Chronic alcohol intake regulates expression of SARS-CoV2 infection-relevant genes in an organ-specific manner

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Chronic alcohol consumption and alcohol use disorder (AUD) have a tremendous impact on the patient's psychological and physiological health. There is some evidence that chronic alcohol consumption influences SARS-CoV2 infection risk, but the molecular mechanism is unknown. Here, we generated expression data of SARS-CoV2 infection relevant genes (Ace2, Tmprss2 and Mas) in different organs in rat models of chronic alcohol exposure and alcohol dependence. ACE2 and TMPRSS2 represent the virus entry point whereas Mas is activating the anti-inflammatory response once the cells are infected. Across three different chronic alcohol test conditions, we found a consistent upregulation of Ace2 in the lung, which is the most affected organ in Covid-19 patients. Other organs such as liver, ileum, kidney, heart, and the brain showed also up-regulation of Ace2 and Mas but in a less consistent manner across the different animal models, while Tmprss2 was unaffected in all conditions. We suggest that alcohol-induced up-regulation of Ace2 can lead to an elevated stochastic probability of cellular virus entry and may thus confer a molecular risk factor for a SARS-CoV2 infection.

Keywords: COVID19, Ace2, Tmprss2, Mas, Alcohol Use Disorder

Biography:

Marion Friske studied Biochemistry and Biophysics at the University Bayreuth and Albert- Ludwigs-University Freiburg. She did her Master Thesis at the Max-Planck-Institute for Immunology and Epigenetics Freiburg focusing on ELAV, a neuron-specific transcription factor essential for neuronal growth. Since 2019, she is PhD student at the Central Institute of Mental Health Mannheim in Rainer Spanagel's Lab, researching on molecular mechanisms of Alcohol Use Disorder (AUD) in human postmortem and rat brain tissue. At the moment, she is working on a translational single-nuclei Sequencing approach combining brain tissue from deceased AUD patients, organoids and post-dependent rats..