

EDUCATION

- Ph.D.** **University of California, Los Angeles (UCLA)**
Civil & Environmental Engineering, July 2021 | UCLA Distinguished Teaching Award
- M.S.** **University of California, Los Angeles (UCLA)**
Civil Engineering, December 2017 | UCLA Distinguished Master's Thesis Award
- B.S.** **University of California, Berkeley**
Environmental Science, May 2015

RESEARCH EXPERIENCE

Stanford University Medical School, Palo Alto. *Postdoctoral Researcher* *Sep. 2022-Present*

Advisor: Dr. James Brooks | School of Medicine, Urology

- Developing and characterizing a patient derived xenograft (PDX) model of human benign prostate hyperplasia (BPH). To produce the BPH PDX model, fresh prostate tissue will be acquired from patients and implanted at a subrenal site in immunodeficient mice.
- Characterizing the role of BMP5, a stromal signature associated with BPH symptom severity and expanding fibroblasts, in a PDX of BPH and the effect of select inhibitors.

University of California, Los Angeles. *Postdoctoral Researcher* *July 2021-July 2022*

Advisor: Dr. Hung Ton-That | Division of Oral Biology-School of Dentistry

- Elucidated the oral pathogen, *Fusobacterium nucleatum*'s, ability to be motile as well as critical factors that contribute to its motility. *F. nucleatum* is a key colonizer in the development of oral biofilms and is classified as an oncobacterium that can proliferate cancers such as colorectal cancer. Most literature characterizes *F. nucleatum* as non-motile without validation. Using a transposon (Tn5) *F. nucleatum* mutant library, I visualized and quantified single cell and colony movement on a macro and micro-scale in real-time.
- Discovered that lipopolysaccharides, a known endotoxin and virulence factor, aids *F. nucleatum* motility. Specifically, I found that truncating the outer most portion of the LPS structure (i.e. O-antigen) leads to reduced viability as well as virulence as demonstrated in a murine pre-term birth model of infection. The results from this work determined that LPS biogenesis is critical for *F. nucleatum* motility, bacterial colonization, and virulence as well as provides a new paradigm through which to view *F. nucleatum* pathogenicity.

University of California, Los Angeles. *Graduate Student Researcher* *Aug. 2015-July 2021*

Advisor: Dr. Shaily Mahendra | Civil & Environmental Engineering

- Constructed an unconventional microbial community comprised of anaerobic (*Dehalococcoides mccartyi* 195) and aerobic bacteria (*Pseudonocardia dioxanivorans* CB1190) to remove chlorinated solvent mixtures over varying redox conditions. Deployed this culture to a field site *in situ* and successfully removed these recalcitrant pollutants from groundwater.
 - *Inventor on patent for the application of this culture*
- Characterized *Pseudonocardia dioxanivorans* CB1190's ability to biodegrade the known carcinogen and water pollutant, vinyl chloride (VC). VC incorporation by CB1190 was confirmed via metabolomics of ¹³C-labeled VC and tracked the production of isotopically labeled amino acids, keto acids, and sugar phosphate molecules.

- Prevented pathogenic microbial attachment to surfaces via a novel superhydrophilic coating and successfully demonstrated the application of this material on Foley catheter segments and their ability to resist microbial adhesion.
 - *Inventor on patent for the application of this material, which is now FDA approved*
- Developed multipronged approach for systematic *in vitro* quantification of catheter-associated biofilms.

University of California, Berkeley. *Research Associate*

May 2012-July 2015

Advisor: Dr. Lisa Alvarez-Cohen | Civil & Environmental Engineering

- Characterized an anaerobic microbial consortium's (*Dehalococcoides mccartyi*, *Desulfovibrio vulgaris*, *Syntrophomonas wolfei*) ability to anaerobically biodegrade the groundwater pollutant, trichloroethene, in the presence of sulfate and sulfide.
- Senior research thesis presented at the American Geophysical Union Conference.

