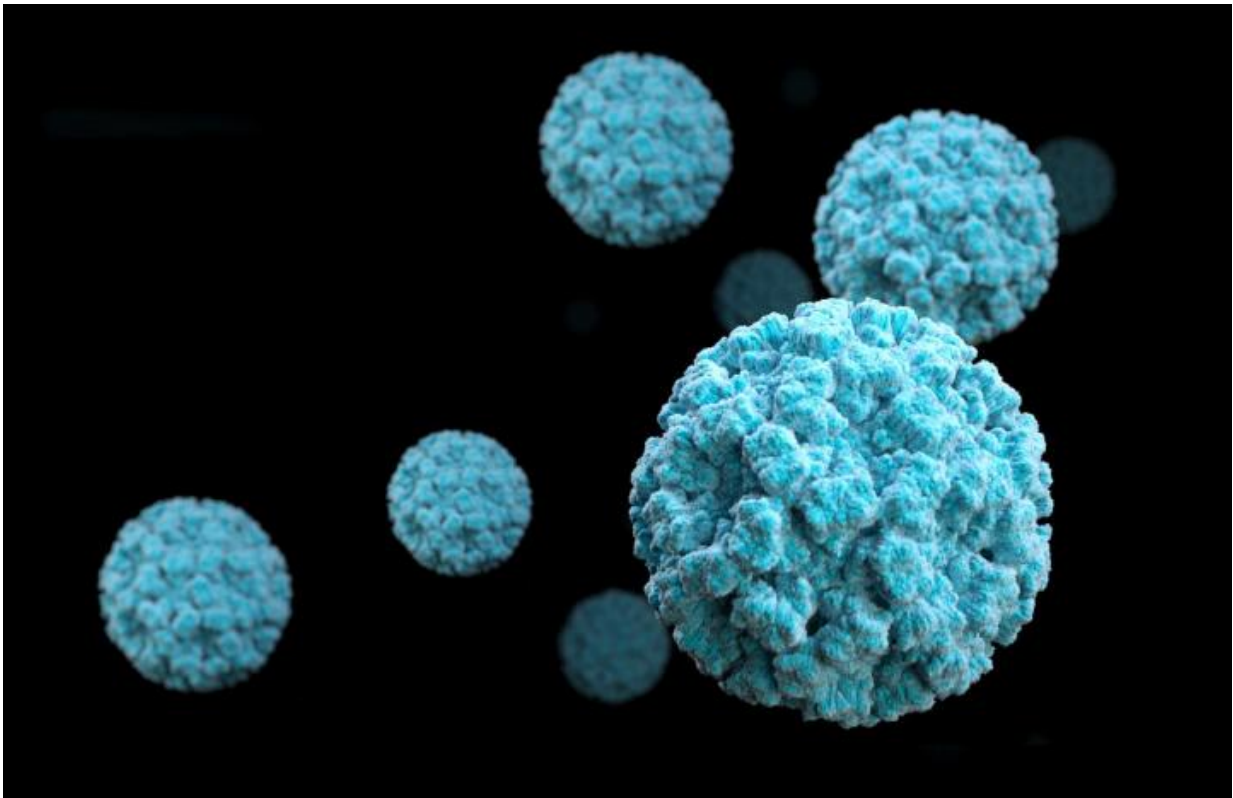


Scientists discover a powerful antibody that inhibits multiple strains of norovirus

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Norovirus. Credit: CDC

Researchers at the University of North Carolina at Chapel Hill Gillings School of Global Public Health and their colleagues at the University of Texas at Austin and the National Institutes of Health Vaccine Research Center have discovered an antibody that broadly inhibits multiple strains

of pandemic norovirus, a major step forward in the development of an effective vaccine for the dreaded stomach virus.

The study, published in the June 18 issue of *Immunity*, describes for the first time the structure of the binding interaction between the virus and a [human antibody](#) that may work against many strains of the pandemic 'stomach bug.'

Research specialist Lisa Lindesmith and professor Ralph Baric, both of The Gillings School's department of epidemiology, are co-authors on the study.

Human noroviruses are the leading cause of acute gastroenteritis, inflammation of the stomach and intestines. It accounts for nearly one in five cases of diarrhea and vomiting, and is responsible for an estimated 200,000 deaths per year, mostly in infants, children and the elderly, according to the Centers for Disease Control and Prevention. Though there are more than 30 known genotypes of human norovirus, nearly 60% of outbreaks are caused by GII.4 genotype strains that have caused periodic human pandemics since 1996 through today, the authors wrote.

"In order to design an effective vaccine for norovirus, scientists needed to identify a neutralizing antibody that could work against many strains of the virus, as well as strains that will circulate in the future," said Baric. "This information can now be used to build better human vaccines."

The most important discovery of this study is a human antibody that can bind to a highly conserved region of the virus common among different strains of norovirus, potentially neutralizing all GII.4 [strains](#) of norovirus that exist in nature.

Highly conserved regions are parts of the virus that do not change. A human antibody that can target these highly conserved areas will provide

broad protection for a prolonged period of time. With this knowledge, vaccine developers will have a better understanding of how, and how often, to reformulate the vaccine over time.

The technology, developed by co-author George Georgiou, was used to discover the key antibody in the study and the approach is applicable to a variety of highly variable bacteria and viruses.

"This study addresses a [fundamental problem](#) in norovirus disease development that could have wide-ranging impact on [global health](#)," says Lindesmith. "We've established an understanding of the [virus](#) and how it changes, how the body's immune response targets it and how we can use that information to make a better [vaccine](#)."

More information: Lisa C. Lindesmith et al, Sera Antibody Repertoire Analyses Reveal Mechanisms of Broad and Pandemic Strain Neutralizing Responses after Human Norovirus Vaccination, *Immunity* (2019). [DOI: 10.1016/j.immuni.2019.05.007](https://doi.org/10.1016/j.immuni.2019.05.007)

Provided by University of North Carolina at Chapel Hill

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