

Usuy David León Tolosa

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Resumen

Researcher and educator with two years of experience, specializing in microscopy, open science, and open-source software. Dedicated to investigating the biological mechanisms driving pattern formation and the regeneration of complex 3D tissues and structures

Education

Bachelor in Biology

Jan 2016 – Dec 2022

National University of Colombia, Bogotá DC.

- 2023 University Award Best Bachelor Thesis of the Year.
- 2023 National Award Top Undergraduate Performance University-Level Saber Pro National Exam

Research Experience

Faculty Assistant,

May 2023 – Dec 2024

University of Maryland, College Park, MD, USA.

Angueyra's Laboratory

- Explored horizontal cell diversity across species using DII staining and confocal microscopy (Snakes, Geckos, Cichlids, Mongolian Gerbil, Zebrafish)
- Characterized effects of thrb modulation on photoreceptor subtypes of *Astatotilapia burtoni*. (preliminary NSF grant data)
- Induced CRISPR mutagenesis on Foxq2 transcription factor; sparse neuron labeling to evaluate synaptic connectivity in *Danio rerio*.
- Recorded electroretinograms and optokinetic responses during early visual development of *Astatotilapia Burtoni*
- Assembled a custom electrophysiology rig and multi-wavelength stimulator for ERG recordings

Research Assistant,

May 2021 – July 2023

National University of Colombia, Bogota DC.

Neurophysiology Research Group

Supervisor: *Maria del Pilar Gomez P.hD, Enrico Nasi, P.hD*

- Established protocols to isolate functional photoreceptors from *schmidtea mediterranea* planaria for patch clamp and calcium imaging.
- Labeled phototransduction cascade elements by immunohistochemistry on planarian ocelli
- Skilled in planarian ocelli dissection and tissue dissociation; culture maintenance

Research Trainee,

May 2020 – Sep 2020

University of Pennsylvania, Philadelphia, USA

Dr Minghong Ma's Laboratory

- Applied machine learning (DeepLabCut) to analyze behavioral effects from optogenetic manipulations in mice ventral striatum.
- Co-authored a review on olfactory and non-olfactory brain network connections.



Research Trainee,
National University of Colombia, Bogotá DC.,
Neurophysiology Research Group
Supervisor: María Del Pilar Gómez, MD, PhD

Jan 2019 – Dec 2020

- Trained in cellular electrophysiology, immunocytochemistry, chicken eye dissection, electrophoresis, Western blot, and neuroblastoma cell culture

Research Trainee,
National University of Colombia, Bogotá DC,
Protein Research Group
Supervisor: Edgar Reyes, PhD

Feb 2018 – Dec 2018

- Purified lectin protein from *Salvia bogotensis*, to test insecticidal activity against *Tecia solanivora*.

Publicaciones

León, U., Forero, J. (2025). **El Solar Observatory of Bacata: New Archeo-Astronomical Perspectives in the historical center of Bogota** eSPECTRA. Revista del Observatorio Nacional de Colombia (On review).

Bhattarai, J.P., Etyemez, S., Jaaro-Peled, H., Janke, E., León Tolosa, U.D., Kamiya, A., Gottfried, J.A., Sawa, A., Ma, M. (2021). **Olfactory modulation of the medial prefrontal cortex circuitry: implications for social cognition..** Seminars in Cell and Developmental Biology

Teaching Experience

Teaching Assistant,
University of Maryland, College Park, MD, USA
Neurophysiology Laboratory 405
Supervisor: Hilary birdman, PhD

Jan 2024 – May 2024

- Supervised weekly 4-hour labs (20 students) on extracellular/intracellular electrophysiology with crayfish, crickets, and worms
- Guided students in experiment design and poster presentations of pharmacology and sensory data

Voluntary Teacher,
Colegio Distrital 20 de Julio, Bogota DC, Colombia
Pre-university course
• Mentored low-resource community students preparing them for National University entrance exam (4 hours a week).

Feb 2017 – Dec 2018

Presentations and Posters

El Observatorio Solar de Bacatá: Nuevas perspectivas arqueoastronómicas en el centro histórico de Bogotá.

2024

León, U., Forero, J. —V Workshop de Astronomía de los Andes, Universidad de Nariño, Pasto.

Waiting for godot? Unveiling the rules for synaptic connectivity of H3 cells.

2024

León, U., Angueyra, J. — Mid Atlantic Zebrafish Meeting (MARZ), Rutgers, NJ.

Planaria eye as a study model of phototransduction.

2023

Puerto, P., León, U., Zuluaga, M., Gómez, P. — XIII Seminario Nacional de Neurociencia (COLNE), Cali.

Contribution of the olfactory system to social cognition in mice.

2020

León, U., Ma, M. — Undergraduate Internship Program, University of Pennsylvania, Philadelphia, PA.



Technical skills

Microscopy: Light sheet, Confocal live, and Expansion microscopy

Electrofisiología: Patch-clamp, Electroretinograms (ERG) Calcium imaging (GCamp6, Fluo4AM)

Molecular Bio: PCR, CRISPR, Western blot, transfección

Staining: Lipid tracing (DII), Golgi staining, Immunocytochemistry

Software and coding

Software: Python, Bash, FIJI/ImageJ, μ Manager, Nikon Elements, Zeiss Zen, DeepLabCut, Prusa Slicer

Tools: Linux, Inkscape, OpenSCAD, Git, LaTeX

Hardware: 3D Printing, Arduino, Raspberry Pi, Basic circuits Soldering

Languages

Spanish	Native
English	C1 Fluent
German	A2 Basic

References

Juan Angueyra, M.D., Ph.D.

Assistant Professor, Department of Biology, University of Maryland
angueyra(a)umd.edu

Karen Carleton, Ph.D.

Full Professor, Department of Biology, University of Maryland
kcarleto(a)umd.edu

María del Pilar Gómez, M.D., Ph.D.

Associate Professor, Department of Biology, National University of Colombia
mpgomzco(a)unal.edu.co

Minghong Ma, Ph.D.

Full Professor, Department of Neuroscience, University of Pennsylvania
minghong(a)pennmedicine.upenn.edu.

Enrico Nasi Lignarolo, Ph.D.

Full Professor, Department of Genetics,
National University of Colombia
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