

Case Western Reserve University gets \$4 million to make 'smart nanoparticles'

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The School of Medicine received \$4 million in funding from the State of Ohio's Third Frontier Initiative for Targeted Nanoparticles for Imaging and Therapeutics (TNIP), which will support the development and commercialization of sub-atomic particles for the early detection of breast cancers and new therapies for hemophilia. Case Western Reserve University will work in collaboration with local companies Cleveland NanoCrystals, Copernicus Therapeutics, Inc., iMedd, Inc., and Ricera Biosciences, Inc. Principal investigator for TNIP is Pamela B. Davis, M.D., Ph.D., professor of pediatrics and senior associate dean for research at the School of Medicine.

Davis said the plan is to create smart nanoparticles that can accomplish several things:

- Light up on imaging only at sites of disease,
- Deliver photoactivated molecules to cancerous lesions so as to kill the tumors, not the healthy tissue around them,
- Deliver payloads of corrective genes to treat genetic disorders, and payloads of inhibitory nucleic acids to suppress viral infections or cancers,
- Deliver effective drugs that are otherwise too toxic or too insoluble to be used in humans.

"There is a full plan to develop not only the science but also to bring the drugs to market so that people can have access to them and benefit," said Davis. "Diseases that are targeted are hemophilia, viral infections, and

cancer."

The grant was announced by Ohio's Lt. Gov. Bruce Johnson as part of a \$75 million grant package handed out throughout the state. More than half the funding will go to Northeast Ohio.

In addition to the nanoparticles grant, the Cleveland Clinic Foundation, Case Western Reserve University and collaborating businesses received two grants for the creation of the Atrial Fibrillation Innovation Center. A Wright Center of Innovation (WCI) grant, worth \$15 million, and a Biomedical Research and Technology Transfer Partnership Program (BRTT), worth \$8 million, will enable the center to develop both surgical and non-invasive treatments to prevent and cure dangerous electrical disturbances of the heart that dramatically increase the risk of stroke and death. Other Ohio partners include the University of Cincinnati and AtriCure, Inc. in Cincinnati, which provides doctors with alternative, more effective surgical technologies.

The Cleveland Clinic and Case also will partner with Wright State University in Dayton to use a \$6 million BRTT grant for the AMD Initiative for Prevention and Cure. The AMD project will develop a diagnostic test to identify individuals at risk for Adult Macular Degeneration and to develop techniques for the early diagnosis and treatment of the disease.

Additionally, the Cleveland Clinic Foundation and Case will join collaborators across Ohio and the nation to use a \$4 million BRTT grant to create the Clinical Tissue Engineering Center (CTEC), which will create new therapies for the repair and regeneration of bone, cartilage, tendon and skin. Target diseases include osteoarthritis, fracture care, osteoporosis, traumatic or degenerative tendon rupture, and acute and chronic soft tissue wounds.

Johnson said that the grants will help accelerate the commercialization of new products and strengthen Ohio's role in the knowledge economy.

"Through the Third Frontier Project, we are reclaiming Ohio's culture of innovation," said Johnson, who also serves as director of the Department of Development and chair of the Third Frontier Commission. "These grants build upon Ohio's research strengths and focus on the development of new products in order to strengthen our economy and create good jobs."

Other grants include: In collaboration with The Ohio State University Research Foundation and others, the Cleveland Clinic Foundation is receiving a BRTT grant of \$4.25 million for a Commercialization Platform of Immunotherapeutics for Multiple Sclerosis, which will develop and commercialize new therapies involving the body's immune system to delay and control the onset of multiple sclerosis.

Goodyear Tire & Rubber Co., Kent State University, the Sherwin-Williams Co., the Timken Co., the University of Akron, and various other state and national collaborators will work with the Ohio State University to develop the Center Ohio Center for Multifunctional Polymer Nanomaterials and Devices (CMPND). The \$22.5 million WCI grant will provide for the acquisition of highly advanced equipment to develop new materials that will improve the strength and durability of components that will be part of automobiles and other manufactured products. CMPND will include a broad-based research, business and outreach program centered at OSU with regional sites at the University of Akron and the University of Dayton and more than 50 company collaborators across Ohio. The project will also have support from the Ohio Polymer Strategy Council.

The Wright Centers of Innovation support large-scale world-class research and technology development platforms designed to accelerate the pace of new product development in Ohio. Wright Centers are

characterized by collaboration among Ohio's higher education institutions, non-profit research organizations and Ohio companies in the areas of advanced materials, bioscience, power and propulsion, information technology and instruments, controls and electronics. The proposals are independently reviewed by the National Academy of Sciences and selected by the Third Frontier Commission.

One additional WCI recipient was OSU's College of Food, Agricultural and Environmental Sciences and its business collaborators who will receive a \$11.6 million grant for the creation of the Ohio BioProducts Center. The Center will develop chemical conversion technologies to produce products such as lubricants and adhesive from raw materials grown in Ohio, including corn and soybeans, giving Ohio farmers a new market for their goods.

"The Ohio BioProducts Innovation Center is a perfect example of how the Third Frontier can benefit Ohio's First Frontier, agriculture," said Johnson. "High tech advances in polymers have the potential for opening up new markets for Ohio-grown products."

The BRTT Program supports biomedical and biotechnology research intended to lead to job creation and improvements in the health of Ohioans. Awarded projects are collaborations among Ohio higher education institutions, non-profit research organizations and Ohio companies in the areas of human genetics and genomics, structural biology, biomedical engineering, computational biology, plant biology and environmental biology. Like the Wright Center awards, they are reviewed by the National Academy of Sciences and selected by the Third Frontier Commission.

A 10-year, \$1.1 billion initiative, the Ohio Third Frontier Project is the state's largest-ever commitment to expand Ohio's high-tech research capabilities and promote start-up companies to create high-paying jobs

for generations to come.

Source: Case Western Reserve University

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