Genetic factors associated with predisposition for COVID-19 critical illness

More than 20 host genetic variants that predispose patients who are infected with SARS-CoV-2 to become critically ill have been identified in a University of Queensland-led study **published in *Nature***. The findings may have direct implications for the development of new treatments and the future prioritisation of therapy. Critical illness in COVID-19 is caused by inflammatory lung injury, which is mediated by the host's immune system. Genetic factors are known to have a role, but researchers are only just beginning to understand the nature of the variants involved. In this study, researchers compared whole genome sequences of more than 7000 patients who became critically ill with COVID-19 with those of more than 48 000 matched control individuals to identify 23 variants that predispose to life-threatening disease. Sixteen of these are newly discovered variants. They include variants within genes involved in interferon signalling, leucocyte differentiation and the production of mucin proteins, which are important factors in the regulation of the immune system and functioning of the lung. Some of the variants identified are suitable targets for drugs, raising the possibility of new therapies designed to target the genetic mechanisms that predispose to life-threatening disease. The results are also broadly consistent with a multicomponent model of COVID-19, in which at least two distinct components can predispose to life-threatening illness: a failure to control viral replication, and an enhanced tendency towards pulmonary inflammation and intravascular coagulation.

https://www.nature.com/articles/s41586-022-04576-6

Reading to at-risk kids builds resilience

Research from the University of South Australia, **published in *Child Abuse and Neglect***, shows that reading aloud can triple a child's resilience at school, particularly for children at-risk. Focusing on early primary school-aged children who had suffered abuse or neglect, the study explored factors that could

modify the negative effects of adverse life circumstances, finding that one of the biggest predictors of resilience in both boys and girls in struggling families was being read to at home. While reading to children at home has long been associated with school readiness and scholastic outcomes, this is the first study that has shown the benefits of reading to mitigate some of the detrimental trajectories of child maltreatment. The study analysed data covering 65 083 children who had completed the Early Australian Development Census at 5–6 years of age, when starting primary school, identifying 3414 high risk children who had experienced maltreatment. Boys were found to be developmentally behind girls, particularly those who had been exposed to abuse or neglect. Among high risk children, 51.2% demonstrated resilience. Predictors of resilience in the multivariable model were being older, not having an emotional condition, and being read to at home. Risk factors were being male, living in rural or remote areas, having a physical or sensory disability, or having a learning disability.

https://www.sciencedirect.com/science/article/abs/pii/S0145213421003707

doi:10.5694/mja2.51450

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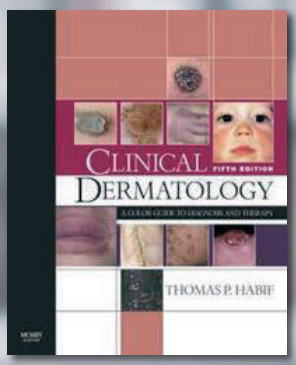

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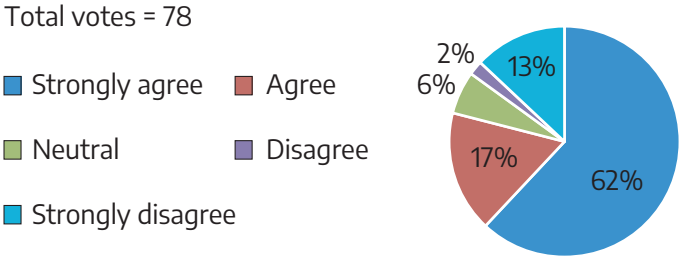

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MJA PODCASTS

Dr CR Robert George is a microbiologist and pathologist with John Hunter Hospital in Newcastle. He talks about the decline of invasive meningococcal and influenza during the COVID-19 pandemic, to accompany his co-authored Perspective published online on 28 March 2022.

Associate Professor Paul Lacaze is the Head of Public Health Genomics at Monash University. He discusses population DNA screening for medically actionable disease risk in adults, to accompany his co-authored Perspective published online on 4 April 2022.

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APRIL

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Lim et al; doi: 10.5694/mja2.51449

4 *Research:* Offering mailed nicotine replacement therapy and Quitline support before elective surgery: a randomised controlled trial
Webb et al; doi: 10.5694/mja2.51453

4 *Editorial:* COVID-19: preparing for the next viral variant
Booy; doi: 10.5694/mja2.51452

MARCH

28 *Podcast:* Dr CR Robert George is a microbiologist and pathologist with John Hunter Hospital in Newcastle

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George et al; doi: 10.5694/mja2.51463

28 *Research:* Achieving lipid targets within 12 months of an acute coronary syndrome: an observational analysis
Alsadat et al; doi: 10.5694/mja2.51442

21 *Podcast:* Professor Fiona Kelly is from La Trobe University, and Associate Professor Ken Pang is from the Murdoch Children's Research Institute

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Harvey et al; doi: 10.5694/mja2.51440

21 *Research:* Area-level social and economic factors and the local incidence of SARS-CoV-2 infections in Victoria during 2020
Roder et al; doi: 10.5694/mja2.51436

14 *Podcast:* Associate Professor Jennifer Power is Principal Research Fellow at the Australian Research Centre in Sex, Health and Society at La Trobe University

14 *Perspective:* Better understanding of the scope and nature of LGBTQA+ religious conversion practices will support recovery
Power et al; doi: 10.5694/mja2.51441

14 *Research letter:* Sentinel lymph node biopsy rates in Victoria, 2018 and 2019
Watts et al; doi: 10.5694/mja2.51424

7 *Podcast*: Professor Evelyne de Leeuw is with the Centre for Health Equity Training Research and Evaluation at UNSW Sydney

7 *Consensus statement*: Australian consensus recommendations for the management of hepatitis B
Lubel et al; doi: 10.5694/mja2.51430