Ruben Alvarez

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Education

Rutgers University, School of Engineering - New Brunswick

- Bachelors of Science in Chemical Engineering | Minor in Mathematics **May 2025**
- Masters of Engineering in Pharmaceutical Engineering **December 2025**
- Cumulative GPA: 3.79/4 | Dean's List all semesters

Work Experience

Advanced Control of Continuous Pharmaceutical Manufacturing Pilot-Plant   **May 2024 - Present**
Research Assistant

- Supervise and manage a team of undergraduate students in designing experiments, analyzing data, and troubleshooting production line issues, resulting in reduced production times.
- Utilize Process Analytical Technology (UV-Vis) to quantify and adjust concentration of injectable Albuterol for a desired range to ensure consistent concentration within the final tank.
- Develop API solutions for real-time monitoring and model calibration, improving concentration accuracy by feeding additional data, and increasing system efficiency.
- Assist in the review, updates, and creation of Standard Operating Procedures (SOPs) for custom PAT program and vial filling system.
- Lead troubleshooting efforts to resolve production bottlenecks and equipment malfunctions, ensuring timely resolutions under strict time constraints.

Machine Learning Models for Anti-Infectives   **May 2023 - August 2023**
Research Assistant

- Developed predictive models that accurately identified potential drug candidates for *Mycobacterium tuberculosis*, enhancing selection efficiency.
- Utilized advanced machine learning algorithms to analyze and predict the efficacy of chemical compounds.
- Enhanced data collection methods by integrating multiple model types, boosting outcome analysis efficiency by 20%.
- Collaborated with an internal lab to validate the machine learning models' candidates prediction, providing feedback to refine the model for various applications in drug discovery research.

Rutgers ODASIS   **May 2021 - August 2021**
Undergraduate Chemistry Tutor

- Created comprehensive problem-solving guides for chemistry topics, significantly improving student understanding as evidenced by a 15% increase in their exam scores.
- Actively engaged with an average of 10 students daily, providing targeted support that led to a high pass rate in their courses.
- Collaborated with faculty to redesign the learning environment, incorporating modern pedagogical techniques that increased student engagement.

Research Projects

Developing and Testing Sodium Alginate Beads for Drug Delivery   **January 2023 - June 2023**

- Developed various alginate bead formulations to enhance drug delivery efficacy, improving absorption rates by 15%.
- Monitored drug release profiles and encapsulation efficiency through UV-Vis spectrophotometry, controlling drug delivery over specific time periods.
- Engineered and evaluated key factors influencing drug absorption, achieving a 20% improvement in controlled release times.
- Investigated and optimized storage methods for alginate beads, preserving diffusion rates effectively over six months.

Skills

Technical Skills: MATLAB, Python, Java, HTML, CSS, Maple, Aspen Plus, Microsoft Applications, Process Development and Optimization, Microscopy

Languages: Bilingual in English and Spanish

Affiliations

Omega Chi Epsilon (OXE)   **June 2023 - Current**
Louis Stokes Alliance for Minority Program (LSAMP)   **May 2023 - Current**