

Newly designed compound targets enzyme-linked to autoimmune disorders and severe COVID-19

Reducing immune overactivation without impairing the body's entire immune response.

BY PRANJAL MEHAR □ MARCH 10, 2021 □ HEALTH

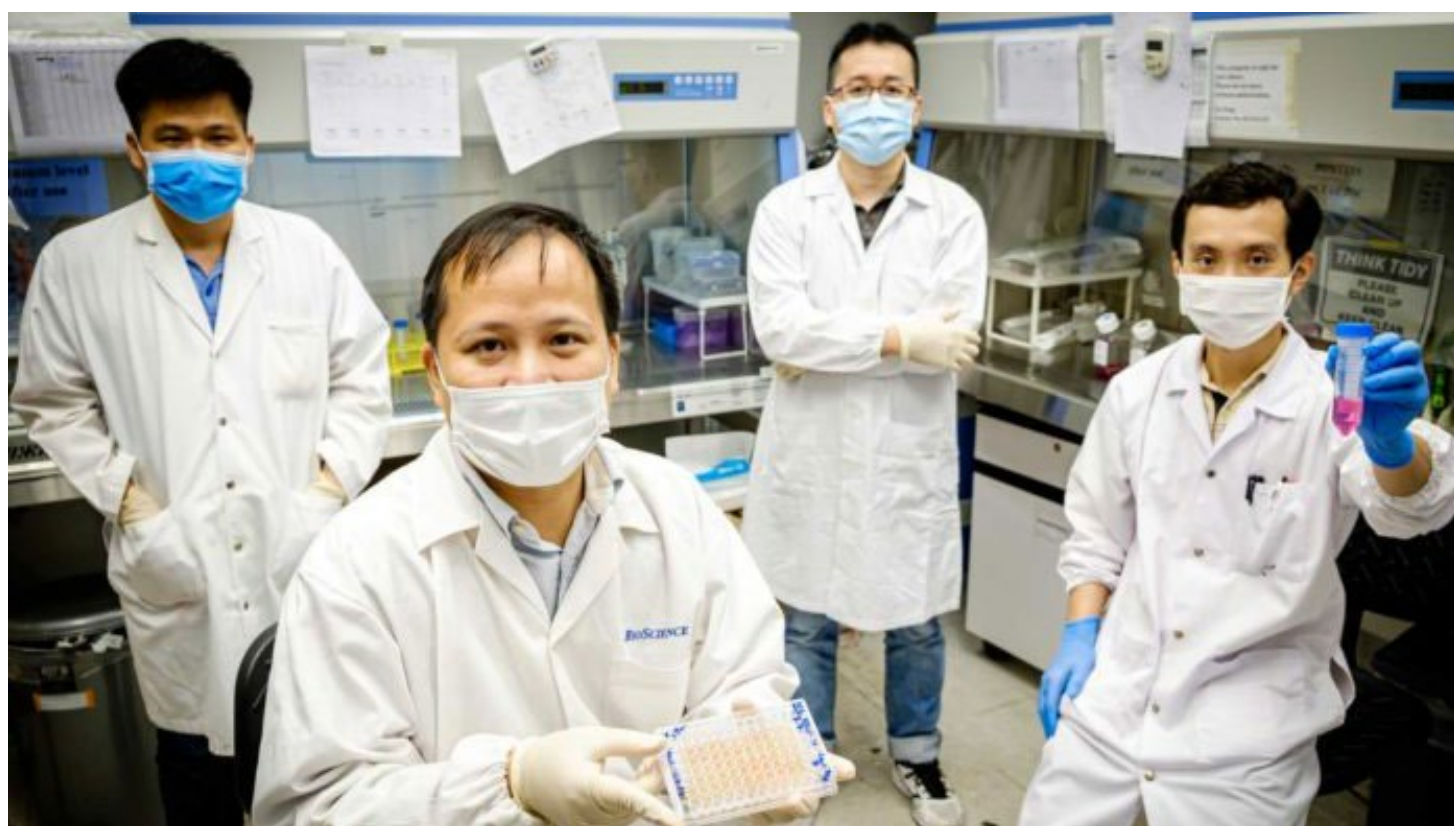


Image: Nanyang Technological University

An overactive immune system prompts numerous immune system disorders, for example, rheumatoid arthritis and type 1 diabetes. It has recently been connected to severe COVID-19 contaminations, in which immune-system signaling proteins increase to risky levels, prompting harm to the body's cells.

Scientists from the [Nanyang Technological University](#), Singapore (NTU Singapore) have created a new compound called ASO-1 that reduces the immune system's overactivation. The compound targets tyrosine kinase 2 (TYK2), a member from the Janus kinase (JAK) family of enzymes that play a crucial role in regulating the body's immune response. Increased levels of TYK2 are associated with severe [COVID-19](#).

Scientists conducted experiments on human cells grown in a dish. They found that the compound reduced TYK2 levels over a sustained period. It also inhibits immune signaling pathways that are linked with autoimmune disorders.

Professor Phan Anh Tuan from NTU Singapore's School of Physical and Mathematical Sciences (SPMS) said, *"This points to the potential of the ASO-1 compound forming the basis for the treatment of autoimmune conditions."*

"Human genetic studies have suggested that deactivating TYK2 could protect against a broad range of autoimmune conditions such as rheumatoid arthritis, psoriasis, lupus, and type 1 diabetes."

Dr. Lim Kah Wai, NTU senior research fellow and co-lead author of the study, [added](#): *"With the UK-led study of critically ill COVID-19 patients published in Nature linking high TYK2 expression to severe COVID-19, ASO-1 could be a therapeutic agent worth investigating further. We are planning to conduct further pre-clinical work to validate its therapeutic potential."*

The compound is an antisense oligonucleotide (ASO), a type of RNA therapeutics that targets the messenger RNA (mRNA), which carries genetic instructions that cells 'read' to make proteins. ASO-1 is designed to bind to TYK2 mRNA, thus preventing cells from producing TYK2 protein.

The NTU researchers plan to partner with several academic collaborators to test ASO-1 in animal models and are open to industrial collaboration on developing the ASO-1 compound for clinical use.