

High throughput platform for identification and characterization of electrogenic bacteria.

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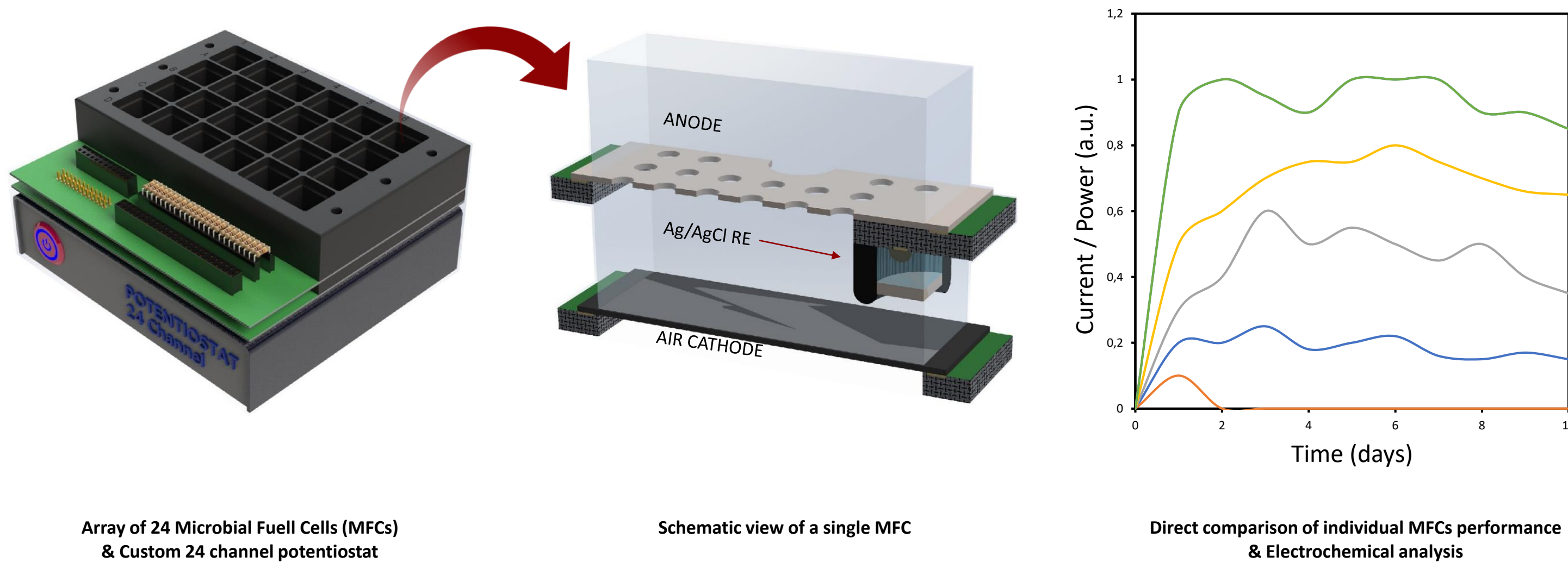
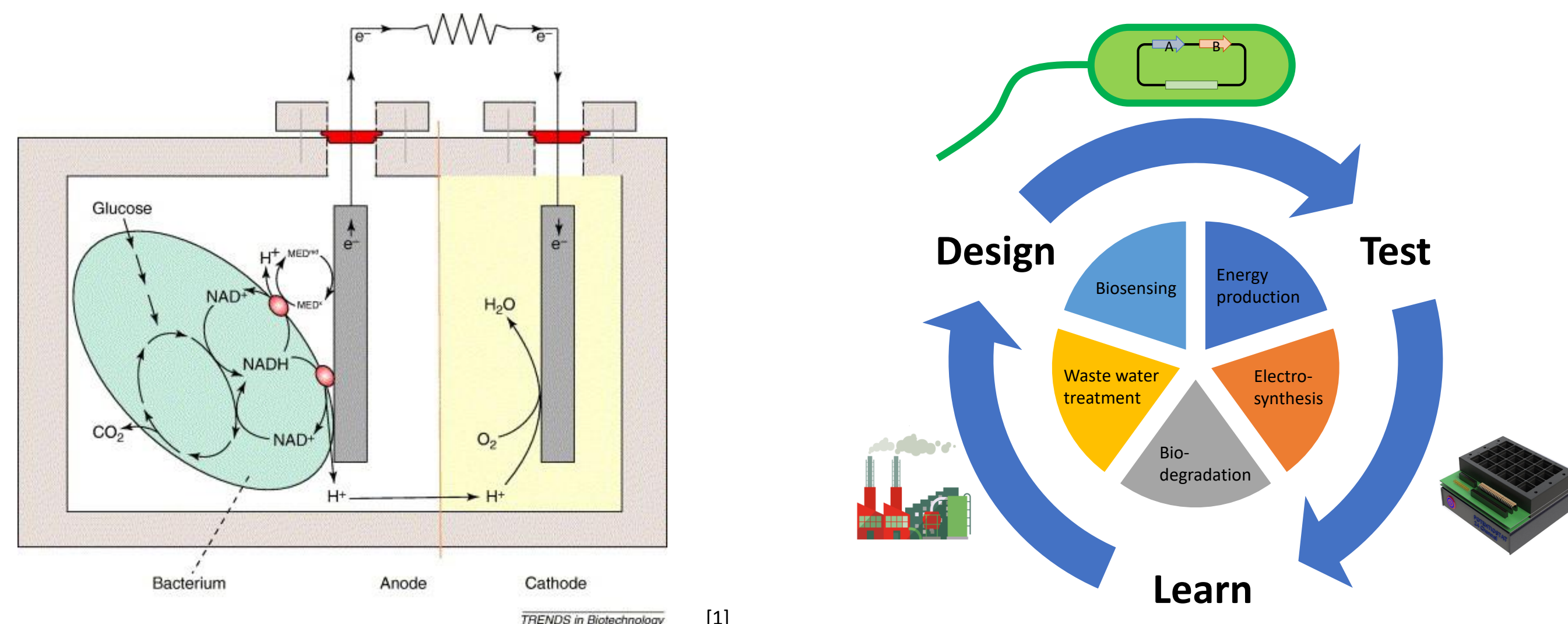
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INTRODUCTION

