

UTMB researchers to be honored at 'Oscars of invention'

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Two University of Texas Medical Branch at Galveston (UTMB) researchers who pioneered the development of an artificial immune system that mimics that of the human body and will allow researchers to speed the development of vaccines are being honored tonight at a showcase known as “the Oscars of invention” held at Chicago’s Navy Pier.

Anesthesiology associate professor Joaquin Cortiella and microbiology and immunology associate professor Joan Nichols are being recognized at R&D Magazine’s 45th Annual R&D 100 Awards for their role in creating an “immune system in a bottle” — a test-tube version of the human immune system that will enable biomedical scientists to quickly and cheaply screen large numbers of prospective vaccines and therapeutic compounds.

The technology, which the magazine said could potentially save “hundreds of millions of dollars in misdirected R&D and lost opportunity costs,” derives from a project funded by the Defense Advanced Research Projects Agency (DARPA) that originally involved more than 60 scientists and engineers at institutions across the country. It’s now under product development by VaxDesign Corp. of Orlando, Fla., which also is being honored at the event along with UTMB and its academic partners in the final stages of the project: Virginia Commonwealth University, Mount Sinai School of Medicine, MIT and the Scripps Research Institute.

“This award means a lot to us — it's recognition that our scientific efforts and those of our collaborators led to a product that will have a big impact on the way we develop vaccines in the future,” Nichols said.

“This is the one of the most innovative things to be brought to the development of vaccines and therapeutics in years, a system based on the human response to disease that allows us to test new vaccines, to evaluate failed vaccines and fix them, to test adjuvants — substances that enhance the body’s response to vaccines — and to do these things in a way that lets us look at the responses of a wide variety of individuals with a wide variety of genetic backgrounds.”

At the heart of the device, Nichols and Cortiella said, is an artificial matrix patterned after the porous structure of human bone marrow. In a human being, bone marrow nurtures the white blood cells that fight infection. The artificial immune system mimics this by providing nutrients and special mixtures of proteins and growth factors that transform stem cells into different specific immune cell types.

Nichols and Cortiella performed their experimental work in small individual "bioreactors" developed by NASA for microgravity studies. But when VaxDesign brings what it calls the MIMIC (Model Immune In vitro Construct) technology to market in the next few years, the system is expected to be fully automated and able to evaluate thousands of different vaccine and therapeutic products per week.

“The R&D 100 award is really a recognition of all the people who worked on this project, from engineers to biochemists to chemists to stem-cell biologists to infectious-disease people,” Cortiella said. “Five years ago we started out with a general concept and then over time narrowed down to a very specific idea, and finally developed a marketable product. It didn’t just come from any one individual or idea, and it’s really a testament to the exciting things you can do when you bring together many people from multiple fields to work on one thing.”

Source: University of Texas

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