

COVID-19 INFECTION AND NEURODEGENERATION: A POTENTIAL LINK REVEALED BY COMPUTATIONAL SIMULATIONS

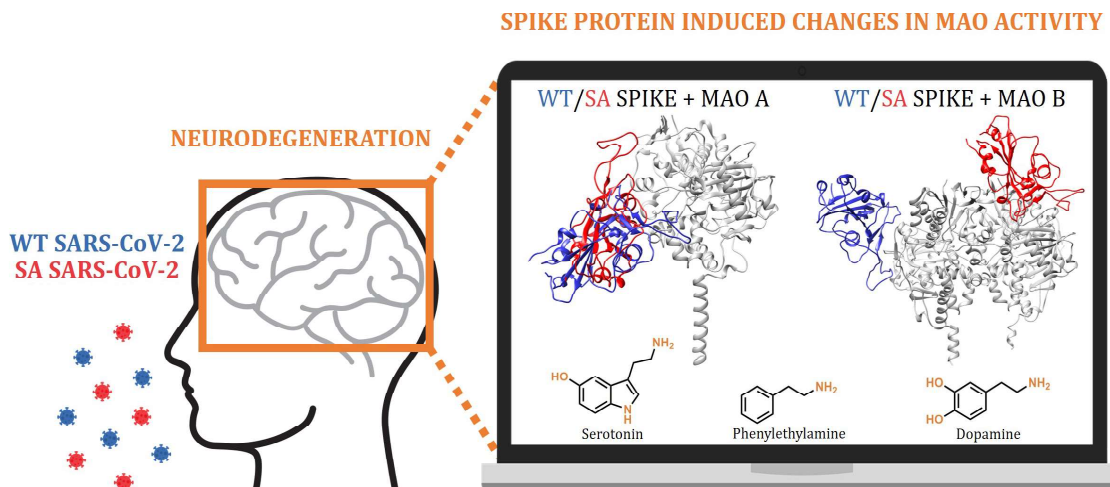
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Although COVID-19 has been primarily associated with pneumonia, recent data show that the SARS-CoV-2 virus can infect other vital organs, such as heart, kidneys and brain. The literature agrees that COVID-19 is likely to have long-term mental health effects on infected individuals, which signifies a need to understand the role of the virus in the pathophysiology of brain disorders that is currently unknown and widely debated.^[1] Our docking and molecular dynamics simulations^[2] show that affinities of spike proteins from the wild type (WT) and South African (SA) variant for MAO enzymes are comparable to those for their ACE2 receptors. This allows for the spike...MAO complex formation, which changes MAO affinities for its neurotransmitters, thus eventually impacting rates of their metabolic conversions and misbalancing their levels. Knowing this fine regulation is strongly linked with the etiology of various neurodegenerative disorders, these results highlight the possibility that the interference with the brain MAO activity is responsible for the increased neurodegeneration following the COVID-19 infection. Since the obtained insight suggests a more contagious SA variant would produce even larger disturbances, and with new and more problematic strains likely emerging in the near future, we firmly advise that the demonstrated prospect for the SARS-CoV-2 induced neurological complications should not be ignored, rather requires further clinical investigation in order to achieve early diagnosis and timely treatment.



References

- 1) P. J. Harrison et al., *The Lancet Psychiatry* 2021, 8, 416.
- 2) L. Hok, H. Rimac, J. Mavri, R. Vianello, *Comput. Struct. Biotechnol. J.* 2022, 20, 1254.