New delivery method could transform vaccine distribution to remote, developing areas

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A peelable, lightweight film, developed by UT Austin professor Maria Croyle, can preserve live viruses, bacteria and antibodies without refrigeration. Credit: The University of Texas at Austin

Access to vaccines around the world could get easier thanks to scientists in the College of Pharmacy at The University of Texas at Austin who have developed an inexpensive and innovative vaccine delivery method that preserves live viruses, bacteria, antibodies and enzymes without refrigeration.

Maria A. Croyle and her research team in the lab of the Division of Molecular Pharmaceutics and Drug Delivery at UT Austin have released a research paper describing a peelable lightweight film that stabilizes biologics and withstands extreme temperature changes. The technology has already demonstrated proof of concept for model Ebola and H1N1 vaccines, and it may prove to be an effective method of delivery for future treatments of pathogens such as the coronavirus that causes COVID-19.

"It is essentially a plug and play platform," said Croyle, who is the Glaxo Wellcome Endowed Professor of Pharmaceutics at UT. "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."

The research team published its findings in the journal *Science Advances*.

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.

Croyle's film is not only inexpensive, but nearly one-thousandth the size of traditional vaccine vials and requires no refrigeration 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 emerging diseases before they spread worldwide.

The film technology developed by Croyle has been 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," said Erin Overstreet, director of licensing in UT Austin'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 the technology benefit the public."

More information: Irnela Bajrovic et al. Novel technology for storage and distribution of live vaccines and other biological medicines at ambient temperature, *Science Advances* (2020). DOI: 10.1126/sciadv.aau4819

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