Festus Fajuyigbe

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Summary

Accomplished and cutting-edge professional with extensive experience in Insitu Enviro-Chemical monitoring, Bio-monitoring, Inorganic chemistry, Organic Chemistry, Physical Chemistry, Synthesis and Instrumental Analysis (UV/Vis Spectrophotometry, Laser Spectroscopy, HPLC, LC/MS/MS, GC/MS, ICP-DRC-MS, FTIR, NMR. FT-ICR-MS BIRD).

Highlights

- More than 10 years experience in Laboratory management and supervision
- Trained in Insitu Water Quality Data Collection
- Trained in Safety and Emergency Management
- Extensive experience in method developments
- Extensive experience in regulatory compliance
- Experience Quality Assurance Office

Experience

Chemistry Adjunct Professor, 02/2007-Date

Cy-fair and Houston Community College System, Houston TX

- Teaching practice of general/organic chemistry including GC/MS
- Supervising student in laboratories, Student grades and administration
- Online, Imaginative and Hybrid Chemistry teaching
- Private Project Write-ups and Financing in Mines and Real Estates

Analytical Chemist, 05/2012-07/2017

Oversea Marine Inspection Company, Lagos Nigeria

- Qualitative and Quantitative Analysis
- Inspecting oil and gas on the Sea/Ocean

Laboratory Coordinator, 05/2005 – 01/2007

Ameriflux Vivaflux Inc., Miami, FL

- Commercial geo-chemical/biochemical analyses

Instrumental operations and maintenance for routine analysis

Laboratory Supervision of Research Assistants and Technicians

Cutting-edge market-targeted medicinal compounds biosynthesis

Research Assistant, 08/2003 – 05/2005

University of Miami-Department of Chemistry, Coral Gables, FL

Organic photonic materials synthesis for potential 3-D data storage devices

Spectroscopies of Optical logic gates and molecular switches

Enhanced computational studies on small organic molecules

Education

Master of Science (Chemistry), 12/2004

University of Miami-Department of Chemistry, Coral Gables, FL

Research and Teaching degree; Summa Cum Laude Graduated with Distinction

Bachelor of Science (Chemistry), 05/1997

University of Ibadan-Department of Chemistry, Ibadan, Nigeria

First Class Honors, Biophysical and Organic chemistry studies and methods

Vocational Trainings

1. Bio-Informatics with Python (Udemy 2021 Summer)
2. Molecular Dynamic Simulation for Drug Discovery (Udemy 2021 Summer)
3. Chemo-Informatics and Medicinal Chemistry (Udemy 2021 Summer)
4. Drug Design and Molecular Docking by Using Computer-Aided Drug Design and Molecular Dynamics (Udemy 2021 Summer)
5. Micro-Controller Embedded C Programming: Absolute Beginners (Udemy 2021 Summer)

Publications

1. An integrated solid-phase extraction system for sub-picomolar detection. Jemere AB, Oleschuk RD, Ouchen F, Fajuyigbe F, Harrison DJ. Electrophoresis. 2002. 23(20): 3537-44. 2.
2. Bead - Based Reagents in Microfluidic Systems (On chip SPE, EC and Immunoassay) CSC2000 Program Calgary Canada Oleschuk R.D., Jemere A.B., Shultz-Lockyear L.L., Fajuyigbe F., Harrison D.J.

3. R.D. Oleschuk, A.B. Jemere, L.L. Shultz-Lockyear, F. Fajuyigbe, D.J. Harrison "Utilization of Bead Based Reagents in Microfluidic Systems", Micro-Total Analysis Systems 2000, Proceedings Volume, Ed. A. van den Berg, W. Olthuis and P. Bergveld, Kluwer Publishing, Netherlands, 2000, pp 11-14.

