Ph.D., is creating a statistical model which would help predict bladder cancer recurrence.

Kristi Neufeld, Ph.D., discovered a genetic quirk that appears to impact the formation of colon tumors.

Brooke L. Fridley, Ph.D., is sorting through genomic data to determine the tiniest differences between ovarian cancers.

Jeremy Chien, Ph.D., is deciphering what makes some ovarian cancers resistant to chemo.

Tomoo Iwakuma, M.D., Ph.D., is studying the molecular causes of bone and liver cancer metastasis.

Clinical Trials

Clinical Trial Stages

Stage I

A drug is tested in a small group of people to determine safety, dosage and side effects.

Stage II

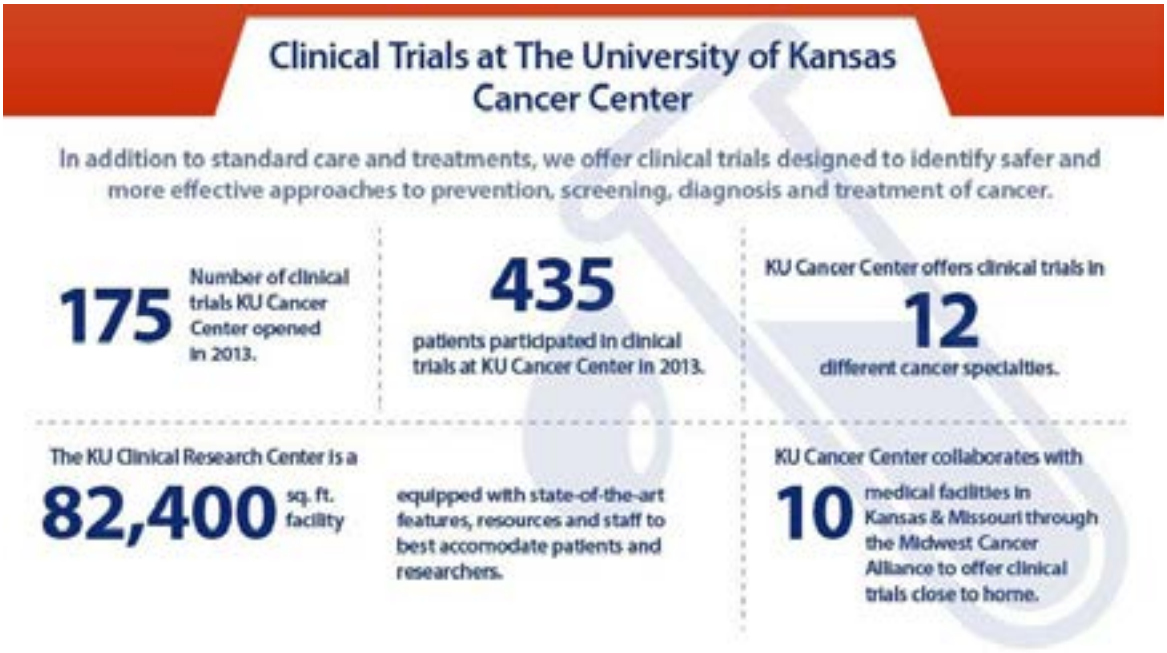
The drug is given to a larger group for further safety evaluations and effectiveness.

Stage III

The size of the group is significantly expanded to confirm drug effectiveness among a diverse population. The drug is compared to standard treatments.

Stage IV

After the drug is approved for consumer use, trials by the drug manufacturer determine more information about the drug's effectiveness compared to other treatments.



Patient Role in Clinical Trials

While the survival rate for all cancers is now almost 68 percent — a 19 percent increase since 1975 — it became the leading cause of deaths in the state of Kansas last year. As the region's only National Cancer Institute-designated cancer center, The University of Kansas Cancer Center is committed to studying new cancer therapies with the goal of improving these statistics.

One of the ways the KU Cancer Center leads our region in cancer research is through clinical trials. These trials range from discovering better courses for prevention to measuring the effectiveness of a new drug to determining how to reduce cancer deaths in certain populations.

New research not only gives hope to millions of cancer patients and their families, but can also improve the outlook for those who have yet to be diagnosed. A stage IV cancer patient enrolled in a KU Cancer Center clinical trial shared her personal story of why she got involved in cancer research.

After her fourth recurrence of stage IV endometrial cancer, Marjorie Schofield's doctor told her there were no more traditional treatment options left.

Schofield was initially diagnosed with stage IV endometrial cancer in 2008. She saw Julia A. Chapman, M.D., a KU Cancer Center gynecological oncologist, for a hysterectomy and traditional chemotherapy. She had two more recurrences before her most recent one in February, where she found out she had developed a blood disorder.

