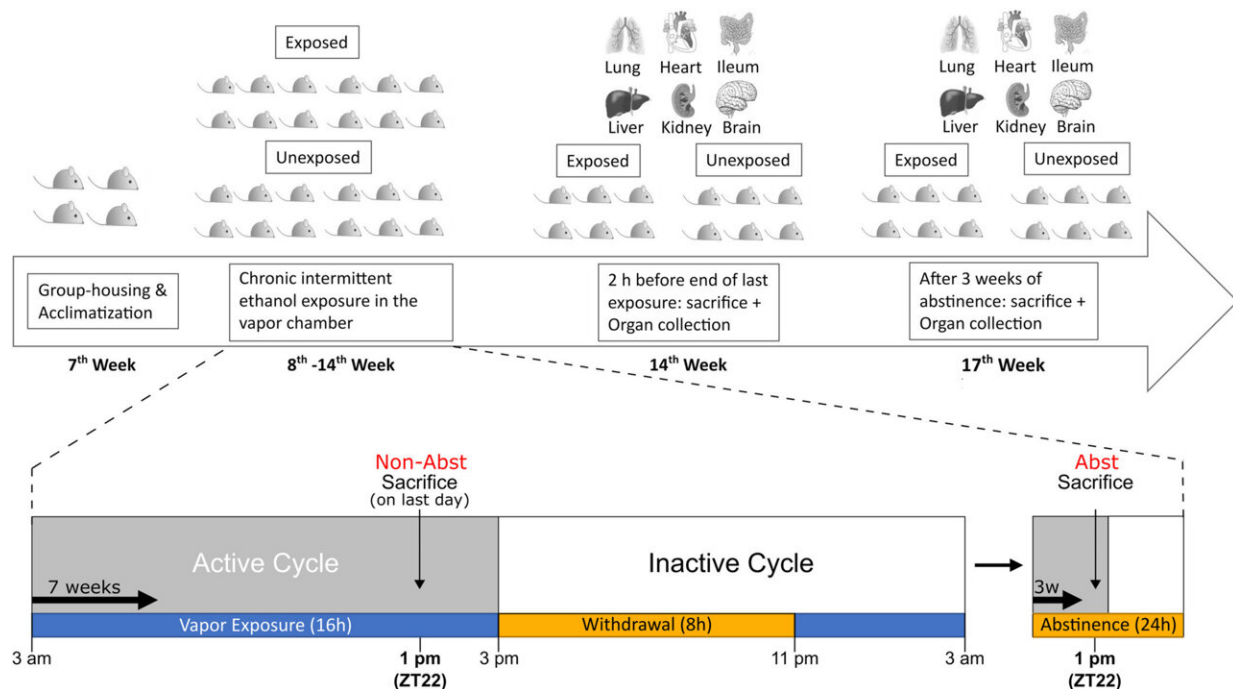


Long-term alcohol use is a potential risk factor for COVID-19 complications

February 20 2023, by Torsten Lauer



Timeline of the chronic intermittent EtOH vapor exposure experiment. *Top:* General experimental setup. Daily cycles of EtOH vapor exposure were performed for seven consecutive weeks with 16 h exposure per day. During the last exposure, half of the animals were sacrificed and the respective organs were collected. After 3 weeks of abstinence, the remaining half of the batch was sacrificed, including organ collection. *Bottom:* Exposure and recovery times during the 7 weeks of intermittent vapor exposure. The animals were sacrificed 2 h before end of the active cycle (ZT22), matching with the subchronic EtOH IP-treated animals. Credit: *Alcohol: Clinical and Experimental Research* (2023). DOI: 10.1111/acer.14981

Studies from animal models suggest that frequent alcohol consumption may lead to an increased risk of COVID-19 infection and present a potential for complications in disease progression.

The COVID-19 pandemic has been a major challenge for many people. As a result, rates of mental illness have steadily increased and [alcohol](#) has become a commonly used means of escaping the worries of everyday life. Many [risk factors](#), such as age and obesity, that contribute to infection and an unfavorable course of COVID-19 disease are known.

However, the extent to which alcohol [consumption](#) has an impact on SARS-CoV2 [coronavirus infection](#), or whether alcohol consumption also contributes to an unfavorable course of COVID-19 disease, has not yet been elucidated. This gap in knowledge is surprising considering that 2.2 billion people consume alcohol on a regular basis.

COVID markers in long-term alcohol consumption

Researchers from the Institute of Psychopharmacology at the Central Institute of Mental Health (CIMH) in Mannheim/Germany have now addressed this question. In several animal models of long-term alcohol consumption and dependence, they investigated the expression of key COVID markers in various organs considered as vulnerable to the disease and potential complications. Here, Prof. Rainer Spanagel's team found that the coronavirus entry receptor, ACE2, was elevated in the lungs of all animal models studied.

"We interpret the results to mean that this increases the risk of COVID-19 infection through increased entry of the virus," says Rainer Spanagel. The lung is considered a very susceptible organ for infection with SARS-CoV2. Thus, [acute respiratory distress syndrome](#) (ARDS) often occurs in cases of serious COVID-19 disease. "So our work first indicates that frequent alcohol consumption can lead to an increased risk

of COVID-19 infection and is a potential for complications in the course of the disease," Spanagel says.

MAS gene reduction

Once cells are infected by coronavirus, a cascade is triggered that kills the virus in the cells. One of the initial factors for this cascade is MAS, a gene with anti-inflammatory effect, which is therefore a protective factor in relation to the COVID-19 disease. In the animals that consumed alcohol, the reduction of this gene was measured in a part of the brain responsible for smelling.

A lower concentration of the MAS gene may lead to a reduced defense response in these cells, allowing the virus to continue to spread undisturbed. The researchers interpreted this reduction of the MAS gene in this brain region as potentially increasing susceptibility to anosmia—the loss of the ability to smell. Alcohol consumption could thus also be a risk factor for long-lasting olfactory loss in COVID-19 disease.

This study thus provides new evidence suggesting that [alcohol consumption](#) may have a [potential effect](#) on overall COVID-19 infection risk and favoring complications associated with the disease. Clarifying [epidemiological studies](#) in patients are urgently needed to further investigate the impact of these effects.

The study is published in the journal *Alcohol: Clinical and Experimental Research*.

More information: Marion M. Friske et al, Chronic alcohol intake regulates expression of SARS-CoV2 infection-relevant genes in an organ-specific manner, *Alcohol: Clinical and Experimental Research* (2023). [DOI: 10.1111/acer.14981](https://doi.org/10.1111/acer.14981)

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