

Electrochemical paper-based device for the detection of SARS-CoV-2 on the surface

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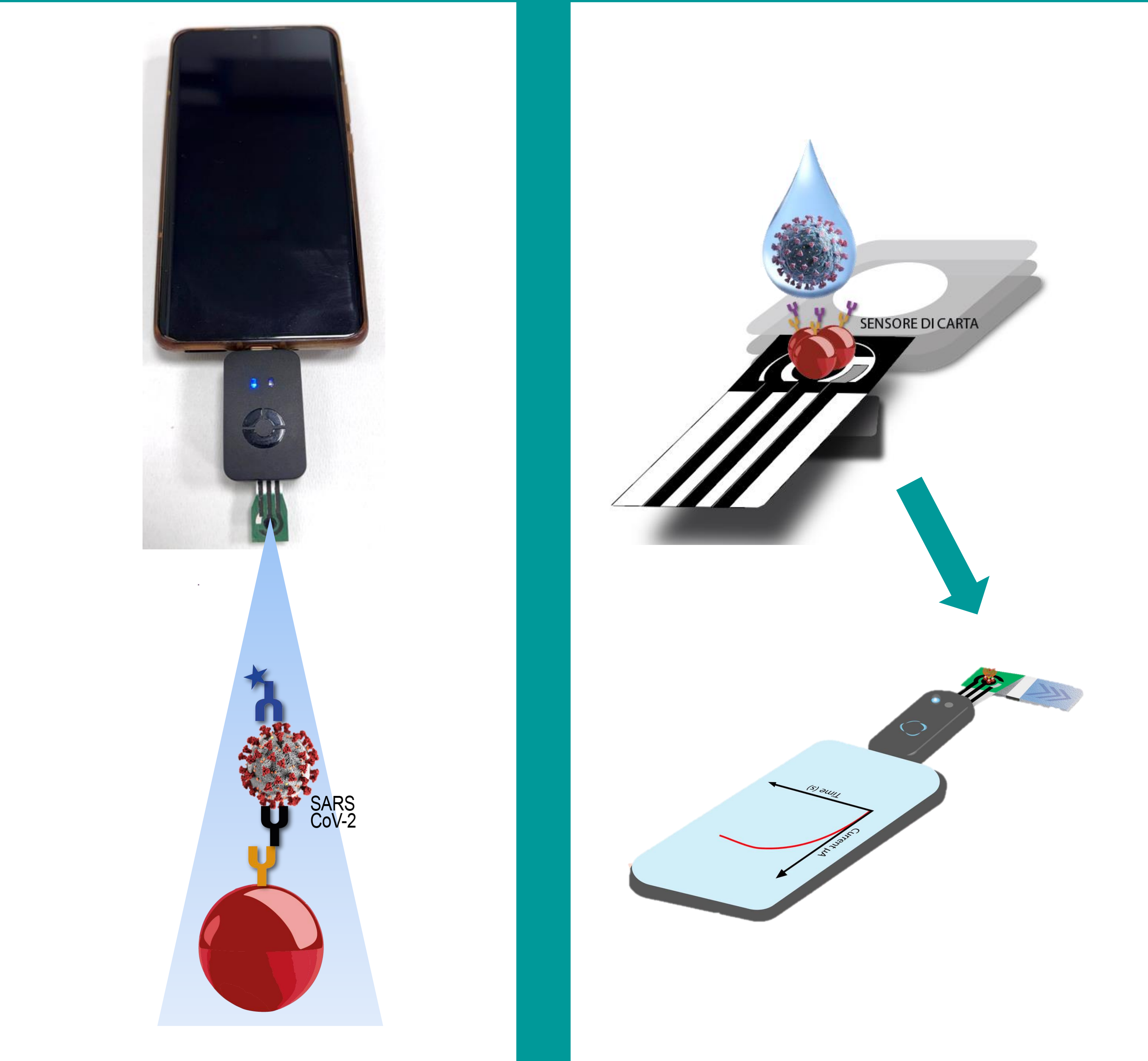
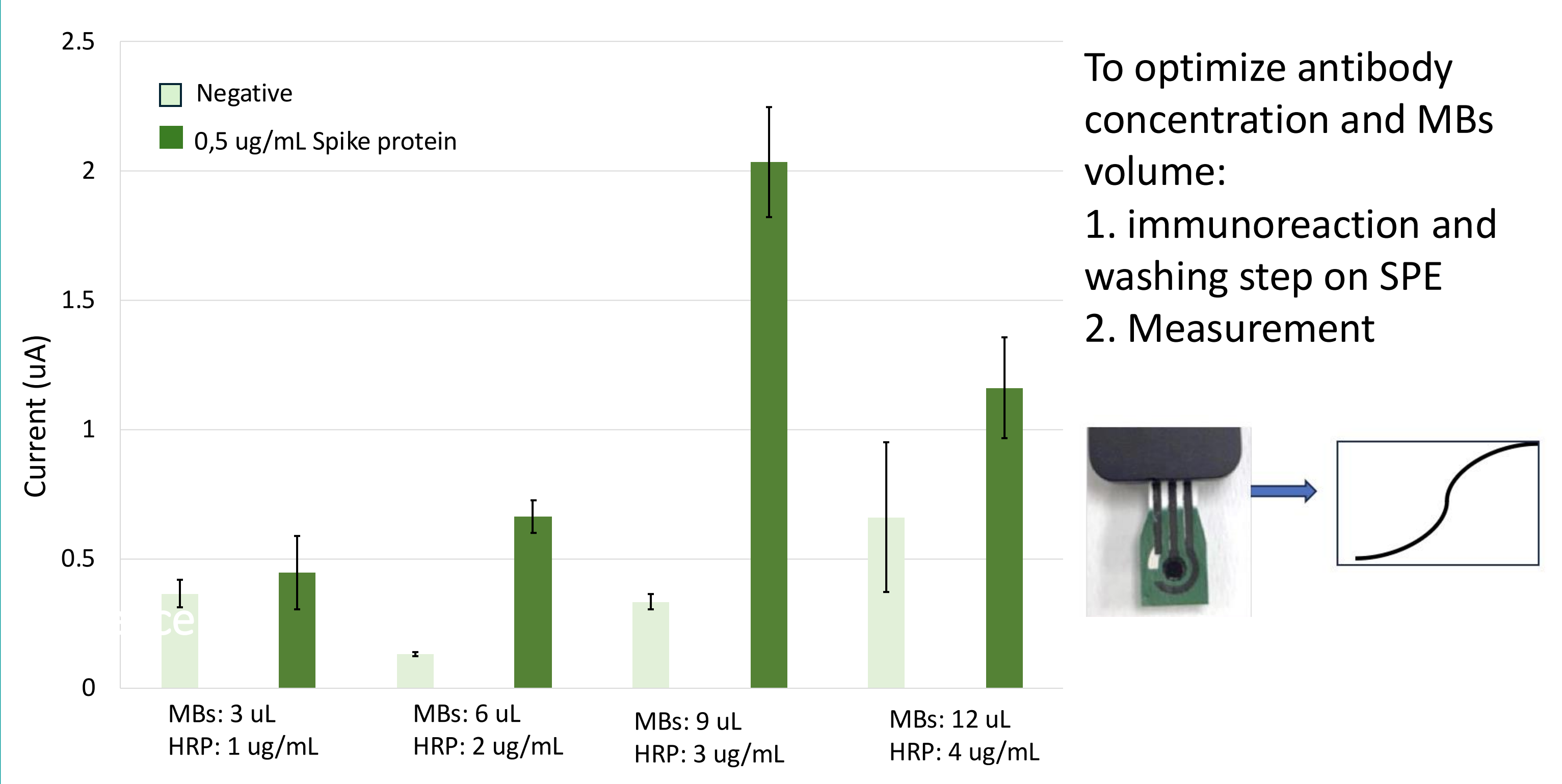
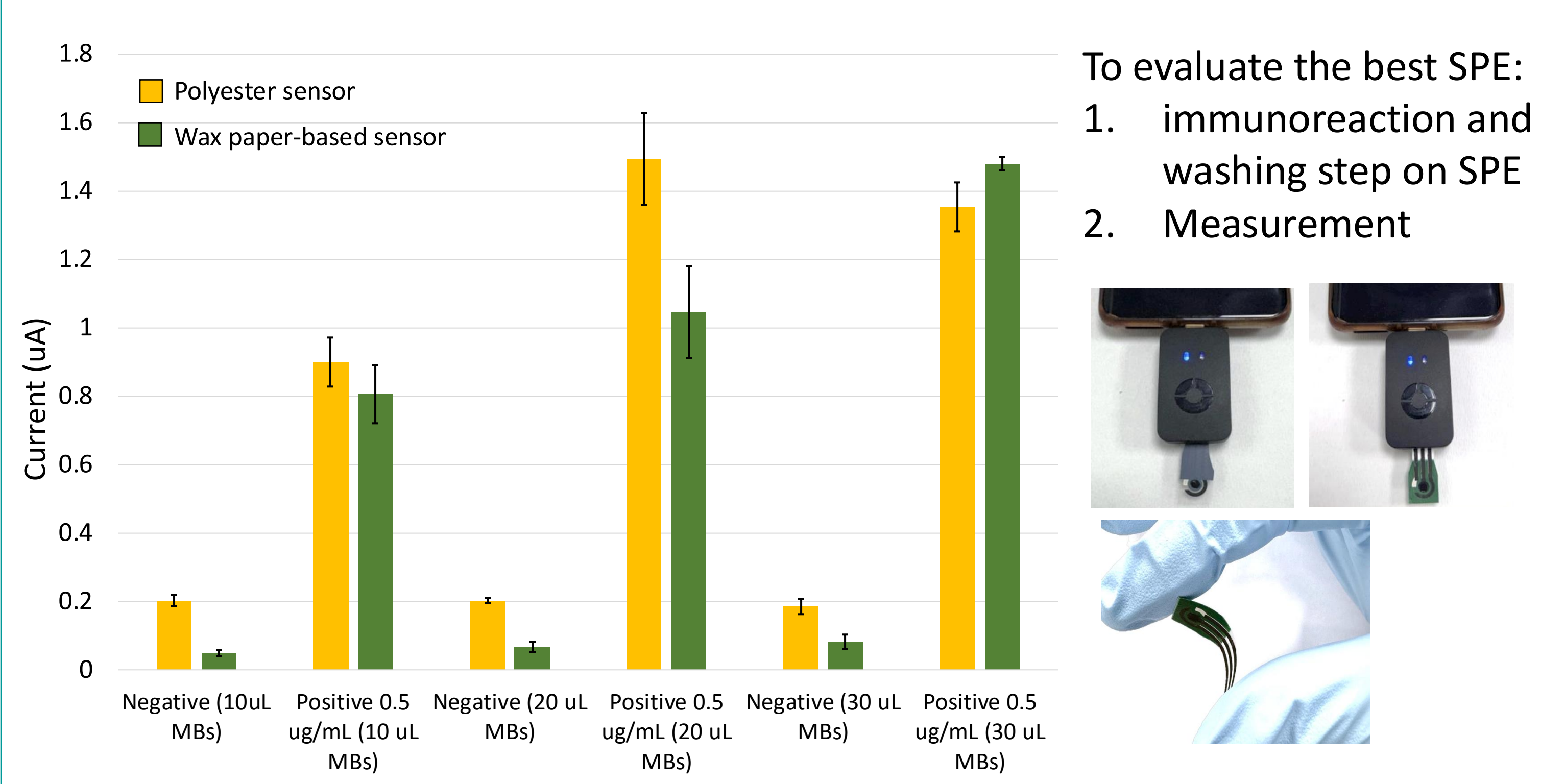
