# BSAC researchers develop next-gen coating for COVID-19 vaccines

Version 4

Published 3/15/2021 by Lena Tang Last updated 1/11/2022 2:17 PM by Anonymous

# Product to preserve medical content through storage, transportation

**Feb. 17, 2021**

A team of Seneca researchers is working to develop a next-generation coating to protect sensitive medicines and some of the emerging COVID-19 vaccines.

Led by investigators at the School of Biological Sciences & Applied Chemistry, the applied research project is a collaboration with Toronto-based Spectral Materials to create thermal barriers that protect vaccines in storage or during transport.

“The end product will help insulate the vaccines from temperature extremes and reduce the susceptibility to sudden heat or freeze shocks,” said Professor Barkev Keoshkerian, a chemistry researcher and one of the project’s three co-investigators. “The idea is to preserve the medical content during the last mile, from refrigerator to the patient.”

Currently, vaccines are not bottled in insulated containers or packages. The World Health Organization estimates about 50 per cent of vaccines are wasted globally and as much as 70 per cent in developing regions.

“The current packaging is not insulated for thermal shocks,” said Alice Yang, Co-Founder and Chief Science Officer of VivaVax, the parent company of Spectral Materials. “All of the pharmaceutical companies are competing to innovate the COVID-19 vaccines, leaving no effort in glass vial or packaging innovation. Because COVID-19 vaccines have to be frozen or refrigerated during the entire storage time, there are additional challenges during transportation.”

With funding from the Natural Sciences and Engineering Research Council of Canada and the Ontario Centre of Innovation, the Seneca project team investigated techniques to develop a transparent coating that improved thermal properties.

Using a type of polyester nanoparticles, Mr. Keoshkerian found an innovative way to freeze the tiny particles to create a synthetic gel coating for the outside of the vial.

Mr. Keoshkerian is working with two co-investigators, Dr. Frank Merante and Dr. Hla Wynn, to complete the project, supported by four research assistants: Jasmin Khan, Meng-Chen Lee, Ishani Maharaj and Carmen Mei who are recent graduates of the School of Biological Sciences & Applied Chemistry.

The team is now working at the Seneca Centre for Innovation in Life Sciences to test the innovative coating's insulation power.

"We are testing the claim that vaccines will be protected, and we are validating the different types of vaccines," Dr. Merante said. "This is imperative for the many vaccines that are very sensitive to warmth."

While the final coating will be virtually unnoticeable, it will extend the time that the contents are protected from warmer temperatures and maintain vaccine efficacy.

"You will now have that extra measure of protection," Dr. Merante said.

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