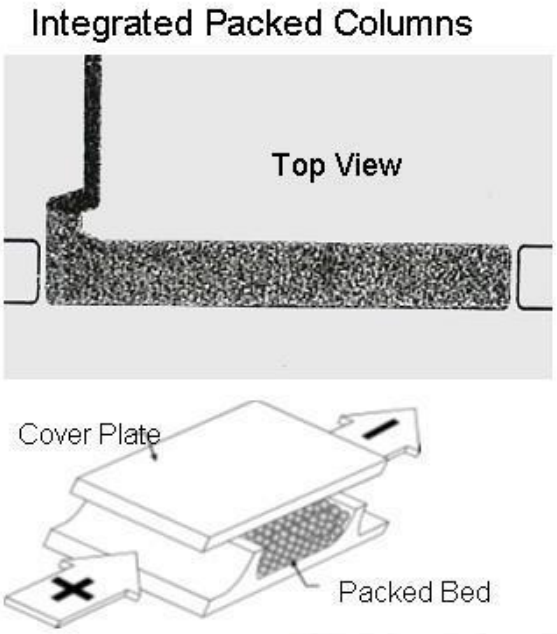
4. Chromatographic Analysis of Plant Extractives and their Active Principles. B.Sc. Thesis March 1997. University of Ibadan, Nigeria.

Fajuyigbe Research Backgrounds and Briefs

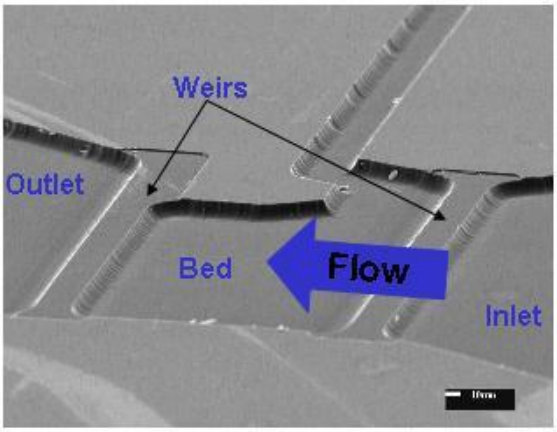
(1) Analytical Chemistry, Micro-TAS, Micro-fluidics, Electrochemistry, Electrophoresis, Electro-Chromatography, Laser and Mass Spectrometric Detection

Microfluidics employing the power of micro-TAS on a designed glass wafer microchips with custom-made micro-channels has afford researchers and industrialists in relevant fields a new and innovative ways of looking at Analytical, organic, inorganic, physical, polymer and material chemistry in the last decade. As a protégé of one of the world-class pioneers in this area, the Bead-based original design below has since given birth to several other new designs around the world:

Bead Based Systems



Two weir/three port designs were fabricated on glass to pack stationary phases for chromatography. Beads that are smaller than the gap between the cover plate and the substrate can be packed. This design allows solid phase extraction and various forms of chromatography to be integrated on chip.



A.B. Jemere *et al. Electrophoresis* **2002**, *23*, In Press

As small becomes the new big, genetics, **Proteomics**, **Multiplexed Devices**, **Bead Based Separations**, **Cell Adhesion**, **Electroporation and Transfection**, **Cell Arrays**,**Pumps**, **Electromagnetic Chromatography** are now possible on this type of devices.

(2) Time Resolved Mass Spectrometry, Protein Kinetics, Energetics and Dynamics, Nano-Electrospray

Research program here focuses on the development and application of mass spectrometry-based techniques, implemented with a 9.4 tesla Fourier-transform ion cyclotron resonance mass spectrometer (FT-ICR MS) equipped with a nanoflow electrospray (nanoES) source, to study the composition, topology and physicochemical properties of protein complexes in the gas and condensed phases. One component of our research program involves the use of time-resolved ion-molecule and ion-dissociation reactions to study the structure and reactivity of gaseous protein assemblies and protein-ligand complexes. These studies are of considerable fundamental importance, providing insight into the intrinsic properties of proteins and protein complexes in the absence of solvent, and are critical to the evolution of mass spectrometry as a powerful tool for proteomics. A second area of research deals with the development of novel strategies to map protein interaction sites and quantify association free energies in the aqueous phase. Some of the specific research projects in our laboratory are described below.

