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Commentary

Proteomics for Understanding Phases and Identifying Biomarkers in COVID-19 Disease

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DESCRIPTION

The emergence of the new coronavirus disease 2019 Corona Virus (COVID-19) caused by the SARSCoV2 corona virus requires urgent development of new diagnostic and therapeutic strategies. Rapid international research and development has already enabled assays for detecting SARSCoV2 RNA and host immunoglobulin. However, the complexity of COVID19 is so complex that a broader definition of the patient's condition, course, outcomes, and response to treatment is now needed. Studies of COVID19 and related disease SARS have increased evidence that protein biomarkers may help provide this definition. Proteins associated with blood coagulation (D-dimer), cell damage (lactate dehydrogenase), and inflammatory response (e.g., creative protein) has already been identified as possible predictors of COVID19 severity or mortality. Proteomics technologies with the ability to detect many proteins per analysis are beginning to extend these early insights. Effective proteomics strategies need to include not only large-scale data collection methods (such as using mass spectrometry), but also computational approaches that can derive practical information from large datasets. Here we review the application of proteomics to COVID 19 and SARS and outline how technology pipelines such as artificial intelligence can help study these diseases.

The complexity of COVID-19 poses challenges in understanding the etiology and evolution of biomarkers

The pandemic of respiratory disease (COVID19) associated with the new coronavirus (SARSCoV2) in 2019 is infection, progression and patients. Recognizes indicators of sequel associated with those who have survived the disease, highlighting the need for biomarkers to stratify and predict the future. COVID19 has been shown to have a high infection rate (initial reproduction number calculation ranges from 2 to 33.4) and a high mortality rate (first reported in China). It depends on the age, but it is 2.3%. In UK, the all-cause mortality rate from COVID 19 is estimated to be 0.7%, rising to 7.8% for people over the age of 80 and dropping to 0.002% for children (Coronavirus (MERSCoV)). First seen on the Arabian Peninsula, it infected about 3,000 people and killed about 850. As of this writing, SARSCoV2 has infected more than 10 million people and killed more than 500,000. However, the difference between these diseases is clear. SARSCoV and SARSCoV2 may affect important organs such as lungs, heart, liver and kidneys. During the 2003 SARS outbreak, major protein changes were shown to occur in peripheral blood Rice field. The definition of the disease risk genotype of COVID19 will undoubtedly be a research area. Given the ages of those most severely affected by SARSCoV2 and associated comorbidities, these data provide an incomplete picture of risk and do not reflect response to treatment or subsequent complications. Proteomics and mass spectrometry techniques are extremely sensitive and can provide comprehensive images of the patient's condition and underlying biomedical processes. Proteomic biomarkers are more useful in infectious diseases because they are more readily available than human transcripts (although transcripts are of great value in detecting the risk of cancer). Moreover, they vary by different pathologies and orbits, as opposed to the genome.

The diagnosis of COVID19 currently consists of two main approaches. Assays that use immunoassays to detect antibodies against specific viruses (such as SARSCoV2) in patient samples and real-time Reverse Transcription Polymerase Chain Reaction (RTPCR) associated with various clinical procedures. It includes broncoalveolar lavage fluid, bronchoscopy, saliva, nasal swabs, throat swabs, feces or blood specimens. However, as the disease progresses, other questionable raised (and the need for associated biomarker assays). Most people infected with SARSCoV2 initiate an immune response and remain healthy (often asymptomatic) within a week of infection. Those who cannot achieve this find that their response to infection adversely affects many physiological processes and has symptoms such as: severe resting dyspnea or dyspnea, hemoptysis, pallor, fainting or collapse, confusion, and decreased urine output. Identifying those who are infected early and those who enter this

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difficult second phase can have a significant impact on the management of this pandemic and its impact on those affected. This can be partially achieved by considering characteristics such as body mass index and perhaps ethnicity. We also need biomarkers that provide additional insights. People at highest risk for signs of developing or increasing severity of the disease (e.g., those who have had an organ transplant, who are being treated for cancer, who have leukemia, respiratory illness, or severe heart disease it is important to monitor).