Fredrick N. Eze, Ph.D.

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POSITION

Siriraj Metabolomics and Phenomics Center (SiMPC), 2022 - Present
Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok

Academic Special Expert, Faculty of Pharmaceutical Sciences 2020 - 2022
Prince of Songkla University, Hat Yai, Songkhla 90110, Thailand.
Researcher, Drug Delivery Systems Excellence Center,
Prince of Songkla University Hat Yai, Songkhla 90110, Thailand.

EDUCATION

Prince of Songkla university, Faculty of Science, Hat Yai, Thailand. 2020
Ph.D., Biochemistry

University of Benin, Faculty of Life Sciences, Benin City, Nigeria. 2014
M.Sc., Biochemistry

Joseph Ayo Babalola University, Ikeji-Arakeji, Nigeria. 2010
B.Sc., Biochemistry (first class honors)

EXPERTISE

Biomedical sciences and natural products research. I have worked on countering chronic disorders such as transthyretin amyloidosis, Alzheimer's disease and type 2 diabetes mellitus via the use of small molecule inhibitors of natural origin and biomimetic nanomaterials. The fabrication, characterization and application of novel nanomaterials synthesized via green approach is one of my current research focus. Also, I had worked extensively on natural products research encompassing the identification of high activity components from plants/marine sources as well as biomass of low economic value, development of facile extraction and enrichment approaches for bioactives, and assessing their potential viability as novel biomaterials and bioactive ingredients with pharmacological, biomedical, nutraceutical, and functional applications. My expertise cuts across biomedicine, chemical biology, natural product research, development of nanobiosensor, biomaterials fabrication as well as drug delivery systems. Consequently, I routinely use standard techniques in phytochemical analysis (LC-MS/MS, HPLC, GC-MS, NMR), physicochemical characterization (FTIR, XRD, DSC, DLS, Zeta potential, FESEM, TEM), cell-free and cell based evaluation of biomedical and pharmacological activities, protein purification and biophysical analysis, green extraction of phytoconstituents, green synthesis of noble metal nanoparticles, fabrication of composites, among others.

EXPERIENCE

Drug Delivery System Excellence Center **2020 – present**

Valorization of tara gum as a multifunctional pharmaceutical intermediate: Free radical-mediated functionalization for enhanced biopharmaceutical properties.

Screened various plant phenolic-rich extracts for neuroprotective, antioxidant, anti-glycation, antimicrobial, anti-amyloidogenic, anti-tyrosinase and antidiabetic activities. Thorough metabolite profiling of the bioactive rich extracts via LC-MS/MS analysis, HPLC-UV, and NMR.

Clean synthesis and characterization of nanomaterials for pharmaceutical, food, biomedical and nutraceutical applications.

Development of nanobiosensor and intelligent composites for analytical detection of biometabolites and monitoring of food freshness.

Enhanced the solubility, safety and oral bioavailability of poorly water-soluble *Kaempferia parviflora* (Krachai dum) methoxyflavones.

Academic Special Expert

Proofread and edit manuscript for faculty and postgraduate students. Provide critical insights and suggestions on how to improve manuscripts from the Faculty and get them published in highly reputable academic journals. Developed and delivered mini-workshops on the art of scientific writing and publishing. Offered numerous one-on-one consultation to faculty and students on English for academic purposes, including journal articles, thesis, and correspondence.

Prince of Songkhla University, Department of Biochemistry, Hat Yai, Thailand. **2015 – 2020**

Graduate Researcher with Assoc. Prof. Dr, Porntip Prapunpoj

Transthyretin amyloidosis therapy: a possibility in "Brahmi" (*Centella asiatica* and *Bacopa monnieri*) phytochemicals.

- Expressed and purified recombinant L55P and V30M transthyretin using *Pichia pastoris* expression system. Purified human transthyretin from plasma using preparative discontinuous native-PAGE.
- Prepared and characterized phenolic- and triterpenoid-rich extracts form *Centella asiatica* and *Bacopa monnieri*.
- Characterized plant extracts using LC-ESI-qTOF-MS, RP-HPLC and UV-vis spectrophotometry.
- Determined the amyloidogenesis modulatory effects of *C. asiatica* and *B. monnieri* extracts *in vitro* using transmission electron microscopy, fluorescence spectroscopy, UV-vis spectroscopy, chemical cross-linking and gel electrophoresis on human and recombinant variant transthyretin.

University of Benin, Department of Biochemistry Benin City, Nigeria

Research Assistant with Prof. Iyere O. Onoagbe **2013 – 2014**

Isolated and characterized tannins from *Harungana madagascariensis* stem bark

Joseph Ayo Babalola University, Department of Chemical Sciences Ikeji-Arakeji, Nigeria

Research Assistant with Prof. Adewale A. Odutuga **2009 – 2010**

Investigated the anti-diabetic effects *Morinda lucida* stem bark extracts on alloxan-induced diabetic rats

GRANTS and AWARDS

- Faculty of Pharmaceutical Sciences, Prince of Songkla University Certificate of Appreciation for publishing more than 5 articles in JCR Journals in year 2021.
- Thailand's Education Hub for ASEAN Countries (TEH-AC 055/2014) scholarship.
- Graduate School of Prince of Songkla University, Thailand Research Grant for Thesis, 2016.
- Recipient of Joseph Ayo Babalola University Grant for Academic Excellence 2007/2008, 2008/2009 and 2009/2010 Sessions and Best Graduating student, Department of Chemical Sciences, Joseph Ayo Babalola University, 2009/2010 academic session.

