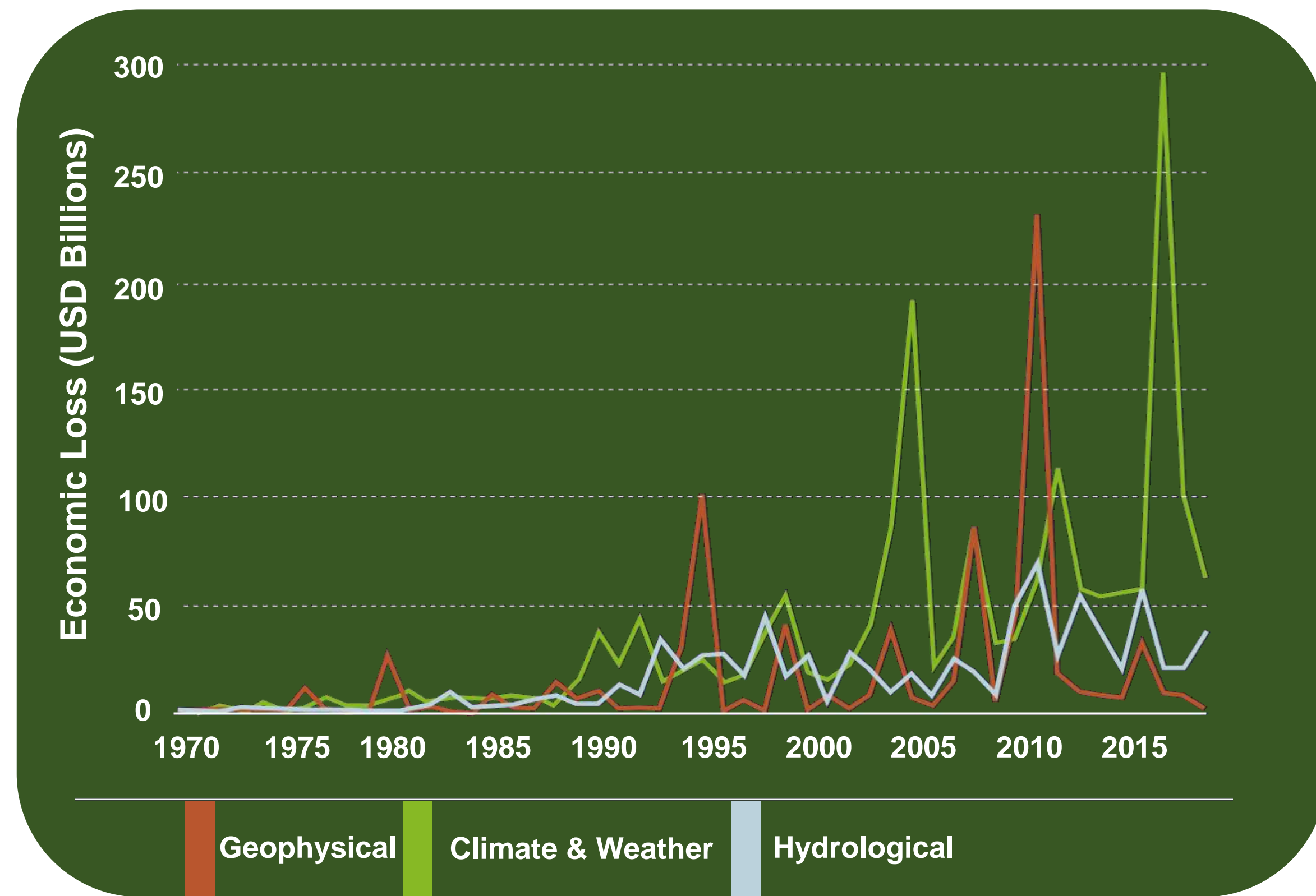


Minimally Invasive Electrochemical Sensors For Remote Monitoring of Crops For Precision Farming Applications

Abdullah Bukhamsin, Abdellatif Ait Lahcen, Jose De Oliveira Filho, Saptami Shetty, Ikram Blilou, Jürgen Kosel, and Khaled N. Salama

