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Key biomarkers for predicting symptomatic SARS-CoV2 infection

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COVID-19, a disease caused by SARS-CoV-2 infection, has led to a global pandemic. In South Korea, there have been over 34 million infections and 35,000 deaths between January 20, 2020, and August 31, 2023, according to the Korea Centers for Disease Control and Prevention. The severity of COVID-19 cases varies, ranging from asymptomatic patients to those requiring intubation and, in some cases, leading to death. In this study, we aimed to identify biomarkers for predicting whether a patient would be symptomatic or asymptomatic. To this end, we analyzed 191 protein levels measured in 554 COVID-19 patients and constructed Lasso models to differentiate between symptomatic and asymptomatic groups. These protein levels were obtained from the Korean Centers for Disease Control and Prevention (KCDC). One notable finding was that healthy individuals without SARS-CoV-2 infection do not exhibit the same or similar protein profiles as asymptomatic patients with the infection. Consequently, we selected asymptomatic patients, rather than healthy individuals, as the control group for constructing our COVID-19 symptom prediction model. In conclusion, through various statistical and machine learning analyses, we identified that Serpin A10 and Complement Component 9 can be key biomarkers for differentiating between asymptomatic and symptomatic patients.