Research Overview

I am an Analytical / Research and Development Chemist, with over 10 years of experience participating in interdisciplinary research and development projects. My research interests span qualitative and quantitative analyses, active ingredient profiling, method development, formulation chemistry, transdermal drug delivery, quality control, and quality assurance. I am dedicated to innovation, efficacy, and sustainability.

My research journey began at the Rubber Research Institute of Nigeria (RRIN), where I was trained to be diligent in conducting research. Tenure tracked as a Research Officer of Analytical Chemistry, I was involved in innovative research projects on sustainable natural rubber alternatives, formulation chemistry, product development, nanochemistry, water treatment, and management with stringent quality control measures. I maintained a perfect compliance record for ten consecutive years and was committed to value addition implementing data accuracy, quality control, teamwork, and collaboration, which were integral to my research.

Driven by my zeal to delve deeper into new analytical chemistry techniques, I received a grant in 2019 from the Analytical Chemistry Trust Fund, Developing World Scholarship, for collaborative research as a visiting researcher at the University of Hull, United Kingdom. There, we developed paper-based microfluidic devices for analyzing heavy metals in water samples. This research resulted in the creation of paper-based microfluidic dip-stick devices with colour-based readout chemistry that can simultaneously measure several toxic metals in water samples which were applicable in resource-limited settings in my home country. This partnership enhanced my collaborative and problem-solving skills.

My BSc. and MSc. research centered on analytical chemistry focusing on materials analysis, nanomaterials, green chemistry, and sustainability. I collaborated with other researchers in these areas of specialization, as evidenced by my scholarly publications.

Understanding the critical role of oils in lipid-based formulations for applications such as increased absorption and controlled release, I was particularly interested in sustained drug delivery during my experience at the Rubber Research Institute of Nigeria. While working in the product development division, I investigated and formulated creams and lotions using rubber seed oils. This gave me valuable insight into the potential of various oils for lipid-based formulations, which I applied in my current research at Nottingham Trent University. My current research involves lipid-based formulations for the transdermal delivery of amino acids to promote muscle protein synthesis and reduce inflammation. My findings, titled "Evaluation of the Transdermal Delivery of L-Arginine in Lipophilic Gel Formulations: Prospect for Muscle Protein Synthesis," have been submitted and will be presented at the Royal Society of Chemistry 5th Commonwealth Chemistry Posters under the theme Good Health and Wellbeing (SDG 3).

In addition to my research activities, I have written and co-written over 20 scientific articles and presented papers at leading conferences like the American Chemical Society (ACS), The Minerals, Metals & Materials Society (TMS), Commonwealth Chemistry Posters, and International Conference (IRC). My academic background includes an MRes degree in Pharmaceutical Analysis from the United Kingdom, an MSc. in Chemistry, and a BSc. in Industrial Chemistry from Nigeria. I am a professional member of the Community Research4Life Programmes (D-Group), the Chemical Society of Nigeria, the Organization for Women in Science for the Developing World, the Materials Science and Technology Society of Nigeria, the American Chemical Society, and the Royal Society of Chemistry (MRSC).

I am passionate about research and development, innovation, and sustainability. I am eager for more opportunities to join any esteemed research group to promote health and well-being.

Expertise

- Interdisciplinary Research and Development: Specializes in method development, cosmetic formulation, QC/QA, qualitative and quantitative analyses, active ingredient profiling, and materials analysis using techniques such as LC-MS, HPLC, NMR, ATR-FTIR, UV-visible spectroscopy, SEM, TEM, DLS, Image J analyses, and data management.
- Leadership and Management: Demonstrates strong supervisory, team building, communication, and interpersonal skills, enhancing operational efficiency and team productivity.
- Green Chemistry: Developed sustainable methods that eliminate the use of expensive solvents, reducing costs and environmental impact.
- Process Optimization: Improved analytical processes, reducing metal analysis time by 40% while enhancing detection limits and accuracy through microfluidics.
- Data Analysis, Data Science, Machine Learning, and Artificial Intelligence: Proficient in Advanced Excel, SQL, Power BI, and AI for data analysis, communication, and management.

Professional Experience

- Analytical / Research and Development Chemist, Kinetic Biosciences Ltd (Neofit Cosmetic Brand), United Kingdom: Developed and optimized novel topical formulations to enhance product quality and cost-effectiveness through advanced analytical techniques like LC-MS and HPLC, while improving laboratory processes and data management, leading to increased productivity, data quality, client trust, and business growth.
- Chemistry Teacher/Laboratory Assistant, Academics Ltd: Taught chemistry and conducted laboratory experiments for over 20 students, improved efficiency and safety by troubleshooting issues, enhancing protocols, and implementing a waste reduction scheme that reduced waste by 20%.
- Chief Research Officer - Analytical Chemistry, RRIN: Investigated sustainable latex sources, developed innovative topical treatments, ensured quality control and operational efficiency, improved scientific communication and data management, conducted environmental analytical chemistry research, led and trained teams, secured funding, and authored over 20 scientific publications.
- Analytical Chemist, University of Hull: Devised green methods for metal analysis, led a lean laboratory initiative to increase throughput by 50%, and supported method validation and quality control by conducting analytical tests to validate elemental analysis using a microfluidic method.
- MRes Pharmaceutical Analysis, Nottingham Trent University: Developed novel cosmetic formulations and enhanced pharmaceutical analysis using advanced techniques, improved lab productivity and product consistency, delivered a 25% quality increase through research collaboration, and optimized data management for better decision-making.

Research Interests

- Research and Development
- Pharmaceutical Analysis
- Cosmeceuticals and Pharmaceutical Topical Formulations
- Emulsions and Gels
- Surfactants and Emulsifiers
- Transdermal Drug Delivery
- Franz Diffusion Cell Experiments
- Microfluidic Analysis
- Quality Control and Quality Assurance
- Materials Analysis
- Oil Extractions and Purification
- Green and Environmental Chemistry
- Data Science, Analytics, and Data Management