Structural Characterization of Protein Assemblies

We are using time-resolved dissociation experiments to dissect gaseous protein assemblies to obtain information on composition, quaternary structure and binding energetics. While the concept is straightforward, implementation is hindered by the limited fragmentation observed for the assemblies and an incomplete understanding of the dissociation mechanisms. Using the blackbody infrared radiative dissociation (BIRD) technique, we are investigating the dissociation pathways, kinetics and energetics of assemblies in the gas phase. These studies provide new insight into the dissociation mechanism and the influence of charge and higher order structure thereon and suggest new strategies to increase the structural information available from MS.

Allied research includes Gas-state Mapping of Intrinsic Protein-Ligand InteractionsUsing a functional group replacement strategy and a thermal activation technique to determine the structural and energetic role of solvent in association(and important for the development of accurate force fields for improved molecular modeling of biomolecules and their complexes); and Binding Affinity and Stoichiometry of Protein-Ligand Complexes Dealing with the application of nanoES-FT-ICR MS to evaluate the affinity and stoichiometry of weakly-binding protein-ligand complexes in solution.

(3) Laser Design and Spectroscopy, Biophysics, Electrochemistry, Single Molecule Detection and Imaging, Time-Correlated Single-Photon Counting, Metallo-organic Synthesis, Molecular Conductors and Insulators, Biosensors,

Our biophysical work utilizes dynamic single molecule imaging, fluorescence correlation spectroscopy, and patch-clamp electrochemistry to answer basic questions about how dynamical changes in protein structure are correlated to biochemical function.

Material Science

Material science program is generally centered on understanding the physical properties and basic design principles necessary to build molecular scale machines. This research thrust area has two major goals:

1. understanding the structural and electronic principles of energy conduction and the charge transfer properties of molecular assemblies and conjugated molecules, and
2. understanding the basic chemical physics necessary to produce mechanical motion from an electromagnetic stimulus.

In addition to the synthetic molecular machine studies we are also engaged in developing self-assembly techniques on solid-supported planar substrates and nano-porous silica beads that are suitable platforms in biosensors and for biophysical studies of membrane proteins.

Allied research entails addressing the mechanics and mechanism of HIV-1 Reverse Transcriptase using the designed and developed fluorescence probes and single molecule imaging techniques as well as a much faster two channel (two different colors or two separate polarizations) time-correlated-single-photon-counting experiment; probing the basic mechanisms, structure-function relationships, and thermodynamic principles of membrane bound proteins; development of luminescence transduction schemes based on distance dependent phenomena and in the development of new amplification schemes based upon a membrane disruption that is triggered by an analyte binding event; design and build new optical based experiments.

(4) Molecular Photonics; Solid State Chemistry; Polymers; Organic Synthesis; Computational Chemistry; Optical Imaging; Informational Technology and Biomedical Research

Molecular Photonics is aimed at the identification of valuable strategies to manipulate molecules with photons and photons with molecules on the basis of absorption and emission processes. The ultimate goal of these fundamental studies is the development of new phenomena and innovative materials for possible applications in biomedical research and information technology. This experimental program demands the design and synthesis of inorganic nanoparticles, organic compounds and macromolecular constructs, their structural characterization and the investigation of their electrochemical, photochemical and photophysical properties. Area of research in Molecular Photonics involves developing mechanisms to:

· perform **logic operations** with photochromic compounds;
· **sense analytes** with chromogenic and luminescent assemblies of inorganic nanoparticles and organic compounds;
· self-assemble films of **electrochromic building blocks** on metallic electrodes;
· design **photochromic compounds** with fast switching speeds and excellent fatigue resistances.
· activate the luminescence of biocompatible **quantum dots** with optical stimulations.

Current research efforts are directed to the design of molecular strategies to overcome diffraction

and permit the acquisition of fluorescence images with resolution at the nanometer level. These fundamental investigations can ultimately lead to valuable analytical tools for the visualization of biological samples at the nanoscale level with far-field optics and, therefore, can have a significant impact on biomedical research. Specifically under development is the experimental protocol to switch the emission of **fluorescent probes** under optical control.