KUMBHA RAVINDRA

Intern Trainee

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SUMMARY

A focused and ambitious Pharmaceutical Engineering student with a strong academic foundation and hands-on research experience. I have contributed to important research projects, including toxicity studies on zebrafish and investigations into the effects of escitalopram, as well as developing and validating nicotine metabolite ratios for targeted tobacco treatments. My certifications in drug discovery and **pharmaceutical instrumental analysis techniques** further enhance my research skills and technical expertise.

I am passionate about scientific inquiry and have honed my analytical, problem-solving, and research skills through various projects. I am eager to contribute to innovative, research-driven environments and continue expanding my pharmaceutical and biotechnology knowledge.

EXPERIENCE/INTERNSHIPS

DRDO, Coimbatore

Project Intern   **June 2024 - September 2024**

- Conducted research on the Effects of Escitalopram on Zebrafish, utilizing advanced laboratory techniques and instruments such as **DLS (Dynamic Light Scattering), UV-VIS Spectrophotometer, XRD (X-ray Diffraction), and ICP-MS (Inductively Coupled Plasma- Mass spectrophotometer)** for data analysis and reporting.
- Gained hands-on experience in **chromatographic analysis**, including method development and validation in compliance with GLP standards.
- Collaborated with senior scientists in performing toxicity studies on zebrafish, ensuring accurate preparation and analysis of samples.
- Demonstrated proficiency in **XRD analysis**, wet lab procedures, and other instrumental techniques crucial for pharmaceutical research.
- Actively contributed to preparing project evaluation reports, ensuring data accuracy and compliance with regulatory requirements.

SKILLS(TECHNOLOGY/FUNCTIONAL):

Analytical Instruments:

- X-Ray Diffraction
- UV-VIS Spectrophotometer
- Fluorescent Microscope
- Particle Size Analyzer and Zeta Potential
- Scanning Electron Microscope

Analytical Software:

- Microsoft Excel
- GraphPad Prism

Soft skills:

- Good Laboratory Practice
- Documentation
- Communication Skills

EDUCATION

B.Tech (Pharmaceutical Engineering)   Kakinada Institute of Technological Sciences   2022-2026   (7.15/10)

Intermediate (Biology, Physics & Chemistry) AP Model School & Jr. College   2020-2022   (7.98/10)

High School   AP Model School   2019-2020   (9.8/10)

PROJECTS

Project Title: Developing and Validation of Nicotine Metabolite Ratio for Target Tobacco Treatment

Project Description:

Objective: Investigated the role of the nicotine metabolite ratio (NMR) as a biomarker to guide smoking cessation treatment.

Responsibilities:

- Conducted an extensive literature review on phenotypic biomarkers for nicotine metabolism.
- Analyzed clinical trials to evaluate the effectiveness of NMR in predicting responses to different smoking cessation therapies.
- Assessed the influence of factors such as genetics, estrogen levels, alcohol use, body mass index, and menthol exposure on nicotine metabolism.
- Recommended treatment options based on NMR classification, such as nicotine replacement therapy for slow metabolizers and non-nicotine pharmacotherapies for normal metabolizers.
- Proposed future research directions to enhance understanding of NMR associations with therapeutic outcomes.

Outcome: Established NMR as a promising biomarker to individualize smoking cessation treatment, with the potential for clinical implementation to reduce relapse rates.

Project Title: Toxicity Profiles of Escitalopram: Understanding dose-dependent adverse Effects on Zebrafish (D. rerio) Larvae.

Project Description:

Objective: Investigated the dose-dependent toxicity of the antidepressant escitalopram on zebrafish (D. rerio) larvae to assess its potential environmental impact.

Responsibilities:

- Conducted in vivo experiments administering escitalopram at concentrations ranging from 2 mg/L to 100 mg/L to zebrafish embryos post-fertilization.
- Monitored and recorded morphological and developmental deformities at multiple time points (48hpf and 96hpf).
- Assessed toxicological parameters such as heart rate, yolk sac edema, spinal deformities, scoliosis, pericardial edema, hatching rate, and mortality rate.
- Investigated the production of reactive oxygen species (ROS), necrosis, and apoptosis as indicators of escitalopram toxicity.

Outcome: Identified dose-dependent toxic effects of escitalopram, with significant morphological deformities and increased mortality observed at higher concentrations. Provided valuable insights into the potential environmental risks of SSRIs on aquatic organisms.

LEADERSHIP EXPERIENCE

- Student Member of the **American Institute of Chemical Engineers.**
- Global Outreach Student Member in the **American Society of Microbiology.**
- Undergraduate Member of the **British Pharmacological Society.**
- IFCAI Member in Infection Control Academy of India.
- Undergraduate member of **the British Society for Gene and Cell Therapy**
- Undergraduate student member of the **Royal Microbial Society**.

WORKSHOPS/CONFERENCES

- Multi-Ligand Docking Hands-on Workshop by Genomac Institute Inc.
- Vaccine Technology by Bioresire.
- Futuristic R&D Endeavours on Soldier Support Technologies from DRDO, Coimbatore.
- Virtual International Conference "**ChemConvergence2025: Advancing Chemistry Through Multidisciplinary Innovations**"

CERTIFICATIONS

- **Drug Discovery** from Coursera.
- Drug Development Process: Combating pain from Open University.
- Good Clinical Practice Training from The National Institute of Drug Abuse.
- **Modern Pharmaceutical Analysis Techniques** from Udemy.

PUBLICATIONS:

Nooka, A. ., Chilaka, H. K. ., Kumbha, R. ., Yemineni, B. B. ., Tanukonda, S. ., & Kalagatur, N. K. . (2025**). Valproic Acid Induces Zebrafish Embryonic Developmental Defects by Inducing Oxidative Stress-mediated Apoptosis: Dose and Time-dependent Analysis.** *Current Trends in Biotechnology and Pharmacy*, *19*(1), 2107–2115. https://doi.org/10.5530/ctbp.2025.1.1