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Patent Spotlight: Patented discoveries vanquish viruses, boost batteries, advance agriculture

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Patented discoveries vanquish viruses, boost batteries, advance agriculture

By Tiffany Roney

Kansas State University faculty and students are some of the most inventive people around. The following original methods and devices are among the patents the university earned in 2016 — with additional patents expected by year-end.

**Electrochemically-grown nanowires and uses thereof**

**Inventors:** Brent N. Hander, associate professor of physics; and Cengiz Ertem, graduate research assistant in physics.

Several biomaterials can thank K-State for a new helpful tool. These nanowires can manipulate and some characteristics of individual cells in transplant procedures. Before this tool, there were few measurements and little characterization at the single-contact cellular level. Whereas conventional scalpels and curettes are too big and bulky to remove surrounding tissue and cells for transplant procedures, this tiny device can get in close and do the job.

**Direct and sequential formation of multilayers of boron nitride and graphene on substrates**

**Inventors:** Michael R. Secret, Surflock Semiconduc- tor, Phong Tuan Nguyen, doctoral student in chemical engineering, and Vinherry, formerly of K-State.

What’s stronger than Superman? The armor may be graphene. It’s the strongest known nanomaterial, and it also has high thermal conductivity — 25 times that of silicon — and high optical transparency — 97 percent work-through — as well as a ferritic structure, meaning it can bend to each use. This invention, a new method of large-area, high-quality graphene production, will potentially detect single molecules, transform electric signals into magnetic ones, and provide hydrogels visualization templates for transmission electron microscopes.

**Composition and methods for controlling parasitic nematodes**

**Inventors:** Kyoung-Ock Chang, professor of diagnostic medicine and pathobiology; Yunjeong Kim, associate professor of diagnostic medicine and pathobiology; and William C. Groutas, Wichita State University professor of diagnostic medicine and pathobiology.

In Army barracks in the U.S. alone. Noroviruses also affect hundreds of millions of people around the world. The following original methods and devices are among the patents the university earned in 2016 — with additional patents expected by year-end.

**Battery materials**

**Inventors:** Ronald A. Rojeski, Catalyst Power Technology; Phong Tuan Nguyen, doctoral student in chemical engineering; and Steven Visko, K-State doctoral graduate.

Wouldn’t it be great if batteries could last longer and charge quicker? Thanks to K-State, there’s a new kind of battery. Rather than graphite or other carbonaceous materials, which are common anodes in current commercial batteries, this invention uses silicon rather than graphite or other carbonaceous materials. Why is this significant? Silicon is inexpensive and easy to mine, lightweight compared to graphite, and offers higher energy density, which is the amount of energy that can be stored in a battery.

**Li-ion battery anode including core-shell heterostructure of silicon coated vertically-aligned carbon nanofibers**

**Inventors:** Ronald A. Rojeski, Catalyst Power Technol- ogy Inc.; Phong Tuan Nguyen, doctoral student in chemical engineering; and Steven Visko, K-State doctoral graduate.

“KSURF and KSU-IC: Turning discovery into commercial success”

By Pat Meglares

Chris Brandt knows that in the business world, the knowledge that is created in the laboratories and classrooms of Kansas State University has value. Brandt, the president and chief executive officer of the Kansas State University Research Foundation, or KSURF, leads a team that makes sure researchers and faculty get credit for their discoveries.

“KSURF provides oversight to ensure faculty and university rights are protected.” — Chris Brandt

KSURF and KSU-IC help spur marketing and economic development that can get the faculty member’s discovery more quickly into the channels where it benefits people.

“Once intellectual property is protected, the Kansas State University Institute for Commercialization, known as KSU-IC, works with the research foundation to connect faculty with potential industry partners that have an interest in licensing the protected intellectual property.”

Kent Glassock, president and chief executive officer of the KSU-IC, said interactions with industry partners can lead to other benefits for universities.

“New corporate relationships can often result in sponsored research opportunities, either to further the development of the marketed technology, or in completely new areas of interest to our industry partners,” he said.

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More information on how the Kansas State University Research Foundation and Kansas State University Institute for Commercialization help university faculty is available at k-state.edu/tech.transfer.