



CURRICULUM VITAE

PROF HULDA SHAI DI SWAI

The Nelson Mandela African Institution of Science and Technology (NM-AIST)
Centre for Research, Agricultural Advancement, Teaching Excellence and Sustainability in
Food and Nutrition Security. (CREATES-FNS)
School of Life Sciences and Bioengineering.
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CAREER SUMMARY

A goal-oriented and results-driven professional with a proven ability to independently formulate, initiate, and execute research projects and implement research programs in the public and private sectors. Experience in sourcing funds both locally and internationally with a remarkable track record in initiating and maintaining collaborations, networks, synergies, exchange programs, and sabbaticals. Display astounding work ethics. Exhibits excellent leadership/ managerial, strategic, organizational, interpersonal, and communication skills. Able to work as an individual and /or part of a team. She is a renowned speaker in both local and international forums. Received several honors, prizes, and excellence awards for achievements, resourceful, and highly organized

CORE COMPETENCIES

- Nanotechnology
- Drug Discovery & Development
- Biomaterials Sciences
- Herbal Medicines
- Encapsulation & Delivery
- Curriculum Development
- Student/Innovators Teaching, Training, Mentoring and Supervising
- Networks & Collaborations
- Fundraising / Grant writing
- Capacity Development
- Strategic Leadership
- Bio-entrepreneurship
- Programme Management
- Contract Negotiation
- Knowledge Generation & Dissemination

FORMAL EDUCATION

- 1995 - 2000: PhD: Biomedical Materials Science (part time) in Biomaterials in Dentistry; University of London, Queen Mary & Westerfield College
Thesis: Water Sorption and Drug Release behaviour from Hetero/Cyclic Methacrylate based Polymers
- 1984 - 1985 Master of Science (MSc): Technology and Development in Chemical Engineering; University of London, Imperial College of Science and Technology
Dissertation: Feasibility Study of Alcohol from Cassava as a Fuel Substitute in Tanzania
- 1977 - 1980: Bachelor of Science (BSc), in Statistics & Chemistry; University of the Dar Es Salaam, Tanzania

ACADEMIC POSITIONS

- 2015 - Present Professor: School of Life Science and Bio-engineering

Nelson Mandela African Institution of Science and Technology (NM-AIST),
Tanzania

2013 - Present Extraordinary Professor: School of Natural and Agricultural Sciences
University of Pretoria, South Africa

PROFESSIONAL POSITIONS

2020- Present Chair Holder Oliver Tambo chair in Nanotechnology in relation with Biomedical
health and Sustainable agriculture.

Achievements:

- The Chair Identified Critical Paths in anti-malarial drug formulation and biofertilizer development using nanotechnology and Pheroid technology.
- Recruited 2 Post-doc fellows to focus on drug delivery technology using nanomedicine with University of Western Cape University of North West, NM-AIST and UNISA
- Developed a working structure and a road map to achieve the dedicated Chair objectives with Partners all over Africa.
- Develop Nanotechnology policy for the region.
- Develop Curriculum for MSC and PhD in Nanotechnology
- Working towards Nanotechnology platform for the region

2019- Present Head/ PI: Incubation Centre namely Data driven innovation incubation Centre (DDI) The Centre address Food and Nutritional Security in the region funded by Intra University Council of East Africa (IUCEA)

Achievements:

- Secured competitive seed funds summing to USD 250,000 for the establishment of the DDI Incubation Centre.
- Supported the Developed of Intellectual Property tools to manage and work with the innovations at NM-AIST
- Recruited Six incubatees in various areas of food and Nutrition security and started the management
- Constructed the container-based Mini Factory design to showcase the production line to prospected investors
- Finalizing the Procurement of the Plants and assembly line of the Mini Factory design

2018 - Present President: First elected female for African Materials Research Society

Achievements.

- Developing international partnerships for AMRS
- Single handily raised USD 173,000 for the conference.
- Submitted grant proposals and lobbying for funds to support AMRS
- Organized a very successful 2019 AMRS conference in Arusha, Tanzania
- Recruiting scientists to join AMRS membership

2017 - Present

Director: The African Centre for Research, agricultural Advancement, Teaching Excellence and Sustainability” in Food and Nutrition Security (CREATES-FNS) in Food and Nutritional Security. CREATES-FNS is a Centre of Excellence funded by the World Bank and hosted at NM-AIST, Tanzania. The process was very competitive involving Eastern and Southern Africa Region