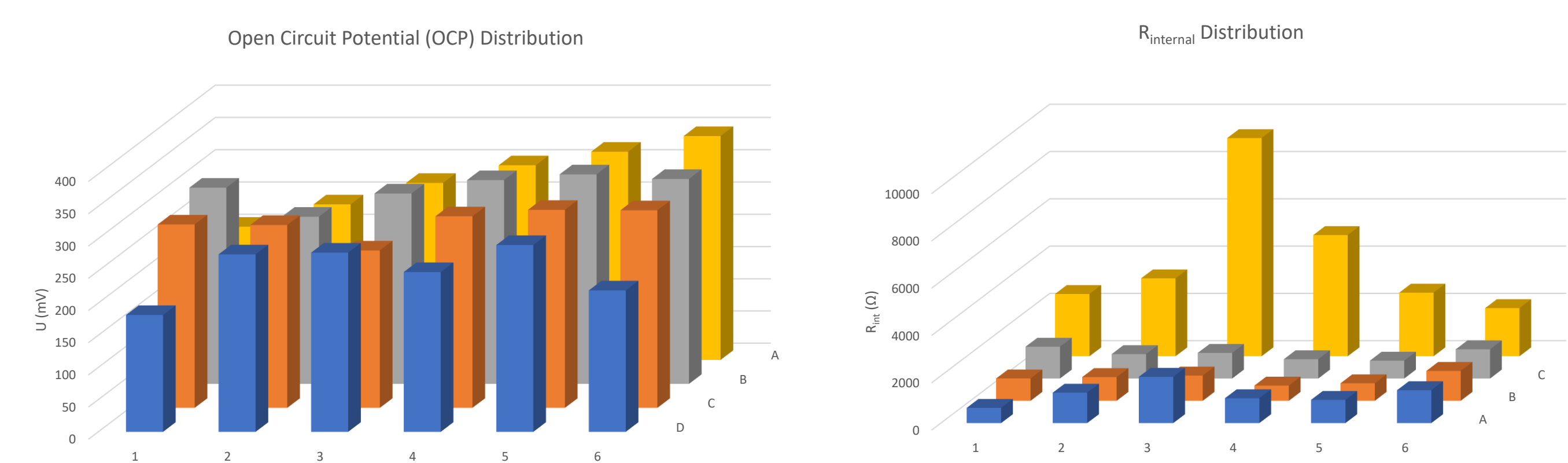
Electrogenic and electron accepting capability of some bacteria strains, are important phenomena which promises advances in the fields of electronically stimulated biotechnological production of valuable chemicals, wastewater treatment, bioremediation, desalination, energy production, novel materials discovery and whole-cell biosensing. Significant boost towards this direction can be achieved with application of high throughput methods known from other biological disciplines. However there is currently a lack of standard and reliable hardware which would enable the same approach in the field of electrogenic bacteria.