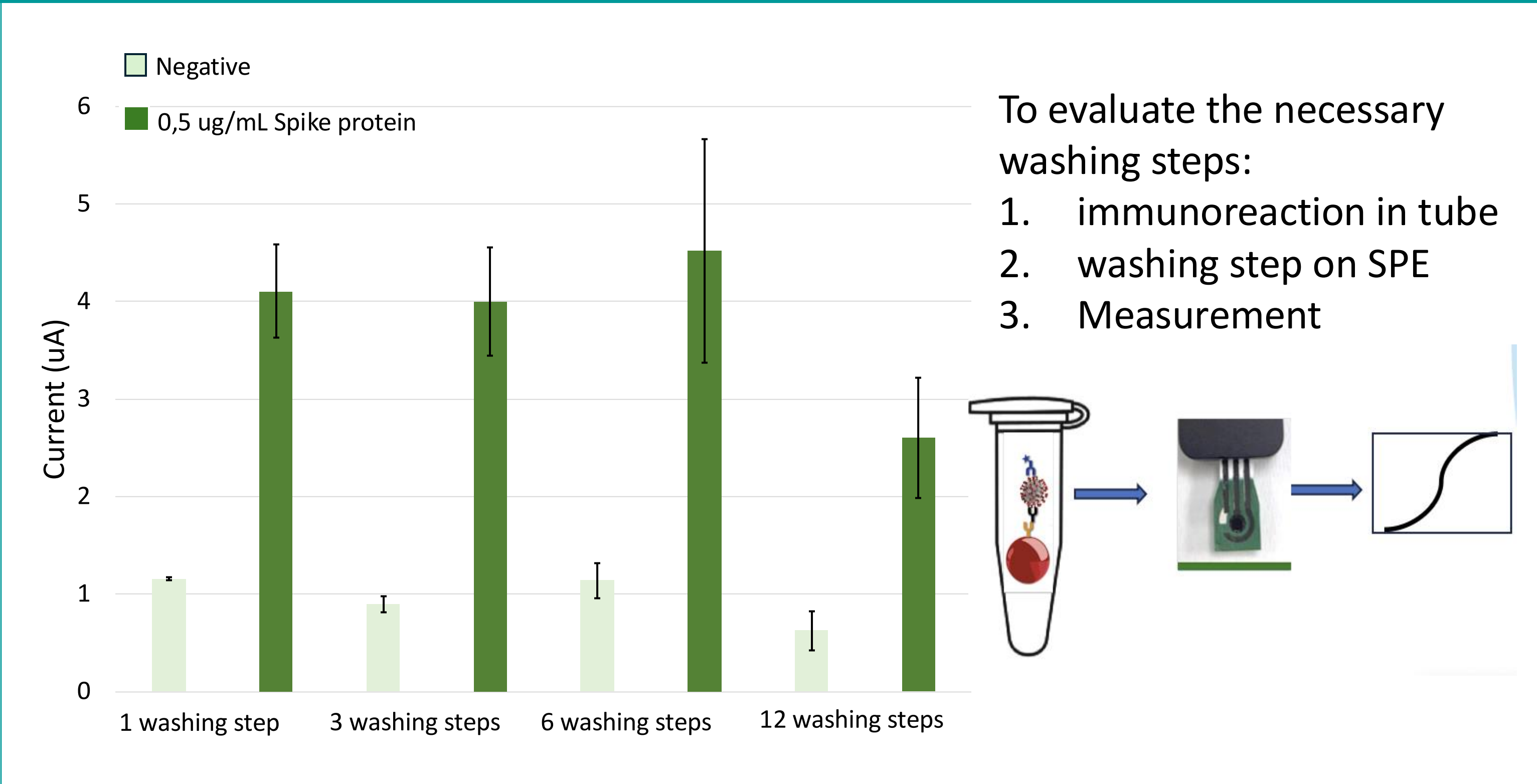
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CONCEPT

