OLJA SIMOSKA

University of South Carolina
Department of Chemistry and Biochemistry
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EDUCATIONAL BACKGROUND

2015– 2020 **University of Texas at Austin**
Doctor of Philosophy (Ph.D.) in Analytical Chemistry (December 2019)
Advisor: Keith J. Stevenson

2011– 2015 **Bard College**
Bachelor of Arts (B.A.) in Chemistry (May 2015)
Advisor: Christopher N. LaFratta

PROFESSIONAL APPOINTMENTS

2022– present **University of South Carolina**
Assistant Professor, Department of Chemistry and Biochemistry

2020– 2022 **University of Utah**
ACS Irving S. Sigal Postdoctoral Research Fellow
Advisor: Shelley D. Minteer

FELLOWSHIPS

- **ACS Irving S. Sigal Postdoctoral Fellowship (2020–2022)**
  Awarded every two years to one outstanding postdoctoral fellow who will pursue chemistry research at the chemistry-biology interface.
- **Charles Morton Share Graduate Fellowship (2019)**
  Awarded annually to an outstanding graduate student in the Department of Chemistry at the University of Texas at Austin in recognition of excellence in research and academic achievements.
- **ACS Division of Analytical Chemistry Graduate Fellowship (2018–2019)**
  Highly competitive fellowship awarded annually to one graduate student in recognition of outstanding research ability and accomplishments, as evidenced by peer-reviewed publications in analytical chemistry.
- **Graduate Dean's Prestigious Fellowship (2018–2019)**
  Awarded by the University of Texas at Austin for excellent performance and initiative to go after external support for the student's research.
- **Graduate School Summer Fellowship (2017)**
  Awarded by the College of Natural Sciences Fellowship Committee at the University of Texas at Austin in recognition of graduate academic excellence and research.
- **Charles Morton Share Graduate Fellowship (2015)**
  Awarded to an entering graduate student in the Department of Chemistry at the University of Texas at Austin.
- **Bard College Foreign Student Scholarship (2011–2015)**
  An annually awarded scholarship, covering all tuition expenses. Given to a Bard College student from abroad who demonstrates outstanding academic excellence. Recipient for four consecutive years.

RESEARCH INTERESTS

Electrochemistry, Electrochemical Sensors, Biosensors, Bioelectrochemistry, Microbial Electrochemistry, Bioelectrocatalysis, Human Health.

PUBLICATIONS (†*denotes equal contribution*; ⊥*undergraduate co-authors, *corresponding author*)

26 published manuscripts, plus 2 manuscripts submitted and under review

At Univ. of South Carolina

- Clay, O. M.†; Weber, C. J. †; **Simoska, O.*** "Electrochemical Monitoring of the Impact of Antibiotic Agents on *Pseudomonas aeruginosa* Phenazine Metabolite Production Rates." *Analytical Chemistry*, **2024**, submitted.
- Weber, C. J.; Whisonant, M. D.; Clay, O. M.; **Simoska, O.*** "Surface-display Techniques in the Design of Electrochemical Biosensors for Health Monitoring" *ECS Sensors Plus* **2023**, submitted (invited perspective article).
- Weber, C. J.; Clay, O. M.⊥; Lycan, R.⊥; Anderson, G.⊥; **Simoska, O**.* Recent Advances in Electrochemical Biosensors for the Detection of Stress Biomarkers *Analytical and Bioanalytical Chemistry* **2023**.
- **Simoska, O.**; Cummings Jr., D. A.; Gaffney, E. M.; Langue, C.⊥; Primo, T. G.⊥; Weber, C. J.; Witt, C. E.; Minteer, S. D. Enhancing the Performance of Microbial Electrochemical Systems via Metabolic Engineering of *Escherichia coli* *ACS Sustainable Chemistry and Engineering* **2023**, *11*, 11855.
- Boucher, D. G.; Carroll, E.; Nguyen, Z.; Jadhav, R. G.; **Simoska, O**.; Beaver, K.; Minteer, S. D. Bioelectrocatalytic Synthesis: Concepts and Applications *Angewandte Chemie* **2023**, *63,* e202307780.
- **Simoska, O.**; Rhodes, Z.; Carroll, E.; Petrosky, K. N.⊥; Minteer, S. D. Biological Anolyte Regeneration System for Redox Flow Batteries *ChemComm* **2023**, *59*, 2142.
- Romadina, E. I.; Akkuratov, A. V.; **Simoska, O.**; Stevenson, K. J. One Compound for All pH Regions: A Water-soluble Phenazine-based Anolyte for Redox Flow Batteries *Batteries* **2022**, *8*, 288.