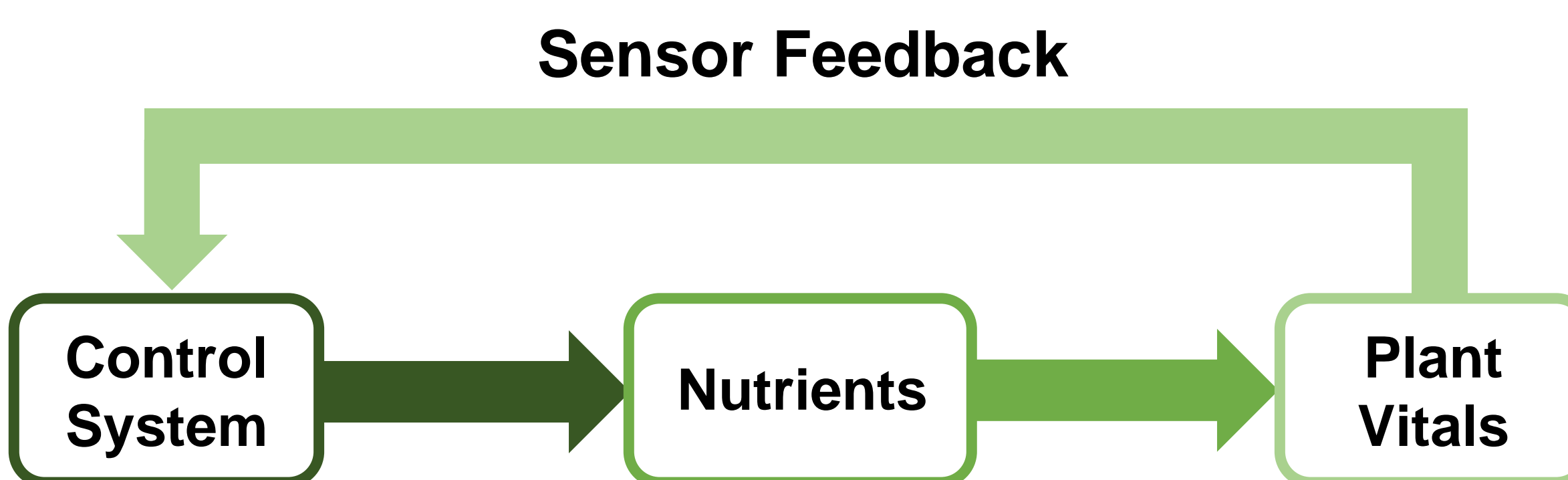
Introduction

- Emerging and endemic plant diseases contribute to an average global annual yield loss of 22.6% across staple crops
- Climate change, rising geopolitical tensions, and human activity have collectively exacerbated food insecurity



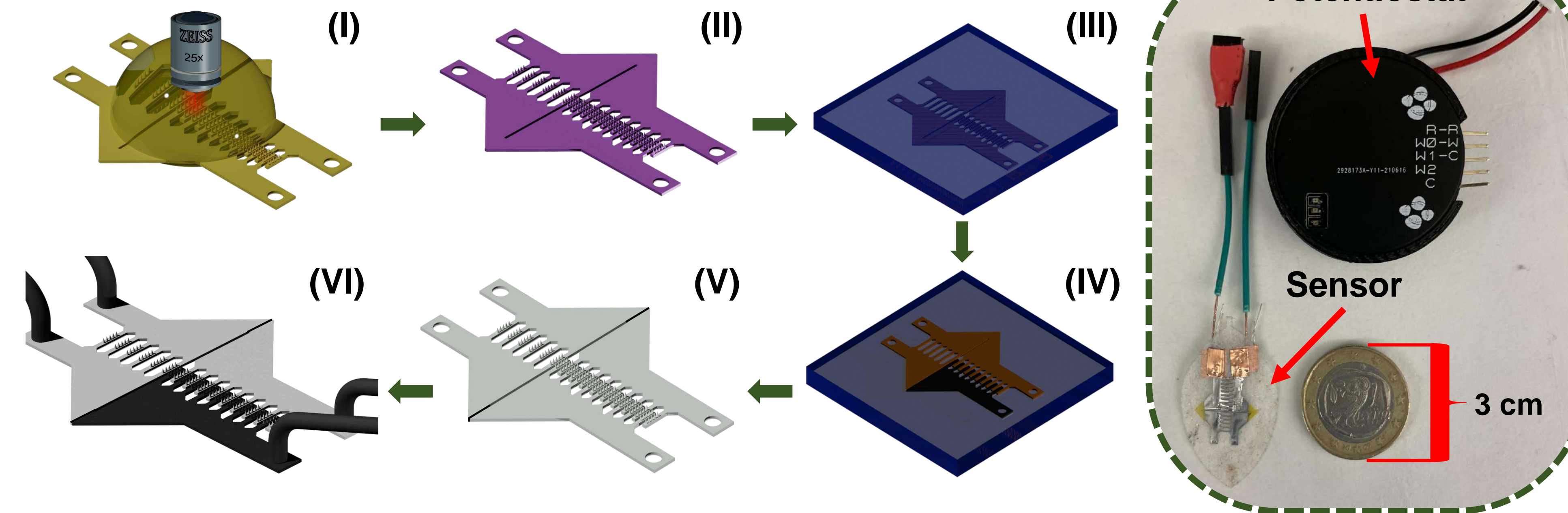
- Sustainable strategies that link the real-time needs of crops to administered resources are required to increase yields without additional land clearance