Arizona State University. *Research Assistant*

June 2009- May 2011

Advisor: Dr. Bruce Rittmann | Sustainable Engineering & Built Environment

- Optimized a mixed culture's (*Dehalo R²*) ability to biodegrade chlorinated ethenes. Specifically, evaluated vitamin B₁₂'s role in aiding cell growth and metabolism of trichloroethene.

AWARDS & FELLOWSHIPS

2022	UCLA Institutional Research and Academic Career Development 3-Year Award (IRACDA) Postdoctoral Fellow Recipient
2022	UCLA School of Dentistry Research Day Oral Presentation Competition, 1 st Place
2021	UCLA Dentist-Scientist and Oral Health-Researcher T90 NIH Training Fellowship
2021	UCLA Distinguished Teaching Award for Teaching Assistants <i>1st female engineering graduate student to receive in UCLA history</i>
2015-2020	Eugene V. Cota Robles 4-Year Graduate Fellowship
2019, 2020	SILQ Industry-Sponsored Research Fellowship
2019	Center for Advancement of Teaching Classroom Mini-Grant
2019	American Water Works Association National Drinking Water Fellowship
2018	Emerging Contaminants Conference Poster Presentation Award, 1 st Place
2017	UCLA Distinguished Master's Thesis Award
2017	UCLA Campus Wide Research Pitch Competition (GradSlam), 3 rd Place
2017	American Society of Microbiology Agar Art Finalist
2016	Brown and Caldwell Women in Leadership Fellowship
2016	New England Biolabs National Passion in Science Fellowship
2016	National Science Foundation Graduate Research Fellowship, Honorable Mention
2015	Malcolm R. Stacey Research Fellowship
2015	Charlene Conrad Liebau Prize for Undergraduate Research, Honorable Mention
2015	Len Assante National Groundwater Research Fellowship
2011	AMEC Consulting Firm Student Scholarship Award
2011	Stockholm Junior Water Prize, Arizona State Winner

PATENTS

1. Shaily Mahendra and **Alexandra L. Polasko**. Anaerobic-Aerobic Bioremediation of Contaminated Water. Application Serial No. 62/590,030, Published on November 26, 2020

- Richard B. Kaner, Dayong Chen, Brian T. McVerry, Ethan Rao, and **Alexandra L. Polasko**. The Regents of the University of California, Hydrophilix. Biofouling Resistant Coatings and Methods of Making and Using The Same. United States patent US 10,729822. 2020 Aug 4.

PUBLICATIONS

- Garcia-Marques, F.J., Zakrasek, E., Bermeduz, A., **Polasko, A.**, Liu, S., Stoyanova, T., Brooks, J.D., Lavelle, J., and Pitteri, S. Proteomics analysis of urine and catheter-associated biofilms in spinal cord injury patients. *Am. J. Clin. Urol.*, 2023, 11, AJCEU0149083.
- *McVerry, B., ***Polasko, A. [co-first author]**, *Rao, E., Haghniaz, R., Chen, D., He, N., Ramos, P., Hayahsi, J., Curson, P., Wu, C.-Y., Bandaru, P., Anderson, M., Bui, B., Sayegh, A., Mahendra, S., Carlo, D. D., Kreydin, E., Khademhosseini, A., Sheikhi, A., and Kaner, R. B., A readily scalable, clinically demonstrated, antibiofouling zwitterionic surface treatment for implantable medical devices. *Adv. Mater.* 2022, 34, 2200254. *authors contributed equally to this work
- ***Polasko, A.**, *Miao, Y., Kwok, K., Park, K., Park, J. O., and Mahendra, S. Vinyl chloride and 1,4-dioxane metabolism by *Pseudonocardia dioxanivorans* CB1190. *J. Haz Mat. Lett.*, 2021, 2:100039. *authors contributed equally to this work.
- ***Polasko, A.**, *Ramos, P., Kaner, R. B., and S. Mahendra. A multipronged approach for accurate *in vitro* quantification of catheter-associated biofilms. *J. Haz. Mat. Lett.*, 2021, 2:10032. *authors contributed equally to this work
- Miao, Y., Heintz, M., Bell, C. H., Johnson, N. W., **Polasko, A.**, Gedalanga, P. B., Favero, D. and Mahendra, S. Profiling microbial community structures in biostimulation and bioaugmentation strategies for treating 1,4-dioxane contaminated groundwater. *J. Haz. Mat.*, 2020. 124457.
- ***Polasko, A.**, A. Zulli, P. Gedalanga, P. Pornwongthong, and S. Mahendra. A mixed microbial community for the biodegradation of chlorinated ethenes and 1,4-dioxane. *Environ. Sci. & Technol. Lett.*, 2019, 6: 49-54.

