Temporal landscape of human gut RNA and DNA virome in SARS-CoV-2 infection and severity

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Video Byte

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Abstract

COVID-19, caused by the enveloped RNA virus SARS-CoV-2, primarily affects the respiratory and gastrointestinal systems. Disease severity varies substantially across patients; the disease is mild or asymptomatic in some cases and causes respiratory failure or death in others. SARS-CoV-2 viral RNA has been detected in fecal samples, suggesting that the gastrointestinal tract may be a site of viral replication. To better understand the effect of SARS-CoV-2 on resident gut viruses (the “gut virome”), researchers examined blood samples and fecal specimens from 98 patients with COVID-19 and 78 healthy individuals. Using shotgun metagenomics, they found that patients with COVID-19 had decreased abundance of certain RNA viruses and DNA-based bacteriophages. In contrast, environment-derived eukaryotic DNA viruses were enriched in COVID-19 patients. The fecal virome expressed more genes associated with stress, inflammation, and virulence in patients with COVID-19, and the baseline abundance of 10 different virus species was inversely correlated with virus severity and with the patients’ age. These results suggest that COVID-19 may affect the composition of the gut virome in association with host stress responses and hyper-inflammation, highlighting the importance of the human gut virome in the severity of and potential therapeutics for COVID-19.