This goal requires a proactive approach for **early detection** and management of biotic and abiotic stress factors in the field

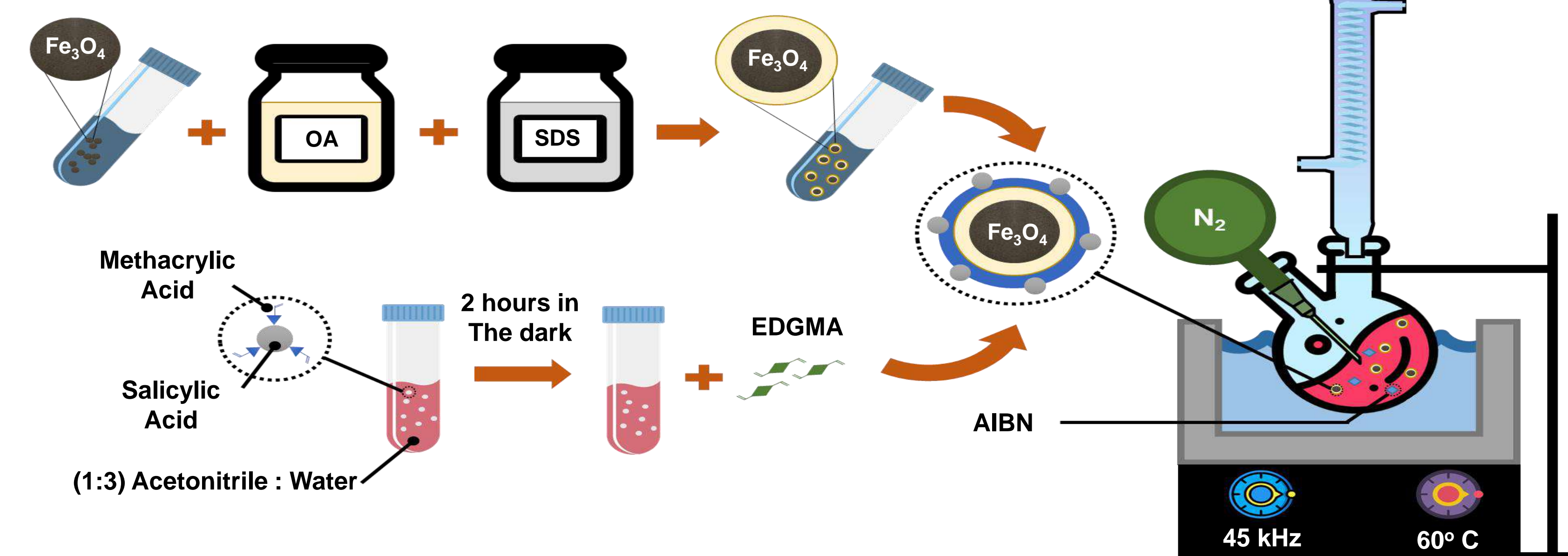


Methodology

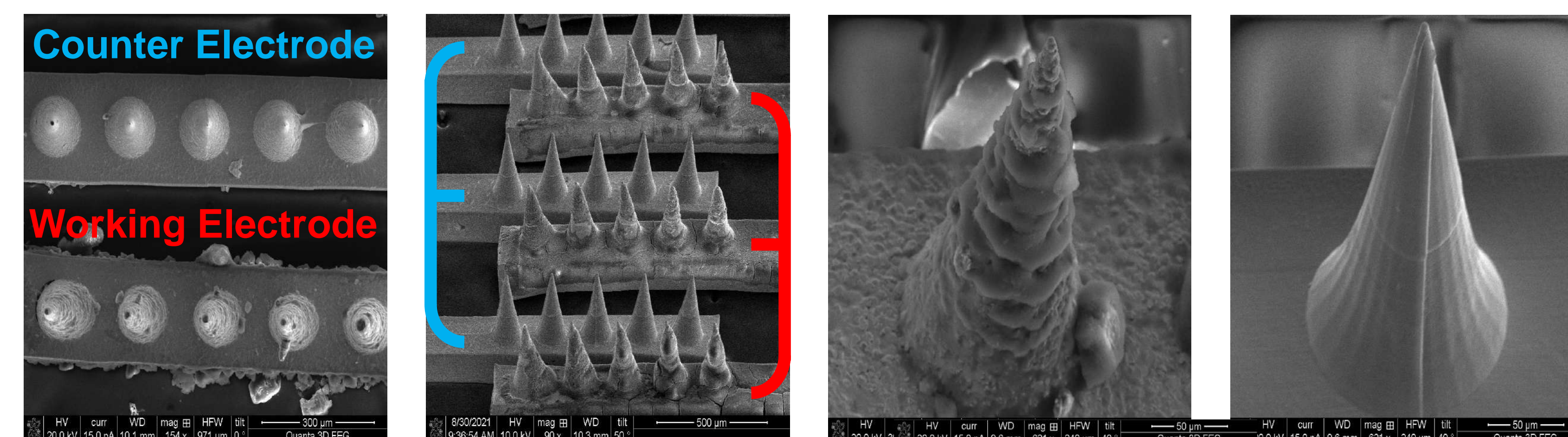
Device Fabrication



