

## INTRODUCTION

- Previously, SARS-CoV-2 infection has been linked to an increased risk of Parkinson's Disease (PD)
- Previous studies have shown that SARS-CoV-2 infection in the brain has resulted in increased inflammation and oxidative stress, as well as increased deposition of alpha-synuclein, a protein marker of PD
- It is not known if SARS-CoV-2 infection will have similar effects if only contained to the respiratory tract

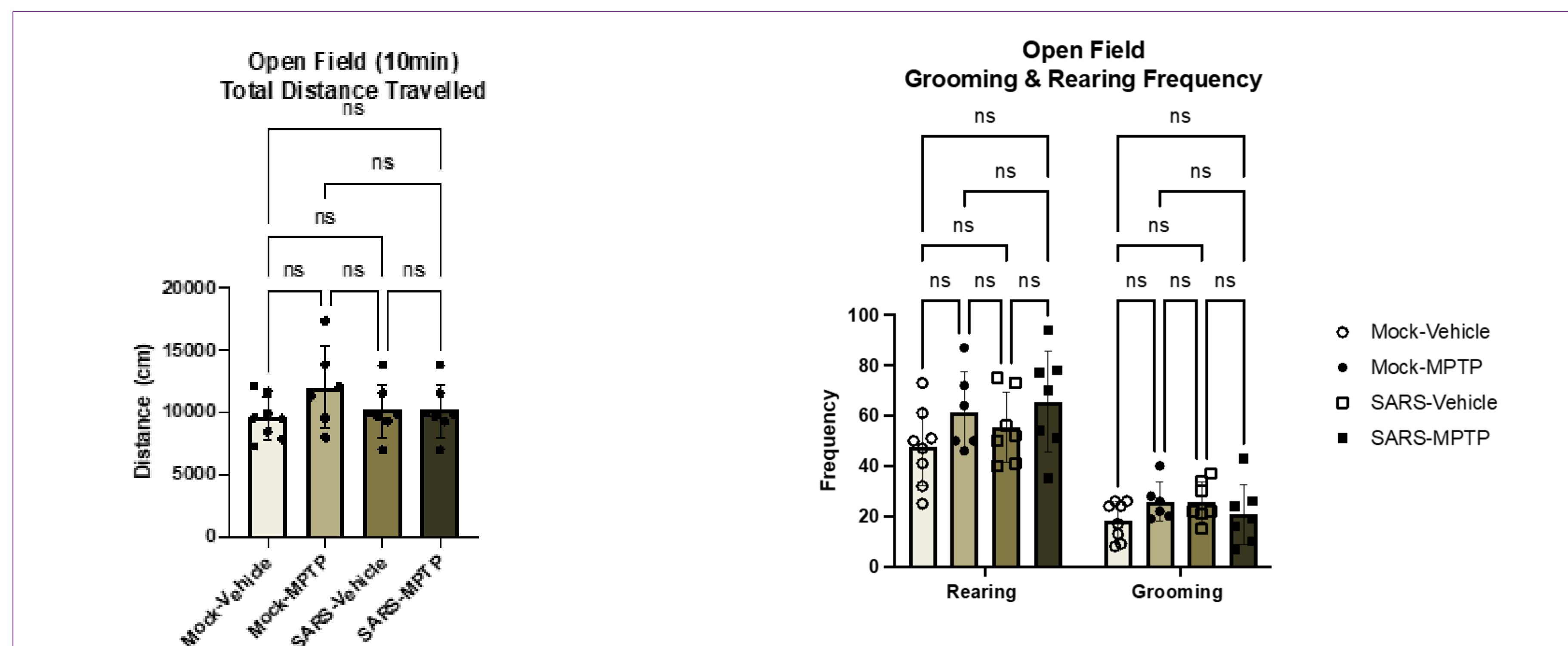
## OBJECTIVE

- Determine whether AAV (adeno-associated virus) infection is providing the same SARS-CoV-2 neurological effects compared to K18-hACE2 mice, a transgenic model of COVID-19 that includes the central nervous system

