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## Quality Assurance

Stephanie Jacques  
*Kansas State University*

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# Quality assurance

Substantial discoveries at Kansas State University are sparking innovation for the private sector, economic growth in the state



A recent 40 percent increase in patents awarded to Kansas State University — and success in licensing this technology — shows the university packs a powerful one-two punch when it comes to discovery and commercialization.

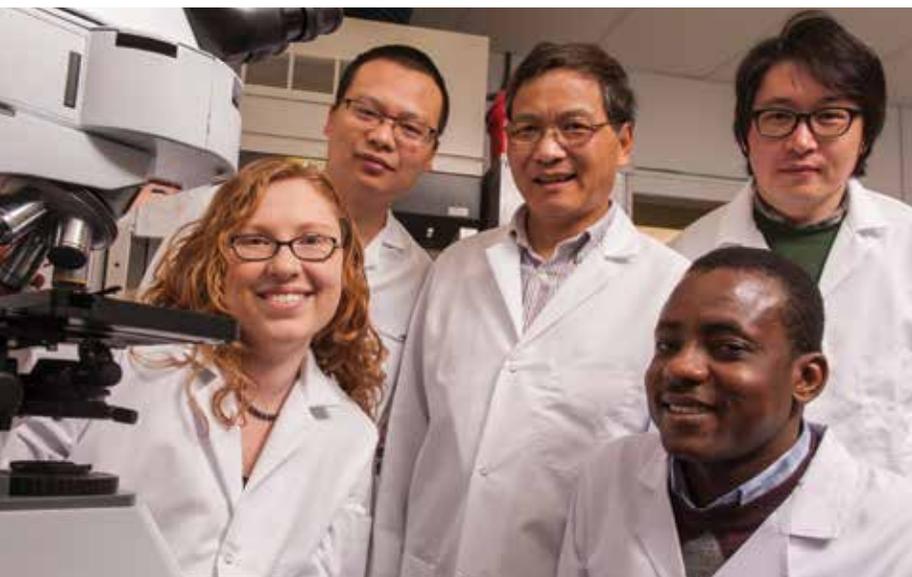
“Kansas State University is quality-focused,” said Kent Glasscock, president of the Kansas State University Institute for Commercialization. “We have an outstanding system that takes quality disclosures and converts them into meaningful partnerships with companies that take our inventions into the global marketplace.”

The Kansas State University Research Foundation and the Kansas State University Institute for Commercialization work together to help university researchers take their ideas and inventions and make them profitable. The foundation handles researcher disclosures and the patent process, and the institute works with companies to license the new technology.

According to the foundation’s records, the university averages four to six patents per year. In 2014, that number rose to 14 patents — but the actual number of patents awarded to university researchers isn’t necessarily the focus.

“Kansas State University’s increase is noticeable in regard to the number of disclosures and patents awarded, but what we also are really good at is converting the patents we generate into licenses that create revenue,” Glasscock said. “We are ranked 36th in the nation by the Association of University Technology Managers for licenses and options to license per 100 disclosures.”

The rankings place Kansas State University ahead of Harvard University,



Duke University, Pennsylvania State University, Johns Hopkins University and Purdue University, among others, in earning more revenue per licensed patent.

In fiscal year 2014, the institute generated \$2.4 million in university revenue and \$3 million in value of equity holdings. It also has created 384 jobs in the region with salaries averaging \$57,200.

As well as fostering industry growth, these successes are helping the university with its visionary plan to be a Top 50 public research university. The K-State 2025 plan includes increasing intellectual capital from research.

“K-State 2025 sets a vision in which Kansas State University is a center of innovation and research for the state, the nation and the world,” said Jim Guikema, Kansas State University Research Foundation president and associate vice president for research. “To be effective, the product of research has to have value. If you give something away freely to everyone, it has no value. If you tell a company here is something you can make money on and we can do it together, now it has value.”

Three innovations — among many — benefited from the Institute for Commercialization and Research Foundation partnership in 2014.

## New opportunities for biomedicine

Xiuzhi “Susan” Sun, university distinguished professor of grain science and bio- and agro-engineering, and Hongzhou “John” Huang, a 2012 doctoral graduate, conducted research that led to U.S. Patent No. 8,835,395, “Novel Protein Peptide Hydrogels.”

The hydrogels are formed from various combinations of short peptides — compounds created from amino acids — and may have numerous biomedical research uses. They also can be used for medical device application, such as scaffolds or artificial extracellular matrix for tissue engineering and healing wounds; cell

therapies; combining with stem cells to repair or replace organs; drug delivery; an adjuvant for vaccines; and drug and cell encapsulation.

This hydrogel patent is licensed to PepGel LLC. The company is an inventor-owned startup and was chosen by CIO Review as one of its 20 most promising biotechnology solution providers.

## Improving livestock health

Jim Drouillard, professor of animal sciences and industry; Tom Herald, food chemist and adjunct professor of grain science and industry; and Matthew Greenquist, former graduate student, conducted research that led to U.S. Patent No. 8,828,421, “Method for Encapsulation of Orally Ingested Materials to Alter the Site of Digestion, Site of Action, or Stability.”

The encapsulation is a candy-like coating — visually similar to peanut brittle — that protects vitamins and other micronutrients given to cattle and other ruminant animals from being prematurely digested by bacteria in the animal’s digestive system. Once the material bypasses the rumen and ends up in the gastric portion of the animal’s stomach, strong acids in the stomach dissolve the coating, releasing the nutrient so the animal can absorb it.

The patent is licensed to AFGRI Operations Limited, part of the South African food group AFGRI. The technology is deployed through AFGRI Animal Feeds, one of South Africa’s leading animal feed manufacturers.

## Safer pest control

Kun Yan Zhu, professor of entomology; Xin Zhang, research associate in the Division of Biology; and Jianzhen Zhang, visiting scientist from Shanxi University in China, conducted research that led to U.S. Patent 8,841,272, “Double-Stranded RNA-Based Nanoparticles for Insect Gene Silencing.”



Double-stranded RNA, or dsRNA, is a microscopic, genetics-based technology that can help safely kill mosquitos and other insect pests by using a biological process known as RNA interference, or RNAi, to destroy the genetic code of an insect in a specific DNA sequence. The technology can have great potential for safe and effective control of insect pests without harming unintended species, such as pets.

The Kansas State University Institute for Commercialization is working with several companies interested in obtaining a license to the patent.

*By Stephanie Jacques*