Salicylic Acid Molecularly Imprinted Polymers Synthesis

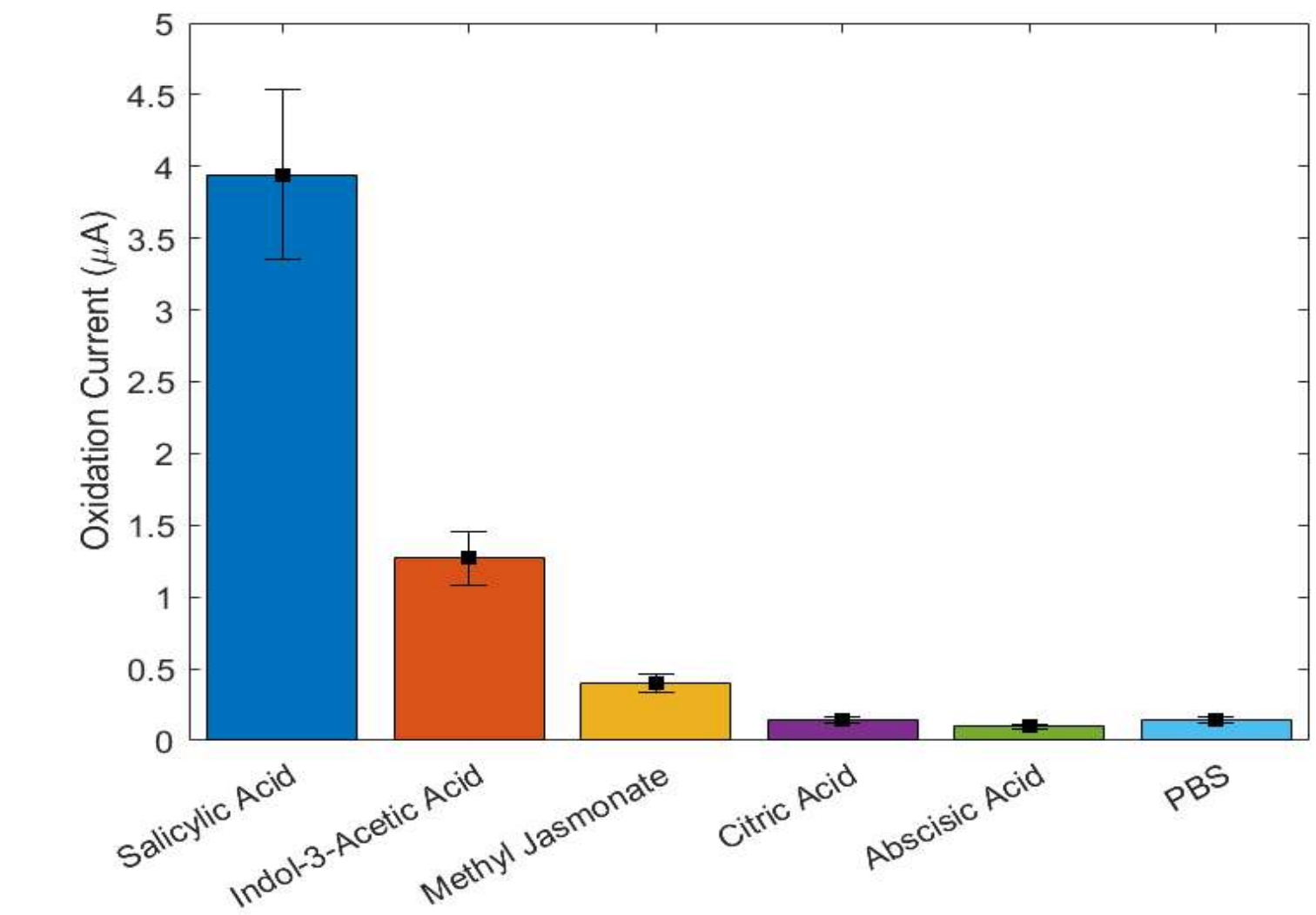
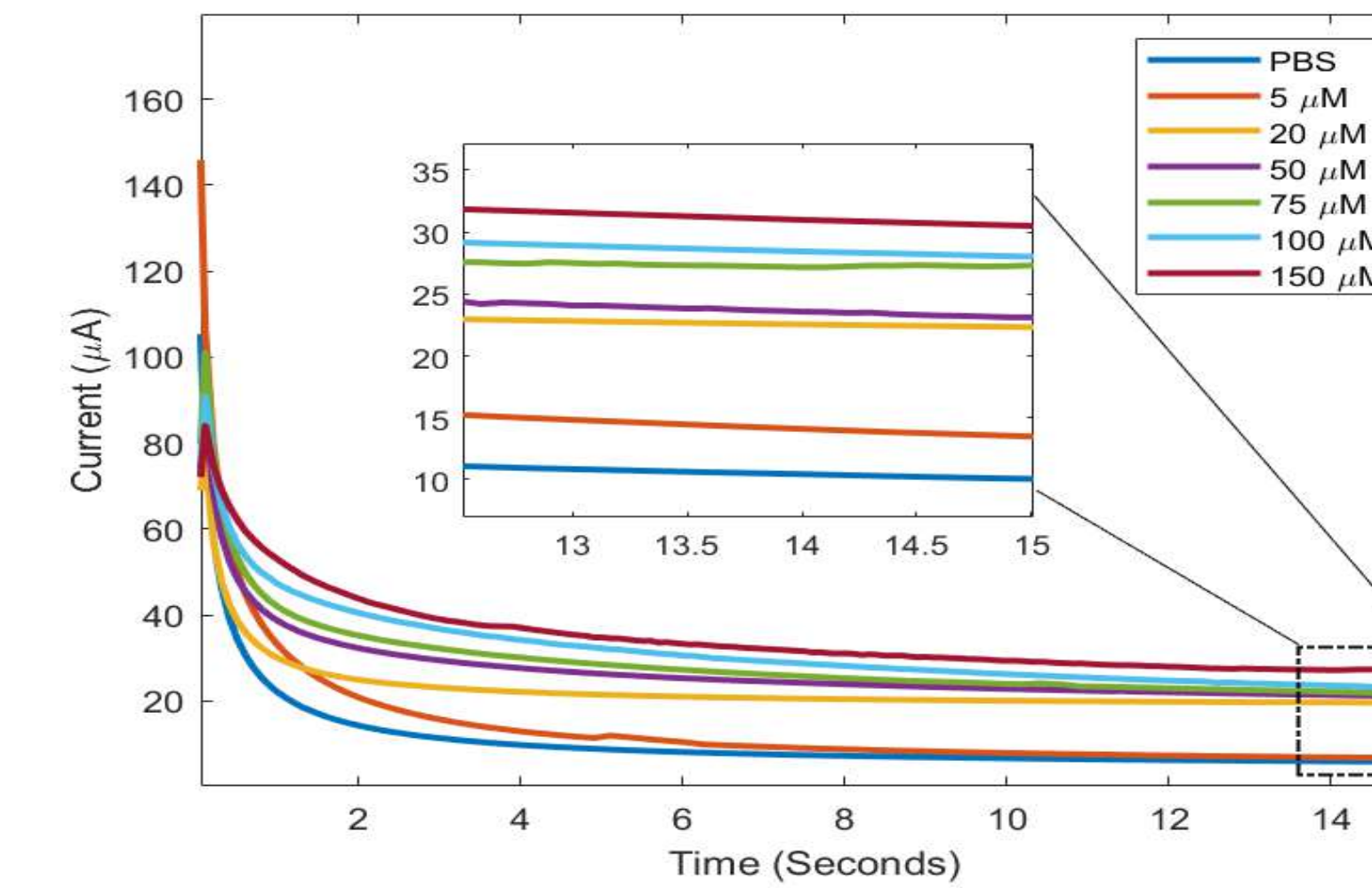