Thus we present a platform based on standard Microplate setup with 24 or 96 single chamber air-cathode Microbial Fuel Cells (MFCs) with integrated reference electrode inside each chamber. All electrodes are individually addressable. The device enables the direct and parallel comparative analysis of different microbes from different sources or under different conditions such as electrode potential, pH and growth medium.

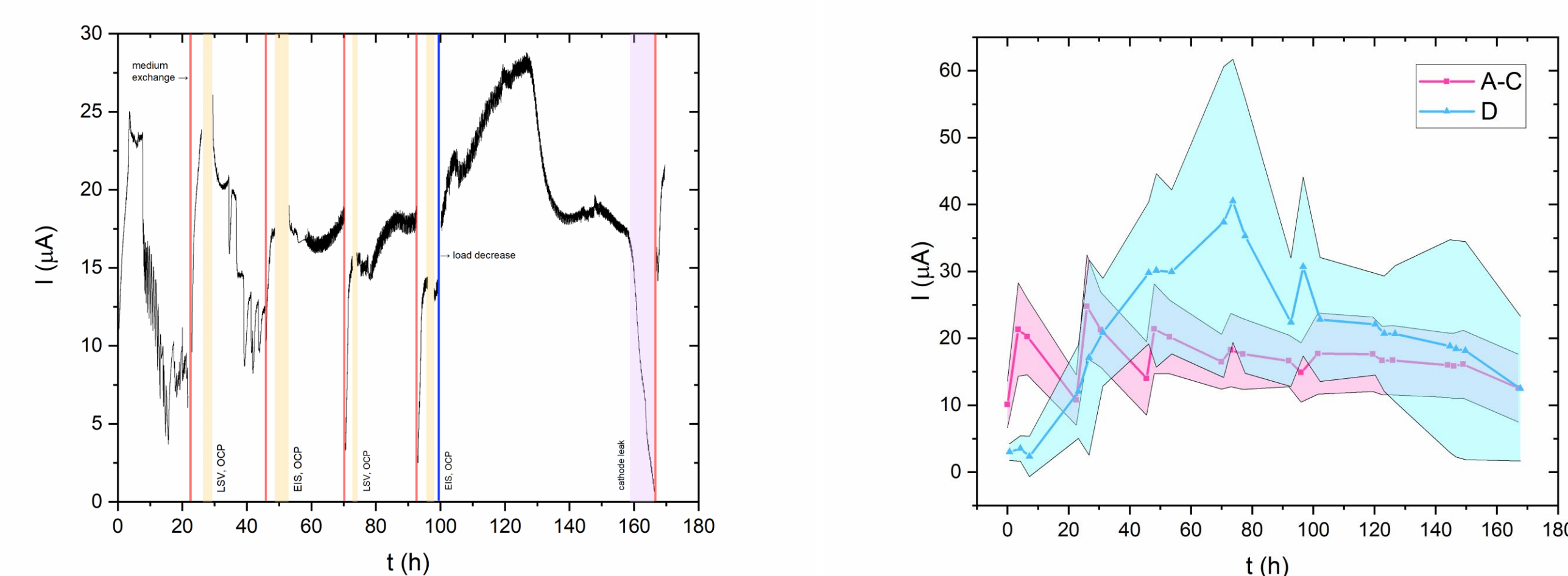


RESULTS

Variability

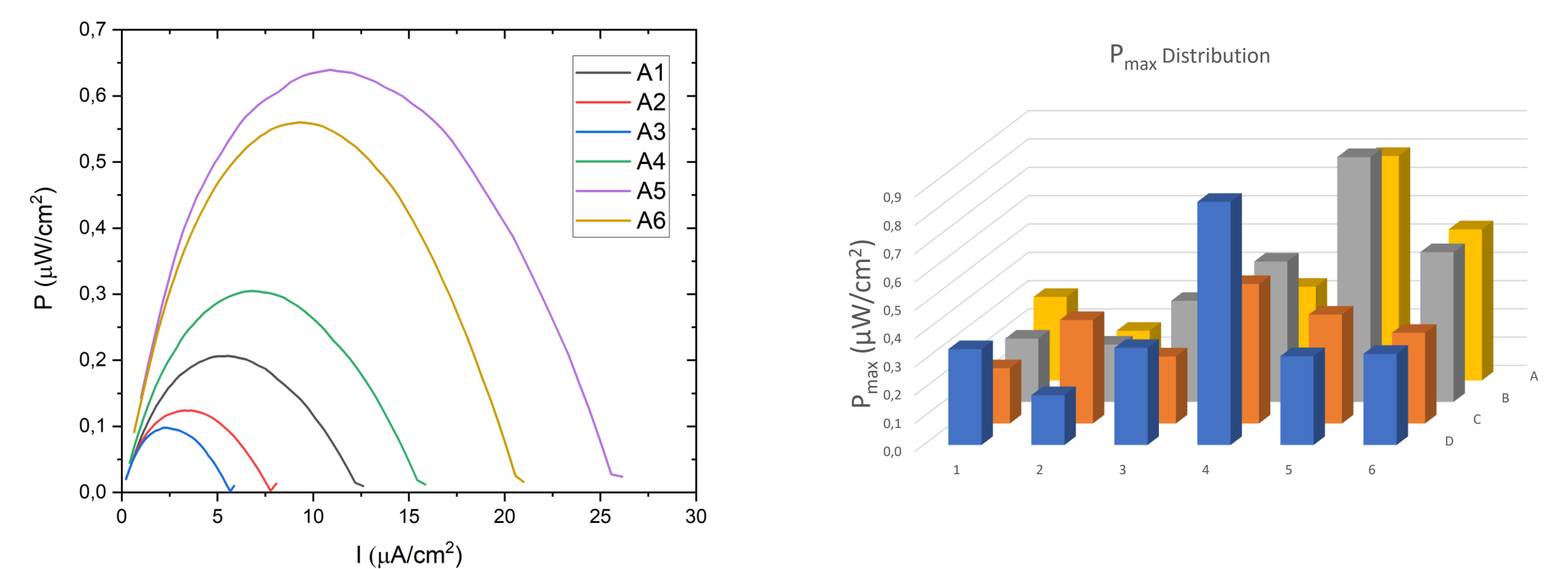


Continuous monitoring

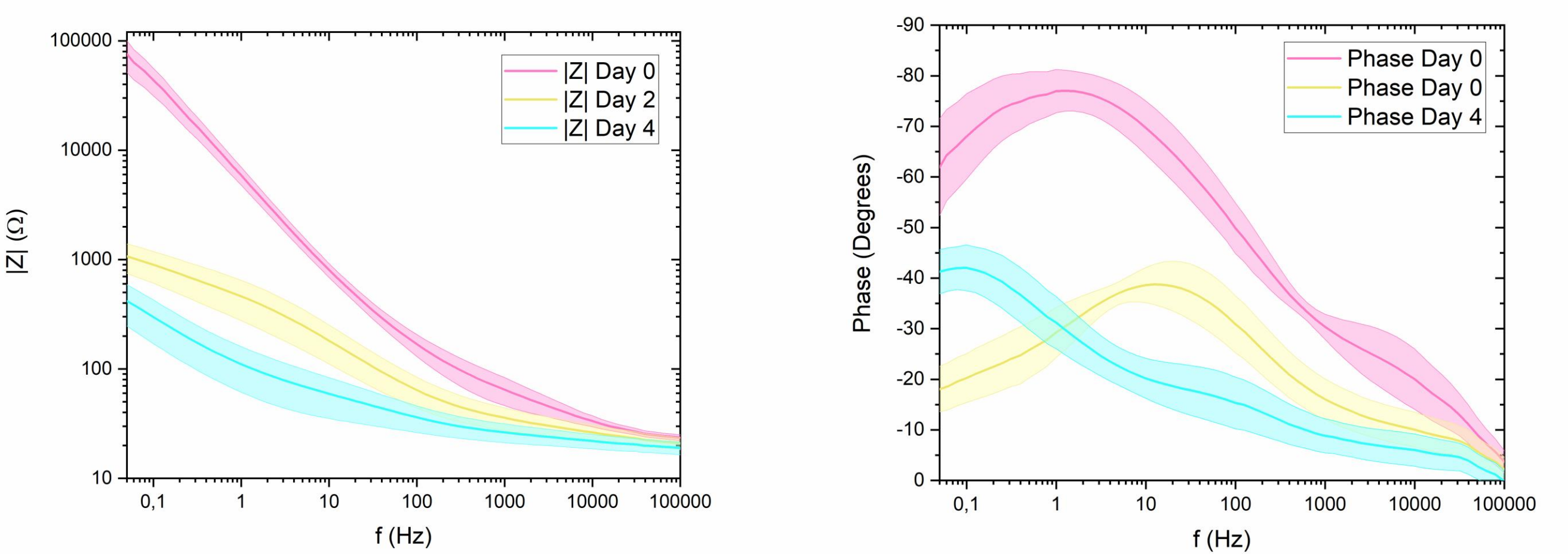


RESULTS

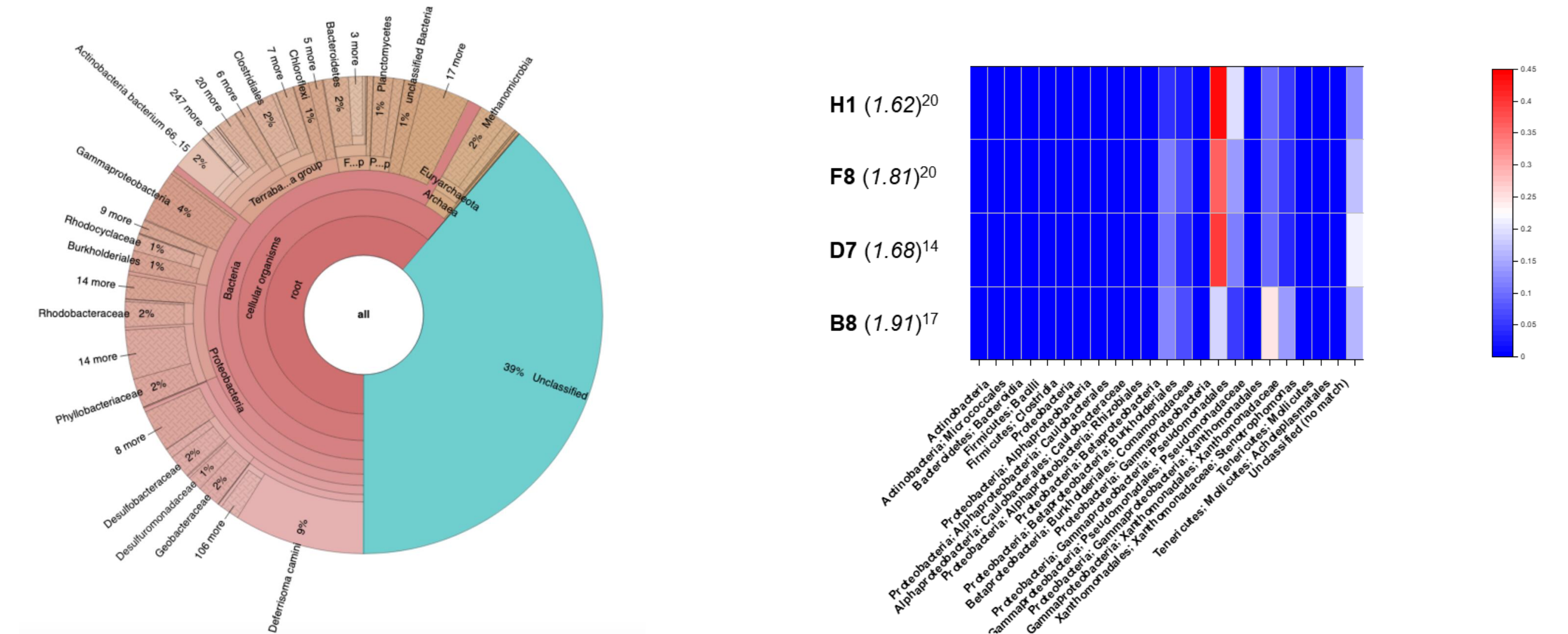
Benchmarking