Before Univ. of South Carolina

- Weliwatte, N. S.; **Simoska, O.**; Powell, D.; Grattieri, M.; Whittaker-Brooks, L.; Minteer, S. D. Deconvoluting Charge Transfer Mechanisms in Conducting Redox Polymer-Based Photobioelectrocatalytic Systems *Journal of Electrochemical Society* **2022**, *169*, 085501.
- Gaffney, E. M.; Dantanarayana, A.; **Simoska, O.**; Minteer, S. D. Investigating the Electroactivity of Novel *Salinovibrio sp.* EAGSL through Electroanalytical Techniques and Genomic Insights *Journal of Electrochemical Society* **2022**, *169*, 025501.
- **Simoska, O.**; Stevenson, K. J. Electrochemical Sensors for Detection of *Pseudomonas aeruginosa* Virulence Biomarkers: Principles of Design and Characterization *Sensors and Actuators Reports* **2022**, 100072 (Invited contribution to a focus issue honoring Prof. James Rusling for his pioneering contribution to biosensors).
- Dong, F.; **Simoska, O.**; Gaffney, E. M.; Minteer, S. D. Applying Synthetic Biology Strategies to Bioelectrochemical Systems *Electrochemical Science Advances* **2021**, e2100197.
- Rhodes, Z.†; **Simoska, O.**†,*; Dantanarayana, A.; Stevenson, K. J.; Minteer, S. D. Using Structure-Property Relationships to Understand the Mechanism of Mediated Extracellular Electron Transfer in *Escherichia coli iScience* **2021**, *24*, 103033.
- Weliwatte, N. S.; Grattieri, M.; **Simoska, O.;** Rhodes, Z.; Minteer, S. D. Unbranched Hybrid Conducting Redox Polymers for Intact Chloroplast-based Photo-bioelectrocatalysis *Langmuir* **2021**, *37*, 7821.
- **Simoska, O.**; Gaffney, E. M.; Minteer, S. D.; Franzetti, A.; Cristiani, P.; Grattieri, M.; Santoro, C. Recent Trends and Advancements in Microbial Electrochemical Sensing Technologies *Current Opinion in Electrochemistry* **2021**, *356*, 100762.
- **Simoska, O.***; Rhodes, Z.; Weliwatte, S.; Cabrera-Pardo, J. R.; Gaffney, E. M.; Lim, K.; Minteer, S. D. Advances in Electrochemical Modification Strategies of 5-(Hydroxy-methyl)furfural *ChemSusChem* **2021**, *14*, 1
- **Simoska, O.**; Gaffney, E. M.; Lim, K.; Beaver, K.; Minteer, S. D. Understanding the Properties of Phenazines that Promote Extracellular Electron Transfer in *Escherichia coli Journal of the Electrochemical Society* **2021**, *168*, 025503.
- Lim, K.; Lee, Y. S.; **Simoska, O.**; Dong, F.; Sima, M.; Stewart, R.; Minteer, S. D. Rapid Entrapment of Phenazine Ethosulfate within a Polyelectrolyte Complex on Electrodes for Efficient NAD^+ Regeneration in Mediated NAD+-dependent Bioelectrocatalysis *ACS Applied Materials and Interfaces* **2021**, *13*, 10942.
- Gaffney, E. M.; **Simoska, O.**; Minteer, S. D. The Use of Electroactive Halophilic Bacteria for Improvements and Advancements of High Saline Biosensing *Biosensors* **2021**, *11*, 48.
- **Simoska, O**.; Duay, J.; Stevenson K. J. Electrochemical Detection of Multianalyte Biomarkers in Wound Healing Efficacy *ACS Sensors* **2020**, *5*, 3557. (*The sensor device and platform presented in this manuscript got an honorable mention and was selected as one of the finalists for 2021 Create the Future Design Contest for the medical sensors category*).

