

# MMR vaccine could protect against the worst symptoms of COVID-19

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Administering the MMR (measles, mumps, rubella) vaccine could serve as a preventive measure to dampen septic inflammation associated with COVID-19 infection, say a team of experts in this week's *mBio*, a journal of the American Society for Microbiology. Long-time collaborators and spouses Dr. Paul Fidel, Jr., Department Chair, Oral and Craniofacial Biology, and Associate Dean for Research, Louisiana

State University Health School of Dentistry and Dr. Mairi Noverr Professor of Microbiology & Immunology at Tulane University School of Medicine in New Orleans co-authored the perspective article based on ideas stemming from research in their labs. Vaccination with MMR in immunocompetent individuals has no contraindications and may be especially effective for health care workers who can easily be exposed to COVID-19, say the researchers.

"Live attenuated vaccines seemingly have some nonspecific benefits as well as immunity to the target pathogen. A clinical trial with MMR in high-risk populations may provide a low-risk-high-reward [preventive measure](#) in saving lives during the COVID-19 pandemic," said Dr. Fidel. "While we are conducting the [clinical trials](#), I don't think it's going to hurt anybody to have an MMR vaccine that would protect against the measles, mumps, and rubella with this potential added benefit of helping against COVID-19."

Mounting evidence demonstrates that live attenuated vaccines provide nonspecific protection against lethal infections unrelated to the target pathogen of the vaccine by inducing trained nonspecific innate immune cells for improved host responses against subsequent infections. Live attenuated vaccines induce nonspecific effects representing "trained innate immunity" by training leukocyte (immune system cells) precursors in the bone marrow to function more effectively against broader infectious insults.

In Dr. Noverr's laboratory, in collaboration with Dr. Fidel, vaccination with a live attenuated fungal strain-induced trained innate protection against lethal polymicrobial sepsis. The protection was mediated by long-lived myeloid-derived suppressor cells (MDSCs) previously reported inhibiting septic inflammation and mortality in several experimental models. The researchers say that an MMR vaccine should be able to induce MDSCs that can inhibit or reduce the severe lung

inflammation/sepsis associated with COVID-19. Mortality in COVID-19 cases is strongly associated with progressive lung inflammation and eventual sepsis.

Recent events provide support for the researchers' hypothesis. The milder symptoms seen in the 955 sailors on the U.S.S. Roosevelt who tested positive for COVID-19 (only one hospitalization) may have been a consequence of the fact that the MMR vaccinations are given to all U.S. Navy recruits. In addition, epidemiological data suggest a correlation between people in geographical locations who routinely receive the MMR vaccine and reduced COVID-19 death rates. COVID-19 has not had a big impact on children, and the researchers hypothesize that one reason children are protected against viral infections that induce sepsis is their more recent and more frequent exposures to live attenuated vaccines that can also induce the trained suppressive MDSCs that limit inflammation and sepsis.

The researchers propose a clinical trial to test whether the MMR vaccine can protect against COVID-19, but in the meantime, they suggest that all adults, especially [health care workers](#) and individuals in nursing homes get the MMR [vaccine](#). "If adults got the MMR as a child they likely still have some level of antibodies against measles, mumps, and rubella, but probably not the myeloid-derived suppressor cells," said Dr. Fidel. "While the MDSCs are long-lived, they are not life-long cells. So, a booster MMR would enhance the antibodies to measles, mumps, and rubella and reinitiate the MDSCs. We would hope that the MDSCs induced by the MMR would have a fairly good life-span to get through the critical time of the pandemic."

Dr. Noverr was recently awarded a "Fast Grant" (part of Emergent Ventures at the Mercatus Center, George Mason University) to test the efficacy of MMR directly in a nonhuman primate model of COVID-19 infection.

**More information:** Paul L. Fidel et al, Could an Unrelated Live Attenuated Vaccine Serve as a Preventive Measure To Dampen Septic Inflammation Associated with COVID-19 Infection?, *mBio* (2020). DOI: 10.1128/mBio.00907-20

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