SEM Characterization

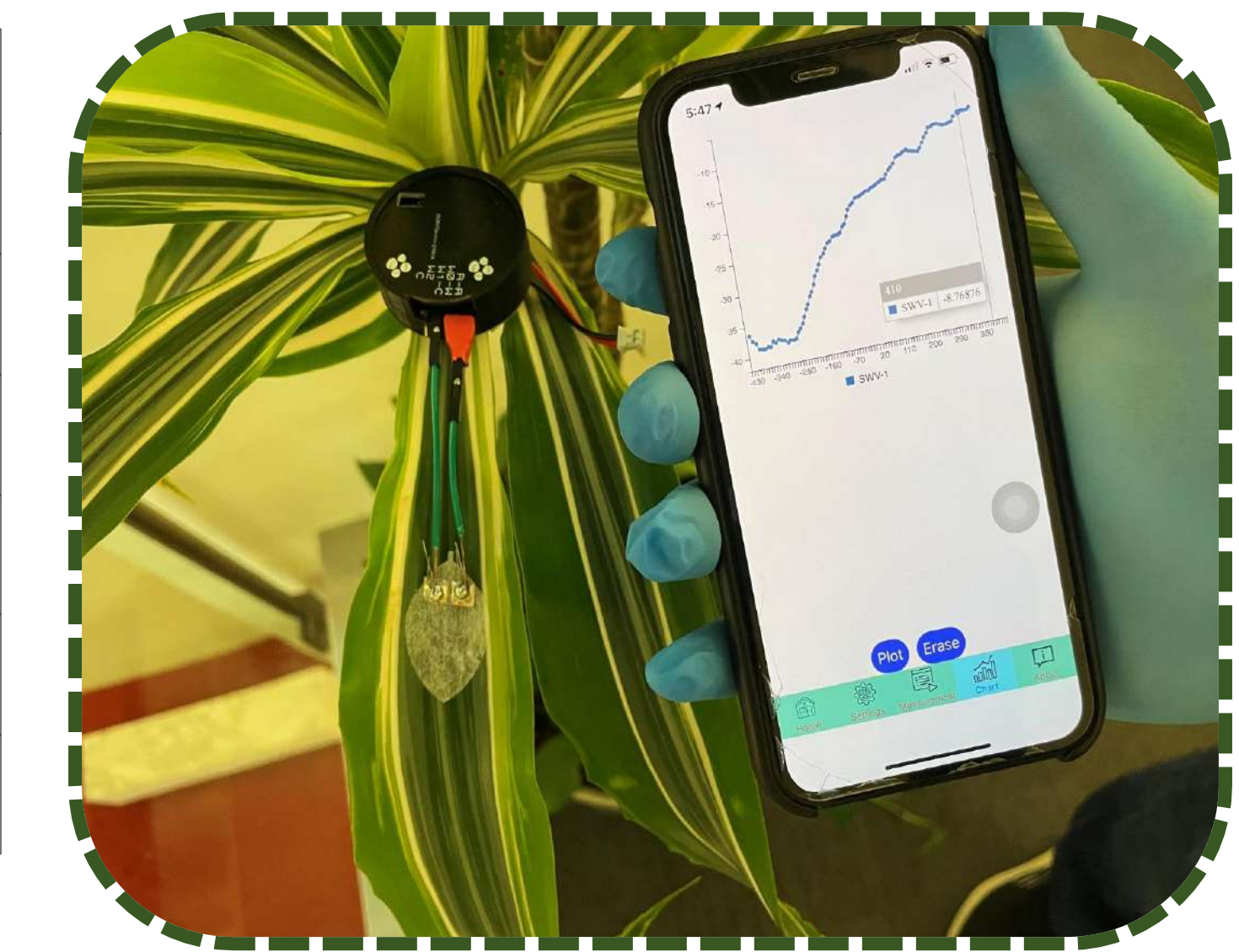
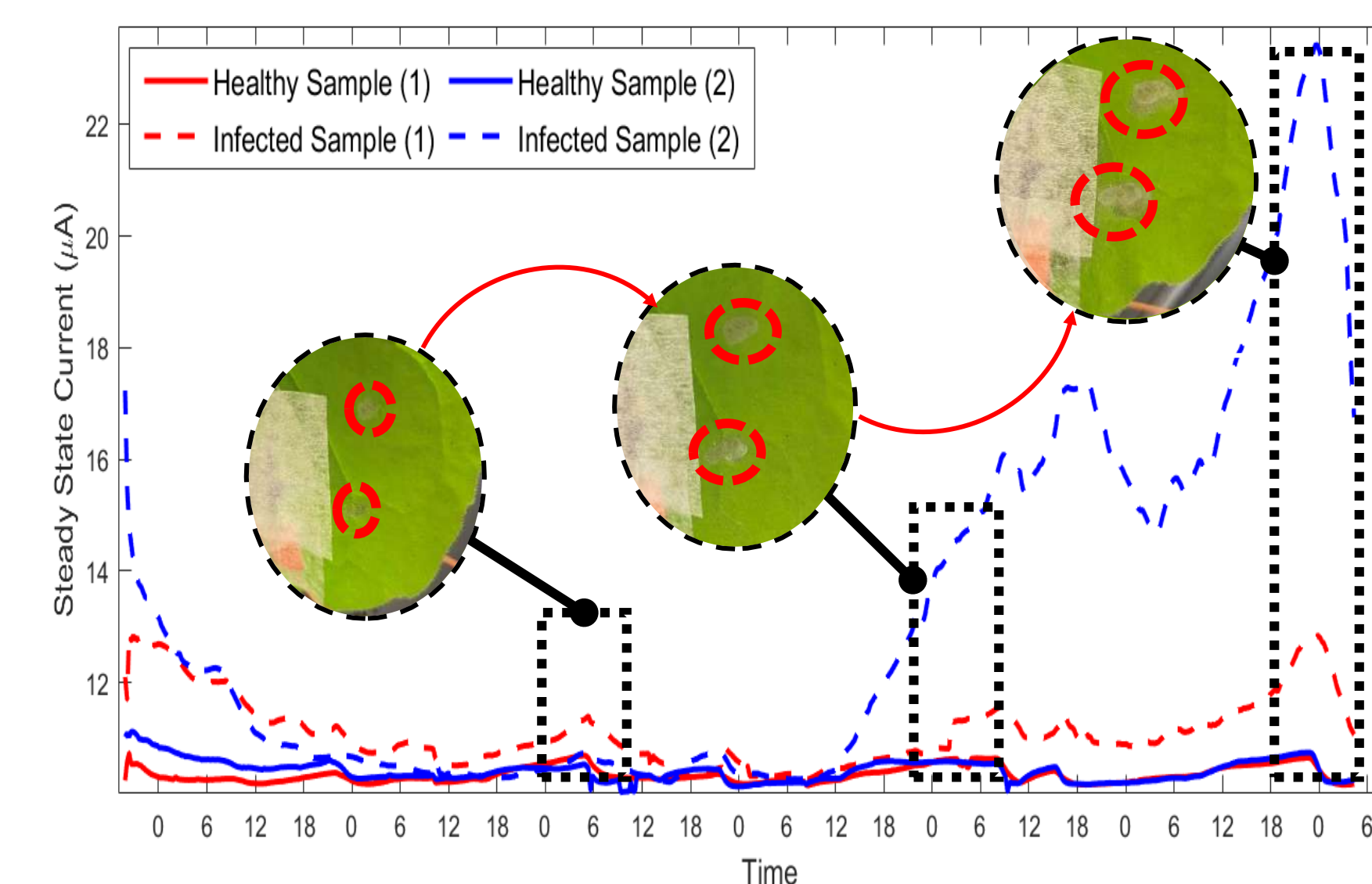


Results

Electrochemical Characterization



Testing in vivo



Conclusions

- Demonstrated the potential for monitoring of physiological activities in a nondestructive and continuous fashion
- Early detection of fungus infestation of leaves 5 minutes post-inoculation compares positively to that achieved previously

References

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