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A plan for economic prosperity in Kansas

You can plan on it: Kansas State University has launched a new strategic initiative to help people and businesses in Kansas.

The university’s Economic Prosperity Plan will add thousands of jobs and billions of dollars into the Kansas economy by leveraging K-State’s strengths in four key areas: food and agriculture systems innovation; digital agriculture and advanced analytics; biosecurity and biodefense; and extension and outreach.

“Our Economic Prosperity Plan will allow K-State to create 3,000 new jobs and $3 billion in additional investments into the state of Kansas in the next 10 years,” said David Rosowsky, vice president for research. “This new initiative will allow K-State to truly demonstrate the value that universities provide to local, state and national economies through job growth and job creation, as well as retaining and attracting talent in the state.”

The plan is a response to a request from the Kansas Board of Regents to demonstrate how Kansas institutions of higher education will add to economic prosperity in the state.

Read more about the Economic Prosperity Plan. k-state.edu/seek
A K-State-developed product called CHAMP is used in veterinary classrooms to help students learn how to handle needles and syringes properly.

Researcher develops a model market CHAMP

Veterinary students can now get a leg up on learning clinical skills thanks to a new tool envisioned by Susan Rose, clinical education technician in the Kansas State University College of Veterinary Medicine, and commercialized with help from K-State Innovation Partners.

After recognizing a need for more accurate and robust models for veterinary teaching, one of Rose’s latest models has been transformed into a product called CHAMP: Canine Venipuncture & Injection Trainer. This unique canine hind limb model was refined and produced in collaboration with REMEDY Simulation Group, a Pennsylvania-based company specializing in human/anatomical teaching models.

“CHAMP provides an opportunity for many students to learn how to handle needles and syringes properly for the first time,” Rose said. “Additionally, it gives them the opportunity to develop muscle memory and hand skills they need to use traditional syringes and needles, butterfly catheters or vacutainers for obtaining blood samples, or how to insert and secure IV catheters.”

Rose began creating models for use in K-State veterinary courses years ago. The origins of the CHAMP began in March 2018 with her development of prototype model limbs for practicing venipuncture in junior surgery lab.

REMEDY acquired the exclusive rights to two of Rose’s models and the final product was released to the market in October.

Telling the story of Black westward settlement

A Kansas State University collaborative project is bringing the history of Nicodemus, Kansas, and the Ellis Trail to life through an interactive website.

The project, “The Ellis Trail to Nicodemus: Revealing Stories in the Landscape of Black Westward Settlement,” is one of 208 humanities projects across the country to recently receive prestigious funding from the National Endowment for the Humanities.

La Barbara James Wigfall, associate professor of landscape architecture and regional & community planning, is leading the project, which also includes researchers from the College of Architecture, Planning & Design and the College of Arts and Sciences. K-State collaborators include Katie Kingery-Page, professor of landscape architecture and associate dean; Kristen Epps, associate professor of history; and Erin Wiersma, associate professor of art. The team will work closely with community partners and project consultants Angela Bates and Robert Alexander, both of the Nicodemus Historical Society.

Nicodemus is the only continuously settled African American town west of the Mississippi River and is a national historic site. The researchers will create an interactive website to describe the Ellis Trail journey that the first Nicodemus settlers took from the train by wagon and on foot to reach the townsite.
From plastic sticker to laser printer

Researchers at the Kansas State University Olathe campus are looking at replacing the plastic sticker on fresh produce with a laser-printed QR code onto the food itself. This would reduce environmental waste and improve food traceability.

Scientists in the Postharvest Physiology and Food Safety labs are testing the quality and safety of using a laser-based engraving technology to “print” on apples, cucumbers and green bell peppers.

In a matter of seconds, the laser engraves a QR code on the surface of the food. Tests are revealing if this exposed surface area affects produce freshness or is more susceptible to microbial contamination.

“The first step was determining whether a laser that’s made for metal, plastic and wood engraving could also work on fruit and vegetable surfaces,” said Manreet Bhullar, research assistant professor of horticulture and natural resources. “We then need to know whether the QR code stays readable until the end of the product’s shelf life and does not increase the chances of microbial contamination on the etched surface. If we can meet those criteria, we can move forward with the technology on commodities that make sense for it.”

While grocers use price look-up, or PLU, stickers primarily for inventory purposes, the QR codes also could better track produce throughout the food supply chain. The potential to quickly trace contaminated produce, to reduce foodborne outbreaks, and to lower large-scale disposal of uncontaminated produce during an outbreak mark critical advantages to using QR codes while protecting public health and reducing food loss, researchers said.

Sensory and Consumer Research Center researchers are evaluating the economic feasibility of the technology by looking at consumer acceptability of QR-labeled food.

“We can develop a method that’s environmentally sustainable, reduces food loss and addresses the French ban on noncompostable stickers — impacting millions of dollars in U.S. exports,” said Eleni Pliakoni, associate professor of urban food production and postharvest handling. “But if consumers don’t want to buy food with a printed QR code on it, then it’s not viable technology.”

The K-State Global Food Systems seed grant program is funding the project.

Photos above: Durga Khadka, master’s student in horticulture and natural resources, uses a laptop to create QR codes that are then etched onto fresh produce with a standing laser. Scanning the QR code with a phone displays information about when the produce was etched. Other photos show the laser-made QR code on cucumbers, red apples and green bell peppers.

Watch a video of a laser printing the QR code on produce.

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Improving vaccine stability

Researchers at Kansas State University are expanding an industry partnership to increase stability in mRNA vaccines — including those against COVID-19 — during transport and storage.

The agreement, coordinated by K-State Innovation Partners, is an exclusive license and option agreement and research collaboration with Tonix Pharmaceuticals.

Through the partnership, researchers will develop zinc nanoparticle, or ZNP, mRNA vaccines that replace the lipid nanoparticle, or LNP, technology in current COVID-19 vaccines.

“The LNP technology of current mRNA COVID-19 vaccines limits our ability to deploy these vaccines in many parts of the world,” said Robert DeLong, associate professor at the Nanotechnology Innovation Center of Kansas State. “The technology we have developed uses zinc to replace LNPs and results in more temperature stable mRNA vaccines.”

Developing new treatment options

Progress continues on a potential COVID-19 treatment based on a series of protease inhibitors developed, patented and licensed by Kansas State University.

Kyeong-Ok “KC” Chang and Yunjeong Kim, both virologists in the College of Veterinary Medicine, developed the protease inhibitors, which can help fight against coronaviruses, including SARS-CoV-2, the virus that causes COVID-19. The work is a collaboration with William Groutas at Wichita State University and Stanley Perlman at the University of Iowa.

Cocrystal Pharma Inc., a clinical-stage biotechnology company, is advancing their intranasal lead antiviral candidate, based on technology licensed by K-State Innovation Partners, with plans to begin phase 1 clinical trials in 2022.