Achievements

- Established an Agri-tech horticulture research, training, learning and business hub at NM-AIST
- Leading the agreement among Ministry of Livestock and Fisheries, RAS Kagera, TACT and NM-AIST and the selected technical team in establishing a Tilapia Cage Fish Farming project in Kagera. The project has attracted 195,000,000 USD from USA
- Organized sensitization and mentorship events for primary, secondary and university teenage students. Including young girls in self-awareness’, opting to STEM subjects and increasing their life skills, health issues, sexual Harassment, stress management and goals setting.
- Developed Centre’s sustainability plan strategy and ensuring survival and continuation of activities even beyond the World Bank funding.
- Successfully secured funds amounting to 6 million USD for establishing CREATES ACE II
- Secured major collaborations and partnerships with national, regional and international organizations for the Centre, e.g. Purdue University
- Organized a successful Industry Partners meeting for sensitization and forging partnerships with the Industry in Tanzania.
- Directly supported and enrolled a total of 122 students for PhD and MSc studies at the (NM-AIST) from all over Africa under the CREATES Scholarship program.
- Personally supervised/mentoring 8 PhD and 11 MSc candidates.
- Completed MOU/MOA with 23 Academic and Industrial partners, resulting in 18 PhD/MSc students receiving exchange program scholarships to train in various labs overseas
- Successfully secured funds and international partners for establishment of a Pedagogical Training between CREATES (through NM-AIST) and Zhejiang Normal University of China and Hamburg University in Germany. The program is aiming at promoting institutionalization of professional development of university faculty in ACE II through pedagogy training. The same program will be financed by the World Bank.
- Submitted several grant proposals to national, regional and international organizations specifically for funds to sustain the seed funds used to establish CREATES
- Developing a joint MBA in Agriculture between CREATES/NMAIST and Egerton, Zhenjiang, University of Ghana and Albaba Institution; to be funded by WB and Albaba
- Initiated and facilitated agreement between NM-AIST and HUNAN University

of Technology to build a research center and laboratories in Science and Engineering at NM-AIST through Sino-Africa program.

- Initiated and facilitating agreement between NM-AIST and Purdue University to jointly host an Industrial Pharmacy and Regulatory Science degree **which** has been approved y TCU. The main aim is to establish the Pharmaceutical Industries in the county. The collaboration involves the existing pharmaceutical industries, Purdue University, St. John University and NM-AIST.

2009 - 2014 Head: Pan-African Centre of Excellence in Nanomedicine Research & Training, CSIR, South Africa

2001 - 2014 Senior Principal Researcher: CSIR Materials Science & Manufacturing, South Africa

Institution: **CSIR (Council for Scientific and Industrial Development)**

Achievements.

- Initiated and developed novel targeted Nano drug delivery systems for TB drugs up to pre-clinical trials, showing reduced dose and dose frequency from several tablets daily to once a week in a slow-release formulation
- Obtained over R 70 million in research funding specifically for my research group projects from several funders such as the South African Department of Science and Technology, Bill and Melinda Gates foundation, ANDI, NRF lateral international agreements, EU, etc
- Raised about USD \$ 1 million in funding through networks and collaborations, scholarships, in kind support international exchange programs
- Organised and hosted 3 fully funded international workshops and summer schools to promote and develop capacity in Nanoscience and Nanotechnology in medicine
- Submitted 3 patent applications and invention disclosures
- Mentored and supervised 13 post docs, 5 MSc and 18 BTech students
- Facilitated 12 international exchange programs
- Invited and funded to deliver several oral presentations at international meetings
- Published several papers and book chapters Received several achievement awards, honors, and prizes.

COMMITTEES

2020

Present - Board Member: Tanzania Institute of Education (TIE)

- 2018 - President: African Materials Research Society
Present
- 2018 - Editor: International Journal of Nanomedicine
Present
- 2012 - Advisory Board Member: WIREs Nanomedicine and Nanobiotechnology (Journal
Present Impact Factor: 6.35)
- 2017 International Scientific Committee Board Member: 4th EU-funded European Summer
School in Nanomedicine
- 2012 Nanomedicine Expert: Nanotechnology curriculum development for South African high
school learners by the South African departments of Science and Technology and
Secondary school Education
- 2012 Nanomedicine Review Board Expert: Monitoring and Evaluation of South African
Department of Science and Technology funded Drug Development projects at South
African Universities
- 2012 Scientific Organising Committee: 1st Pan-African summer school in Nanomedicine, 4-
10 November 2012, the farm inn lodge, Pretoria, South Africa
- 2011 - 2014 Steering Committee Member: ISHReCA (Initiative to Strengthen Health Research
Capacity in Africa)
- 2011 International Scientific Committee: 1st International Workshop on Nanomedicine for
Infectious Diseases of Poverty: Perspectives & Possibilities. 27-31 March 2011,
Magaliesberg, South Africa.
- 2011 International Scientific Committee:
Committee Member: Review Grants for Nanotechnology Projects submitted to the
National Research Foundation, South Africa
- 2011 Advisory Committee Member: NANACODE for responsible Nanotechnology research in
South Africa
- Nov 2011 UNECA Expert: Pan-African University Stakeholder Curriculum Validation Workshop;
Addis Ababa, Ethiopia
- Oct 2011 UNECA Expert: UNECA STI report on major trends and development in the generation,
acquisition, management, use and ownership of the technology in Africa Addis Ababa,
Ethiopia
- 2010 International Scientific Committee: India-Brazil-South Africa (IBSA) Summer School on
Nanoscience and Nanotechnology
- 2009 Scientific organising committee: 1st South African Nanoscience and Nanotechnology
Summer School. Nov 2009, The Farm Inn Lodge, Pretoria, South Africa
- 2009 Nanomedicine Expert: Scientific Committee on Malaria - the African Network for Drugs
& Diagnostics Innovation
- 2008 Committee Member: TB Alliance working group on new drugs
- 2008 Nominated to the Developing Countries Coordinating Committee (DCCC) of the
European Developing Countries Clinical Trials Partnership (EDCTP).