- Chen, H.†; **Simoska, O.**†; Lim, K.; Grattieri, M.; Yuan, M.; Dong, F.; Lee, Y. S.; Beaver, K.; Weliwatte, S.; Gaffney, E. M.; Minteer, S. D. Fundamentals, Applications, and Future Directions of Bioelectrocatalysis *Chemical Reviews* **2020**, *120*, 12903. ***ACS Editor's Choice.***
- **Simoska, O.**; Stevenson K. J. Electrochemical Sensors for Rapid Detection of Pathogens in Real-Time *Analyst* **2019**, *144*, 6461 (invited contribution to the themed collection on versatile electrochemical approaches).
- **Simoska, O.**; Sans, M.; Eberlin, L. S.; Shear, J. B.; Stevenson K. J. Electrochemical Monitoring of the Impact of Polymicrobial Infections on *Pseudomonas aeruginosa* and Growth Dependent Medium *Biosensors and Bioelectronics* **2019**, *142*, 111538.
- **Simoska, O.**; Sans, M.; Fitzpatrick, M. D.; Crittenden, C. M.; Eberlin, L. S.; Shear, J. B.; Stevenson K. J. Real-time Electrochemical Detection of *Pseudomonas aeruginosa* Phenazine Metabolites using Transparent Carbon Ultramicroelectrode Arrays *ACS Sensors* **2019**, *4*, 170.
- Darch, S.; **Simoska, O.**; Fitzpatrick, M. D.; Barraza, J. P.; Stevenson K. J.; Bonnecaze, R. T.; Shear, J. B.; Whiteley, M. Biological Determinants of Quorum Signaling in *P. aeruginosa* Infection Model *Proceeding of the National Academy of Sciences of the USA* **2018**, *115*, 4779.
- Elliott, J.†; **Simoska, O.**†; Karasik, S.$^{\perp}$; Shear, J. B.; Stevenson, K. J. Transparent Carbon Ultramicroelectrode Arrays for the Electrochemical Detection of a Bacterial Warfare Toxin, Pyocyanin *Analytical Chemistry* **2017**, *89*, 6285.
- Elliott, J.; Duay, J.; **Simoska, O**.; Shear, J. B.; Stevenson, K. J. Gold Nanoparticle Modified Transparent Carbon Ultramicroelectrode Arrays: The Quantitative Characterization of a Cellulose Acetate Membrane for the Electroanalytical Detection of Nitric Oxide *Analytical Chemistry* **2017**, *89*, 1267.
- LaFratta, C.N.; **Simoska, O**.; Pelse; I., Weng, S.; Ingram, M. A Convenient Direct Laser Writing System for the Creation of Microfluidic Masters *Journal of Microfluidics and Nanofluidics* **2015**, *19*, 419.
- LaFratta, C. N.; Jain, S.; Pelse, I.; **Simoska, O**.; Elvy, K. Using a Homemade Flame Photometer to Measure Sodium Concentration in a Sports Drink *Journal of Chemical Education* **2013**, *90*, 372. (*Cited in Quantitative Chemical Analysis textbook, 9th edition*).

