

# **Mechanism of action of Silver against SARS-COV2 (COVID-19) virus**

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- Bio-consultant trained and experienced in Molecular Biology, infectious diseases, viruses, Bioinformatics, **Biosafety and Biosecurity** with the University of Florida and the Mayo Clinic.

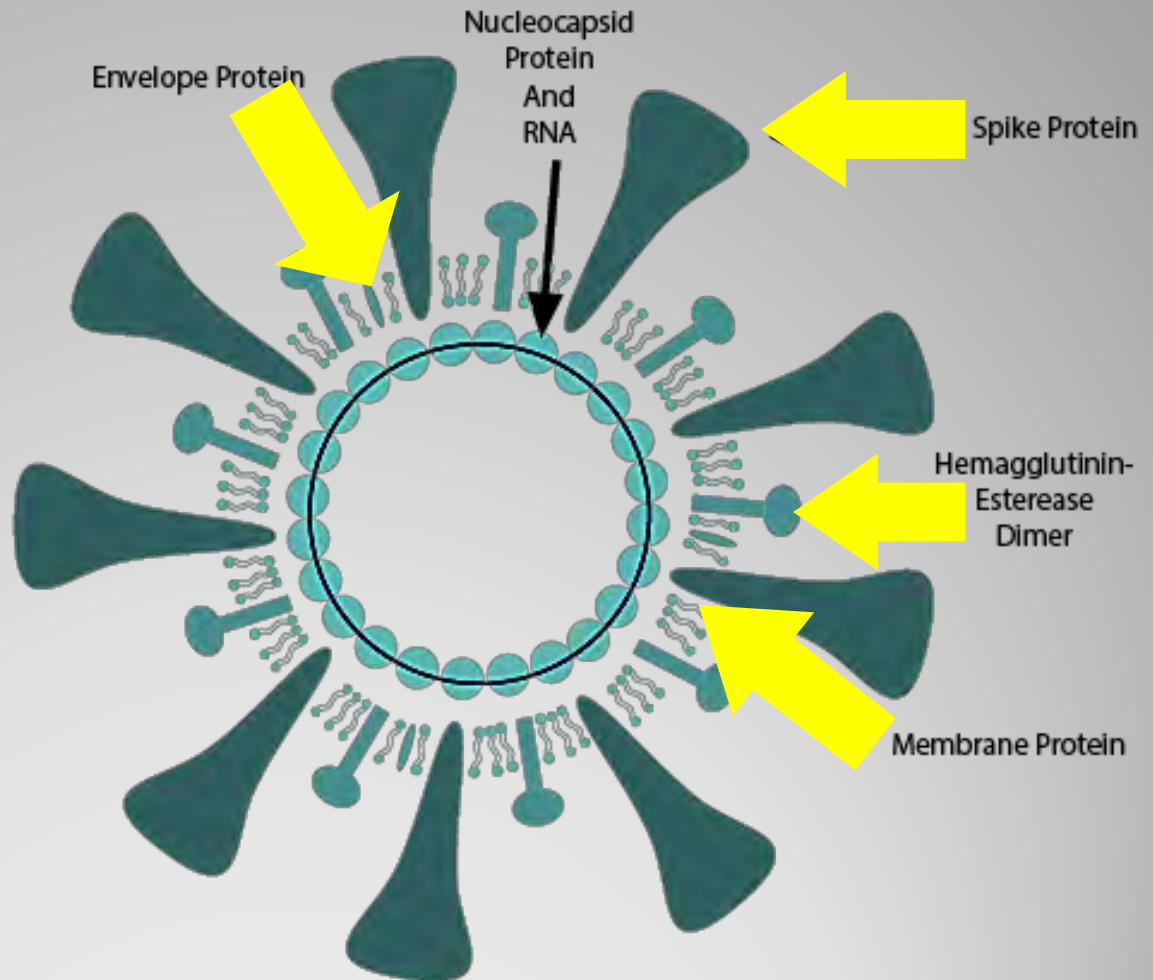
- **Maria Isabel Salazar, PhD**

- PhD in **Microbiology** from Colorado State University.
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## Consultants

SARS-COVID2 the virus responsible for the COVID-19 global pandemic is a single strand enveloped RNA virus.

Membrane proteins shown on the outside of the viral particle (yellow arrows) are responsible for virus integrity and for adherence to human cells.