CAREER HISTORY

- 2020- Present Oliver Tambo chair in Nanotechnology in relation with Biomedical health and Sustainable agriculture
- 2019- Present Head/ PI: Incubation Centre namely Data driven innovation incubation Centre (DDI) The Centre address Food and Nutritional Security in the region.
- 2015 - Present: Professor: School of Life Science and Bioengineering
- 2017 - Present: Director: The African Centre for Research, Agricultural Advancement, Teaching Excellence and Sustainability” (CREATES) in Food and Nutritional Security. CREATES is a Centre of Excellence funded by the World Bank and hosted by NM-AIST, Tanzania
CREATES is a 5 year USD \$ 6 million project, established in Jan 2017 through the World Bank’s African Centres of Excellence (ACE II) initiative. The ACE II initiative aims at building training and research capacity in the region by raising a critical mass of specialized and skilled human capital that can use a multidisciplinary approach to ensure a sustainable environment, food and nutritional security
- Institution: Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha, Tanzania
- Background: NM-AIST is part of a network of Pan-African Institutions of Science and Technology located across Sub-Saharan Africa (SSA). These institutions, which are the proud brainchild of the late Nelson Mandela, envision training and developing the next generation of African scientists and engineers with a view to impacting profoundly on the continent’s development through the application of Science, Engineering and Technology and Innovation (SETI).
- Responsibilities: • Teaching, Training, Supervising & Examining PhD and MSc students in Biomedical Health
• Developing and directing a platform on Science driven Herbal medicine in collaboration with indigenous herbal medicine custodians in the region
• Directing the activities of CREATES by ensuring proper management of projects, funds, infrastructure of students
• Raise funds, establish and maintain beneficial networks and collaborations, locally and internationally, to support CREATES and NM-AIST
- 2018 - Present: President: African Materials Research Society
- Background: AMRS was formed in August 2000 through a US-Africa Materials Workshop, held in South Africa and co-funded by the US National Science Foundation (NSF) and the South African National Research Foundation (NRF). This workshop sought to explore opportunities for collaboration between USA and Africa with an overarching objective of developing materials research capacity in Africa. AMRS holds a series of biennial conferences with the aim of knowledge generation, collaboration and capacity development in Materials Science and Technology.
- Responsibilities • Oversee the organisation and hosting the 2019 Africa Material Research Society Biennial Conference
• Raise funds to offset conference costs

- Develop strategies to empower the AMRS to make impact beyond conferences.

2013 - Present: Extraordinary Professor: School of Natural and Agricultural Sciences

Institution: University of Pretoria (UP), South Africa

Background: Founded in 1908, UP ranks the 3rd best university in Africa and is the largest public research university in the South Africa, with over 62,000 enrolled students.

Responsibilities:

- Developing and executing joint research projects
- Joint supervision of Post-doctoral, PhD and MSc students
- Internal Examiner for both PhD and MSc students
- Involved in fund raising through joint proposal writing.

Achievements:

- Obtained funding for joint research projects between UP & CSIR for TB drug development.
- Co-Supervised / mentored 3 post docs, 2 PhD students.
- MoU between CSIR & UP
- Facilitating MoU between NM-AIST and UP

Institution: CSIR (Council for Scientific and Industrial Development)

2009 - 2014: Head: Pan-African Centre of Excellence in Nanomedicine Research & Training

2001 - 2014: Senior Principal Researcher: Materials Science & Manufacturing

2001 - 2014: Research Group Leader: Encapsulation & Delivery research group

Institution: CSIR (Council for Scientific and Industrial Development)

Background The CSIR (Council for Scientific & Industrial Research) performs relevant multidisciplinary research and development. The Pan-African Centre of Excellence in Nanomedicine for Research & Training is nested within the Encapsulation & Delivery Research Group (EDRG). EDRG falls under the Competency Area of Polymers and Composites, within the Operating Unit of Materials Science and Manufacturing (MSM). MSM is one of the CSIR's 10 operational units, bound by the common objective of using science, engineering and technology to contribute to national priorities.

My research projects focused on two main areas:

- Using nanotechnology to develop novel drug delivery systems for optimizing drugs used to treat diseases of poverty like TB, HIV & Malaria
- Increase the shelf life of highly sensitive foods and pharmaceutical actives.

