

# Rodolfo Padilla

Rockville, MD | (301) 919-8943 | [rodolfo.mac3@gmail.com](mailto:rodolfo.mac3@gmail.com)

Biology Graduate, Computational Biologist & Full-Stack Developer with 3+ years of laboratory experience in microbiology and molecular biology, complemented by 5+ years in machine learning, web development, and bioinformatics. I specialize in bridging biological research with software solutions through custom tool development, data pipeline automation, and ML model deployment. Experienced in GMP-regulated environments, containerized applications, and scientific software engineering for research and production.

- My Portfolio website with full project details: [portfolio-site-pi-vert.vercel.app](https://portfolio-site-pi-vert.vercel.app)

## Technical Projects & Portfolio

**Projects & Portfolio** - [Remote @ <https://portfolio-site-pi-vert.vercel.app/> ]

**Marker Finder** - Python/Flask bioinformatics tool automating biomarker discovery and primer design (NCBI API + Primer3), with PDF reporting, containerized deployment, and RESTful API.

**GBM Drug Sensitivity Visualization (GDSC2 Dataset)** - Analyzed mutation-specific drug response in glioblastoma using GDSC2 data. Joined pharmacological and genomic datasets in R to explore relationships between gene mutations and  $\ln(\text{IC}_{50})$  drug sensitivity. Produced publication-style plots in ggplot2 revealing subtype-specific treatment resistance patterns.

**TickID Hub** - ML pipeline for tick image classification (PyTorch → ONNX) deployed in R Shiny with Docker; includes batch inference, model monitoring, and reproducible workflows.

**Vector-Borne Disease Modeling Platform** - Stage-structured ODE models (R/deSolve) simulating tick population dynamics; identified host density thresholds informing public health strategies.

## Professional Experience

**Laboratory Assistant** - [University of Oregon, Roy Lab]

- Conducted sample prep, microscopy, and aseptic techniques in GMP-aligned labs; prepared media/reagents; built R/Python pipelines for ecological data analysis.

**Software Developer** - [New Frontier Data, Washington, DC]

- Built and deployed ML models (TensorFlow, PyTorch) with performance optimization; enhanced inference speed, pipeline integration, and usability within agile, collaborative workflows.

**Internet Marketing Manager** - [Potomac Holistics, Rockville, MD]

- Oversaw website architecture, POS integration, and database management; optimized uptime/performance and implemented automated marketing workflows with data-driven processes.

#### **Data Collector** - [Retail Data LLC, Germantown, MD]

- Performed in-store audits with accuracy validation; developed QC processes and data verification workflows.

### **Research Experience**

#### **Independent Research Proposal** - [University of Oregon]

- Designed experimental protocols on Sca4/Sca2-mediated cytoskeletal remodeling; integrated literature review with proposed assays (PCR, immunofluorescence, cytoskeletal analysis) to demonstrate protocol development, assay design, and analytical planning skills.

### **Education**

#### **University of Oregon** - [Eugene, OR]

##### **Bachelor of Science** in Biology, Minor in Chemistry (2022-2025)

Relevant Coursework: Biochemistry, Molecular Genetics, Organic Chemistry, Cell Biology, Bacterial-Host Interactions, Microbiology, Data Analysis/Visualization

#### **Montgomery College** - Rockville, MD (2020-2021)

##### **Associate of Science** in Biology

### **Technical Skills**

**Laboratory & Molecular Biology:** Aseptic techniques (BSL-2), PCR/qPCR/ddPCR, DNA/RNA extraction, gel electrophoresis, HPLC/FPLC, microscopy, GMP/CLIA compliance, LIMS.

**Programming & Software:** Python, R, JavaScript; Flask, Django, Node.js, Next.js, React, Shiny; SQLAlchemy, MySQL; Docker, Kubernetes, CI/CD; Git.

**Scientific Computing & ML:** NumPy, Pandas, Matplotlib, SciPy, Biopython, PyTorch, NLP, ONNX, scikit-learn; bioinformatics pipelines, sequence analysis.

**Data & Visualization:** Statistical analysis, experimental design, reproducible pipelines, dashboards, publication-ready figures.

**Professional Strengths:** Bilingual (English/Spanish), technical writing, problem-solving, team collaboration, GLP/cGMP compliance.