***Awarded ACS Editors' Choice - This is an open access article published under an ACS AuthorChoice**

- Zhao, L., Lu, X., **Polasko, A.**, Johnson, N.W., Miao, Y., Yang, Z., Mahendra, S., and Gu, B. Co-contaminant effects on 1,4-dioxane biodegradation in packed soil column flow-through systems. *Environ. Pollut.*, 2018, 243: 573-581.
- Safdari, M.S., Kariminia, H.R., Rahmati, M., Fazlollahi, F., **Polasko, A.**, Mahendra, S., Wilding, W.V. and Fletcher, T.H. Development of bioreactors for comparative study of natural attenuation, biostimulation, and bioaugmentation of petroleum-hydrocarbon contaminated soil. *J. Haz. Mat.*, 2018, 342: 270-278.
- Mao, X., **Polasko, A.** and Alvarez-Cohen, L. The effects of sulfate reduction on TCE dechlorination by *Dehalococcoides* containing microbial communities. *Appl. Environ. Microbiol.*, 2017, 83:1-28.
- Mao, X., Stenuit, B., **Polasko, A.** and Alvarez-Cohen, L. Efficient metabolic exchange and electron transfer within a syntrophic TCE degrading co-culture of *Dehalococcoides mccartyi* 195 and *Syntrophomonas wolfei*. *Appl. Environ. Microbiol.*, 2015, 81: 2015-2024.
- Ziv-El, M., Popat, S.C., Parameswaran, P., Kang, D.-W. **Polasko, A.**, Halden, R.U., Rittmann, B.E. and Krajmalnik-Brown, R. Using electron balances and molecular techniques to assess trichloroethene-induced shifts to a dechlorinating microbial community. *Biotechnol. and Bioeng.*, 2012, 109: 2230-2239.

CONFERENCE POSTERS & PRESENTATIONS

- Polasko, A.**, Zhang, D., Chiu, J., Qiu, P., Peterson, E., Ramraj, A., Zhao, H., and Brooks, J. B. Establishment and characterization of a patient-derived xenograft model of human benign prostatic hyperplasia. CAIRIBU, Nov., 2023.
- Polasko, A.**, Zhang, D., Chiu, J., Qiu, P., Peterson, E., Ramraj, A., Zhao, H., and Brooks, J. B. Establishing and characterizing the molecular profiles, cellular features, and clinical utility of patient-derived xenograft models using benign prostatic tissues. Stanford Urology Symposium, July, 2023.