Responsibilities:

- Provide strategic leadership and direction to the Encapsulation and Delivery Group and the Pan-African Centre of Excellence in Nanomedicine
- Raise funds to sustain the activities of the group and centre
- Establish beneficial networks and collaborations
- Conduct real and relevant research according to the mandate of the CSIR
- Recruit, mentor and supervise staff, researchers and students
- Generate and disseminate knowledge from research projects
- Develop capacity in form of human capital, infrastructure and collaborations
- Direct teams members in developing experiments, conducting research, compiling

- and disseminating results
 - Manage stakeholders in public and private sector
 - Develop patents, publish papers, present at conferences
- 2000 - 2001 Short-term Consultant
Joint United Nations Program for HIV/AIDS (UNAIDS); Pretoria - South Africa
- Responsibilities:
- Rendering advisory services to the United Nations SADC Regional AIDS (UNAIDS) Program on Accelerating Access to Care and Drug Intervention for people living with HIV and AIDS (PLWHA) with special focus on mother to child transmission.
 - Attended the training of UNAIDS consultants held in Zimbabwe to provide technical support to countries in the region on the drug access initiative.
 - Commissioned to review the drug access initiative in Uganda
- 1991 - 2000 Biomedical Materials Researcher
Inter-Disciplinary Research Council (IRC), University of London, UK
- Responsibilities:
& Achievements
- Responsible for the research into the development of alternative materials and treatment in the field of intra-oral drug delivery systems.
 - Involved in the development of a polymer system, which was used as a vehicle in the slow release delivery of anti-fungal drugs. This drug delivery system received Medical Control Agency approval for clinical trials in UK for the HIV/AIDS-Candida infected patients
 - Monitored and evaluated the release of anti-fungal drugs from methacrylate polymers for use in HIV/AIDS-Candida infected patients.
 - Monitored, assessed and evaluated the clinical trial for the HIV/AIDS-Candida infected patients
 - Interacted with departmental head to determine funding and project parameters
 - Synthesised polymers for use in the development of drug delivery systems
 - Monitored the release of drugs from known polymers
 - Prepared and compiled presentations for symposia and conferences
 - Compiled publications on research for international distribution
 - Interacted with business and finance managers to plan funding
 - Managed financial budgets for projects
 - Planned project needs and order equipment and materials
 - Prepared and presented proposals to financiers for funding
- 1989 - 1991 Quality Control Manager & Product Controller
PSP Dental Product Company, London, UK
- Responsibilities
&
Achievements:
- Responsible for the control of quality procedures in the manufacture of cements and composites for dental products
 - Supervised twelve staff - technicians and general operatives
 - Planned testing procedures to meet ISO and British standards
 - Assessed quality of raw materials and finished products
 - Determined company procedures for testing
 - Set testing procedures for mechanical performance of product and consistency
 - Identified staff training needs and deliverables
 - Managed day to day production - oversee eight production staff
 - Received orders and plan programmes to meet targets
 - Monitored product quality and performance

1980 - 1987: Project Officer
National Development Corporation (NDC) Tanzania

- Responsibilities & Achievements
- Organised, managed and monitored 5 major projects of which 2 of them went to full production
 - Applied appropriate technologies to suite the country's needs
 - Mobilised funds from donors and government for staff training on the project
 - Prepared contractual documents and managed consultants employed by NDC
 - Managed appraised performance and identified training needs of 11 staff members, 6 supporting staff and 8 field officers.
 - Liaised with relevant government institutions and formulated development programmes for donor assistance
 - Carried out in house feasibility studies, assessed and recommend appropriate technology
 - Assessed and determined National Industrial Development needs
 - Assessed international potential for industrial support and funding
 - Wrote periodic reports (quarterly, semi-annual and annual) on NDC programmes.

PREVIOUS AND CURRENT STUDENTS & TEAM MEMBERS SUPERVISED / MENTORED

Name	Citizenship	Period	Level & Institution	Current Employment Status
1. Boitumelo Semete-Makokotlela	South Africa	2006 - 2011	Post-Doc (CSIR)	Executive Director; CSIR in South Africa
2. Paul Chelule	South Africa	2007- 2009	Postdoc (CSIR)	Assoc. Prof; MEDUNSA , SA
3. Lebohng Katata	South Africa	2009 -2011	Postdoc (CSIR)	Senior Lecturer: University of Limpopo, South Africa
4. Lonji Kalombo	South Africa	2006 - 2007	Pre- Doc (CSIR)	CSIR- Principal Engineer
5. Yolandy Lemmar	South Africa	2008--2015	PHD and Pre-Doc & Post- Doc (CSIR)	CSIR- senior researcher in the polymers and composites research group & Research Group leader: Lead development Biosciences
6. Admire Dube	South Africa	2011-2013	Post -Doc (CSIR)	Associate Professor University of Western Cape
7. Rose Hayeshi	South Africa	2010- 2014	Post -Doc (CSIR)	Associate Professor North West University
8. Mohamed Balogon	South Africa	2011-2014	Post -Doc (CSIR)	Senior researcher CSIR in South Africa
9. Mirabel Nyamboli Ndofor	South Africa	2009 -2012	Pre- Doc (CSIR)	Director at Intellectus Campus, Avacare Health International
10. Wesley Omwoyo	South Africa	2012-2013	Post -Doc (CSIR)	Lecturer Odinda Odinga University, Kenya
11. Nichoraus Mlalila	Tanzania	2014 to present	Post -Doc (NM-AIST)	Assistant Lecturer/Post doctoral at NM-AIST
12. Theopista Mzena	Tanzania	2014 to present	PhD (NM-AIST)	Assistant Lecturer, St. John's University of Tanzania

