

## Sensing temperature and touch

The Nobel Prize 2021 in physiology or medicine has been jointly awarded to David Julius and Ardem Patapoutian for the discovery of novel receptors involved in sensing temperature and touch by the human body, respectively. Dr Julius, from the department of physiology at the university of California, USA, while trying to find out how we perceive pain on coming in contact with capsaicin a compound present in chili peppers discovered a gene which encodes a novel ion channel named as TRPV1, heat sensing receptor which gets activated at temperatures perceived as painful. Later, histeam discovered another receptor TRPM8, which gets activated by cold.

Ardem Patapoutian, molecular biologist at Scripps Research in La Jolla, California studied how mechanical stimuli get converted into an electrical impulse responsible for sensing touch and proprioception. Patapoutian and his team discovered novel ion channels named as Piezo1 and Piezo2, which gets directly activated by the exertion of pressure on cell membranes. Both these channels are involved in the regulation of blood pressure, respiration and urinary bladder. Their findings also showed that Piezo2 is critically important in proprioception.

*(Nobelprize.org 4 October 2021)*

## The malaria vaccine

Almost a decade after the beginning of the trial RTS, S/AS01 (RTS,S) - Malaria vaccine recently got the WHO's recommendation for its widespread use among children living in the sub-Saharan Africa and other regions with moderate to high prevalence of *P.falciparum* malaria. RTS,S is not only the first antimalarial vaccine but also the first vaccine developed against any parasite.

The pilot program, which was started in 2019 in three African countries – Ghana, Kenya and Malawi, had vaccinated almost 800,000 children by administering 2.3 million doses leading to a significant (30%) reduction in the severe malaria in high *P. falciparum* prevalence areas. Apart from this, the introduction of RTS, S has been proven to be feasible through the routine vaccination program with documented safety, efficacy and without any compromise of the other routine malaria control interventions. In areas of moderate to high transmissions of *P. falciparum*, it has been proven cost-effective by significant reduction in hospital admission for severe malaria or severe anemia due to malaria. A four dose schedule has been recommended for children aged 5 months or above, with 4 weeks gap between the first three doses and last dose to be taken after two years.

*(who.int 6 October 2021)*

## Impact of COVID-19 – Do adults transmit influenza and RSV?

Since the recognition as a human respiratory pathogens, the seasonal occurrence of epidemics of influenza and respiratory syncytial virus (RSV) in children are causing significant morbidity and mortality. Studies over the years have described the role of children, especially the elder siblings, in the transmission of these two. But recently, the incidence of the respiratory infections and

the role of children and adults have been reviewed. The results showed a significant decline (94-99%) in the incidence of RSV and influenza cases compared to last few years (2012-2019) in the winter months in Western Australia, New Zealand, Chile, European and South African region. Initially this was thought to be an indirect consequence of various measures taken to control COVID-19. However, around September 2020, despite the reopening of schools with the return of children including younger ones (<5 years) to schools, sustained low incidence of these pathogens have highlighted a probable role of adults in transmission. The change in adult behavior like social distancing, use of mask and hand hygiene; due to current pandemic supports the role played by adults in the occurrence of these illnesses in children, which has to be looked into actively.

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## Vaccination for children

The subject expert committee has forwarded its recommendations to the Drug Controller General of India (DCGI) for the use of Bharat Biotech's COVID-19 vaccine- "Covaxin" for use in the children aged 2-18 years. After DCGI's approval this will be the first COVID-19 vaccine worldwide, approved for the use in children aged 2-18 years. Recently ZydusCadila's DNA vaccine ZyCoV-D was approved for the emergency use in children aged 12-18 years. Though the results of the clinical trial by Bharat Biotech have not been disclosed publically, but the documented efficacy in adults is 77.8% against symptomatic infection. The availability of these vaccines will likely pave the way for the reopening of schools and return to normal life for children – full of outdoor activities and social interaction.

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## Mask - the savior!

During the current pandemic, use of face mask along with social distancing and hand hygiene have been suggested as the best methods to avoid the virus. There have been news reports on cautioning against the use of N95 mask while doing exercise in adults, but what about children? Parents are worried that the use of N95 mask can cause breathing difficulty or low oxygen levels in children.

An Italian study divided children into two groups to use N95 masks with and without exhalation valve, while being monitored over 72 minutes initially without wearing a mask after that with wearing a mask followed by a 12 minute walk. The use of masks did not affect the oxygen saturation or pulse rate significantly in the two groups, but the use of N95 mask without exhalation valve was associated with the significant increase in  $P_{ETCO_2}$  and respiratory rate even without walking test. Thus, surgical mask is believed to be the best option as for use in children as the use of N95 mask could potentially cause breathing difficulty, especially if the child is doing physical activity and the mask does not have an exhalation valve.

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