Amador C. Lagunas

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EDUCATION

University of Michigan **Ann Arbor, MI**
PhD in Biomedical Engineering *Expected completion in April 2025*
GPA: 3.97/4.00
Thesis: Pudendal Nerve stimulation for treatment of Lower Urinary Tract Dysfunction

MS in Biomedical Engineering *April 2022*
GPA: 3.96/4.00
Selected Coursework: Neural Engineering, Machine Learning for Biomedical Signals and Imaging, Project Management Consulting, Experimental Design, Clinical Trial Design, IP Strategy

University of California, San Diego **La Jolla, CA**
BS in Bioengineering: Biosystems *June 2020*
GPA: 3.67/4.00

RESEARCH EXPERIENCE

University of Michigan - Peripheral Neural Engineering and Urodynamics Lab **Ann Arbor, MI**
Graduate Research Assistant *August 2020 - Present*
Advisor: Dr. Tim Bruns

- Plan and complete experiments in over 30 clinical procedures to obtain human physiological signals including EMG
- Work with physicians in a multidisciplinary team to perform a neuromodulation study of the human urinary system
- Create MATLAB, R, and Python workflows to analyze data from 600+ human experimental trials to assess the performance of currently available devices and identify areas of improvement and unmet needs
- Outline and execute feline and ovine experiments to investigate the capabilities of pudendal neuromodulation for lower urinary tract symptom treatment and selective electrical stimulation to inform future human therapies
- Utilize electrochemical characterization to evaluate the performance of several dozen novel multicontact nerve cuffs

University of California, San Diego - DVJ Lab **La Jolla, CA**
Undergraduate Research Assistant *June 2018 - June 2020*
Advisor: Dr. Daniela Valdez-Jasso

- Performed power analysis to determine necessary study sample size and execute analysis of variance to determine if there are statistical differences between sample groups
- Created MATLAB programs that quantify tissue composition and calculate blood vessel opening angles
- Generated a protocol and designed a system for whole heart decellularization

PUBLICATIONS

1. **Lagunas A. C.**, Chen P.-J., Ruiz L., Jhand A. S., Baishya N., Lempka S. F., Gupta P., & Bruns T. M. Factors affecting anal sphincter recruitment during intraoperative pudendal nerve stimulation. *MedRxiv* 2024.
   - Using clinical data, identified key indicators for optimal device implantation helping doctors ensure proper neurostimulator placement to maximize patient benefit
2. Chen, P-J., **Lagunas, A.C.**, Soriano, V., Gupta, P., Bruns, T. Perineal and rectal nerve recruitment order varies during pudendal neurostimulator implant surgery. *MedRxiv* 2024.
   - Reported the physiological effect of neurostimulation to better understand the outcomes of current treatments

LEADERSHIP & SERVICE

University of Michigan, Biomedical Engineering Graduate Student Council **Ann Arbor, MI**
Social Lead, Recruitment Chair, Treasurer *January 2022 – Present*

- Planned an in-person PhD recruitment event for 80+ prospective students over three days and a virtual visit day, which contributed to the recruitment of outstanding applicants and maintained high department quality
- Wrote proposals and budgets for over 20 student run events to foster connections between students, faculty, and staff
- Organized events to bring students together, enhancing peer connections and fostering a strong sense of community

Letters to a Pre-Scientist **Ann Arbor, MI**
Volunteer STEM Professional Pen Pal *September 2023 - Present*
- Explain science concepts in an accessible manner to elementary students to foster excitement for STEM careers
- Engage students by answering questions and providing relatable stories of personal struggles and successes

Ann Arbor Ultimate Frisbee Club Team **Ann Arbor, MI**
Team Captain *May 2023 - November 2023*
- Co-led team of 30 adults by planning practices and strategy, ensuring alignment with team goals and expectations
- Managed interpersonal conflicts through clear communication to maintain team cohesion and performance

PROJECT EXPERIENCE

Michigan Life Sciences Engineering Advising and Development Consulting Group **Ann Arbor, MI**
Consultant *March 2024 - Present*
- Synthesized documents summarizing scientific rigor in four distinct research areas of women's health over six weeks
- Advised client on directions to prioritize research and investment through weekly project deliverables
- Presented clear recommendations on behaviors to improve women's health during three client meetings

External Morcellator Development Team - SLING Health **Ann Arbor, MI**
Engineer September 2020 – May 2021
- Conducted background research to identify a market gap in the surgical device space
- Consulted with clinicians and experts in the field for feedback on device design and direction
- Developed a product to fit the market need culminating in the drafting of a patent

HONORS AND AWARDS

University of Michigan Rackham Merit Fellowship *June 2020 - Present*
Rackham graduate student research grant, University of Michigan *2022*
Trainee Professional Development Award, Society for Neuroscience *2021*
National Finalist, SLING Health Medical Entrepreneurs 2021 Demo Day *2021*
UC, San Diego American Heart Association Summer Undergraduate Fellowship *2018*

ABSTRACTS AND PRESENTATIONS (selected of 17)

1. **Lagunas AC**, Chen P-J, Gupta P, Bruns T: The effects of Pudendal Neuromodulation on the Lower Urinary Tract During Urodynamics, *Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction 2024 Meeting*, Fort Lauderdale, FL, 2024, podium presentation.
2. Chen P-J, **Lagunas AC**, Soriano V, Gupta P, Bruns T: Urethral recruitment and activation pattern during clinical pudendal neurostimulator implant surgery, *Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction 2023 Meeting*, Nashville, TN, 2023, poster.
3. **Lagunas AC**, Chen P-J, Gupta P, Bruns T: Changing pudendal neuromodulation settings shifts patient sensation and pelvis floor responses, *Society for Neuroscience*, San Diego, CA, 2022, poster.
4. Ortiz-Lopez M, **Lagunas AC**, Patel P, Bruns T: Pudendal nerve stimulation to prevent urinary leakage using multi-contact cuff electrodes, *Society for Neuroscience*, San Diego, CA, 2022, poster.
5. Gupta P, Chen P-J, **Lagunas AC**, Kotkar A, Ruiz LC, Shah G, Lempka SF, Bruns TM: Pudendal nerve mapping and the use of urodynamics to examine the effects of pudendal neuromodulation, *American Urological Association* 2022, New Orleans, LA, 2022, poster.
6. **Lagunas AC**, Chen P-J, Ruiz Perez L, Kotkar A, Lempka S, Gupta P, Bruns T: Quantifying anal sphincter recruitment with clinical pudendal nerve stimulation, *Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction 2022 Meeting*, San Diego, CA 2022, poster.
7. Ruiz LC, Mirzakhalili E, Kotkar A, Lapetina R, Chen P-J, **Lagunas AC**, Shah G, Gupta P, Bruns TM, Lempka S: Patient-specific computational modeling of neural recruitment during pudendal nerve stimulation, *North American Neuromodulation Society*, Orlando, FL, 2022, poster.
8. **Lagunas AC**, Chen P-J, Ruiz Perez L, Kotkar A, Lempka S, Gupta P, Bruns T: Quantifying anal sphincter recruitment during clinical pudendal nerve stimulation, *Society for Neuroscience*, Virtual, 2021, poster.
9. **Lagunas AC**, Valdez-Jasso D, Omens J: The induction process for studying PAH in a mammal, *Summer Research Conference*, University of California, San Diego, CA 2018, presentation.