SOUTHERN AFRICAN BIOCHEMISTRY AND INFORMATICS OF NATURAL PRODUCTS
PROGRESS REPORT

SABINA PROJECT MEMBERS AND FELLOWS

Introduction

- Grant –USD800,000 from Carnegie-IAS RISE for 2.5 years, starting from 2008
- 6 key and broad research areas
  - Molecular biology/functional genomics
  - Natural product chemistry
  - Synthetic chemistry
  - Biochemistry
  - Food science
  - Bioinformatics

Project purpose and goal

- Implementation of proactive postgraduate programmes in chemistry/biochemistry and bioinformatics of natural products. The specific objectives are:
  i. Implementation of both PhD and MSc programmes.
  ii. Development of networks integrating chemical and biological sciences.
  iii. Strengthening networking among the departments of chemistry and biochemistry in key SADC universities.

Expected outputs

- Innovative networking in chemistry and biochemistry of natural products among SADC universities and research institutes.
- Cadre of doctoral and MSc young men and women actively involved in studies on the chemistry and biochemistry of natural products using top class facilities.
  - 10 PhDs and 8 MSc's by the end of 2013
- Greatly enhanced participation in publication of scientific results in international journals.

Achievements

- **Innovative networking in chemistry and biochemistry of natural products among SADC universities and research institutes**
  - Secretariat hosted two visiting teams
  - WIO-RISE counterparts(7-9 February 2010)
  - POL-SABINA PM (July 2010)
  - New member, Prof Debra Meyer joining as a project member
  - Supplementary funding (US$24 000) from Carnegie-RISE
  - UNIMA hosted Annual Research meeting, 2-4 Dec, 2009
  - Organized jointly with POLSABINA a HPLC/Phylogenetics/Project management training workshop at UP,Aug,29-Sept,4, 2010
  - Collaborative training of staff/students
  - SABINA website populated

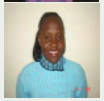
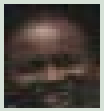
Achievements

- **Cadre of doctoral and MSc young men and women participating actively in studies on the chemistry and biochemistry of natural products**
  - Joint degree programmes between institutions in the network
    - being discussed
  - Hosting of fellows at advanced laboratories-CSIR and Wits (CSIR hosted 2PhD students from WITS and UNIMA; UP hosted 2 students, 1 each from UNIMA and UDSM)
  - Thirteen students
    - 2 PhD and 4 MSc students awarded scholarships in December, 2008 (3 male + 3 female)
    - 5 PhD and 2 MSc students awarded scholarships in mid September, 2009 (5 male + 2 female)
- 4 MSc students are expected to complete their studies in the first half of 2011 of which 50% to proceed to PhD studies in the second phase of funding
- Postdoc funding converted into PhD scholarship for Bioinformatics

SABINA Fellows

Fellow	University	Study Area	Supervisors/ Collaborators
Justin Omolo (TZ) 	WITS, PhD	Phytochemistry and synthesis of bioactive natural products isolated from Tanzania medicinal plants	Prof Charles De Koning Dr. Vinesh Maharaj
Nicholas Mphangwe (MW) 	UP, PhD	Genetic studies and use of molecular markers in tea breeding and selection	Prof Zeno Apostolides Dr. H. Nyirenda
Tinotenda Shoko(ZW) 	UNIMA, MSc	Flavour chemistry of some indigenous fruits and vegetable used in Malawi	Prof JDK Saka Mr Maurice Monjerezi Prof Z. Apostolides
Ms Secilia Ilonga(NM) 	UNAM, MSc	Screening of Anticancer and antioxidants compounds from selected indigenous plants	Dr Martha Kandawa-Schulz Dr S. Lyantagaye
Ken Ngwira (MW) 	UDSM, MSc	Phytochemistry of antimalarial plants used in Malawi	Dr. Quintino Mgani Dr. Vinesh Maharaj
M. Pelly Malebe(SA) 	UP, MSc	Development of genetic markers for tea	Prof Zeno Apostolides

SABINA Fellows

	University	Study Area	Supervisors/Collaborators
Adushan Pillay (RSA) 	Wits, PhD	Synthesis of benzoquinones as potential anticancer agents	Prof Charles De Koning Dr. Vinesh Maharaj
Ms. Petrina Kapewangolo (NM) 	UP, PhD	Biochemistry of Natural Products	Prof Debra Meyer Dr Martha Kandawa-Schulz
Godwil Madamombe (TRFCA-Zw) 	UP, PhD	Mechanical harvesting on physiology of tea(*Camellia sinensis*) in terms of yield and quality	Prof Zeno Apostolides Dr Nicolette Taylor Dr. H. Nyirenda
Kumbukiani Nyirenda (MW) 	UNIMA, PhD	Phytochemistry and biological activities of 4 local plants used in treating priority diseases in Malawi	Prof John Saka Dr Vinesh Maharaj Dr E Fabiano
Benjamin Kumwenda (MW) 	UP, PhD	Comparative genomics study of complete sequenced *Thermus sp* strains	Dr Oleg Reva Prof F. Joubert
Ms Moola Nyambe(NM) 	UNAM, MSc	Chemical analysis of Namibian teeth cleaning(chewing) sticks	Dr M. Kandawa Schultz Dr S. Lyantagaye
Ms Liberata Mwita(TZ), 	UDSM, MSc	Discovery of potential drugs from mushroom of the genus *Coprinus*	Dr Oleg Reva Dr S. Lyantagaye