BOOKS AND BOOK CHAPTERS

- **Simoska, O.**; Minteer, S. D. Techniques in Electroanalytical Chemistry, American Chemical Society InFocus Book Series, **2022**. DOI: 10.1021/acsinfocus.7e5021.
- **Simoska, O.**; Lee, Y. S.; Minteer, S. D. Fundamentals and Applications of Enzymatic Bioelectrocatalysis (Book Chapter for Comprehensive Inorganic Chemistry III, *Elsevier*, **2021**). DOI: 10.1016/B978-0-12-823144-9.00057-1.

PRESENTATIONS AND INVITED TALKS

- **O. Simoska** "Enhancing the Performance of Microbial Electrochemical Systems via Metabolic Engineering of *Escherichia coli*" 2024 Gordon Research Conference (GRC) in Electrochemistry, Ventura, CA.
- **O. Simoska** "Enhancing the Performance of Microbial Electrochemical Systems via Metabolic Engineering of *Escherichia coli*" 243rd Electrochemical Society Meeting (ECS) 2023, Boston, MA (Invited Talk, David C. Grahame Award Symposium honoring Keith J. Stevenson).
- **O. Simoska** "Understanding the Properties and Mechanism of Phenazine-based Mediated Electron Transfer in *Escherichia coli*" 2022 Gordon Research Conference (GRC) and Gordon Research Seminar (GRS) in Electrochemistry, Ventura, CA. Selected as Discussion Leader.
- **O. Simoska** and S. D. Minteer "Using Structure-function Relationships to Understand the Mechanism of Phenazine-mediated Extracellular Electron Transfer in *Escherichia coli*" 2021 North American Meeting of the International Society for Microbial Electrochemistry and Technology (NA-ISMET), Los Angeles, CA.
- **O. Simoska** and S. D. Minteer "Understanding the Properties and Mechanism of Phenazine-based Mediated Electron Transfer in *Escherichia coli*" 2021 Postdoctoral Research Series organized by the ACS Women Chemist Committee in the Department of Chemistry at the University of Illinois at Urbana-Champaign, virtual event.
- **O. Simoska** and K. J. Stevenson "Electrochemical Detection of Multianalyte Biomarkers in Wound Healing Efficacy" 239th Electrochemical Society Meeting (ECS) 2021, virtual event (Invited Talk, Session: *H01: Wearable and Flexible Electronic and Photonic Technologies*).
- **O. Simoska** and S. D. Minteer "Understanding the Properties of Phenazines that Promote Extracellular Electron Transfer in *Escherichia coli*" 239th Electrochemical Society Meeting (ECS) 2021, virtual event (Session: K01 *Advances in Organic and Biological Electrochemistry in Memory of Dennis Peters*).