A side effect of chemotherapy is thrombocytopenia, or a low platelet count, which interferes with the ability for blood to clot and plug up damaged blood vessels. Though most people on chemo can have platelet transfusions, Schofield developed a disorder where platelet transfusions were no longer effective. And with her platelet count plummeting with each session, Dr. Chapman told her she needed to stop chemotherapy.

With the cancer coming back in her diaphragm and abdominal cavity, Schofield was told she had four to six months to live. Dr. Chapman suggested she consider enrolling in a clinical trial at the KU Cancer Center.

Schofield went home "full of gloom and doom and ready to make funeral plans" when, a few days later, she received a call from Raymond Perez, M.D., medical director of the University of Kansas Clinical Research Center and co-leader of the Drug Discovery, Delivery and Experimental Therapeutics Program at the KU Cancer Center. Dr. Perez told her she was a possible candidate for a clinical trial he was heading up.

"I said I've got nothing to lose, at least afterwards we'll know whether or not the drug works for my kind of cancer and spare some other people from trying if it doesn't," Schofield says. "And if it does work, even better."

She was also grateful she didn't have to travel hundreds of miles part of the trial. "I was so thrilled there was something here locally I could try," she said. "It's a great thing that KU is doing this so many people here in the Midwest can benefit from this new research."

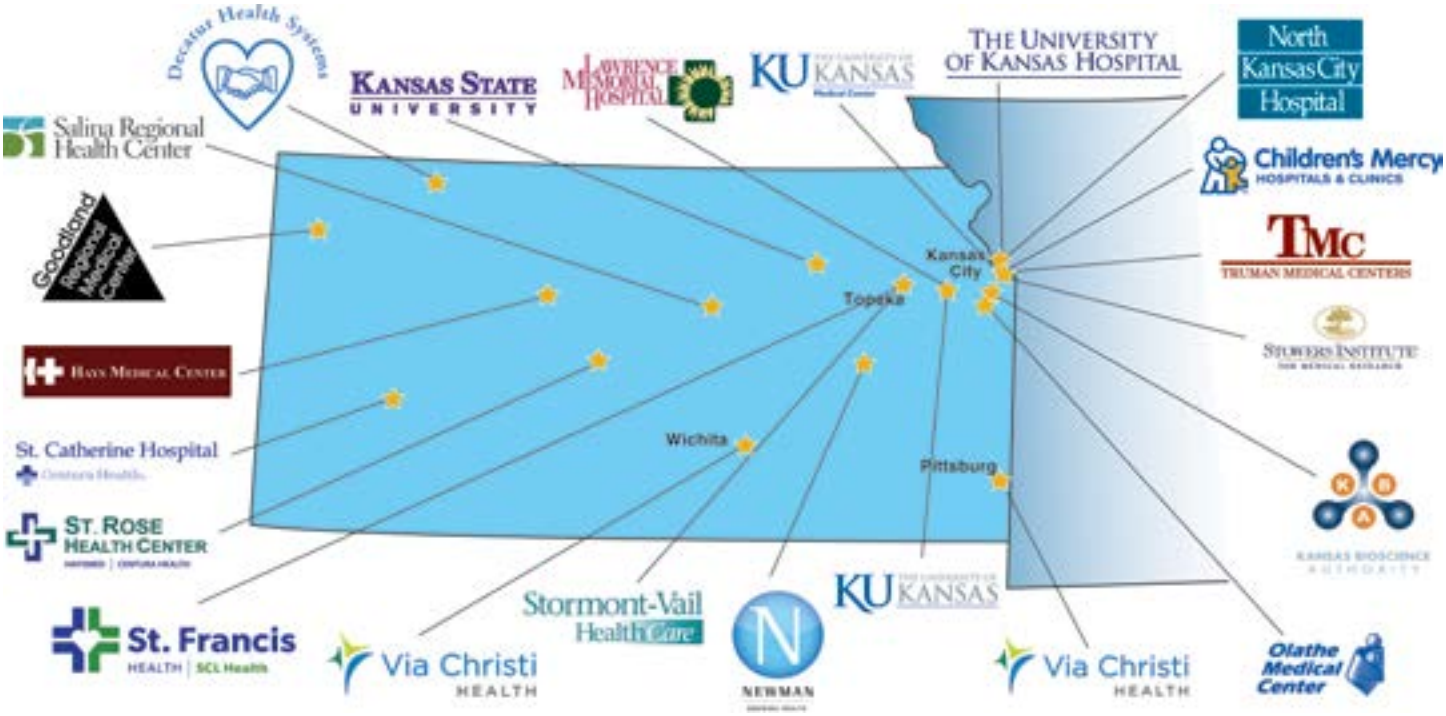
Schofield's trial is open to patients with any type of solid tumor or blood cancer so the drug she is taking could affect a wide swath of cancer patients, if proven effective. It is a phase I trial, meaning doctors are still trying to find a safe dose of the drug and how the drug affects both the cancer and the whole body.