13. Geoffrey Omarch	Tanzania	2014 to present	PhD (NM-AIST)	Pursuing PhD
14. Japhet Ngetchi	Kenya	2017 to present	MSc (NM-AIST)	Assistant Research Officer, KEMRI
15. Jeremiah Waweru Gathirwa	Kenya	2017 to present	Post Doc (KEMRI)	Senior Researcher, KEMRI, Centre for Traditional Medicine and Drug Research (CTMDR)
16. Paul Akpa	Nigeria	2012-2013	Post Doc (CSIR)	HOD, Dept of Physical Pharmaceutics, University of Nigeria, Nsukka
17. Florence Oloo	Kenya	2012-2017	Post Doc (CSIR)	Strathmore University, Associate Professor & Deputy Vice Chancellor
18. Daniel Madulu	Tanzania	2017 - present	PhD (NM-AIST)	Assistant Lecturer, St. John's University of Tanzania
19. Elizabeth Gachanja	Kenya	2017 - present	PhD (NM-AIST)	Pursuing PhD
20. Albert Silo	Tanzania	2017 - present	MSc (NM-AIST)	Pursuing MSc
21. Msule Mshindo	Tanzania	2017 -present	MSc (NM-AIST)	Pursuing MSc
22. Solomon Stephano	Tanzania	2017 – present	MSc (NM-AIST)	Pursuing MSc

ACHIEVEMENTS, NOMINATIONS, AWARDS & PRIZES

Achievements & Funding Awards

- Elected the President for Africa Material Research Society (AMRS); 2018
- Awarded African Center of Excellence funded by the World Bank; 2016. This is a \$ 6 M Grant with a 5 years project.
- Successfully raised funds, organised & chaired the “1st Pan-African Summer School in Nanomedicine”, 4 – 10 November 2012, Pretoria South Africa. The school was taught by world class Nanomedicine and disease experts from across the Globe. Over 100 Researchers (some MSc and PhD students) received theoretical training and practical exposure to the concepts of Nanomedicine, encompassing all aspects from lab to clinic.
- Awarded Status of Pan-African Centre of Excellence in Nanomedicine Research and Training by the African Network for Drugs and Diagnostics Innovation (Oct 2011)
- Completed Nanomedicine sensitization seminars which brought together 20 universities and research institutions in Kenya, Nigeria and Ethiopia, Cameroon and Tanzania.
- Successfully organised the first fully-funded International Nanomedicine workshop in Africa entitled: “International Workshop on Nanomedicine for Infectious Diseases of Poverty, perspectives and possibilities”, 27-31 March 2011, Magaliesberg, South Africa. The workshop had over 80 participants, with nearly half coming from beyond South Africa. The international delegates represented over 20 different countries, and most were leading experts in either Nanomedicine and/ researchers in drug discovery/development for poverty related diseases. The workshop was official launched by Ms Naledi Pandor, honourable Minister of Science and Technology in South Africa, with 4 Ambassadors in attendance.
- Received \$560,000 support and recognition as a centre of excellence in pharmacology and therapeutics for clinical trials and therapeutics in Kenya, from the Kenyan Consortium for National Health Research
- Funding from DST amounting to R 31 million, for a project of three years, 2010 – 2012, awarded on the basis of excellence
- Secured R28.1 million from the Department of Science and Technology (DST)
- Received \$100,000 USD from the Gates Foundation through competitive funding SA-bilateral agreements, including IBSA
- Initiated a TB Nanodrug Delivery Project and grown to a team of 14 people(4 Post-Docs, 4 PhD students, 3 MSc students, 2 technicians and 1 project manager)
- Successfully initiated and now leading a consortium for TB Nanodrug delivery

- Initiated projects on HIV & Malaria towards building a platform for PRDs
- Organised several training events and international exchange programs with world class institutions for Research Groups team members.
- Involved in 12 International exchange programs thus far
- Have supervised 13 Post-doctoral fellows, 5 MSc and 18 BTech students
- Currently supervising 2 Post – Doc, 4 PhD, 4 MSc, and 1 BTech students.
- Involved in coaching and training different research teams to date

Awards & Prizes

- 2018: Elected the President for Africa Material Research Society (AMRS)
- 2016: Awarded status of African Centre of Excellence World Bank Grant
- 2016: Appointed Director, CREATES African Centre of Excellence, NM-AIST
- 2015: National Health innovation Award given by National Institute of Medical Research (NIMRI) biannually to the most prominent Biomedical researcher 2013 Biotech Fundi Capacity Builder Award
- 2012 CSIR MSM Excellence Awards: Winner – Career Achievement Award
- 2011 ANDI Centres of Excellence: Nanomedicine Platform recognised by ANDI as a Pan-African Centre of Excellence in Nanomedicine Research and Training.
- 2011 4th ANDI Stakeholders Meeting: Best poster presentation.
- 2010/11 National Science and Technology Forum (NSTF) awards: Finalist - Contributions to Science Engineering and Technology by an Individual
- 2010/11 NSTF and T W Kambule Awards: Finalist - life time achievement by a Black Researcher
- 2010 CSIR-Wide Biennial Excellence Awards: Winner - President's prestigious award for excellence
- 2010 CSIR-Wide Biennial Excellence Awards: Winner - Mentorship award
- 2010 CSIR MSM excellence awards: Winner - Director's award for excellence in mentorship
- SA Bioplan 2009 business plan competition in Association with Emory University, USA: Winner - Best business plan & Best presentation (cash prize of R 160,000.00, and eligible to apply for up R 15 million funding for business plan idea submitted)
- Material Science and Manufacturing excellence award for special contribution on the Nano drug delivery project- 8 June 2006
- Polymer and Bioceramics special Achievement award with respect to TB Nano-drug delivery to address patient non-compliance to TB treatment– December 2005
- Featured in the "Who is Who" in South Africa, the by Mail and Guardian in 2006 & 2009

