Originally Designed with Developing Countries in Mind: Croyle Lab Develops Innovative Vaccine Delivery Method

The Croyle Laboratory’s oral platform preserves live viruses, bacteria, antibodies, and enzymes without refrigeration and may transform vaccine distribution across the globe

AUSTIN, Texas — The Croyle Laboratory at The University of Texas at Austin College of Pharmacy recently published findings that may greatly increase access to vaccines on an international scale. Researchers in the lab of Division of Molecular Pharmaceutics and Drug Delivery professor Maria A. Croyle, R.Ph., Ph.D. released a research paper describing a peelable lightweight film that stabilizes biologics, is inexpensive, and withstands extreme temperature changes. The technology has already demonstrated proof of concept for model Ebola and H1N1 vaccines, and may prove an effective method of delivery for future treatments, such as for coronavirus (COVID-19).

“It is essentially a plug and play platform,” says Croyle. “Once we know the specific qualities of a vaccine candidate, we can adapt the film’s components to meet those requirements; suspending and sealing it within the film matrix in a way that allows it to withstand extreme temperature changes and release the vaccine components in a precise and controlled manner.”

As researchers develop vaccines and biologic treatments for deadly diseases, a second challenge comes in distributing those treatments to remote, developing, and low-income areas around the world. More than half of the leading causes of death in low-income countries were the result of infectious disease, while costs associated with storage and shipping vaccines and biological drugs make up 40% of the cost of drugs in the Western world.

The research team published its findings in “Novel technology for storage and distribution of live vaccines and other biological medicines at ambient temperature” in the journal Science Advances. The research authors include Irnela Bajrovic, a doctoral candidate in the College of Pharmacy’s Division of Molecular Pharmaceutics and Drug Delivery, Stephen C. Schafer from the College of Pharmacy’s Division of Molecular Pharmaceutics and Drug Delivery, Dwight K. Romanovicz from Institute for Cellular and Molecular Biology in the College of Natural Sciences, and Dr. Croyle.

“According to the World Health Organization, more than 1.5 million people continue to die annually from vaccine preventable diseases. I felt this was unacceptable,” says Bajrovic. “The
potential to work on a project that could effectively eliminate the cold-chain and make vaccines more readily accessible to the developing world was the opportunity of a lifetime.”

Croyle’s film is not only inexpensive, but nearly one thousandth the size of traditional vaccine vials and requires no refrigeration chain throughout the delivery and administration process. The technology could significantly increase the survival rates for existing preventable diseases and drastically reduce the timetable and cost to combat newly-emerging diseases before they spread worldwide.

The film technology developed in the Croyle Laboratory was licensed to a new startup company based in Chapel Hill, North Carolina. Early investors include the founders of Asklepios BioPharmaceutical, Inc. (AskBio). The company was established to develop the film technology for applications in stabilizing biological therapeutics, such as vaccines, anti-infective and chemotherapeutic agents, and gene therapy products.

“We are excited to partner with AskBio to develop Maria’s platform technology,” says Erin Overstreet, Director of Licensing in UT’s Office of Technology Commercialization. “We believe the technology is poised to help patients with rare diseases, with the potential to help many other patients as well, and look forward to seeing Maria’s technology benefit the public.”

Research in the Croyle Laboratory focuses on the development of novel technology to stabilize and deliver biological medicines in a safe and effective manner and understand the impact they have on human health and disease. Some of the viruses it studies include influenza, adenoviruses, adeno-associated viruses and lentiviruses. Dr. Croyle is also the Glaxo Wellcome Endowed Professor of Pharmaceutics and recipient of one of the first Johnson & Johnson JLABS Quickfire challenges.

For more information, please contact:
Nick Nobel
College of Pharmacy
(512) 232-1769
nobel@utexas.edu

###