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New nano coating could preserve vaccines and save millions of lives

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(Medical Xpress)—The delivery and storage of vaccines poses a big challenge for public health officials in remote locations and the developing world. Most vaccines are stable below or around room-temperature, but they degrade over time if not refrigerated.

This challenge often leads to wastage and leaves vulnerable patients without the life-saving treatments they need. Estimates suggest that more than 1.5 million children under five die every year from vaccine -preventable diseases, including rotavirus, measles, tetanus, meningococcal disease and whopping cough. Costs for the transportation and storage of vaccines are also very high – recent reports suggest these can run to as much as $200 million a year.

Now, for the first time, scientists at Bath are working on developing a 'nano-coating' that would protect a vaccine from its environment both in transit and for storage. Using the latest chemistry advances, researchers hope to show how nano-silica can be grown around individual vaccine molecules, enabling a vaccine to be taken anywhere in the world without refrigeration.

This technique would produce a lightweight, easy-to-transport, solid material packed with vaccine. Once doctors were ready to administer the vaccine substance, the protective coating could be broken using either chemical or physical methods, such as acid or microwaves.

Silica expert in the Department of Chemistry, Dr Asel Sartbaeva, was

recently short-listed for the prestigious L'OREAL – UNESCO Women in Science Fellowship for her work on this subject.

She said: "I am excited that my knowledge of silica can be used to help solve such a complex issue as "cold chain" – our dependence of constant vaccine refrigeration - which leads currently to a large waste of vaccines and threatens vaccination programmes worldwide.

"Once we can show that silica is the right material for vaccine preservation and storage, it will help save millions of lives and I am hopeful it will help us eradicate many vaccine-preventable diseases."

Provided by University of Bath

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