ENTREPRENEURSHIP

- Successfully initiated and fully developed Eden natural mineral water from a concept idea. This is the first locally made mineral water in Tanzania.
- Involved in standardizing packaging and marketing of Omega Herbal 48 (a food supplement)

TECHNICAL EXPERTISE

- Microsoft office (Word, power point, excel, access, project, publisher, one note)
- Open office (Writer, Calc, Impress)
- Novell applications (workflow, peoplesoft, Groupwise), Oracle applications (e.g. Electronic Procurement)
- 2D and 3D packages for structures: ISIS, Top Draw
- Statistical software: various statistical packages
- Internet, Email, webpage development and maintenance, social networks
- Code 8 Driving License

SELECTED SHORT COURSES

- Sep 2017: Leadership Course Bahari Beach Dar –es-Salaam
- Oct 2009: Creative thinking skills, the building blocks of innovation, CiLLA- CSIR
- Sep 2009: How do you think, CiLLA- CSIR
- Dec 2008: Brain Power, Peak Performance Training
- Jun 2008: Training on Presentation and Public Speaking, CiLLA- CSIR
- Mar 2008: Media Skills, CiLLA- CSIR
- Aug 2007: Workshop on Rules and Regulations in Pharma, North West University
- Oct 2003: Scientific Report Writing, CiLLA- CSIR
- Oct 2003: Internet as a Research Tool, CiLLA- CSIR
- May 2003: Fire Fighting, Fotracon through CiLLA- CSIR
- May 2003: First Aid, IEFA through CiLLA- CSIR
- Apr 2003: Product Development, University of Pretoria
- Nov 2002: Experimental Design, University of Pretoria
- Aug 2002: Global Warming Debate, University of Pretoria
- Jun 2002: Toastmasters International, Scientia Toastmasters Club
- May 2002: Negotiating Skills, CiLLA- CSIR

INVITED WORKSHOPS, MEETINGS, SYMPOSIA, CONFERENCES

National and International Invitations

- Clinical Nanomedicine (CLINAM), Basel Switzerland September 2017, Speaker; Regulatory Panel
- Clinical Nanomedicine (CLINAM), Basel Switzerland September 2018, Speaker; Regulatory Panel
Nanomedicine and Biotechnology workshop, African University of Science and Technology, Abuja, Nigeria 1-3 December 2012. Key note address Nanomedicine: Recent Developments and opportunities for Africa
- Oral Presentation at 4th ANDI Stakeholders meeting, Oct 2011, Ethiopia
- Oral Presentation at 3rd ANDI Stakeholders meeting, Oct 2010, Kenya
- Oral Presentation at 1st world congress on Nanomedicine, April 2010, India
- Oral presentation at the Nanotoxicology conference Sep 2009 in South Africa
- Plenary speaker for the NanoAfrica conference Feb 2009 in South Africa
- Participation in a roundtable discussion on a collaborative industry initiative for Research & Development into Neglected Diseases 29 May 2008, Geneva, Switzerland
- Oral presentation to President Thabo Mbeki, during his visit to CSIR in 2007
- Oral presentation to the Nigerian Nanotechnology Forum, also attended by the Nigerian ministers of Science & Technology and Health, January 2007
- Oral presentation to the WHO in Switzerland on 10 September 2006, leading to a follow up invitation to submit a full proposal
- Oral presentation at the NanoAfrica conference 28 November. 2006
- Oral presentation at to South African Minister of Science and Technology, and Group Executive at Department of Science & Technology, Pretoria, November 2006
- Invited book chapter on Potential of Nano drug delivery for Malaria in the book “Biotechnology in South Africa”
- Oral presentation at the 3rd Annual Symposium on Diseases Relevant to SA at North West University on 14 July 2006
- Oral presentation at the NRF/Royal society workshop held 29-30 June 2006
- Oral presentation at the SA day in London on 29 January 2006
- Oral presentation at the EuroNanoForum - UK September 2005

- Oral presentation at the Japanese /SA bilateral forum May 2004.

