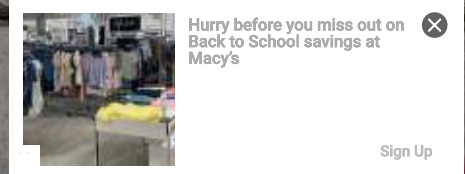
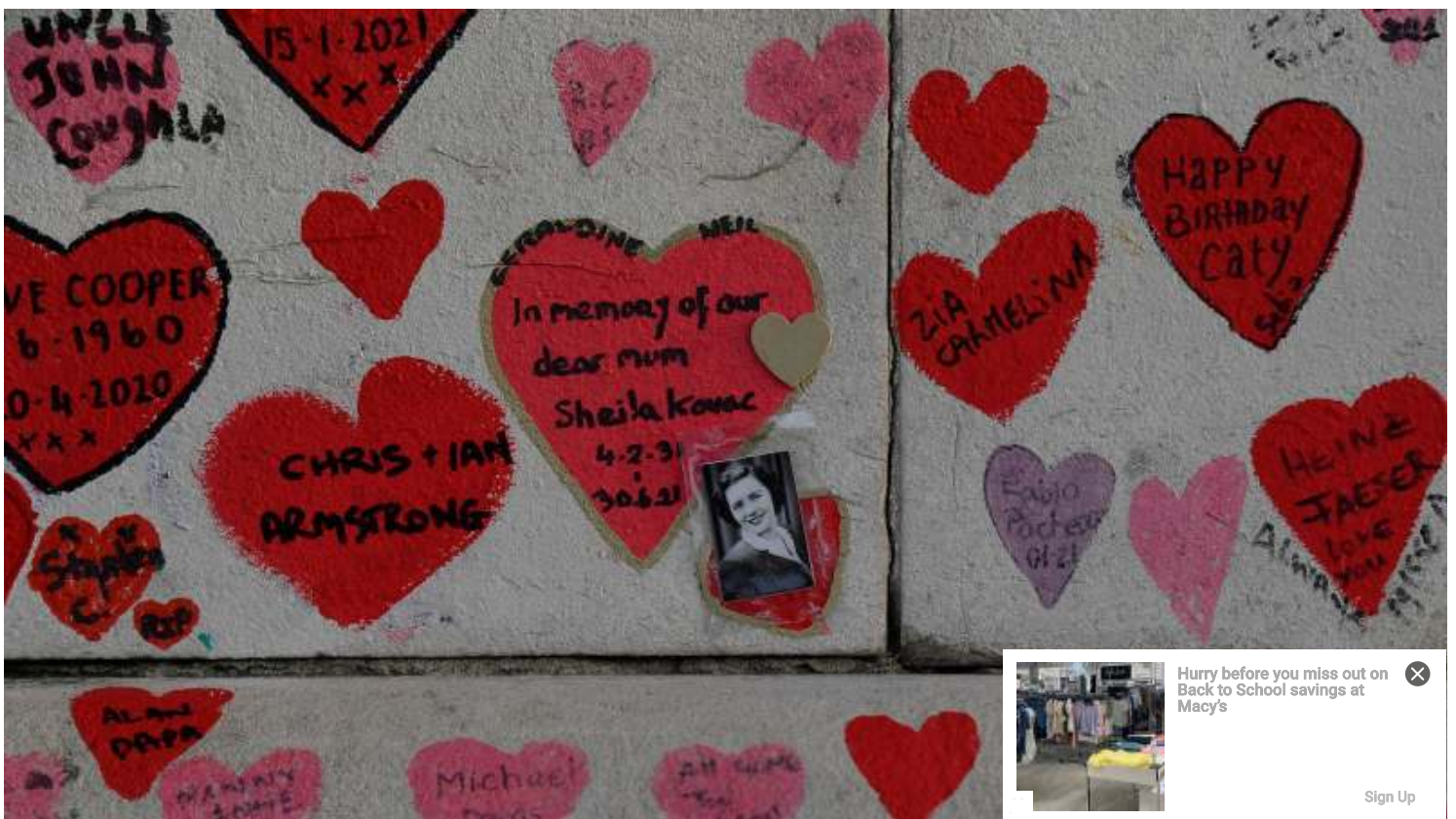



Scientists identify how the coronavirus spike protein causes heart damage

New research has uncovered "direct evidence that the SARS-CoV-2 spike protein is toxic to heart muscle cells," according to its lead author.

🕒 Monday 25 July 2022 14:41, UK




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Scientists believe they have identified why heart damage is so common among patients hospitalised with COVID-19 in a preliminary study.

The new research has found that the SARS-CoV-2 [coronavirus](#) spike protein is capable of causing heart muscle injury through the

inflammatory process, setting it apart from previously known coronaviruses.

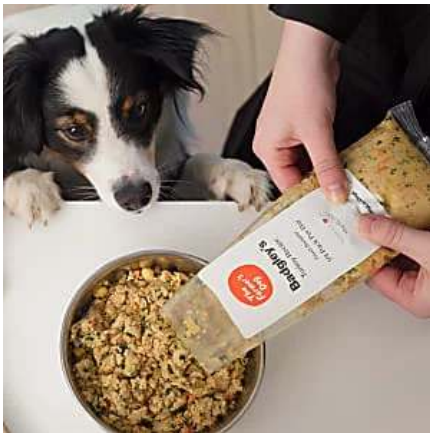
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The good news is that the preliminary research suggests the damage caused by the process, which is part of the heart muscle cells' "own natural immune machinery" can be reduced by vaccination.

Research published in 2020 discovered [abnormal changes to the way the heart was pumping](#) in 55% of hospitalised patients, with around one in seven showing evidence of severe dysfunction.

"It's already known from the clinical side that [COVID-19](#) infection can induce heart injury, however, what we don't know is the mechanistic details of how this occurs," said Dr Zhiqiang Lin.

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"What we suspect is that the spike protein has unknown pathological roles," added Dr Lin, the study's lead author and an assistant professor at the Masonic Medical Research Institute in Utica, New York.

"Our data show that the spike protein from SARS-CoV-2 causes heart muscle damage. That's why it's important to get vaccinated and prevent this disease," added Dr Lin.

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The first line of defence against the invasion of the SARS-CoV-2 pathogen is natural immunity, and heart muscle cells have their own immune machinery - but in the case of COVID-19 infections the immune response "may also impair heart muscle cell function and even lead to cell death and heart failure," Dr Lin said.

They studied another coronavirus known as HCoV-NL63 which has a similar spike protein that also binds to the cell receptor ACE2 to help the virus break into cells.

But unlike with SARS-CoV-2, the NL63 spike protein does not trigger the natural immune response in heart muscle cells which can cause so much damage to the organ.

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"The fact that the SARS-CoV-2 spike protein is activating the natural immune response may explain the high virulence compared to the other coronaviruses," Dr Lin said.

During laboratory testing of heart cells that had been cultured in dishes, the researchers observed how the SARS-CoV-2 spike protein made heart muscle cells much larger compared to cells without either spike protein.

"We found direct evidence that the SARS-CoV-2 spike protein is toxic to heart muscle cells," explained Dr Lin.

But the researchers caution that the mechanisms they detected for how the virus causes damage may not be the entire picture - and that there are more questions to be answered.

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