Though it's no guarantee how effective the trial will be for Schofield, right now she said she feels better than she did on chemo and still works full-time at a publishing company. "Knowing that no one has given up on me yet can be better medicine than taking anything," she said. "It helps you think more positively. Even though they said they couldn't give me statistics or the percentage of people this medicine helped, it'll give me hope and a chance. I can help give the doctors valuable information with the time I have left."

Midwest Cancer Alliance

The Midwest Cancer Alliance (MCA) is a membership-based organization that brings together cancer research, care and support professionals to advance the quality and reach of cancer prevention, early detection, treatment, and survivorship in the Heartland.

The MCA links The University of Kansas Cancer Center research and services with member hospitals, medical professionals and their patients so that the latest cancer research and care can be found close to home.



- **Tele-Oncology:** Tele-video based system for on-site patient consultations with oncology teams at KU Cancer Center and continuing education for professionals.
- **Patient Navigation:** Assistance from trained MCA Patient Navigator in developing a customized system by which trained health professionals proactively guide patients through community health resources to get the care they need.
- **Transitions Clinic:** To address the needs of adult survivors of pediatric cancers, Children's Mercy Hospitals and KU Medical Center will work with childhood cancer survivors entering young adulthood to facilitate communication with oncologists and primary care providers to address the impact of late effects of cancer care.
- **Clinical Trials:** Information about the latest research protocols including Phase I to III therapeutic and prevention trials.
- **Biobanking:** The MCA's Biobank Coordinator assists members to procure speciments for the purpose of research.
- **Outreach Programs and Events:** Individualized prevention, screening, early detection, and survivorship programs and events co-sponsored by the MCA and member institutions.

The Road to Comprehensive Cancer Center Status

We reached a significant milestone in 2012 by achieving NCI designation, but our journey is not over. We have embarked on a goal to attain the most elite designation available to a cancer center: NCI comprehensive cancer center designation.

Achieving comprehensive designation will enable us to offer the highest level of research, prevention, treatment and survivorship available. Of more than 5,000 cancer centers in the U.S., just 68 are NCI-designated; of those, only 41 have achieved comprehensive designation.

To obtain comprehensive cancer center designation, The University of Kansas Cancer Center's research efforts must be wider, deeper and larger.

Wider

- **Physician-Scientist Recruitment:** One of our most important goals includes the recruitment of top caliber physician-scientists who focus on translational research. This research speeds the translation of laboratory discoveries into practical applications for patient care. Expanding the depth and breadth of our already impressive team will allow for more time to be devoted to the study of cancer prevention, detection and treatment.
- **Clinical Research and Early Phase Clinical Trials:** The recruitment of funded clinical investigators in medical oncology, as well as other disciplines, is necessary to create a robust clinical trials program.

Deeper

- **Population Health/Community Outreach:** The focus for comprehensive cancer center designation is to demonstrate hightly effective and wide-spanning outreach capabilities and advances in medical care with dissemination into the general population, including underserved socio-economic groups.
- **Personalized Medicine:** The field of health care is moving from the inefficient and one-size-fits-all medicine of today towards the data-driven and personalized medicine of tomorrow. Soon, diagnosis, prognosis, treatment and, more importantly, prevention will be tailored to the unique genetic information of each person. Personalized medicine aims to deliver "the right drug or treatment, at the right time, to the right patient, at the right cost."

Larger

- **Drug Discovery and Development:** A top priority is to create, reformulate and test drug efficacy for use in patients. Additionally, pilot projects in a variety of disease-specific areas like lung, blood, gastrointestinal and ovarian cancers are essential to providing the initial data needed to obtain large federal grants and National Institutes of Health funding for long-term support.
- **Tobacco Prevention and Smoking Cessation:** In the state of Kansas alone, more than 19 percent of the population uses tobacco. We know 31 percent of all cancers could be eradicated if people no longer smoked. As part of our education and prevention focus for comprehensive designation, we will focus on educating the public on the dangers of tobacco use. Overall we strive to see a minimum of a 20 percent decrease in the use of tobacco over the next 15 years.

Without the support of the state of Kansas, we would not have been successful in achieving NCI designation. On behalf of all Kansans, we greatly appreciate your support for the KU Cancer Center. Thank you for the opportunity to provide this update.