Oral Presentations

- Clinical Nanomedicine (CLINAM), Basel Switzerland September 2017, Speaker; Regulatory Panel
- Clinical Nanomedicine (CLINAM), Basel Switzerland September 2018, Speaker; Regulatory Panel
- Nanomedicine and Biotechnology workshop, African University of Science and Technology, Abuja, Nigeria 1-3 December 2012. Key note address Nanomedicine: Recent Developments and opportunities for Africa.
- WIPO/ANDI/MRC training program in successful technology licensing, 1-2 November 2012, Geneva, Switzerland. Fully sponsored participation.
- Inaugural Conference of Nanotechnology and Materials Science Development in Kenya. 18-21 July 2012, Nairobi, Kenya. Key Note address: Nanomedicine: Recent Developments and opportunities for Africa.
- Meeting of the National Institute of Science and Technology in Nanobiotechnology, 24 June – 1 July 2012, University of Brasilia, Brazil. Invited Oral Presentation: Nanomedicine for diseases of poverty.
- 3rd SA TB conference: TB/HIV Integration Conference. 12-15 June 2012, Durban, South Africa. Oral Presentation “*Nanomedicine: a revolutionary approach to treating TB and MDR-TB*”
- 9th International Symposium on Polymer Therapeutics: From Laboratory to Clinical Practice. 28 - 30 May 2012. Valencia, Spain - Session Chair, Oral Presentation: “*Nanomedicine applications in drug delivery for poverty related diseases*”
- Department of Science and Technology Budget Vote, 15 May 2012, Cape Town. Key Note address at dinner: Nanomedicine: Recent Developments and opportunities for Africa.
- 18th Annual Conference of the Cameroon Biosciences Society, Bioscience and Millennium Development Goals 1-3 Dec 2011, Douala, Cameroon – Oral Presentation: “*Nanomedicine-based smart drug delivery for poverty related diseases*”
- 4th African Network for Drugs and Diagnostics Innovation Stakeholder’s Meeting and High Level Forum, 24-28 October 2011, Addis Ababa – Oral presentation: “*An ANDI centre of excellence in nanomedicine for poverty related diseases*” – Awarded Pan African Centre of Excellence in Nanomedicine.
- 6th biennial EDCTP Forum, Strengthening Research Partnerships for Better Health and Sustainable Development, Addis Ababa, Ethiopia, 9-12 Oct 2011 - *Invited poster presentation and session chair*
- 14th Natural Product Research Network for Eastern and Central Africa (NAPRECA) Symposium, ICIPE, Nairobi, Kenya 8-11 Aug 2011 – *invited oral presentation*. Oral Presentation: “*Nanomedicine-based smart drug delivery for poverty related diseases*”
- International Workshop on Nanomedicine for Infectious Diseases of Poverty: Perspectives & Possibilities. 27-31 March 2011, Magaliesberg, South Africa – *chair of organising committee, host, chair on round table discussions, Oral Presentation: Meeting objectives*.
- 3rd African Network for Drugs and Diagnostics Innovation Stakeholder’s Meeting and High Level Forum, 10-14 October 2010, Nairobi, Kenya – Oral presentation: “*An ANDI centre of excellence in nanomedicine for infectious diseases of poverty*”

- United Nations Economic Commission for Africa 2nd Science with Africa Conference, 23-25 July 2010, Addis Ababa, Ethiopia – *Oral Presentation: “Nanomedicine for poverty related diseases in Africa - it is doable”*
- 2nd TB Conference, Durban – South Africa, 1-4 June 2010 – *Poster presentation “Nanomedicine: An innovative approach towards improving poverty related disease therapies”*
- 1st World Conference on Nanomedicine and Drug Delivery (WCN – 2010), Kottayam, Kerala, India, 16-18 April 2010 – *Session chair and Oral presentation “Nanomedicine: An innovative approach towards treating poverty related diseases”*
- 2nd International Conference on Drug Discovery and Therapy (2nd ICDDT 2010) Dubai, UAE, 1-4 Feb 2010. *Oral presentation “Potential of improving the treatment of Tuberculosis through nanotechnology”*
- Workshop on Biomaterials: Perspectives & Possibilities, University of Mauritius, Mauritius 30 Nov – 4 Dec 2009 - *Invited oral Presentation*
- 5th PAN-African Multilateral Initiative on Malaria “Improved Tools for the Elimination of Malaria in Africa, Nairobi Kenya; (A joint initiative of ANDI, TDR, EU & WHO Nov 2009 - *Invited ANDI by in expert capacity to look into the possibility of applying Nanomedicine in malaria therapy*
- 2nd international meeting of African Network for Drugs & Diagnostics Innovation, Cape Town, South Africa, 4-7 Oct 2009- *Poster presentation and tasked to develop a questionnaire for a researcher database Oct 2009*
- Gates Foundation Grand Challenges in Global Health Meeting, Arusha, Tanzania 18 – 21 Oct 2009 - *Poster presentation*
- 5th Biennial EDCTP Forum, fighting HIV/AIDS, Tuberculosis & Malaria in One World, One Partnership, Arusha, Tanzania, 10 – 15 Oct 2009 - *Invited oral presentation and session chair*
- EU funding, CSIR ICC 18 – 19 Nov 2009 - *Workshop and roundtable discussions*
- EU-FP7-Africa Call 2010, Belgium, 18 Sep 2009 – *oral presentation during workshop on Africa information day for FP7 Africa call*
- BIT Life Science 2nd Annual World Summit on Antivirals 2009, Beijing China (17 – 21 July 2009) - *Invited oral presentation*
- 3rd international Congress of Nanobiotechnology & Nanomedicine, NanoBio 2009, San Francisco, USA June 22 – 24 June 2009- *Invited oral presentation*
- Challenges for the future: research on HIV/Aids Malaria and Tuberculosis, Brussels, Belgium, 13-14 Nov 2008. *Oral presentation “Potential of treating tuberculosis through nanotechnology”*
- CSIR Science Real and Relevant Conference 17-18 Nov 2008 - *Oral Presentatio: “Potential of treating TB via nanoparticulate drug delivery, Novel Nanoparticles for tuberculosis chemotherapy”.*
- 39th Union World Conference on Lung Health, Paris, France, 16-20 Oct 2008. *Poster presentation “Potential of Treating Tuberculosis using Nanotechnology”*
- 9th International Conference on Particles, Sep 2008. *Oral presentation: “Nanobased drug delivery system for the treatment of TB”*
- SA Bio2Biz, 15-18 Sep 2008, Sandton Convention Centre, Johannesburg. *Oral presentation: “Potential of using nanotechnology to improve TB treatment”*
- 9th International Conference on Particles: Risks and opportunities Lagoon Beach Hotel, Cape Town

