

Vaccine via the nasal passage could be the new line of defense against Strep A

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As Streptococcus A cases continue to be prevalent in Queensland and internationally, a new nasal vaccine could provide long-term protection from the deadly bacteria.

Associate Professor Manisha Pandey, Professor Michael Good, and their team from Griffith University's Institute for Glycomics, are leading the

development of a Strep A [vaccine](#) which is currently in Phase 1 [clinical trials](#) in Canada and quickly advancing to Phase 2 efficacy trials.

The team's new preclinical research shows an experimental liposome-based [vaccine approach](#) incorporating a conserved M-protein epitope from Strep A and an immunostimulatory glycolipid (3D(6-acyl) PHAD) administered via the nasal passage, can provide long-term mucosal protection against Strep A. The paper "A Glycolipidated-liposomal peptide vaccine confers long-term mucosal protection against *Streptococcus pyogenes* via IL-17, macrophages and neutrophils" has been published [in *Nature Communications*](#).

Lead author Dr. Victoria Ozberk said studies have shown most pathogens enter or colonize via the soft tissue in the upper respiratory tract, which is essentially the highway to the rest of the body.

"This has the potential to be a world-first as there are currently no subunit vaccines that target the [upper respiratory tract](#) due to a lack of licensed immunostimulants suitable for [human use](#)," Dr. Ozberk said.

"We demonstrated that a liposomal mucosal vaccination strategy can induce robust local protective immunity."

Associate Professor Pandey said the team found PHAD plays an augmenting role in inducing enduring humoral and cellular immunity, which was evident for at least one-year post-vaccination.

"The longevity of immune response is a critical hallmark of successful vaccination and therefore the findings from this study are highly significant," she said.

Professor Good said, "In the future, this vaccine platform could pave the way for other mucosal pathogens."

Group A Streptococcus is a global human pathogen that leads to a wide range of infections from illnesses such as mild pharyngitis and impetigo to invasive diseases such as [toxic shock syndrome](#), necrotising fasciitis, and cellulitis.

Professor Mark von Itzstein AO, Director of the Institute for Glycomics, welcomed these research findings.

"This platform provides a real shot at developing a new direction for vaccine discovery against significant infectious pathogens that cause serious and life-threatening diseases," he said.

Immunity to Strep A takes several years to develop, and currently, there is no vaccine available.

Moreover, repeated infections can lead to the post-streptococcal sequelae of rheumatic fever and [rheumatic heart disease](#), for which the Australian Indigenous population bears the highest disease burden globally.

Strep A causes 700 million human infections each year and there are more than 500,000 deaths globally.

The team has developed a Strep A vaccine which is currently being tested in a human clinical trial in Canada.

More information: Victoria Ozberk et al, A Glycolipidated-liposomal peptide vaccine confers long-term mucosal protection against *Streptococcus pyogenes* via IL-17, macrophages and neutrophils, *Nature Communications* (2023). [DOI: 10.1038/s41467-023-41410-7](https://doi.org/10.1038/s41467-023-41410-7)

Provided by Griffith University

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