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Immunology

Pre-existing immunity to covid-19 hints at universal coronavirus vaccine

Michael Le Page

EFFORTS to develop vaccines against a wide range of potentially pandemic-causing coronaviruses have been boosted by the discovery that some people had pre-existing immunity to the SARS-CoV-2 virus amid the first wave of the pandemic.

During the first half of 2020, around 700 healthcare workers in the UK were tested weekly as part of a crowdfunded study called COVIDsortium. Most of these people, who wore protective equipment, never tested positive for covid-19 in PCR tests or developed covid-19 antibodies – proteins that bind to the outside of viruses, preventing cells from being infected.

However, when Leo Swadling and Mala Maini at University College London and their colleagues looked more closely, they found that some of those who tested negative had a protein in their blood that is linked to covid-19 infection, as well as T cell responses to the SARS-CoV-2 virus. It appears these people had what Swadling calls an “abortive infection”, where a strong, early

T cell response enabled them to get rid of the virus very quickly.

Cells infected by viruses sound the alarm by displaying viral proteins on their surface, and T cells are the immune cells that learn to recognise these proteins and destroy infected cells. While antibodies can only target proteins on the outside of a virus, T cells can learn to recognise any viral proteins.

Many teams are trying to develop jabs that give wider protection

When the researchers looked at early blood samples from people who had an abortive infection, they found that even before being exposed to SARS-CoV-2, they had some T cells that could recognise the proteins that this virus uses to replicate itself inside infected cells (*Nature*, doi.org/gndqs2).

The most likely explanation is that these people were often exposed to the existing human coronaviruses that cause around 10 per cent of colds, says Maini.

The proteins involved in viral replication are very similar

in SARS-CoV-2 and other coronaviruses, meaning that if vaccines can be developed that elicit a strong T cell response against these proteins, they should protect against a very broad range of coronaviruses – a so-called universal coronavirus vaccine. One way to do this would be to add mRNAs coding for these proteins to the existing mRNA vaccines that target the virus’s external spike protein.

Extra components added to the next generation of coronavirus vaccines might protect both against new variants of SARS-CoV-2 that could evolve and against animal coronaviruses that may jump into people and spark a new pandemic, says Swadling.

“It’s a matter of time before another of these members [of the coronavirus family] creates an epidemic or pandemic,” says Olga Pleguezuelos at UK-based firm SEEK, whose team is working on a broader coronavirus vaccine.

“If we end up with something that is as infectious as covid and as lethal as MERS, then we are in serious trouble,” she says. ■



SHUTTERSTOCK/F8 STUDIO

Psychology

Imposter syndrome may make you better at your job

PEOPLE with “impostor syndrome”, who feel underqualified for their jobs, tend to make better employees because they compensate by striving to be likeable, empathetic and collaborative.

Impostor syndrome is associated with anxiety and low self-esteem. As a consequence, it has long been assumed to hinder work performance. Basima Tewfik at the Massachusetts Institute

of Technology measured levels of impostor syndrome among 155 employees at an investment advisory firm in the US. The participants rated their own abilities, while supervisors were asked to rate the participants’ performance and interpersonal skills. Those with impostor syndrome were generally rated as having better interpersonal skills than their more confident peers and were considered as competent (*Academy of Management Journal*, doi.org/gm7v4b).

“People with impostor syndrome were basically the ones you’d want to work with,” says Tewfik.

In another experiment, Tewfik asked 70 trainee doctors to take the case history of a patient with a migraine or a sexually transmitted infection, played by an actor. Those with impostor syndrome had the same diagnostic accuracy as those without, but were more likely to offer statements recognising the patient’s pain, ask follow-up questions, make eye contact, nod, use open hand gestures and speak

“People with impostor syndrome were basically the ones you would want to work with”

with a receptive, agreeable tone.

People with impostor syndrome may have better interpersonal skills because they unconsciously try to compensate for their self-perceived ineptitude by being personable and easy to get along with, says Tewfik. “Maybe it is this silver lining that does actually contribute to success in some respects,” she says.

Terry Fitzsimmons at the University of Queensland, Australia, believes impostor syndrome can be positive, but this desire to prove oneself risks leading to stress and overwork, he says. ■

Alice Klein