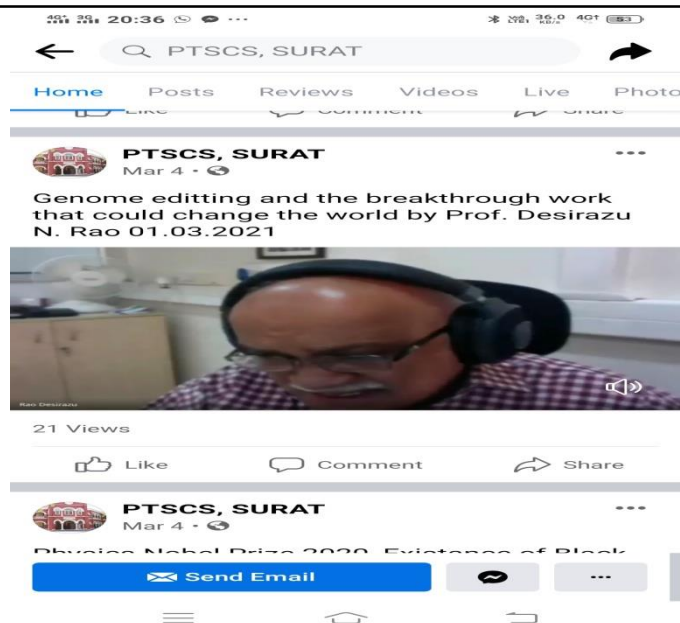
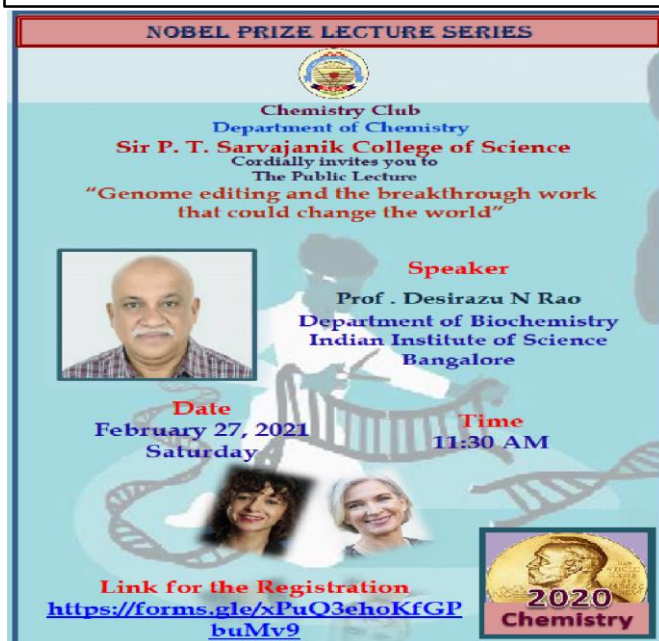


Webinar on "Nobel Prize in Chemistry -2020"

Date: 01-03-2021

Participants: 202

Resource Person: Prof. Desirazu N. Rao, Department of Biochemistry, IISc Bangalore



Brief Report:

The 2020 Nobel Prize in chemistry for the discovery that a bacterial immune system called CRISPR that can be repurposed to edit DNA, the molecule of heredity has been awarded to a French microbiologist Emmanuelle Charpentier of the Max Planck Institute for Infection Biology, Berlin, Germany and an American biochemist Jennifer Doudna of the University of California, Berkeley, USA.

"CRISPR" stands for Clustered Regularly Interspaced Short Palindromic Repeats, that describes a genome sequence in bacteria. Cas9 is an endonuclease – an enzyme that cuts DNA. In viral infections, the bacteria cut sequences out of the viral genome and insert them into the CRISPR sequence. The bacteria can use the resulting transcribed CRISPR-RNA and an additional RNA molecule to identify the viral genome if it attacks again. They can cut through it, incapacitating the pathogens. In this way, the CRISPR-Cas9 system provides the bacterial immune system with a kind of memory.

CRISPR-Cas9 consists of a guide molecule (RNA) plus an enzyme that cuts DNA. Once the guide leads the enzyme to the site of the disease-causing mutation in the genome of cells, the enzyme cuts out the problematic chunk of DNA. The CRISPR molecules can stop there, if removing the DNA is enough to cure a disease. Alternatively, they can carry an additional molecule, a repair gene, so that once the misspelled DNA is deleted then the correct, non-mutated, healthy DNA can be slipped into the site on the genome where it had been and take its place. The gene-editing technology has opened up a vast window of opportunity. In the last few years, the tool has enabled scientists to edit human DNA in a dish and early-stage clinical trials are being attempted to use the tool to treat a few diseases, including inherited disorders/diseases and some types of cancer. Prof. Rao explained this in a very lucid language. He not only talked about the current Nobel prize but also made it interesting by talking about the history of Nobel prize and especially Bio Chemistry. Video link of the same is provided here.

<https://fb.watch/6PTAgzz6Y0/>