

DBT-NIBMG scientists trying to re-purpose immunomodulatory drugs for COVID-19

A group of scientists at the Department of Biotechnology's National Institute of Biomedical Genomics (DBT-NIBMG) led by Dr. Saroj Kant Mohapatra, faculty member and a clinical scientist is trying to see whether knowledge gained from research on sepsis could help deal with the current pandemic of COVID-19.

For example, cytokine storm is a common feature of both sepsis and COVID-19 that significantly contributes to organ dysfunction and mortality. As a follow up, the scientists have initiated a clinical trial to try and re-purpose immunomodulatory drugs like Sepsivac, which has a role in inhibiting the cytokine storm, for COVID-19 also.

The group has found some interesting connection between sepsis and cancer too. Using a systems biology approach, they have identified the pathways that are perturbed in both sepsis and cancer. They showed that the clustering of genes separates tumors into two groups. One that shares the pathway signature with sepsis, 'sepsis-like cancer (SLC) group', and the other, without any shared pathways with sepsis or 'cancer alone (CA) group'.

The researchers have shown that artificial intelligence tools can help to label an incoming cancer sample in one of these groups with a high level of accuracy (more than 98%). The SLC group consisted mainly of cancers of the upper gastrointestinal tract, such as oesophagus, stomach, liver, and gallbladder.

They further showed that some of the upregulated pathways, such as phagocytosis, provide protection against both sepsis and SLCs. Since sepsis is caused by infection and the underlying cause of many SLCs are viral infections, they hypothesize that specific pathways upregulated in both these groups provide protective host immuno-inflammatory response to pathogens.

Segregation of cancer into these two groups has biological and clinical implications. The gut may play an important role in the pathogenesis and progression of the SLC group. Dr. Mohapatra's group is investigating the possibility of using known treatment for sepsis for the SLC group cancers also.

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