[Image source: https://www.prosci-inc.com/covid-19/](https://www.prosci-inc.com/covid-19/)

## **SARS-COV2 viral structure**

- **Proteins in the viral envelope have shown to be sensitive to silver ions ( $\text{Ag}^+$ ) and silver ( $\text{Ag}^0$ ).**

Source:

<https://www.nature.com/articles/s41467-020-15562-9?elq=03a7e0300359475c8c8458e122634958&elqCampaignId=10607&elqTrackId=3f6d0c397d4d41f6ab5cf222b0f07cd2&elqaid=27834&elqat=1>

Inactivation of these proteins in the viral envelope results in virus inactivation as the virus loses its ability to bind and enter human cells.

# Coronavirus SARS-COVID2

- Previous reports indicate that the mechanism of inactivation of virus as a response to silver is due to:

**“Action at the cell or capsid protein surface or on the nucleic acid of cells or viruses.”**

Source :

<https://www.tandfonline.com/doi/abs/10.1080/10643388909388351>

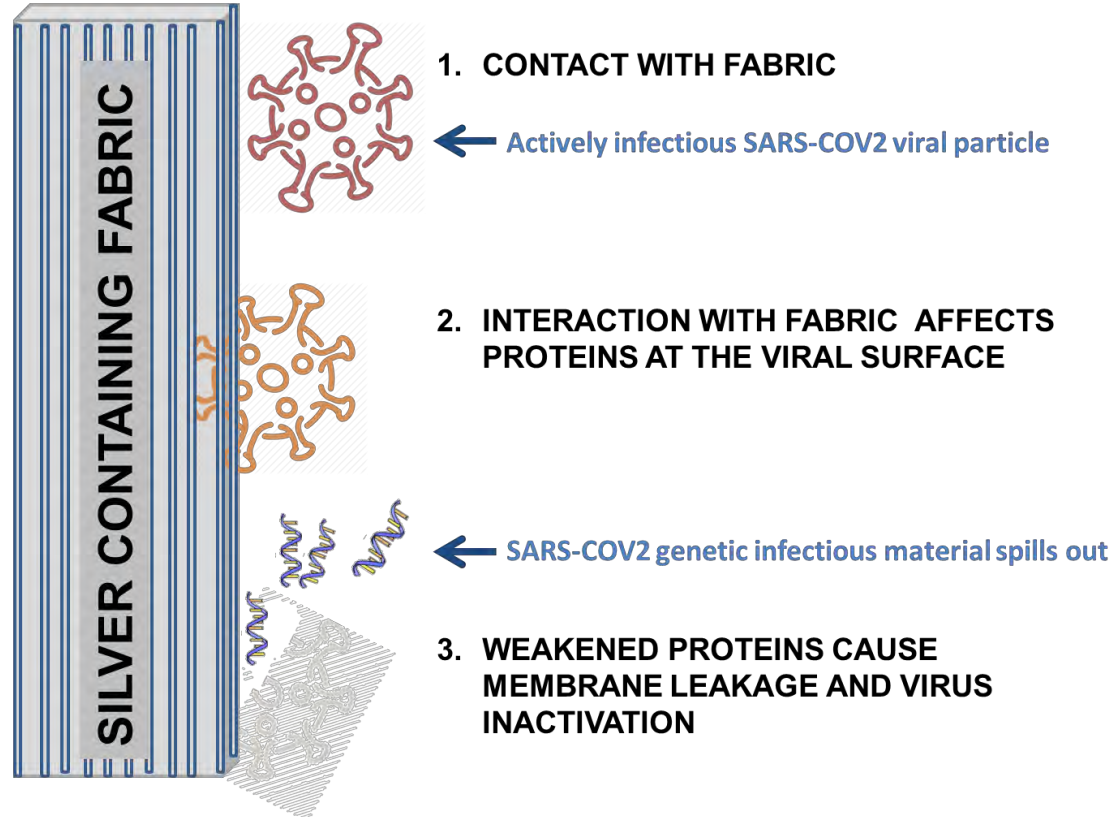
- **“Both ionic  $\text{Ag}^+$  and  $\text{Ag}^0$  have an affinity for the thiol groups of bacterial enzymes and (glyco)proteins exposed on the viral surface”**

Source: <https://aem.asm.org/content/aem/76/4/1082.full.pdf>

**Previous reports in mechanism of action**

While the mechanism of action of silver against viruses is a complex mechanism, it appears that the first step is crucial. In this first step, silver particles and/or silver ions present in the fabric interact with the virus on contact. This contact destabilizes the structure of the viral envelope causing viral contents to spill outside of the cell. As the viral contents are spilled out, the virus is unable to infect the cell (inactivation).

### STEPS FOR SARS-COV2 INACTIVATION ON CONTACT WITH FABRIC



# Graphic representation

Please email me at:

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Thank you !

**Questions?**