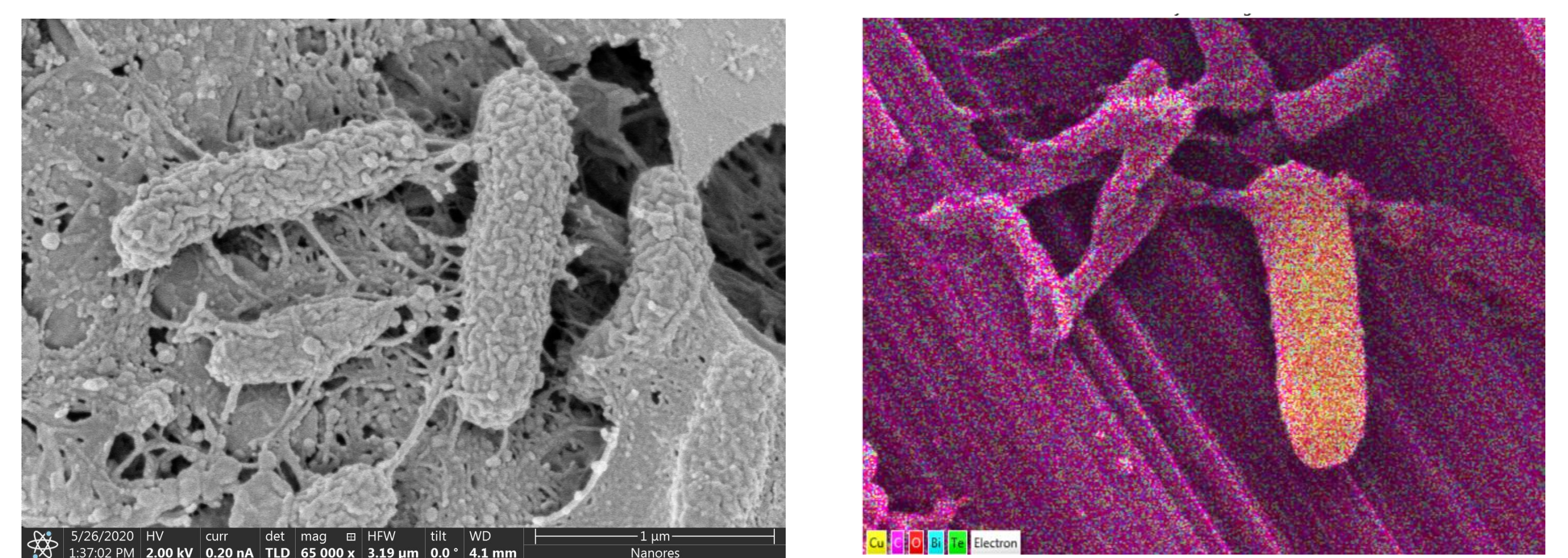
Electrochemical analysis



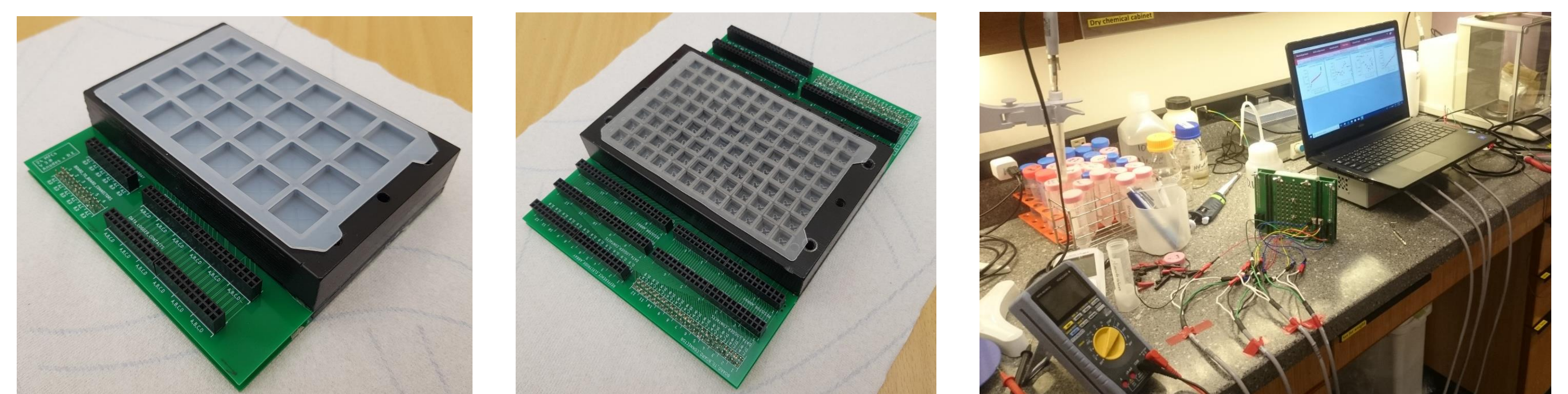
Taxonomy analysis



SEM imaging



Final devices



REFERENCES

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Rabaey, K., Verstraete, W.
- [2] High-throughput screening and selection of PCB-bioelectrochemical, electrogenic microbial communities using single chamber microbial fuel cells based on 96-well plate array.
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- [3] High-throughput 96-well bioelectrochemical platform for screening of electroactive microbial consortia.
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