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Research in brief

Cancer drug for SARS-CoV-2

Apratoxin S4 (Apra S4), an anti-cancer drug candidate that targets a human protein, can interfere with the replication of viruses such as SARS-CoV-2, say researchers. They found that when tested with monkey and human cells exposed to SARS-CoV-2, treatment with Apra S4 reduced the number of infected cells compared with remdesivir treatment. It was also effective against influenza A, Zika, dengue, and West Nile virus infections. Apra S4 did not prevent SARS-CoV-2 from entering cells but reduced the amount of viral protein that was produced and transported in cells, especially the spike protein, and decreased viral RNA replication. The researchers say that Apra S4 and other inhibitors of the human Sec61 protein are broadly effective against these viruses and shedding them into the saliva in large amounts. Additional experiments confirmed that sucking had caused both mother-to-pup and pup-to-mother viral transmission.

Flu vaccine and Alzheimer’s

People aged 65 years and older who received at least one influenza vaccine were 40% less likely than those who did not receive influenza vaccines to have developed Alzheimer’s disease over the course of 4 years, a study of a large US claims database has found. It compared the risk of Alzheimer’s disease incidence between 935,887 patients with and without flu vaccination in the USA. During approximately 4 years of follow-up, about 5.1% of flu-vaccinated patients were found to have developed Alzheimer’s disease, compared with 8.5% of non-vaccinated patients.

COVID-19 and pregnancy in sub-Saharan Africa

A study has found that pregnant women hospitalised with COVID-19 in sub-Saharan Africa are dying at a greater rate than pregnant people without COVID-19 and non-pregnant people with COVID-19. The study examined outcomes of over 1300 female patients of child-bearing age who were hospitalised between March, 2020, and March, 2021, in six countries: DR Congo, Ghana, Kenya, Nigeria, South Africa, and Uganda. Both pregnant women with COVID-19 and non-pregnant women with HIV or a history of tuberculosis and COVID-19 had a two-fold increased risk of intensive care unit admission. Rates of supplemental oxygen use were at least two-fold higher and the death toll increased five-fold in pregnant women with SARS-CoV-2.

New route for enteric viruses

Scientists have discovered that enteric viruses, such as noroviruses and rotaviruses, can grow in the salivary glands of mice and spread through their saliva. It was known that enteric viruses can spread by consuming food and drink contaminated with faecal matter containing these viruses, which were believed to bypass the salivary gland and target the intestines, exiting later through faeces. The new findings still need to be confirmed in human studies. In mice, researchers collected saliva samples and salivary glands from mouse pups and found the salivary glands were replicating these viruses and shedding them into the saliva in large amounts. Additional experiments confirmed that sucking had caused both mother-to-pup and pup-to-mother viral transmission.

Drug-resistant Neisseria gonorrhoeae in Austria

Researchers have described the case of an extensively drug-resistant N gonorrhoeae strain that shows high-level resistance to azithromycin and resistance to ceftriaxone, cefixime, cefotaxime, ciprofloxacin, and tetracycline. The strain was detected after a heterosexual man in Austria presented with symptoms in April, 2022, following condomless sex with a female sex worker in Cambodia. Following the initial treatment course, the test of cure was negative, but a PCR test from the urethral swab culture sample was positive for N gonorrhoeae. Molecular investigation of the isolate showed that it was relatively close to the WHO Q reference strain, which was associated with three cases of gonorrhoea notified in the UK and Australia in 2018, with reported links to southeast Asia.

Bacteriophages in antibiotic-resistant infections

The largest case series of patients treated with bacteriophage therapy for antibiotic-resistant infections, involving 20 patients in the USA with antibiotic-refractory mycobacterial infections, showed good results. All patients had varying underlying conditions and most had cystic fibrosis. The authors reported no adverse reactions to phage therapy, regardless of type of bacterial infection, type of phages used, or method of treatment. 11 patients displayed some measure of symptom improvement or reduced bacterial presence; four exhibited no response to treatment.

T-helper cells key to malaria vaccine

Scientists studying why immunity against Plasmodium falciparum lasts only a short time after immunisation found that T-helper cells reacted exclusively to the protein sequence of the vaccine strain and showed hardly any cross-reactivity with naturally occurring variants. They studied the T-helper-cell response to CSP, the quantitatively dominant protein on the surface of sporozoites. Analysis revealed that the T-cell receptors mainly targeted amino acids 311–333 of the CSP, but there was virtually no cross-reactivity between the individual T-cell clones. The study recommends that further development of the vaccine should test whether inducing a broader spectrum of T-helper cells could generate longer-lasting immune protection.

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