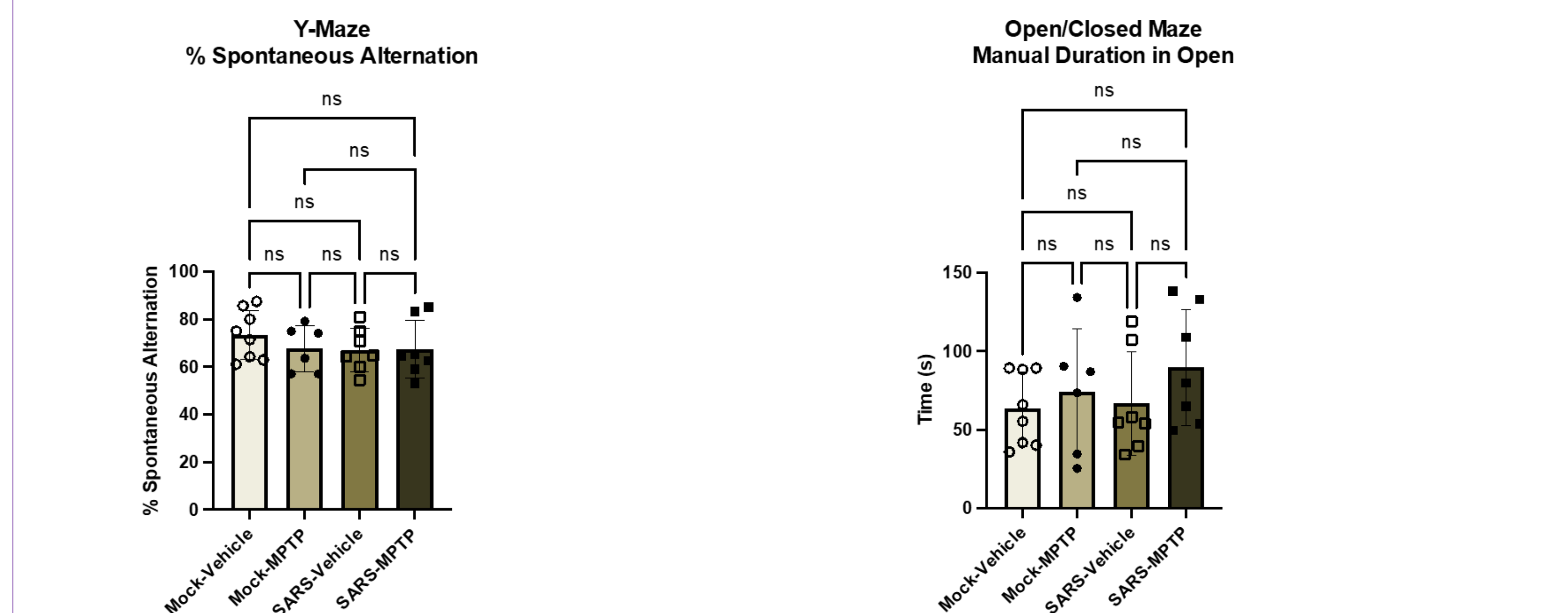
## MATERIALS & METHODS

- ACE2 receptor expression was induced in mice via administration of intranasal AAV
- After ACE2 expression, mice were given treatments and assigned to four different treatment groups: Mock-Vehicle, SARS-Vehicle, Mock-MPTP, and SARS-MPTP
- Mice were subjected to behavioral testing through an open field, Y maze, Rotarod, and O maze
- Behaviors were analyzed and compared across groups

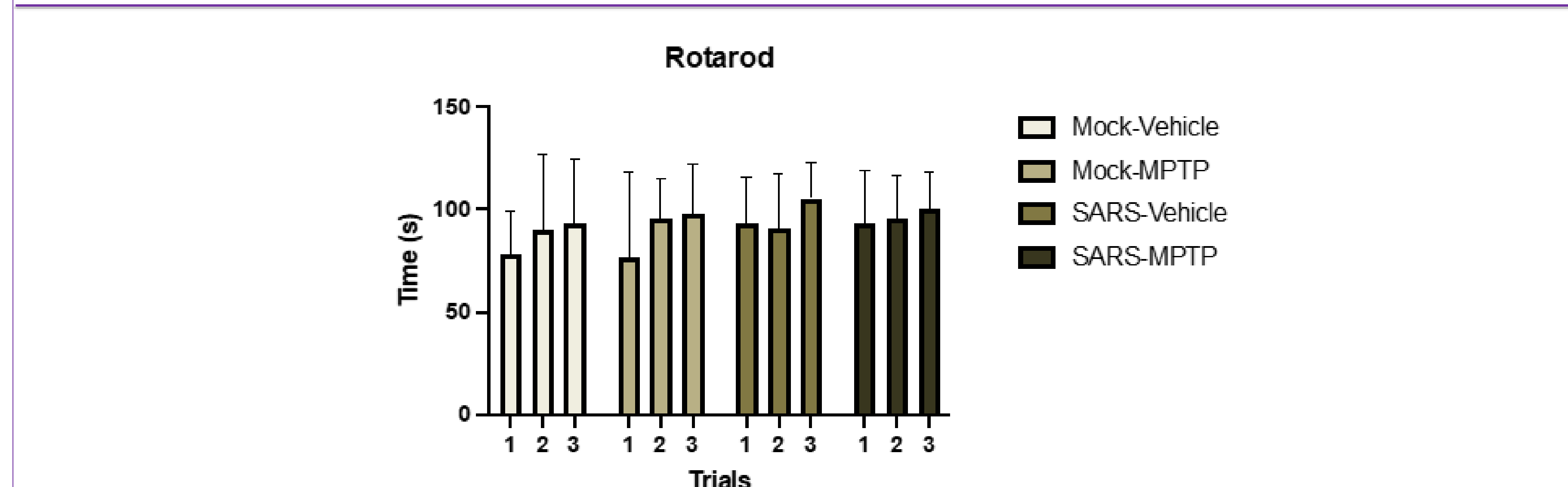
## RESULTS



No statistically significant difference in behaviors were observed in the Open Field. More stress and anxiety were expected to be seen in MPTP mice, indicated by increased rearing and grooming and decreased distance travelled.



Spontaneous alteration was expected to be increased in the MPTP groups. However, no difference was observed between groups. MPTP mice were expected to be less exploratory in the O maze, but these results were not yielded.



MPTP groups were expected to spend less time on the Rotarod, indicating decreased motor coordination, but no significant difference was observed between the four groups.

## SUMMARY/CONCLUSION

- No statistically significant difference were found across various behavioral testing or between any of the four groups
- Next steps in the study are to section mice brains and stain for markers of AAV, SARS-CoV-2, dopaminergic neurons, and microglia.
- Further investigation may include repeating experiments to determine if similar results are yielded.

## REFERENCES/BACKGROUND LITERATURE

Lee, B et al. "SARS-CoV-2 infection exacerbates the cellular pathology of Parkinson's disease in human dopaminergic neurons." *Cell Reports Medicine*, vol. 5, no. 5 (2024). doi: <https://doi.org/10.1016/j.xcrm.2024.101570>

Smeyne, Richard J et al. "COVID-19 Infection Enhances Susceptibility to Oxidative Stress-Induced Parkinsonism." *Movement Disorders*, vol. 37, no. 7 (2022):1394-1404. doi:10.1002/mds.29116

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