14. Ramraj, A., **Polasko, A.**, and Brooks, J. B. Establishing and characterizing a patient-derived xenograft model of benign prostatic hyperplasia. Undergraduate CAIRIBU Conference, June, 2023.
15. Ramos, P., **Polasko, A.**, Kaner, R., and Mahendra, S. A multipronged approach to clinical & environmental biofilm quantification. Assoc. of Environmental Engineering and Science Professors, St. Louis, MO June 2022.
16. **Polasko, A.L.**, Miao, Y. Kwok, I. Park, K., Park, J.O. and Mahendra, S. Vinyl chloride and 1,4-dioxane metabolism by *Pseudonocardia dioxanivorans* CB1190. Battelle's 12th International Conference on Chlorinated and Recalcitrant Compounds, Palm Springs, CA., May 2022
17. LaPat-Polasko, L., **Polasko, A.**, Hayes, M and Lamont, P., In situ bioremediation of elevated levels of chlorinated ethenes in complex hydrogeologic conditions. Battelle's 12th International Conference on Chlorinated and Recalcitrant Compounds, Palm Springs, CA., May 2022.
18. Miao, Y., Heintz, M.B., Bell, C.H., Johnson, N.W., **Polasko, A.L.**, Favero, D., and S. Mahendra, S. Microbial indices for monitoring and evaluation of groundwater and soil bioremediation processes. Battelle's 12th International Conference on Chlorinated and Recalcitrant Compounds, Palm Springs, CA., May 2022.
19. **Polasko, A.**, LaPat-Polasko, L., and Mahendra, S. In situ biostimulation and bioaugmentation of chlorinated solvents and 1,4-dioxane. Battelle's 12th International Conference on Chlorinated and Recalcitrant Compounds, Palm Springs, CA., May 2022.
20. ⁺**Polasko, A.**, Chen, Y. Chen, Y-W., and Ton-That, H. Oral pathogen on the move: Characterizing *Fusobacterium nucleatum*'s motility. UCLA School of Dentistry Research Day, Mar. 2022.
+2022 UCLA School of Dentistry Research Day Oral Presentation 1st Place
21. **Polasko, A.**, Ramos, P., Rao, E., McVerry, B., Kaner, R.B., and S. Mahendra. A multipronged approach for accurate quantification of catheter-associated biofilms. American Chemical Society, Virtual, Apr. 2021.
22. Tsai, K., Alkidim, S., **Polasko, A.**, Koutnik, V. S., Borthakur, A., Mahendra, S., and S. Mohanty. Has Lake Baikal become befouled? A review and analysis of environmental pollutants in the world's largest freshwater lake, 24th Annual UCLA Undergraduate Conference on Slavic & East/Central European Studies, Virtual, Apr. 2021.
23. Tsai, K., **Polasko, A.**, Mahendra, S., From Wet Lab to MATLAB: Investigating the number of groundwater sites Impacted by 1,4-dioxane and vinyl chloride, Annual Biomedical Research Conference for Minority Students, Nov. 2020.
24. **Polasko, A.**, Kwok, I., Miao, Y., Johnson, W. N., and Mahendra S., From Widely Used to Wanting to be Removed: The Presence and Biodegradation of Emerging Water Contaminant, 1,4-Dioxane. Russian Science Technology and Education Conference (RusTEC), Virtual, Oct. 2020.
25. Kwok, I., **Polasko, A.**, Mahendra, S., One Microbe, Two Contaminants: Degradation of vinyl chloride in the presence of 1,4-dioxane, Annual Biomedical Research Conference for Minority Students, Nov. 2019.
26. **Polasko, A.**, Robolino, D., Zulli, A., Gedalanga, P., Pornwongthong, P., and Mahendra, S., Building an unconventional microbial community: integrating novel bioremediation methods into educational approaches. Association of Environmental Engineering and Science Professors Conference, Tempe, AZ, May 2019.
27. **Polasko, A.**, Zulli, A., Dworatzek, S., Mack E., Walecka-Hutchison, C., and Mahendra, S. Optimizing a mixed microbial community to biodegrade chlorinated ethenes and 1,4-dioxane, Battelle's 11th International Conference on Chlorinated and Recalcitrant Compounds, Palm Springs, CA., Apr. 2018.
28. LaPat-Polasko, L., Taggart, D., Rosolina, S., Clark, K., Baldwin, B., **Polasko, A.**, and Mahendra, S. Field-Scale evaluation of in situ biodegradation of 1,4-dioxane via bioaugmentation with *Pseudonocardia dioxanivorans* CB1190, Battelle's 11th International Conference on Chlorinated and Recalcitrant Compounds, Palm Springs, CA., Apr. 2018.
29. ⁺**Polasko, A.**, Zulli, A., and Mahendra, S. Biodegradation of CVOCs and 1,4-dioxane by an engineered microbial community, Emerging Contaminants Summit, Denver, CO., Mar. 2018.
+2018 Emerging Contaminants Summit Student Poster Presentation 1st Place
30. LaPat-Polasko, L. Rosolina, S., **Polasko, A.**, and Mahendra, S. Innovative Approach to Source Zone Remediation of Chlorinated Solvents and 1,4-Dioxane", 14th Annual Gatekeeper Regulatory Conference, Mar. 2018.

