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National Institutes of Health funds cancer-related research at Kansas State University

Tackling lung cancer with development of a minimally invasive treatment option is the goal of researchers from the Kansas State University Colleges of [Engineering](#) and [Veterinary Medicine](#), along with industry partner, Broncus Medical, San Jose, California.

The project, funded by a \$1,321,648 grant from the National Institutes of Health's National Cancer Institute, is expected to lead to a bronchoscopic microwave ablation system for treating lung tumors.

Punit Prakash, assistant professor of [electrical and computer engineering](#), is principal investigator for the five-year study "Bronchoscope-Guided Microwave Ablation of Early-Stage Lung Tumors," awarded under the NIH Academic-Industrial Partnerships to Translate and Validate in Vivo Cancer Imaging Systems program.

"We will develop flexible, microwave ablation devices with precise control of microwave radiation that can be delivered to lung tumors via a bronchoscope," Prakash said. "These devices will be integrated with a computerized image-guidance, navigation and treatment planning platform to guide physicians in the optimal approach for treating the targeted tumors while preserving healthy tissue."

This project will support an interdisciplinary team of faculty, postdoctoral scholars and graduate students conducting cutting-edge research on microwave technology for therapeutic applications and their translation to the clinical setting.

This grant builds upon an earlier project from 2016-17 between Broncus Medical and the electrical and computer engineering department. Technology products in that study led to novel bronchoscopic deliveries of microwave energy for treating lung tumors, resulting in patent filings by the Kansas State University [Research Foundation](#). The research foundation and the Kansas State University [Institute for Commercialization](#) are working with Broncus Medical to develop strategies to further protect and commercialize the intellectual property resulting from the previous project and this new grant.

Kansas State University researchers to study effect of starch on human health

Kansas State University researchers have received a three-year, \$450,486 grant from the U.S. Department of Agriculture to study the relationships between the digestion of starch and its effect on human health, particularly diet-

related disorders such as obesity, diabetes and cardiovascular disease.

The team includes Yong-Chen Shi, a professor of [grain science and industry](#) and project leader, who will help develop novel starch ingredients that control digestibility. Conducting human clinical studies and preparing bread for sensory evaluation will be the role of food, nutrition, dietetics and health department faculty members Sara Rosekranz, assistant professor, and Mark Haub, professor and department head.

"As a major component in cereal grain foods, starch plays an important role in controlling the structure, texture and stability of these foods, and is the most important source of food energy," Shi said. "Even so, information about the metabolic qualities of starchy foods is scarce."

Starch is thought to be the most important carbohydrate in the human diet and is present in thousands of everyday foods.

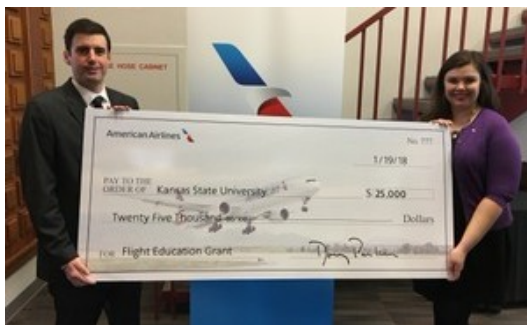
Kansas State University already has been very active in developing starch-based ingredients for functional and nutritional applications, as well as studying the structure and digestibility of starches. Shi said that researchers hope to determine the link between the structure of starch and the glycemic response in humans, or the effect that food has on blood sugar levels.

"The results generated from this study will help us design starch products with slowly digestible and resistant starch properties," Shi said. "These products may be used to formulate low- or reduced-glycemic food products."

Gaining a better understanding of the crystalline structure of starch also is important, he said.

"That will allow us to better design cereal grain foods for improved shelf life and storage stability," Shi said. "The results from the human trials will provide insight into the glucose and insulin response to products with high-resistant starch content."

The researchers have already developed a patent-pending process to make starch products with controlled digestibility, and their work on the new project could lead to more breakthrough in understanding the effects of starch on human health.



