# A potentially longer-lasting cholera vaccine

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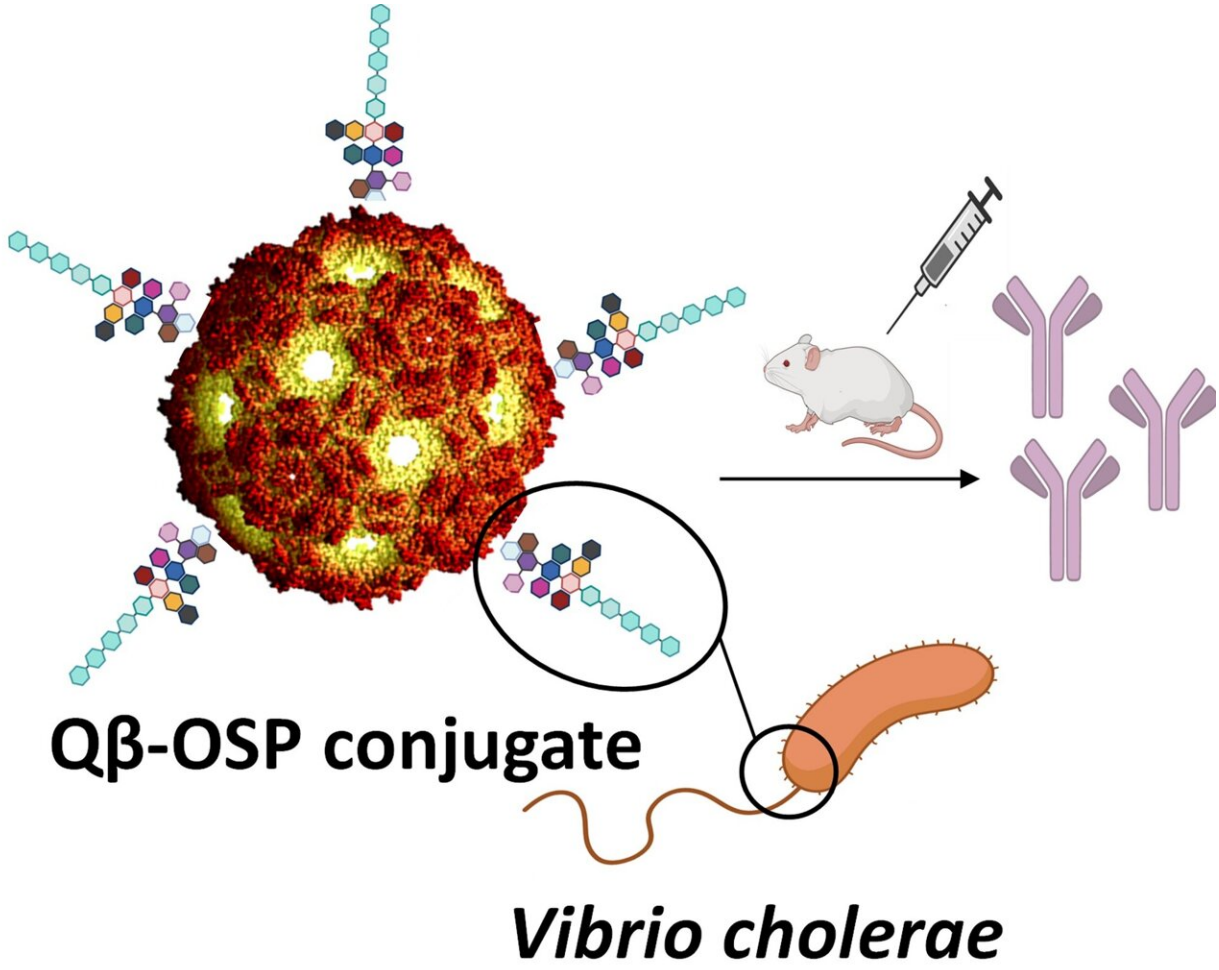


A virus-like particle (Qβ-OSP conjugate) displaying a polysaccharide from Vibrio cholerae bacteria generates a strong, long-lasting immune response in mice. Credit: Adapted from *ACS Infectious Diseases* 2022, DOI: 10.1021/acsinfecdis.1c00585

Cholera, a diarrheal disease caused by the highly transmissible bacteria *Vibrio cholerae*, kills tens of thousands of people each year worldwide. Current vaccines last only 2–5 years, and they don't work very well in young children. Now, researchers reporting in *ACS Infectious Diseases* have developed a new type of cholera vaccine consisting of polysaccharides displayed on virus-like particles. The vaccine generated long-lasting antibody responses against *V. cholerae* in mice.

Current cholera vaccines contain killed or weakened *V. cholerae* bacteria and are administered orally. They offer the lowest level and duration of protection in young children, who are commonly affected by cholera in endemic countries. The immune system produces antibodies against the O-specific polysaccharide (OSP) on the surface of *V. cholerae*, but this polysaccharide in isolation does not generate a strong, long-lasting immune response. Peng Xu, Edward Ryan, Xuefei Huang and colleagues wondered if attaching OSP to virus-like particles could induce stronger, longer-lasting immunity.

So the researchers developed a method to efficiently link multiple copies of OSP to Qβ, a virus-like particle that infects bacteria. The modified virus-like particles were recognized by antibodies in blood taken from recovering cholera patients, but not from patients with typhoid, another bacterial disease. Next, the team immunized mice with Qβ-OSP, observing that three doses caused a strong antibody response that persisted at least 265 days after the first dose. The immunized mice had antibodies that recognized the OSP from the natural lipopolysaccharide of *V. cholerae*. When the researchers mixed serum antibodies from the mice with other immune system proteins that kill bacteria and with live *V. cholerae*, antibodies from two of the five mice triggered more bacterial death than those from mice immunized with Qβ alone. The virus-like particle could mimic natural bacteria by presenting multiple copies of OSP on its surface, the researchers say, and it warrants further evaluation as a next-generation cholera vaccine.

**More information:** Virus-like Particle Display of Vibrio cholerae O-specific Polysaccharide as a Potential Vaccine against Cholera, *ACS Infectious Diseases*, 2022. pubs.acs.org/doi/abs/10.1021/acsinfecdis.1c00585

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