

Start-up looks to turn 'lights out' on flu, other viruses

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Imagine if killing flu viruses and other microbes were as simple as turning on a light. Exposing a unique surface coating to light may in fact hold the key to protecting you from virtually all viruses and bacteria, including the feared avian flu.

Laboratory testing of a novel, permanent nano-coating, developed in collaboration by researchers at North Carolina State University College of Textiles and Emory University School of Medicine, has been shown to kill or inactivate most viruses and bacteria when exposed to visible light. Early tests have shown that the coating kills 99.9 percent of influenza viruses and 99.99 percent of vaccinia virus, which causes rash, fever, head and body aches.

The coating technology was developed by Dr. Stephen Michielsen, associate professor in NC State's College of Textiles, and Drs. Igor Stojiljkovic and Gordon Churchward, associate professors at Emory University's School of Medicine in Atlanta.

NC State has applied for a patent on the invention, which has been licensed to Research Triangle Park-based start-up LaamScience, Inc. The company – whose name stands for Light Activated Anti Microbials – has raised more than \$400,000 in seed financing from North Carolina angel investors that will enable it to optimize the coating and begin developing product prototypes.

Prototypes will be used in performance trials targeting hospital areas

including waiting rooms. The company is also developing a room air purifier that incorporates its nano-coated filter technology. Other potential application areas include anti-viral filter systems for airplanes and businesses, as well as for a variety of uses for first responders and the military, including anti-viral masks. Perhaps equally important, the invention may be used to make everyday objects resistant to viruses and bacteria in the presence of light.

"We have many exciting opportunities to use these proprietary coatings to stop infection before it causes disease and death," says Tom Roberg, chief executive officer of LaamScience. "The technology developed at NC State and Emory University provides a huge opportunity to impact the health and welfare of people throughout the world."

The invention grew out of Michielsen's research into nanotechnology and its use to modify the surface of polymers and fibers. The thin coating is a type of dye that can be applied to the surface of all types of fabrics and materials. When exposed to light, the coating acts as a photo catalyst, sparking a chemical reaction with air and killing most viral and bacterial microbes.

"In the presence of light, a specific reaction takes place on the surface that makes the air poisonous to the microbes, yet harmless to people," Michielsen says. "The coating doesn't wear out and continually regenerates so it's able to continue killing viruses again and again."

Michielsen presented the results of his coating research last fall as part of the Achieve More Field Day series, which is organized by the NC State's Office of Extension, Engagement and Economic Development. The Achieve More Field Day invites industry executives, venture capitalists and science and technology entrepreneurs to campus to learn more about NC State's research, resources and partnership opportunities. Roberg heard Michielsen's presentation and approached him and the

university about licensing, patenting, and commercializing the coating technology.

"This is an outstanding example of how quickly breakthrough research results can be brought to market when the right conditions are present," said Dr. A. Blanton Godfrey, dean of the College of Textiles. "NC State's continuing focus on economic development coupled with our traditional land-grant mission creates the right atmosphere for bringing leading researchers together with entrepreneurs. The potential economic benefit to the Triangle area and state is only overshadowed by the potential benefit to the health of our and the world's population."

LaamScience's headquarters and laboratory are in the Becton Dickinson Technologies' incubator space in Research Triangle Park, where the company will develop the coating technology for commercial uses.

"The potential uses for this technology are unlimited," says Dr. Patrick Mize, LaamScience's chief science officer. "These are applications that can change the world."

Source: North Carolina State University

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