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Cleveland—The Case-Coulter Translational Research Partnership has announced more than $1 million in funding and support for the 2015 cycle. This includes six full biomedical engineering projects, from an affordable and easy method to screen for Barrett’s esophagus, to synthetic life-saving blood platelets, to a technology that reduces pain after joint-replacement surgery.

The 9-year-old program, a partnership between Case Western Reserve University and the Wallace H. Coulter Foundation, invests more than $1 million a year in direct funding and support services to help research teams from Case Western Reserve advance products from the laboratory to the marketplace, where they can be available to improve patient care.

“For nearly 10 years, the Case-Coulter Translational Research Partnership has provided unique direct resources for successfully moving concepts toward becoming products, and has enriched the culture of the Biomedical Engineering Department and the entire university through faculty education and support for the translational process,” said Robert Kirsch, PhD, professor and chairman of the university’s Department of Biomedical Engineering.

Funding for full projects can range from $50,000 to $200,000 per year. Smaller pilot grants are available as well. The money goes toward preparing projects for commercialization, such as demonstrating technical feasibility, and gauging their market feasibility and industry interest.

The Case-Coulter oversight committee received 32 proposals this program year.

“We are fortunate to be in an environment at Case Western Reserve where having to narrow the possibilities to these six projects was an incredibly difficult task,” said Stephen D. Fening, PhD, director of the Case-Coulter Translational Research Partnership. Projects must have the potential to leave the university within 12 to 30 months and be led by an engineer-clinician team.

The technologies and researchers

**Screening system for Barrett’s esophagus (Amitabh Chak, MD; Sanford Markowitz, MD, PhD; Joseph Willis, MD)**

Barrett’s esophagus, a complication of chronic acid reflux, is diagnosed when patients with heartburn undergo upper endoscopy with biopsy. Endoscopy is expensive, time-consuming and uncomfortable. This novel technology allows caregivers to more regularly follow at-risk patients to either prevent or detect early cancer of the esophagus. The new method uses a laboratory DNA test performed on material obtained from a tethered sampling capsule, which is far less expensive than endoscopy, less invasive and can be performed in minutes.

**Direct current nerve block (Niloy Bhadra, PhD; Kevin Kilgore, PhD; Elias Vezi, MD, PhD)**

This technology proposes to use direct current nerve block, using temporary, removable electrodes passed through the skin to decrease pain following surgical procedures, especially after joint-replacement surgery. The technology could also be used to reduce peripheral pain from other sources, such as cancer, and to reduce muscle spasms and spasticity after stroke and spinal cord injury.

**CorCalDx: dual energy X-ray coronary calcium scoring (David Wilson, PhD; Robert Gilkeson, MD)**

This game-changing software enables fast and high throughput detection of coronary calcium using the commonly ordered dual-energy chest X-ray exams. An excellent biomarker for coronary artery disease, coronary calcium scoring has long been assessed using expensive computed tomography. As the chest X-ray is the most common medical imaging procedure by far, CorCalDx will help radiologists screen for coronary calcium and identify coronary artery disease risk with little or no additional cost or radiation.

**SynthoPlate: synthetic platelets (Antiran Sen Gupta, PhD; Vikram Kashyap, MD)**

Platelets are blood cells that help form clots to stop bleeding. With severe bleeding injuries, natural platelets derived from donor blood are transfused to stop bleeding faster and stabilize the patient. However, platelets have limited availability, high risk for bacterial contamination in storage and a short shelf life of three to five days. SynthoPlate stops bleeding in a way similar to natural platelets, while providing advantages of large-scale manufacture, low contamination, portability and long shelf-life.

**HemeChip: point-of-care diagnosis of Sickle Cell Disease (Umut Gurkan, MD; Jane Little, MD; Connie Piccone, MD)**

Half to 80 percent of babies born with Sickle Cell Disease (SCD) in countries with limited resources die before age 5, due to lack of diagnosis. The World Health Organization estimates at least 70 percent of those deaths could be preventable with simple, cost-efficient approaches, such as newborn screening, followed by standard treatment and care. HemeChip technology promises to break the diagnostic barrier by providing an affordable, easy-to-use, point-of-care method for newborn screening of SCD and other hemoglobin disorders.

**NeuroRadVision (Pallavi Tiwari, PhD; Lisa Rogers, DO; Anant Madabhushi, PhD)**

NeuroRadVision promises to solve one of the most challenging problems in the management of brain tumors: distinguishing benign radiation induced effects from recurrent brain tumors after radiation treatment. Currently, invasive biopsy offers the only reliable diagnosis, since benign radiation effects and tumor recurrence have a similar appearance on follow-up MRI. This decision support technology leverages advanced image analysis techniques to discriminate recurrent brain tumors from benign radiation effects on MRI to obviate unnecessary biopsy.

The Translational Research Partnership between Case Western Reserve and the Coulter Foundation fosters collaborations among clinicians and biomedical engineering faculty on translational research projects with the potential to impact patient care.

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The partnership has funded more than $6 million in Case Western Reserve research projects since 2006, leading to more than $40 million in follow-up investment. The partnership
provides $700,000 in capital for projects annually—a vital step in moving research from lab to real-life applications. Projects are vetted by an external oversight committee of
expert advisors from the startup community, biomedical industry and clinicians.

“In our current environment,” said Michael Haag, executive director of technology management for the university’s Technology Transfer Office, “early-stage capital at this
funding level is very difficult to find but critical to a successful commercial translation.”