

# María Díaz de León Derby

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## RESEARCH INTERESTS

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I am interested in developing machine learning techniques for the diagnosis of Neglected Tropical Diseases, a group of conditions that affect one billion of the world's most vulnerable people.

## EDUCATION

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| Ongoing | <b>University of California, Berkeley and University of California, San Francisco</b><br>Ph.D. in Bioengineering<br>Advised by Prof. Daniel Fletcher |
| 2013-18 | <b>Tecnológico de Monterrey, Mexico (ITESM)</b><br>Bachelor of Science in Mechatronics Engineering<br>GPA of 96/100                                  |
| 2016-17 | <b>Karlsruhe Institute of Technology, Germany (KIT)</b><br>DAAD Mexican Engineers Exchange Programme<br>Faculty of Mechanical Engineering            |
| 2014-15 | <b>University of British Columbia, Canada (UBC)</b><br>International Student Exchange Program<br>Faculty of Applied Science                          |

## PUBLICATIONS

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- [1] Jean T. Coulibaly, Kigbafori D. Silue, Maxim Armstrong, **María Díaz de León Derby**, Michael V. D'Ambrosio, Daniel A. Fletcher, Jennifer Keiser, Karla Fisher, Jason R. Andrews, and Isaac I. Bogoch. "High Sensitivity of Mobile Phone Microscopy Screening for *Schistosoma haematobium* in Azaguié, Côte d'Ivoire". In: *The American Journal of Tropical Medicine and Hygiene* 108.1 (2023), pp. 41–43.
- [2] Sita S. Chandrasekaran, Shreeya Agrawal, Alison Fanton, Aditya R. Jangid, Bérénice Charrez, Arturo M. Escajeda, Sungmin Son, Roger McIntosh, Huyen Tran, Abdul Bhuiya, **María Díaz de León Derby**, et al. "Rapid detection of SARS-CoV-2 RNA in saliva via Cas13". In: *Nature Biomedical Engineering* 6.8 (Aug. 2022), pp. 944–956.
- [3] Parinaz Fozouni\*, Sungmin Son\*, **María Díaz de León Derby\***, Gavin J. Knott, Carley N. Gray, Michael V. D'Ambrosio, Chunyu Zhao, Neil A. Switz, G. Renuka Kumar, Stephanie I. Stephens, Daniela Boehm, et al. "Amplification-free detection of SARS-CoV-2 with CRISPR-Cas13a and mobile phone microscopy". In: *Cell* 184.2 (2021), 323–333.e9.
- [4] Tina Y. Liu, Gavin J. Knott, Dylan C. J. Smock, John J. Desmarais, Sungmin Son, Abdul Bhuiya, Shrutee Jakhanwal, Noam Prywes, Shreeya Agrawal, **María Díaz de León Derby**, Neil A. Switz, et al. "Accelerated RNA detection using tandem CRISPR nucleases". In: *Nature Chemical Biology* 17.9 (Sept. 2021), pp. 982–988.
- [5] Carolina Chávez-Madero\*, **María Díaz de León Derby\***, Mohamadmahdi Samandari, Carlos Fernando Ceballos-González, Edna Johana Bolívar-Monsalve, Christian Mendoza-Buenrostro, Sunshine Holmberg, Norma Alicia Garza-Flores, Mohammad Ali Almajhadi, Ivonne González-Gamboa, Juan Felipe Yee-de León, et al. "Using chaotic advection for facile high-throughput fabrication of ordered multilayer micro- and nanostructures: continuous chaotic printing". In: *Biofabrication* 12.3 (June 2020), p. 035023.
- [6] Ehsan Samiei, **María Díaz de León Derby**, Andre Van Berg, and Mina Hoorfar. "An electrohydrodynamic technique for rapid mixing in stationary droplets on digital microfluidic platforms". In: *Lab Chip* 17 (2 2017), pp. 227–234.

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\* denotes equal contribution.

- [7] B. A. Nestor, E. Samiei, R. Samanipour, A. Gupta, A. Berg, **María Díaz de León Derby**, Z. Wang, H. Rezaei Nejad, K. Kim, and M. Hoorfar. “Digital microfluidic platform for dielectrophoretic patterning of cells encapsulated in hydrogel droplets”. In: *RSC Adv.* 6 (62 2016), pp. 57409–57416.

