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Zombie virus research could make vaccines last longer, be more available, save billions of dollars

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Researchers at Portland State University (PSU) have found a way to preserve viruses in a glassy, dissolvable substance – a technique that could extend the shelf life of vaccines and allow for storage at room temperatures.

The discovery by PSU biology professor Ken Stedman and graduate student James Laidler shows that viruses – which form the basis of many vaccines – can be covered with a silicate coating that keeps them in a state of suspended animation. The coating harmlessly melts away when it's ingested by or injected into a living host. Stedman nicknamed the process "zombification" because the "undead" viruses come back to life once the coating has been removed.

Vaccines are often extremely fragile and will spoil quickly if they're not stored at cold temperatures. Up to 50 percent of vaccines spoil due to inadequate refrigeration during transport. The new preservation technique could drastically reduce spoilage and allow for easier, more inexpensive transport and storage within the developing world.

"It's really hard to put a fridge on the back of a donkey," Stedman said. "This process has the potential to stabilize vaccines so that they can get to more places and more people more often. Six million people per year – mostly children – die from diseases that could be helped with vaccination." The process could save the pharmaceutical companies that

make vaccines about $2.3 billion per year by cutting product losses, Stedman added. It would also reduce the cost of shipping and encourage the development of new markets.

Stedman and Laidler discovered "zombie" viruses while taking samples from bubbling hot springs in the American West. Silica from the hot springs protected the viruses from drying out, and allowed them to stay viable outside their natural environment. Their study, which was recently published in the *Journal of Virology*, was partially funded by NASA because the survivability of the viruses could give clues to the origins of life on earth and the possibility of life on other planets, Stedman said. He estimates another five to 10 years of research will be required before the technique can go into widespread use.

Provided by Portland State University