K-State Polytechnic's aviation education outreach efforts gets boost from American Airlines Flight Education Grant

Thanks to a \$25,000 grant from American Airlines, plans are taking off on the Kansas State University [Polytechnic Campus](#) to help more



K-State Open House offers visitors a chance to experience the future

Students, visitors and community members are invited to find out why adventure starts at Kansas State University. On Saturday, April 7, the Manhattan, Olathe and Polytechnic campuses will offer hands-on demonstrations, activities, learning, fun and food as

secondary students learn what it's like to be an airplane pilot.

The grant, designed to increase enrollment in K-State Polytechnic's professional pilot degree program, will fund construction of a mobile aircraft simulator lab, support short introductory flights for prospective pilot students and sponsor middle and high school student scholarships to the campus's aviation youth Discover Programs.

The mobile lab will be constructed by placing one of the campus's retired aircraft simulators into a specially designed enclosed trailer. It will then be taken to schools, county fairs and community events to give youth and prospective students a hands-on introduction to the pilot profession.

Researchers develop material to deliver targeted, lethal dose to insect pests

If pesticides are bombs intended for pests, then butterflies, bees and other species are often collateral damage.

A new material developed by K-State researchers may both eliminate off-target killings and deliver much more effective management of important stored-grain pests, disease-causing insects and other threats. A multidisciplinary team led by John Tomich, professor of [biochemistry and molecular biophysics](#), developed a nontoxic material that can deliver biomolecules that are lethal to a particular species. The material is made of peptides - combinations of amino acids - formed into tiny capsules that are harmless to the environment.

"The best way to think of it is that we have developed a carrier, and we stick active ingredients to it," Tomich said. "We could target termites, roaches, or vectors like mosquitoes, and we can go specifically for that species as opposed to using something that kills other species."

Species-specific weapons also fight pesticide resistance, a growing problem worldwide.

Tomich and his colleagues took aim at the red flour beetle and the pea aphid. The red flour beetle infests

part of the annual All-University Open House.

Open House will take place from 9 a.m. to 3 p.m. on the Manhattan campus, 9 a.m. to 2 p.m. on the Olathe, and 8 a.m. to 1 p.m. on the Polytechnic campus in Salina. This all-ages event is an opportunity to explore some of the university's 475-plus clubs and organizations and 250 majors and options.

Open House is free and no registration is required. Additional information will be available on the [K-State Open House website](#).

Patented vaccine technology offers options for cattle care

A new divisional patent issued to researchers at Kansas State University's [College of Veterinary Medicine](#) could help lead cattle producers to a path of least resistance by providing a nonantibiotic treatment option for beef cattle liver infections.

The latest work by the university's T.G. Nagaraja and M.M. Chengappa, and former College of Veterinary Medicine researchers Sanjeev Narayanan and Amit Kumar, "Composition and Methods for Detecting, Treating and Protecting Against Fusobacterium Infection" uses vaccine-based technology that circumvents antibiotic use and the potential public health concerns associated with antibiotic resistance when treating cattle and sheep for liver abscesses caused by Fusobacterium. The liver infections are a significant economic concern to the feedlot industry.

The researchers' work improves a previous patent they earned for their novel approach to preventing fusobacterial infections, said Nagaraja, university distinguished professor of microbiology in the diagnostic medicine and pathobiology department of the College of Veterinary Medicine.

"We have identified a protein and learned the mechanisms of how the protein attaches to cells, so we created compositions and methods to use the protein to prevent the attachment of Fusobacterium to the cells in the rumen - the first compartment of a cow stomach - and liver," Nagaraja said. "If bacteria do not

sotred products, particularly food grains, and the pea aphid inflicts damage on forage crops such as alfalfa and clover. The inty capsules Tomich and his team developed will make studying these species and other insects easier.

The study, "Delivery of Lethal dsRNAs in Insect Diets by Branched Amphiphilic Peptide Capsules," was published Feb. 2 in the Journal of Controlled Release.

attach to cells, they are highly unlikely to cause infection."

The new Fusobacterium patent is effective for 20 years and is administered through the Kansas State University Research Foundation.

DID YOU KNOW?

Kansas State University's Open/Alternative Textbook Initiative has saved students in excess of \$3 million dollars by offering low or no-cost options to traditional, expensive textbooks.



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