

# 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 PhD, Enrico Nasi, PhD

- 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

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Leon, 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

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**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*

Feb 2017 – Dec 2018

- Mentored low-resource community students preparing them for National University entrance exam (4 hours a week).

## Presentations and Posters

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**El Observatorio Solar de Bacatá: Nuevas perspectivas arqueoastronómicas en el centro histórico de Bogotá.** 2024

León, U., Forero, J. —V Workshop de Astronomia 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

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**Microscopy:** Light sheet, Confocal live, and Expansion microscopy

**Electrofisiología:** Patch-clamp, Electrophysiological recordings (ERG) Calcium imaging (GCamp6, Fluo4AM)

**Molecular Bio:** PCR, CRISPR, Western blot, transfección

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

## Software and coding

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**Software:** Python, Bash, FIJI/ImageJ,  $\mu$ Manager, Nikon Elements, Zeiss Zen, DeepLabCut, Prusa Slicer

**Tools:** Linux, Inkscape, OpenSCAD, Git, LaTeX

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

## Languages

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Spanish	Native
English	C1 Fluent
German	A2 Basic

## References

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### 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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