The European project RELIANCE aims to create modified self-disinfecting surfaces as a way to control the spread of pathogens better. In this context, we present a paper-based electrochemical immunosensor capable of measuring the effectiveness of the specific surface modification. Following up on our previously published work¹, which was the first publication describing an electrochemical immunosensor for SARS-CoV-2 detection in saliva, we adapted the sensor to easily detect the virus on the surface. The method uses the magnetic beads as support for the sandwich-type immunological chain, which, thanks to their high surface/volume ratio, permits the load of a high amount of antibodies, improving the sensitivity. For electrochemical measurement, we functionalised the working electrode by drop casting with carbon black, demonstrating improved sensitivity using this affordable nanomaterial.

Optimization of MBs-based assay



Future developments

- Optimization of reagent pre-loading
- Test of the analytical performances
- Specificity test with different viruses
- Surface test for real application.

References

1. Fabiani, L., Saroglia, M., Galatà, G., De Santis, R., Fillo, S., Luca, V., Faggioni, G., D'Amore, N., Regalbuto, E., Salvatori, P., Terova, G., Moscone, D., Lista, F., Arduini, F. (2021). Magnetic beads combined with carbon black-based screen-printed electrodes for COVID-19: A reliable and miniaturized electrochemical immunosensor for SARS-CoV-2 detection in saliva. *Biosensors and Bioelectronics*, 171, 112686. 10.1016/j.bios.2020.112686

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