## PRESENTATIONS

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- 03/2023 **Tropical Infectious Diseases Gordon Research Seminar**  
Poster and Talk: *Mobile Phone-based Diagnostics for Neglected Tropical Diseases: Automated Identification of Schistosoma haematobium from Urine Samples*
- 10/2022 **American Society for Tropical Medicine and Hygiene 2022 Annual Meeting: Advances in Point-Of-Care Technologies for NTDs Symposium**  
Talk: *Machine Learning for Automated Schistosomiasis Detection*
- 10/2022 **UC Berkeley/UCSF Graduate Program in Bioengineering: Annual Conference and Retreat**  
Talk: *Mobile Phone-based Diagnostics for Neglected Tropical Diseases*
- 09/2021 **UC Berkeley Health Tech Co-Lab Grand Opening**  
Invited Talk: *Harnessing Mobile Phones for Diagnosis of Neglected Tropical Diseases*
- 05/2021 **Conversations on Bioinspired Engineering - Seminar Series, UC Berkeley**  
Invited Talk: *Amplification-free detection of SARS-CoV-2 with CRISPR-Cas13a and mobile phone microscopy*
- 08/2018 **ACS Fall 2018 National Meeting and Exposition**  
Poster: *Continuous 3D chaotic printing: Using the chaotic flow induced by a Kenics mixer to continuously fabricate complex micro- and/or nanostructure at high resolution*
- 01/2018 **2018 Research and Development Congress at ITESM**  
Poster: *Continuous 3D chaotic printing: Using the chaotic flow induced by a Kenics mixer to continuously fabricate complex microstructure at high resolution*

## TEACHING AND MENTORING

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- 2023 **Graduate Student Mentor, Berkeley Bioengineering Scholars Program**  
- Working with one Bioengineering undergraduate student to design a gravity-assisted syringe pump for Point-of-Care diagnostics of Schistosomiasis
- 2021 **Graduate Student Instructor, University of California, Berkeley**  
- Bioengineering 168L - Practical Light Microscopy  
- Lead Instructor: Prof. Daniel Fletcher  
- Responsible for leading a laboratory section, conducting weekly office hours, and grading assignments.
- 2019-21 **Teaching Assistant, Center for Cellular Construction Workshop**  
- Helped design and teach a two week workshop where 20 high school students and teachers are introduced to cellular engineering and program robots that mimic cellular behaviour.

## INDUSTRIAL WORK EXPERIENCE

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- 2017 **Intern, Daimler AG**  
- Hybrid Drives - Data analysis, development and testing.  
- Developed a MATLAB evaluation tool for analysing data obtained from test vehicles.

## SERVICE

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- 2018-20 **Diversity, Equity and Inclusion (DEI) Enhancement Committee Member, UC Berkeley-UCSF Bioengineering Association of Students (BEAST)**  
- Organizing and leading a DEI workshop for our student body at the annual retreat  
- Prospective Student Recruitment at 2019 SACNAS National Diversity in STEM Conference

- Working with the BioE Executive and Admissions Committees to increase the diversity of our program's incoming cohort of students
- Evaluation of contribution to DEI of candidates in department faculty searches.

2020 **Visit Weekend Committee Co-Chair, UC Berkeley-UCSF Bioengineering**  
 - Responsible leading the committee of students in charge of the two recruitment visits of the year, where more than 80 prospective students visited our program

## AWARDS AND DISTINCTIONS

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2022 SACNAS National Diversity in STEM Conference Student Travel Award  
 2021 UC Berkeley/UCSF Bioengineering Service and DEIB Award  
 2020 Craven Award in Bioengineering (UC Berkeley Bioengineering)  
 2019 UC MEXUS-CONACYT Doctoral Fellowship  
 2016 Mitacs Globalink Fellowship  
 2016 DAAD Mexican Engineers Scholarship  
 2014 Emerging Leaders in the Americas Program Scholarship

## VOLUNTEER WORK

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2022 **Be A Scientist**  
 - Graduate student mentor at Longfellow Middle School in Berkeley, California

2014-16 **Prepanet**  
 - Science and Mathematics tutor for an online high school system serving underprivileged Mexican students

2013-16 **Team LamBot 3478 (FIRST Robotics)**  
 - Lead mentor responsible for leading a group of 15 academic and industry mentors and 50 high school students from San Luis Potosí, Mexico.

2013-14 **FIRST Robotics**  
 - Judge assistant, field assembly volunteer, and referee

## LANGUAGES

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Spanish Native  
 English Native (iBT TOEFL 119/120)  
 German Very Good Command (B2.2)  
 French Basic Command