31. **Polasko, A.**, Zulli, A., and Mahendra, S. Optimizing a mixed microbial community for biodegradation of CVOCs and 1,4-dioxane, Strategic Environmental Research and Development Program Annual Conference, Washington, D.C., Nov. 2017.
32. Taggart, D., Clark, K, Baldwin, B., **Polasko, A.** and LaPat-Polasko, L. Evaluating Enhanced bioremediation of 1,4-dioxane following bioaugmentation with CBI190, Fourth International Symposium on Bioremediation and Sustainable Environmental Technologies, Miami, FL, May 2017.
33. Mao, X., **Polasko, A.** and Alvarez-Cohen, L. A system level approach to modeling the effects of environmental factors on the dechlorination kinetics of *Dehalococcoides*-containing microbial consortia, 115th ASM General Meeting, New Orleans, LA, June 2015.
34. **Polasko, A.**, Mao, X. and Alvarez-Cohen, L. Effects of sulfate and sulfide on *Dehalococcoides mccartyi* and *Desulfovibrio vulgaris* Hildenborough's ability to biodegrade trichloroethene, American Geophysical Union Annual Meeting, San Francisco, CA, Dec. 2014.
35. Mao, X., Yu, K., Stenuit, B., **Polasko, A.** and Alvarez-Cohen, L. Structural analysis of *Dehalococcoides mccartyi* within a TCE dechlorinating community maintained in a steady state chemostat, Superfund Research Program Annual Meeting, San Jose, CA, Oct. 2014.
36. Mao, X., Stenuit, B., **Polasko, A.** and Alvarez-Cohen, L. Structure and global gene expression of *Dehalococcoides mccartyi* in a TCE dechlorinating community within a completely mixed flow reactor, Superfund Research Program Annual Meeting, Baton Rouge, LA, Oct. 2013.
37. Mao, X., Stenuit, B., **Polasko, A.** and Alvarez-Cohen, L. Efficient electron transfer within a sustainable Syntrophic TCE degrading co-culture *Dehalococcoides mccartyi* 195 and *Syntrophomonas Wolfei*, UC Berkeley Superfund Research Program, Berkeley, CA, September 2013.
38. Ziv-El, M., Popat, S.C., Parameswaran, P., Kang, D-W, **Polasko, A.**, Halden, R.U., Rittmann, B.E. and R. Krajmalnik-Brown. Using electron balances to predict and assess trends in the microbial community structure of trichloroethene-reducing consortia. Battelle International Symposium on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA, May 2012.
39. Ziv-El, M., Popat, S.C., Parameswaran, P., Kang, D-W., **Polasko, A.**, Halden, R.U. Using electron balances to predict TCE-induced shifts to the microbial community structure, 112th ASM Meeting, SF, CA., June 2012.

TEACHING EXPERIENCE & MENTORSHIP

Graduate Student Instructor

1. Graduate Teaching Seminar (Fall 2019): Instructed 30 engineering students weekly on techniques for communicating engineering principles, concepts, and methods to undergraduate students.
2. Graduate Teaching Seminar-Online (Fall 2020): Built and instructed a course for 16 engineering students on how to effectively teach online. Course introduced incoming doctoral students to the existing and new responsibilities required of online teaching assistants and resources for equitable/inclusive teaching.

