

Spectroscopic and electrochemical studies of Tuberculosis treatment drugs using N-acetyltransferase based biosensors

^aRachel F. Ajayi, ^bPriscilla Baker

^{a,b}SensorLab, Chemical Sciences Building, University of the Western Cape, Robert Sobukwe Road, Bellville, 7535,

^aTel: 021 959-3049, e-mail: fngece@uwc.ac.za; ^bTel: 021 959-3050, e-mail: pbaker@uwc.ac.za

Fluorescence spectroscopy will be employed in this study to probe the biotransformation of the Tuberculosis (TB) treatment drugs Isoniazid (INH), Rifampicin (RIF) and Ethambutol (EMB) in plasma and urine. To achieve this, 8-anilino-1-naphthalene sulphonic acid ammonium hydrate (ANSA) will be chemically bound to the cationic group of histidine in the enzyme N-acetyltransferase in the absence and presence of goldsilver nanoparticles (AuNPs) and the resultant complexes (ANSA/NAT and ANSA/NAT-AuNPs) will be used to probe the interaction of the TB drugs with NAT; while monitoring the fluorescent life-time of the complexes. The second step of this study will involve the electrochemical determination of these drugs using electrochemical lab-on-a-chip (ELC) biosensors developed by potentiodynamic electropolymerization of ANSA to poly (8-anilino-1-naphthalene sulphonic acid ammonium hydrate) (PANSA) on interdigitated microsensor electrodes (IME) in the absence and presence of AuNPs. Biosensor development will be achieved by electrochemically incorporating NAT on PANSA or PANSA/AuNPs nanocomposites by adding NAT to a degassed buffer solution followed by the application of a constant potential. PANSA or PANSA/AuNPs nanocomposite together with the developed ELC biosensor systems will be characterised using Voltammetry (Square Wave (SWV) and Differential (DPV)) and Electrochemical Impedance Spectroscopy (EIS).



UNIVERSITY of the
WESTERN CAPE

Faculty of Natural Science Chemistry Department

Private Bag X17, Bellville, 7535
South Africa
Tel: +27 (0) 21 959-3054/3056
Fax: +27 (0) 21 959-1316
Cell: +27(0) 79 358 6225
E-mail: fngcece@uwc.ac.za

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Re: VISITING PROFESSOR TO UNIVERSITY CERGY PONTOISE

Dear Prof Philippe Banet

Thank you for extending the invitation to partner with LPPI (University Cergy Pontoise) for the year 2016.

Your institution has a long standing partnership with SensorLab through the development of funding proposals, successful student exchange programmes and the co-supervision of postgraduate students. Additionally, the partnership between Prof Aubert and Prof Baker has seen excellent project designs which have resulted in publications.

I look forward to initiating a partnership with you and your institution and working closely with you as we continue to contribute to knowledge.

Hence, it is with great pleasure that I accept the invitation to the visiting professor appointment for 2016.

Yours sincerely,

Rachel Fanelwa Ajayi
Lecturer and researcher SensorLab (UWC)