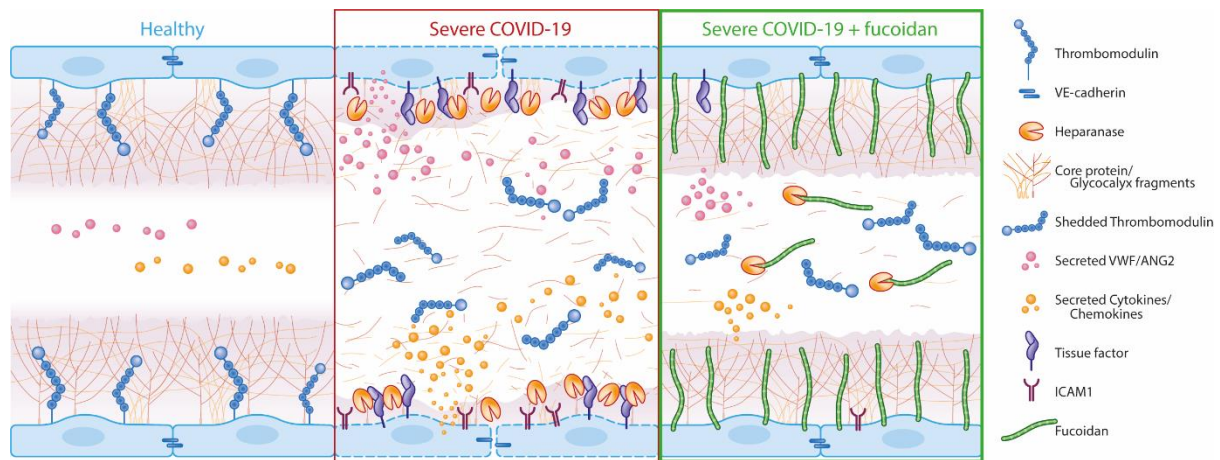


## Graphic abstract



Under homeostatic conditions (healthy), intact endothelial glycocalyx maintains a stable endothelial barrier. COVID-19 serum of patients on ICU induces endothelial activation (cytokine release, ANG2 and VWF and shedding of thrombomodulin), glycocalyx degradation, loss of endothelial barrier function and EC procoagulable state (increased tissue factor expression). Supplementation of the heparan sulfate mimetic fucoidan restores the endothelial glycocalyx and barrier function and reverses the endothelial procoagulable state.