- **O. Simoska** and K. J. Stevenson "Electrochemical Detection of Multianalyte Biomarkers in Wound Healing Efficacy" Oral Presentation 2021 Pittcon Conference, virtual event (Session: Nanotechnology/Nanoscience: Sensors).
- **O. Simoska** and S. D. Minteer "Understanding Generation of Electrical Current in Model Microorganism *Escherichia coli* using Artificial Mediator Systems" 2021 Pittcon Conference, virtual event (Session: Bioanalytical Electrochemistry).
- **O. Simoska** and K. J. Stevenson "Electrochemical Detection of Multianalyte Biomarkers in Wound Healing Efficacy" 2021 Frontiers in Electrochemistry and Electroanalysis: Advances Made by Young Female Scientists, virtual event (Session: Electroanalytical Chemistry).
- **O. Simoska** "Real-time Electrochemical Monitoring of Metabolism Dynamics of Pathogenic Bacteria Using Carbon Ultramicroelectrode Arrays" 2020 Gordon Research Seminar (GRS) in Electrochemistry, Ventura, CA. Selected as one of GRS speakers.
- **O. Simoska** and K. J. Stevenson "Real-time Electrochemical Monitoring of Metabolism Dynamics of Pathogenic Bacteria Using Carbon Ultramicroelectrode Arrays" 2020 Gordon Research Conference (GRC) in Electrochemistry, Ventura, CA.
- **O. Simoska** and K. J. Stevenson "Real-time Electrochemical Detection of *Pseudomonas aeruginosa* Phenazine Metabolites using Transparent Carbon Ultramicroelectrode Arrays" Spring 2019 American Chemical Society National Meeting, Orlando, FL (Invited Talk, Session: Advances in Electrochemistry).
- **O. Simoska** and K. J. Stevenson "Real-time Electrochemical Detection of *P. aeruginosa* Phenazine Metabolites using Transparent Carbon Ultramicroelectrode Arrays" 2019 Pittcon Conference, Philadelphia, PA (Session: Electrochemistry–Biological Applications).
- **O. Simoska** and K. J. Stevenson "Real-time Electrochemical Detection of *P. aeruginosa* Phenazine Metabolites" 2019 Workshop on Electrochemistry, Austin, TX.
- **O. Simoska** and K. J. Stevenson "Carbon Ultramicroelectrode Arrays as Sensors for the Electrochemical Detection of Pathogenic Cellular Response Mechanisms" 3rd International Electrochemistry Conference for Young Scientists, Moscow, Russia (Invited Talk).
- **O. Simoska,** J. Elliott, J. B. Shear, and K. J. Stevenson "Detection of Bacterial Warfare Toxin, Pyocyanin using Transparent Carbon Ultramicroelectrode Arrays" 2018 Pittcon Conference, Orlando, FL (Session: Bioanalytical Sensors).
- **O. Simoska,** J. Elliott, J. B. Shear, and K. J. Stevenson "Transparent Carbon Ultramicroelectrode Arrays for the Detection of Bacterial Warfare Toxin, Pyocyanin" 2017 Procter and Gamble Poster Competition for Ph.D. students and Postdocs, Austin, TX. **Selected to compete in the top 12 finalists among Life Science, Chemistry, and Engineering at the University of Texas at Austin**.
- **Olja Simoska**, E. C. McLaughlin, and C. N. LaFratta. "Synthesis and Characterization of a Benzoin Type Photoinitiator for the Improvement of the Resolution of One-Photon Direct Laser Writing" 2015 ACS Undergraduate Chemistry Research Symposium, SUNY New Paltz, New Paltz, NY. Award recipient for outstanding undergraduate research.

AWARDS AND HONORS

- **Ereztech BridgeForward Award (2021)**
  Awarded annually to a post-doctoral graduate pursuing careers in materials science chemistry.
- **Henze Teaching Award (2018)**
  Awarded for exemplary performance as a chemistry teaching assistant at the University of Texas at Austin.
- **University of Texas at Austin Professional Development Award (2018)**
  Awarded for expenses costs to a conference where a student presents an original paper on their research.
- **Department of Chemistry Service Awards (2016, 2017, 2018)**
  Awarded on stellar service with the Department of Chemistry graduate recruiting endeavors at the University of Texas at Austin. Recipient of award for three consecutive years.
- **ACS Undergraduate Research Award (2015)**
  Awarded by the mid-Hudson American Chemical Society to an undergraduate student for excellence in undergraduate research.
- **C.T. Sottery Award (2014)**
  An award given annually to a Bard College junior for a significant achievement in chemistry and an outstanding contribution to the work of the Division of Science, Math, and Computing.

- **C.V. Starr Foundation Scholarship Award (2012, 2014, 2015)**
  An award for a Bard College student from abroad who demonstrates academic excellence.

