Rodolfo Padilla

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Biology Graduate, Computational Biologist & Full-Stack Developer with 5+ years of laboratory experience in microbiology and molecular biology, complemented by 8+ 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

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.

Lab Inventory Management System - Flask + SQLAlchemy application for inventory tracking with low-stock alerts, expiry management, CSV import/export, and GMP-compliant audit trails.

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, PostgreSQL; Docker, Kubernetes, CI/CD; Git/GitHub.

Scientific Computing & ML: NumPy, Pandas, Matplotlib, SciPy, Biopython; TensorFlow, PyTorch, 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.