PEER REVIEWED PUBLICATIONS INDEXED in SCI/SCIE

Eze, F.N.,* Ovatlarnporn, C., Jayeoye, T. J., Nalinbenjapun, S. and Sripetthong, S. 2022 One-pot biofabrication and characterization of Tara gum/Riceberry phenolics – silver nanogel: A cytocompatible and green nanoplatform with multifaceted biological applications. **International Journal of Biological Macromolecules**. 206, 521-533

Jayeoye, T.J., **Eze**, F.N.,***** Opeyemi Joshua Olatunji, O.J., and Tyopine, A.A. 2022 Synthesis of biocompatible Konjac glucomannan stabilized silver nanoparticles, with *Asystasia gangetica* phenolic extract for colorimetric detection of mercury (II) ion. **Scientific Reports**. 12:9176

Huang, Y., An, M., Fang, A., Olatunji, O.J. and Eze, F.N.***** 2022 Antiproliferative Activities of the Lipophilic Fraction of Eucalyptus camaldulensis against MCF-7 Breast Cancer Cells, UPLC-ESI-QTOF-MS Metabolite Profile, and Antioxidative Functions. **ACS Omega**. 7, 31, 27369–27381

Eze, F.N.,* et al. 2022 Ultra-fast sustainable synthesis, optimization and characterization of guava phenolic extract functionalized nanosilver with enhanced biomimetic attributes. **Arabian Journal of Chemistry**. 15(10), 104167

Eze, F.N.* and Jayeoye, T.J. 2021 *Chromolaena odorata* (Siam weed): A natural reservoir of bioactive compounds with potent anti-fibrillogenic, antioxidative, and cytocompatible properties. **Biomedicine & Pharmacotherapy**, I41, 111811

Eze F. N.* et al. 2021 Fabrication of intelligent pH-indicator film with antioxidant potential for monitoring shrimp freshness via the fortification of chitosan matrix with broken Riceberry phenolic extract. **Food Chemistry**. 366, 130574

Eze, F. N.* et al. 2021 Bio-fabrication of a label-free and eco-friendly ROS optical sensor with potent antioxidant properties for sensitive detection of hydrogen peroxide in human plasma. **Colloids and Surfaces B: Biointerfaces** 204, 111798

Jayeoye, T.J., **Eze, F.N**., Olatunde, O.O., Benjakul, S., Rujiralai, T., 2021. Synthesis of silver and silver@zero valent iron nanoparticles using Chromolaena odorata phenolic extract for antibacterial activity and hydrogen peroxide detection. **Journal of Environmental Chemical Engineering** 9, 105224.

Jayeoye, T.J., **Eze, F.N**., Olatunde, O.O., Benjakul, S., Rujiralai, T., 2021. Synthesis of gold nanoparticles/polyaniline boronic acid/sodium alginate aqueous nanocomposite based on chemical oxidative polymerization for biological applications. **International Journal of Biological Macromolecules**. 179, 196-205.

Jayeoye, T.J., **Eze, F.N.**, Olatunde, O.O., Singh, S., Zuo, J., Olatunji, O.J. 2021. Multifarious Biological Applications and Toxic Hg2+ Sensing Potentiality of Biogenic Silver Nanoparticles Based on Securidaca inappendiculata Hassk Stem Extract. **International Journal of Nanomedicine**. 16: 7557–7574.

Pang, X., Makinde, E.A., **Eze, F.N.**, Olatunji, O.J. 2021. Securidaca inappendiculata Polyphenol Rich Extract Counteracts Cognitive Deficits, Neuropathy, Neuroinflammation and Oxidative Stress in Diabetic Encephalopathic Rats via p38 MAPK/Nrf2/HO-1 Pathways. **Frontiers in Pharmacology**. 12:737764.

Eze, F. N.* and Tola, A. J., 2020. Protein glycation and oxidation inhibitory activity of *Centella asiatica* phenolics (CAP) in glucose-mediated bovine serum albumin glycoxidation. **Food Chemistry** 332, 127302

Eze, F. N.* and Nwabor, O. F., 2020. Valorization of Pichia spent medium via one-pot synthesis of biocompatible silver nanoparticles with potent antioxidant, antimicrobial, tyrosinase inhibitory and reusable catalytic activities. **Materials Science and Engineering: C 111104.**

Eze, F.N.; Leelawatwattana, L.; Prapunpoj, P., 2019. Structural Stabilization of Human Transthyretin by *Centella asiatica* (L.) Urban Extract: Implications for TTR Amyloidosis. ***Biomolecules 9*, 128.**

Eze, F. N., Ingkaninan, K. and Prapunpoj, P., 2019. Transthyretin anti-amyloidogenic and fibril disrupting activities of *Bacopa monnieri* (L.) Wettst (Brahmi) extract. ***Biomolecules* 9, 845**.

Eze, F. N., Tola, A. J., Nwabor, O. F. and Jayeoye, T. J., 2019. *Centella asiatica* phenolic extract-mediated bio-fabrication of silver nanoparticles: characterization, reduction of industrially relevant dyes in water and antimicrobial activities against foodborne pathogens. **RSC Advances, 9, 37957-37970.**

Eze, F. N.* and Osamede, J. A., 2012. Quantitative Phytochemical Evaluation of Stem Bark Extracts of *Harungana madagascariensis*. **Journal of Pharmaceutical Research International, 4(17), 2068-2074.**

***Corresponding author

EDITORIAL and REVIEWER EXPERIENCE

Reviewed for the following WoS indexed Journals

Chemosphere (Elsevier)

Scientific Reports (Nature Portfolio)

Applied Sciences (MDPI)

Materials (MDPI)

Molecules (MDPI)

Journal of Food Science (Wiley)

BMC Complementary Medicine and Therapies (Springer Nature)

International Journal of Environmental and Public Health Research (MDPI)