

# Review of: "Co-expression of the SARS-CoV-2 entry receptors ACE2 and TMPRSS2 in healthy human conjunctiva"

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**Potential competing interests:** The author(s) declared that no potential competing interests exist.

**Aim and scope of the article:** In their article « Co-expression of the SARS-CoV-2 entry receptors ACE2 and TMPRSS2 in healthy human conjunctiva », Mencucci et al. analyze the co-expression of the main viral entry receptor ACE2 and its auxiliary molecule TMPRSS2 in specimens of healthy human conjunctiva using three different methods.

The intention of the authors to elucidate the expression of two SARS-CoV-2 entry receptors in conjunctivae, as an alternative entry route, is valid. Evidence exists that the conjunctiva is, in fact, a potential, SARS-CoV-2 entry site.

The methodology seems to have been carried out accurately. However, antibodies differ among authors (manufacturer, dilution, pretreatment, etc, see, for instance, Hikmet et al. or Lee et al.) which can lead to differences in staining and expression patterns.

**Discussion of the article:** Retinal detachment surgery has allowed for retrieval of healthy conjunctivae, which is a major advantage of the study, compared to other studies (for instance, paraffin-embedded material). However, the limited sample size (n=4+7=11) can be critically seen. The authors state this, too, and claim for a more systematic analysis of receptor expression in healthy conjunctiva. In their study, they detect expression of both entry molecules, which is in line with previous publications, e.g. Lange et al.

**Conclusion:** Mencucci et al. describe relevant data and support them adequately with three methods. The role of the conjunctivae in viral transmission is still not clear. Its investigation is urgent and crucial as face masks do not cover this potential viral entry site and thereby, cannot impede viral transmission accurately.

## References

Hikmet F, Méar L, Edvinsson Å, Micke P, Uhlén M, Lindskog C. The protein expression profile of ACE2 in human tissues. *Mol Syst Biol.* 2020 Jul 1;16(7):e9610.

[Lange C, Wolf J, Auw-Haedrich C, Schlecht A, Boneva S, Lapp T, et al. Expression of the COVID-19 receptor ACE2 in the human conjunctiva. J Med Virol. 2020 Oct 1;92\(10\):2081-6.](#)

[Lee IT, Nakayama T, Wu C-T, Goltsev Y, Jiang S, Gall PA, et al. ACE2 localizes to the respiratory cilia and is not increased by ACE inhibitors or ARBs. Nat Commun. 2020 Oct 28;11\(1\):5453.](#)