

Researchers develop 3-in-1 vaccine against traveller's diarrhea

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Professor Mario Monteiro. Credit: University of Guelph

A first-ever vaccine designed to deliver a one-two-three punch against the main causes of traveller's diarrhea worldwide may result from new research published by a University of Guelph chemist.

Prof. Mario Monteiro says his novel three-in-one approach to developing a new vaccine could also save lives in developing countries, where it's estimated that these three common pathogens kill more than 100,000 children under age five each year.

His research was recently published in the journal *Vaccine*.

The paper discusses Monteiro's so-called conjugate vaccine that yokes together proteins from pathogenic *E. coli* with sugars from *Shigella* and *Campylobacter jejuni*. All three bugs are major causes of bacterial diarrhea globally.

In tests with mice, the vaccine provided immunity against all three pathogens.

No licensed vaccines exist against any of these pathogens. A sugar-based vaccine developed by Monteiro in 2009 against campylobacter alone is currently undergoing human trials but is still an estimated decade away from potential release.

He said this new three-in-one approach may ultimately overtake that earlier single-target vaccine, although any new vaccine may take decades to test and release. "We're targeting three [pathogens](#) at the same time," he said. "Instead of three shots, maybe you only need one."

As with the earlier [campylobacter](#) vaccine, this new method has been patented by U of G and the United States Naval Medical Research Center, which funded the research.

Monteiro said further research is needed to determine the optimum amounts of protein and sugars in the vaccine and to make the [vaccine](#) more efficient.

He worked on the project with former post-doc Zuchao Ma and former graduate students Brittany Pequegnat and Eman Omari, along with U.S. navy researchers.

More information: Renee M. Laird et al, Evaluation of a conjugate

vaccine platform against enterotoxigenic Escherichia coli (ETEC),
Campylobacter jejuni and Shigella, *Vaccine* (2018). [DOI:
10.1016/j.vaccine.2018.09.052](https://doi.org/10.1016/j.vaccine.2018.09.052)

Provided by University of Guelph

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