

Vaccines for Global Health

Single-dose vaccine for multiple respiratory viruses could save lives of infants and children in developing countries

Worldwide, more than five million children under age five die each year from respiratory infections like influenza and pneumonia. Nearly all of them live in the developing world.

Vaccines could save many of these young lives. But today's vaccines cost too much to be given routinely in many developing countries. It's not only the cost of the vaccine itself, but also the expense of getting the vaccines to people who need them most. On top of that, most vaccines need to be refrigerated and handled carefully to stay active — impossible in many areas of the world.

So why doesn't someone come up with a more stable vaccine that's easier to transport and deliver? For one thing, vaccine development is expensive and risky. Sales of vaccines in developing countries are unlikely to recoup even the costs of manufacturing for most companies.

But UNC epidemiology professor Dr. Ralph Baric and his team believe there's a way to produce a single-dose synthetic vaccine that is both affordable and easy to store and transport. To help Baric and his team explore their ideas, the UNC Gillings School of Global Public Health recently funded their proposal for a Gillings Innovation Lab (GIL).

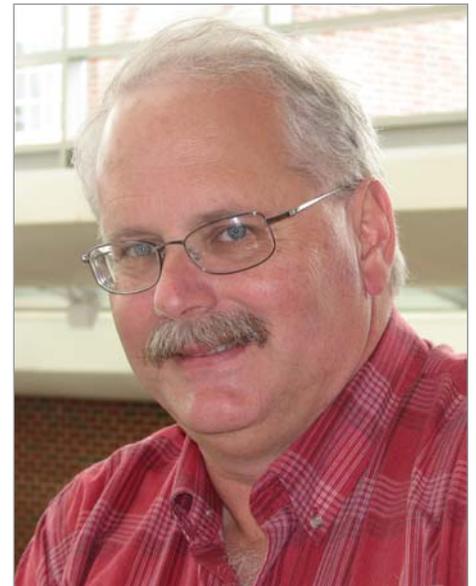
"Our goal is to build a whole new class of vaccines accessible to the population who needs them most," says Baric, leader of the project. "We'll partner with existing UNC

global health initiatives to promote new interdisciplinary programs that address fundamental questions, like how to create and administer these new, stable vaccines."

Project partners include the Carolina Vaccine Institute and its director, Dr. Robert E. Johnston; the UNC School of Medicine; and Global Vaccines Inc.—a non-profit company in Research Triangle Park, N.C., founded and directed by Johnston.

The team wants to create a vaccine that will have a shorter production cycle than current vaccines which can take up a year to culture, Baric says. This is critical to respond effectively to emerging diseases. The team aims to develop a low-cost, single-dose vaccine that is stable at room temperature and inhaled, rather than given with a needle. They also plan to use synthetic genomics and computer-based genome design. If they are successful, their work could lead to a whole new approach for designing and administering other global health vaccines.

"Of course it's risky and our group faces enormous challenges, especially in vaccine manufacture and delivery. However, the beauty of the Gillings Gift is that it empowers scientists to tackle formidable global prob-



Dr. Ralph Baric

lems in new and creative ways. At a minimum, this vision will allow us to establish an approach that could revolutionize rapid response vaccine genome design and provide monumental protection against newly emerged pathogens of the future," Baric says.

"This is a highly innovative, interdisciplinary project that addresses a significant global health issue," adds Dr. Andrew F. Olshan, professor and chair of epidemiology at the School who is part of Baric's team. "The project incorporates a complete program to design, build and manufacture a much needed vaccine."

For more information on this GIL, visit www.sph.unc.edu/accelerate. ■

— BY TORREY WASSERMAN AND
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