Achievements

- EU-ACP funding of 945 000 euro and co-funding from SA Dept of Science and Technology:
  - POL-SABINA secretariat at ACGT established
  - Development of a knowledge management system for SABINA (Virtual Research Environment)- UP and WITS linked on trial before rolling out
  - Establishing external peer review (IAC) and evaluation procedures for SABINA
  - Training of mentors and students in research methodology, project management, research fund management and grant writing

Scientific publishing and networking

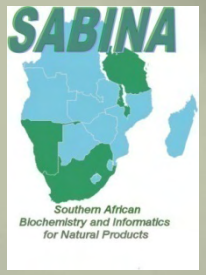
- **Anticipated greatly enhanced participation in publication of scientific results in international journals**
  - This would be achieved starting from Year 2 of the project implementation; 3 manuscripts are at an advanced stage and being submitted before end of 2010
- Promising and unique research results from students are being exploited further
- Participation and linkages to SANBIO of NEPAD- capacity building
- Mid annual reports submitted in time in Dec, 09 and June, 10

Unique features of project

- Individuals committed to sustainable socio-economic development - reduction of poverty and better livelihoods
- Project ideas and issues highly relevant to national development agenda and those of countries in the South.
- Full support from the senior management level and continued commitment by the project staff and students

Challenges

- Project management and administrative issues
  - Institutional overhead costs
  - Variable fees despite the SADC protocol on local fee application to other SADC nationals
  - Different academic calendars-students registering at different times
  - Reporting on students' progress variable
- Resource administration
  - Currency fluctuations-economic crisis



Sustainability

- Development of Joint degree programme amongst 3 institutions in the network empathising on the biochemistry and chemistry of NPs
  - Major purpose is consolidate on going research and ensure sustainability beyond the second phase
  - Focus subject areas
    - Non timber products
    - Biochemistry/Biosynthesis/Molecular biology of natural products
    - Characterisation of NPs (Molecular markers/NMR, GC-MS/HPLC.MS/Synthesis of NPs)
    - Bioactivity of NPs- Linear Free Energy Relations
    - Bioinformatics
    - Knowledge Management
    - Development and management of projects
- Consultative workshop on the programme in 2011

Concluding Remarks

- The IAS/RISE model is unique, innovative and valuable in funding "scientific networks" instead of the old model of funding institutions, with several levels of bureaucracy and long delays.
  - Funding a network of peers who can look each other in the eye, prioritize issues and reach consensus amongst themselves is more cost effective than the old methods.
- Direct funding of and to networks is a global phenomenon and should be emulated by most research funding institutions.
- Contribution to the Second Phase made and issues prioritised for SABINA component.

SABINA Network partners

- **MALAWI**
- Chancellor College, University of Malawi (Email: sabina@chanco.unima.mw)
  - Prof John DK Saka, Project Academic Director, Chemistry Department
  - Mr Frank Ngonda, Project Manager, Secretariat
  - Mr Calvin Ziba, Project Accountant, College Finance Office
- Tea Research Foundation of Central Africa (TRFCA)
  - Dr Hastings Nyirenda,
- **NAMIBIA**
  - Dr Martha Kandawa -Schultz, Department of Chemistry and Biochemistry, University of Namibia,
- **SOUTH AFRICA**
  - Prof Jane Morris, African Centre for Gene Technologies (ACGT),
  - Dr Vinesh Maharaj, Centre for Scientific and Industrial Research (CSIR)
  - Prof Zeno Apostolides, Department of Biochemistry, University of Pretoria
  - Prof Charles de Koning , School of Chemistry, Witwatersrand University
  - Dr Oleg Reva, Bioinformatics and Computational Biology Unit, University of Pretoria
  - Prof Debra Meyer,Department of Biochemistry, University of Pretoria
  - Dr
  - Ms Ella Nyakunu, Project Manager, Project Manager, POL-SABINA, ACGT
- **TANZANIA**
- Dr Quintino Mgani, Department of Chemistry, University of Dar es Salaam,
- Dr Sylvester Lyantagaye, Dept. of Molecular Biology and Biotechnology, University of Dar es Salaam,

SABINA Network partners

Some of the SABINA project members who participated in the project management course, University of Pretoria