TEACHING EXPERIENCE AT THE UNIVERSITY OF SOUTH CAROLINA

- **CHEM 322 – Analytical Chemistry for Majors (Fall 2023), undergraduate-level course**
- **CHEM 721 – Electroanalytical Chemistry (Spring 2023, Spring 2024), graduate-level course**

STUDENT MENTORING AT UNIVERSITY OF SOUTH CAROLINA

Current Graduate Research Students

- Courtney J. Weber (August 2022–present): University of South Carolina graduate program
- Olivia M. Clay (June 2023–present): University of South Carolina graduate program
- Megan D. Whisonant (June 2023–present): University of South Carolina graduate program

Current Undergraduate Research Students

- Savanah Belt (August 2022–present): University of South Carolina
- Reese Lycan (December 2022–present): University of South Carolina
- Gracie Anderson (March 2023–present): University of South Carolina
- Natalie Strom (September 2023–present): University of South Carolina
- Emma Vagnoni (November 2023–present): University of South Carolina
- Addison Meeker (November 2023–present): University of South Carolina
- Brienne Hingst (November 2023–present): University of South Carolina
- Jessica Bunge (January 2024–present): University of South Carolina
- Maeve Lembke (January 2024–present): University of South Carolina
- Helen Vrouvakis (January 2024–present): University of South Carolina
- Sophia Woytowitz (January 2024–present): University of South Carolina

Undergraduate Research Student Alumni

- Olivia M. Clay (August 2022–May 2023): University of South Carolina
- Emilee Brockner (September 2022–May 2023): University of South Carolina

High School Research Students

- Cyndy Martinez-Garcia (June 2023–August 2023): University of South Carolina (ACS SEED Summer Program)

SERVICE

PROFESSIONAL

- Guest Editor for Special Issue on Electroanalytical Chemistry for Wiley–VCH *Electroanalysis* (October 2023–present)
- Guest Editor for Special Issue on Microbial Electrochemistry for the *Journal of the Electrochemical Society* (October 2023–present)
- Society of Electroanalytical Chemistry (SEAC) Board of Directors Elected Member (January 2023–present)
- Electrochemical Society (ECS) Physical and Analytical Division Executive Committee (January 2023–present)
- Editorial Advisory Board for Wiley–VCH *Chemistry–Methods* (November 2022–present)
- ACS Division of Analytical Chemistry Educational Committee (March 2019–present)
- Peer-review referee for Analytical Chemistry, Current Opinion in Electrochemistry, RSC Analyst, Journal of the American Chemical Society, ACS Sensors, ACS Measurement Science Au, ECS Sensors Plus, Journal of the American Chemical Society Au

DEPARTMENTAL

- Undergraduate Research Initiative (URI) Program – Founder and Faculty Lead (June 2023–present), University of South Carolina
- Graduate Education and Research Committee (July 2023–present), University of South Carolina

- Undergraduate Education Enhancement Committee (July 2023–present), University of South Carolina
- Web and Communication Committee (July 2023–present), University of South Carolina
- Stockroom Committee (August 2022–July 2023), University of South Carolina
- Recruitment Committee (August 2022–July 2023), University of South
- Department of Chemistry Postdoctoral Committee Member (2021–2022), University of Utah
- Welch Summer Scholar Program Research Coordinator (2018), University of Texas at Austin
- Council of Graduate Chemists President (2016–2019), University of Texas at Austin
- Mentor, Women in Chemistry (2017–2019), University of Texas at Austin
- Bard College Science Outreach Leader (2013–2015), Bard College

UNIVERSITY

- Postdoctoral Association Board Member, Secretary, and Treasurer (2020–2022), University of Utah

COMMUNITY

- Volunteer for National Chemistry Week at the Science Center (2022–present)
- Volunteer for Longhorn Halloween (2016–2019)
- Volunteer for Explore UT (2015–2019)
- Volunteer for Fun with Chemistry (2016–2019)

PROFFESIONAL ORGANIZATIONS

- American Chemical Society (ACS)
- Society of Electroanalytical Chemistry (SEAC)
- Electrochemical Society (ECS)
- International Society for Microbial Electrochemistry and Technology (ISMET)