Abraham Gabriel, PhD

Electrochemist & Biosensor Development Scientist · Immunoassays · Multiplexed Lab-on-Chip Diagnostics

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PROFILE

Biosensor scientist with more than six years of experience developing antibody-, enzyme- and nucleic-acid-based sensors on microfabricated, multiplexed chips, from electrode and cartridge design through surface biofunctionalisation and assay optimisation to validation in complex real samples. 7 peer-reviewed papers (3 first-author) and a published US patent application.

RESEARCH EXPERIENCE

Postdoctoral Researcher, Biosensor Development Jan 2026 – present

Bioelectronics & Electrochemistry Laboratory, ARO–Volcani Institute, Israel (Dr Sefi Vernick)

- Lead lactate and TMAO sensing for a miniaturised multiplexed biochip for candidate urinary markers of cancer-immunotherapy response, in a project with Sheba Medical Center: set experimental priorities, optimise electrode and assay architectures, develop methods.
- Develop enzyme-based amperometric L-lactate sensing (lactate oxidase, chitosan, Nafion) and label-free impedimetric TMAO sensing on G-quadruplex DNA monolayers.
- Contribute to a 48-cell ion-selective chip for nitrate in agricultural water and to impedimetric chips for antimicrobial-resistant bacteria.
- Supervise MSc, PhD and undergraduate researchers; train colleagues on electrochemical instrumentation; contribute to successful research proposals and IP documentation.

PhD Researcher, Electrochemical Immunosensors Mar 2019 – Sep 2025

Hebrew University of Jerusalem / ARO–Volcani Institute, Israel (Dr Sefi Vernick)

- Cleanroom-fabricated single and multiplexed thin-film gold biochips (photolithography, sputtering, PECVD, RIE, wet etching).
- Developed a label-free impedimetric immunosensor for microcystin-LR: detection limit 3 ng/L, five-log dynamic range, results in under 10 minutes.
- Developed a complementary enzyme-assisted amperometric immunoassay on the same chip design (detection limit 0.066 µg/L, about 20 minutes), forming a multi-method biosensor (US patent application).
- Validated on treated-wastewater samples with Mekorot (Israel National Water Company), in strong agreement with ELISA.
- Contributed to SARS-CoV-2 pseudovirus immunodetection, immunomagnetic pathogen capture and an ethylene sensor.

MSc Researcher, Soil & Water Transport Oct 2016 – Jan 2019

Hebrew University of Jerusalem / ARO–Volcani Institute (Dr Uri Nachshon)

- Experiments and HYDRUS 2D/UNSATCHEM modelling of evaporation-driven salt accumulation; published in Soil Sci. Soc. Am. J.

EDUCATION

PhD, Soil and Water Sciences, Hebrew University of Jerusalem 2025

Thesis: Electrochemical Signal Transduction of Cyanotoxins in Biosensing Applications in Surface-Water Sources with Various Qualities

MSc, Environmental Quality Sciences, Hebrew University of Jerusalem (Pears Global Scholarship) 2019

BTech, Crop and Environmental Protection, Ladoke Akintola University of Technology, Nigeria (First Class Honours) 2015

SKILLS

Assays & biointerfaces: immunoassays (label-free and enzyme-labelled), ELISA, antibody/enzyme/DNA immobilisation, SAMs, EDC/NHS and thiol chemistry, bioconjugation, chitosan and Nafion coatings.
Microfabrication & fluidics: photolithography, sputtering, PECVD, RIE, wet etching, profilometry, PDMS moulding, syringe-pump flow, chip packaging.
Electrochemistry: EIS and equivalent-circuit fitting, CV, chronoamperometry, potentiometry, DPV; PalmSens multichannel and BioLogic systems.
Data: Origin, JMP, GraphPad Prism, Excel. **Languages:** English (C1), Yoruba (native).

PEER-REVIEWED PUBLICATIONS

1. Gunasekaran D, **Ogungbile AO**, Icin I, Vernick S. Comparative evaluation of electrochemical and fluorescent readouts for immunomagnetically captured waterborne pathogens using a biochip with bifunctional magnetic nanoparticles. *ACS Meas. Sci. Au* 2026, 6(2), 349–360.
2. **Ogungbile AO**, Vernick S. A Comparative Study of a Multi-Method Electrochemical Biosensor for Rapid Detection of Microcystins in Treated Wastewater. *J. Electrochem. Soc.* 2025, 172, 097503.
3. **Ogungbile AO**, Goldstein M, Simkhovich L, Gilad D, Zeira G, Vernick S. Real-time chip-based impedimetric detection of cyanotoxins in treated wastewater. *ACS ES&T Water* 2025, 5(2), 696–702.
4. Gal-Oz R, Gandhi S, **Ogungbile A**, Roy D, Ghosh M, Vernick S. Biocomposite-based electrochemical chip for ethylene detection. *Sens. Actuators B* 2023, 397, 134652.
5. Ashur I, Alter J, Werbner M, **Ogungbile A**, Dessau M, Gal-Tanamy M, Vernick S. Rapid electrochemical immunodetection of SARS-CoV-2 using a pseudo-typed vesicular stomatitis virus model. *Talanta* 2022, 239, 123147.
6. **Ogungbile AO**, Ashur I, Icin I, Shapiro OH, Vernick S. Rapid detection and quantification of microcystins in surface water by an impedimetric immunosensor. *Sens. Actuators B* 2021, 348, 130687.
7. Nachshon U, Baharier B, **Ogungbile AO**, Katzir R. Impact of slope inclination on salt accumulation due to bare soil evaporation. *Soil Sci. Soc. Am. J.* 2019, 83(6), 1655–1663.

Patent: Ogungbile AO, Vernick S. Integrated multi-method electrochemical biosensor for rapid on-site detection and/or quantification of small-molecule targets in a sample. PCT/IL2021/051409; US 2025/0264433 A1.

HONOURS & SERVICE

ECS Travel Grants (2021, 2023); HUJI PhD International Travel Grant (2023); runner-up, Best Oral Presentation, ARO–Volcani Student Conference (2023, 2024); Doctoral Scholarship, ARO–Volcani/HUJI (2019–2025); Pears Global Scholarship (2016–2018). Reviewer for Microchimica Acta, Discover Applied Sciences and Food Analytical Methods; member, The Electrochemical Society. References available on request.