Graduate Teaching Assistant

3. Introduction to Environmental Engineering (Fall 2016): Led weekly discussion sections with 20-40 students on the environmental engineering problems, obstacles and solutions. Helped students solve quantitative homework problems and develop a deeper understanding of concepts.
4. Water and Wastewater Treatment (Winter 2017): Led weekly 2-hour discussion section with 15 students on fundamentals of water and wastewater treatment processes. Live and recorded demonstrations were used to illustrate biological and chemical treatment methods.
5. Environ. Biotechnology-Online (Spring 2019): Led weekly online classes on biological processes in natural and engineered environments. Developed course content, online interactions, and grading.

Guest Lecturer: Fate & Transport of Organic Chemicals (UCLA, Fall 2017, Fall 2018), Environmental Biotechnology (UCLA, Winter 2018), Microbial Remediation (Pepperdine, Fall 2020, Summer 2021), Environmental Microbiology (UCLA, Winter 2021), Microbial Remediation (Antelope Valley Community College, Spring 2021), Microbiology (UCLA-School of Dentistry, Winter 2022), Immunological Techniques in the Laboratory (San Jose State University, Fall 2023)

Undergraduate Research Mentor

- Mentored and designed research projects for 4 Master's, 9 undergraduate, 4 high school students.
- 88% undergraduate researcher assistants from underrepresented/underserved communities
- 3 undergraduate students received UCLA's Dean Undergraduate Research Award
- Mentored 2 Masters students from California State Universities
- 3 students received UCLA CARE Science, Engineering, and Math Summer Research Fellowship
- 2 students presented at ABRCMS & won 1st Place in Poster Competition (*Biology Division*)
- 1 student from UC Davis Summer Program for Undergraduate Research (SPUR)

Community Outreach

- **Stanford Undergraduate Pre-Renal Mentorship Program [2023-present]:** Lead research mentor for undergraduate students interested in urological research. As a mentor, I aim to prepare trainees for careers as independent investigators in Urology through hands-on independent research projects with direct applications to patient outcomes. Specifically, students learn a variety of critical research techniques such as in vitro and in vivo experimental design best practices, cell culturing, immunohistochemistry, and statistical analysis of data. Residence times of mentees are 1+ years.

- **CNSI Nanoscience Education Outreach [2021-2022]:** UCLA graduate students and postdoctoral scholars facilitate nanoscience-based experiment demonstrations for LA-based high school teachers. As a facilitator, I was part of a team that designed laboratory experiments, protocols, and exam materials that illustrate concepts from a wide range of UCLA research avenues including biopolymers, artificial intelligence, and genetics. Our goal was to bring nanoscience to students in a way that supports their educators.
- **UCLA Nanovation Youth Program [2021-2022]:** Teams of middle and high school students in LA create cutting-edge design and technology business proposals based off CNSI's Nanoscience Institute workshop series. As a mentor, I met weekly with the students and guided their literature review, proposal writing, slide deck preparation, and pitch meeting.
- **Graduate Society of Women Engineers [2016-2021]:** Elected VP of Undergraduate-Graduate Affairs and Secretary for the GradSWE. Led 5+ events connecting undergraduates with research laboratories.
- **UCLA Online Tutoring and Mentoring Program [2015-2017]:** Provided online mentoring and tutoring services for LA-based Emerson middle school in the area of physics and biology.

ACADEMIC COMMITTEES & PROFESSIONAL SERVICE

- UCLA Doctoral Student Advisory Committee for Civil Engineering Faculty Search-*Committee Chair, 2021*
- UCLA CARE Science, Engineering, and Math Undergraduate Summer Research Program-*Mentor, 2017-2020*
- American Chemical Society & American Society of Microbiology-*Member, 2019-Present*
- ***Peer Reviewer for Journals:*** Current Microbiology, International Journal of Biological Macromolecules, Journal of Hazardous Materials, Water Research, Environmental Science & Technology

Languages: R, Prism, Russian (*Advanced-First Certification Level, TORFL-1*)

REFERENCES

1. Dr. James Brooks

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