

UMSAEP UM-UWC Linkage Report
Visit to Missouri July 1 – August 15, 2017

Synthesis and characterization of reproducible PGM metal nanoparticles using Parr reactor for biological applications

Submitted by Prof MO Onani

- 1) To utilize Parr reactors in the production of palladium nanoparticles as a prime green nanotechnological tool
- 2) To obtain a training in various aspects of Palladium nanoparticles production
- 3) To initiate their applications in medical imaging
- 4) To initiate their applications in catalytic studies for the production of pharmaceutically useful chemical intermediates.

Outcome

1. Lab work

My visit was very fruitful. I found that Prof Katti has an established and reproducible method for the production of palladium nanoparticles. I was able to reproduce the same following a protocol. This technique will be used in the anticipated Green Nano technological Centre to be supported by the South African DST/Medical Council. The application is currently under review. The prepared nanoparticles were fully characterized, first with FTIR, this confirmed the functional groups from the polyphenols while the UV-Vis confirmed the metal reductions. The polyphenols of choice were Epigallocatechin gallate (EGCG), mangiferin (MGF), and resveratrol (RES).

The nanoparticles were tested in the cell culture lab which was conveniently stationed just next to the chemical lab. The MTT assay was conducted and apoptosis assessed.

Several variants of the nanoparticles were suggested for future investigations.

2. Tour of facilities

During my visit, it was also planned to tour the Materials Science and Engineering Department, Division of animal science and Veterinary health centre facilities.

3. Presentations

I was scheduled to present seminars to the group regarding my research.

OBJECTIVE SUCCESSES

Most of the objectives were

Attended the Mizzou Technology Road Show sponsored by my host. Several presentations on the engineering and scientific achievements from Mizzou. Prof Kattesh V. Katti, who is MU Curators Distinguished Professor of Radiology and Physics and Director, Institute of Green Nanotechnology among others presented a sterling work on the topic Nano-Ayurvedic Medicine which he and his research team invented. Prof Elizabeth Loba, the Dean college of Engineering opened the talks and highlighted impressive biomedical innovations. Mizzou boasts the host of the largest nuclear research reactor on any University in the US. There was a presentation by Dr Tamara Wilgers, about the non-invasive glucometer which the companies shy away from investing. Several snapshot presentations were given before a very warm mixer. They included ; Mark Hunter, Chief, MU Division of Gynecologic Oncology
Optical Polarization Tractography Enhanced Colposcopy, Mark Daniels, Associate Professor, MU Molecular Microbiology & Immunology & Department of Surgery
POSH Inhibitor-Based Treatment of Leukemia; Teresa Lever, MU Assistant Professor of Otolaryngology
Down the Hatch Solutions: Clinical Tool for Early Detection and Monitoring of Laryngeal Dysfunction; Bret Ulery, MU Assistant Professor of Chemical Engineering

