

## RESEARCH & DEVELOPMENT EXPERIENCE

- **Design & development of Planar Artificial Membrane Lipophilicity Assay (PAMLA)-**  
*A novel assay that uses an engineered lipid device for lipophilicity profiling of small-molecule drugs.*  
*Device demonstrated better accuracy than prior-art (octadecylsilane layer) in biopharmaceutics modelling.*  
*Biomimetic attribute of device ensures validity of oral drug absorption simulated mechanics.*  
  
*Design and development of PAMLA biodevice*
- **Design & development of Computational Antioxidant Capacity Simulation (CAOCS) assay -**  
*A novel kinetic assay, analytical framework and computational technology for phenolic antioxidant capacity profiling.*  
*Method holds considerable promise for biorelevant output and quality by design (QbD) of dietary supplements.*  
  
*Design & development of CAOCS assay kit.*
- **Design and development of 4-carboxyl-2,6-dinitro benzenediazonium ion (CDNBD)-**  
*A highly reactive and versatile aryl diazonium ion reagent for instrumental chemical analysis (absorption spectroscopy & liquid chromatography)*  
*A highly reactive and versatile synthetic intermediate for organic synthesis.*  
  
*Design & development of CDNBD assay kit.*
- **Design and synthesis of 4-carboxyl 2,6-dinitro phenylazo hydroxynaphthalenes (CDNPAHNP's)-**  
*A new class of CDNBD-derived, functionalized and potential non-toxic (azo dyes) colour additive.*
- **Veterinary Pharmacy & Ethnopharmacology -**  
*Investigation of medicinal plants with folklore claims of usefulness as anthelmintics in the management of helminthosis of livestock.*
- Qualification/validation of analytical methods
- Over 50 scientific publications/abstracts
- Creative writing and oral presentation skills
- Pharmacist Council (Nigeria) Certified Professional
- Member, American Chemical Society (ACS)

#### AREAS OF EXPERTISE

- **Mathematical chemistry.** Mathematical modeling of chemical phenomena is undertaken to aid process understanding, simulation of biological process, leading to development biorelevant assays.
- **Development of pharmaceutical assay technologies.** Variety of techniques, including spectroscopy chromatography and micro-volumetric analysis are explored in developing assay technology platforms. The assay technologies are useful for routine quality control purposes or biorelevant assays for pharmaceutical profiling.
- **Manufacturing science of quality-assured active nutraceutical ingredients (ANI).** Quality-by-design (QbD) techniques of manufacturing science are adopted to prepare ANI's from plant extracts that are rich in bioactive phytochemicals. This invariably requires mathematical modeling of phytochemical reactivities, identification of critical quality attribute (CQA) and characterization of critical process parameters (CPP).
- **Molecular engineering.** In particular, mathematical modeling was applied to a popular organic chemistry reaction: "hydrolysis of aryl diazonium salt". Identification of critical-to-quality (CTQ) parameters enabled the optimal synthesis of a crystalline form of a very reactive aryl diazonium. The diazonium is a versatile reactive, which is currently undergoing extensive development as a specialty chemical.