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New vaccine delivery may be more effective against measles

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Worldwide, there are estimated to be 10 million cases of measles and 197,000 deaths from the disease each year. While vaccines exist to protect children against measles, the vaccines are often difficult to store, costly to transport and may be prone to contamination when shipped to developing countries. Research to be presented at the 2009 American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition will reveal new methods for delivering measles vaccines that could potentially reduce costs and improve safety.

"Vaccination has become controversial in some international communities which believe vaccines might be hazardous," said Robert Sievers, Ph.D., from the University of Colorado and one of the study's principal investigators. "However, in many parts of the world, the disease itself is a serious hazard, killing hundreds of thousands of children each year."

While a liquid vaccine using a hypodermic needle is presently the only way to prevent the disease, Dr. Sievers' study shows promise for a new method that allows the patient to inhale a finely-powdered. In order to produce the inhalant, the weakened measles virus must be mixed with high-pressure carbon dioxide to produce microscopic bubbles and droplets, which are then gently dried to produce an inhalable powder. The powder is then puffed into a small inhaler-like device and administered. The aerosol vaccine was shown effective in test animals, and human trials are expected to begin next year in India, where more than half of the world's measles cases occur.

Researchers from Aridis Pharmaceuticals also have been working to develop a room temperature stable measles formulation that can be easily inhaled using cost-effective dry-powder inhalers in collaboration with the non-profit foundation PATH. According to Satoshi Ohtake, Ph.D., from Aridis and the study's principal investigator, "There is a need for technologies that could stabilize the measles vaccine, as this would facilitate mass vaccination in developing world countries where transport, storage, administration costs and other complexities have limited vaccine coverage by 70 percent."

Dr. Ohtake's study used a combination of mild spray drying process conditions and unique stabilizers to produce stable dry powders with excellent preservation of vaccine activity. The potency of the dried vaccine was then tested while being stored at different temperatures over several week-long periods. The results found that the dry-powdered aerosol was stable for at least eight weeks at 37°C, surpassing the World Health Organization requirement for heat stability of one week at similar storage conditions.

"This study offers hope for developing countries that desperately need more stable and efficient vaccination methods," says Dr. Ohtake. "This new method could potentially offer safer, more affordable and effective treatments to patients that need them the most."

Source: American Association of Pharmaceutical Scientists