South Africa, 2-5 Sep 2008. *Oral presentation "Novel approach for treatment of tuberculosis"*

- Collaborative Industry Initiative on Research & Development in Neglected Diseases, Geneva, Switzerland, 29 May 2008. Roundtable discussion,
- 1st Joint Ghana-South Africa biennial conference on Biotechnology and Materials Technology, Accra, Ghana, 22-24 Apr 2008. *Oral presentation "potential of treating TB using nanotechnology"*
- Biopharmaceutical Nanotechnology, London, UK, 31 Mar – 1 Apr 2008. *Poster presentation "Potential of treating TB via Nanoparticulate drug delivery"*
- 10th European Symposium on Controlled drug delivery, Noordwijk aan Zee, The Netherlands 2-4 April 2008. *Poster presentation "Potential of treating TB via nanoparticulate drug delivery"*
- 5th International Nanomedicine and Drug Delivery Symposium (NanoDDS'07), North Eastern University, Boston, Massachusetts 2–3 Nov 2007 – *poster presentation*
- International Research on Nanomaterials (Organised by ICMR, Jackson State University and the University of Zululand), Richard's Bay, South Africa, 29 Jul – 1 Aug 2007 – *Oral presentation: "TB treatment using polymeric Nanodrug delivery system"*
- NSTI Nanotech 2007 - 10th Annual Conference, Santa Clara California, 20-24 May 2007. *Poster presentation*
- India- Brazil-South Africa (IBSA) trilateral on nanotechnology for health, India, 1-3 April 2007. *Part of DST-South Africa delegation to India. Oral presentation "TB Nanodrug delivery systems"*
- International Symposium on Polymer Therapeutics. Institute of Chemistry and Biochemistry, FU Berlin. 19-21 Feb 2007. ISPT-07 Scientific Program. *Poster presentation*
- NanoAfrica 2006, Cape Town, South Africa, 28 Nov 2006. *Oral presentation "Potential for treating TB with polymeric Nanodrug delivery systems"; and Poster presentation "Solid nanoparticles and self-assembling particulate structures for delivery anti-TB drugs"*
- International Conference on Neglected Infectious Diseases, Brussels, Belgium 8-9 Nov 2006. *Oral Presentation "TB nanodrug delivery"*
- Third Annual European and Developing Countries Clinical Trial Partnership (EDCTP) Forum; Partnership and Leadership: Challenges and opportunities, Stockholm, Sweden 8-11 Oct 2006 *Poster presentation "Potential for treating TB with Nano drug delivery system"*
- Geneva Health Forum: Towards Global Access to Health, Geneva, Switzerland 30 Aug 2006. *Poster Presentation "Nanopolymeric delivery of anti-Tuberculosis drugs"*
- Particles 2006 - Medical/Biochemical Diagnostic, Pharmaceutical, and Drug Delivery Applications of Particle Technology, Florida 13-16 May 2006. *Poster presentation "Evaluation of Nanoencapsulation performed by spray drying technique for the delivery of Tuberculosis drugs"*
- CSIR Research and Innovation Conference, Pretoria, 27-28 February 2006 *Poster presentation- "Evaluation of Nanoencapsulation techniques in different polymeric system for the delivery of anti-Tuberculosis drugs"*
- EuroNanoForum 2005 Conference, Nanotechnology and the health of the EU citizen in 2020, Edinburgh, UK, 5-9 September 2005 – *Invited oral presentation "Evaluation of Nanoparticles delivering Anti-TB drugs"*
- Polymers in Nanoscience and Nanotechnology (EUPOC2005), Gargnano, Italy 29 May - 3 Jun 2005. *Poster presentation: "Evaluation of Nano-Encapsulation Techniques for Delivering Anti-Tuberculosis"*

Drugs”

- 4th Workshop on Nanotechnology in Medicine, Berlin, Germany, 14-15 Oct 2004. Poster presentation “Novel Ways of Delivering Anti-TB Drugs”
- Japanese Science Forum, Department of Science & Technology, Pretoria, South Africa, 11-12 May 2004. Oral presentation
- Macromolecules- Special Sessions on Polymers and Medicine, The Molecular Society of South Africa, 5- 8 April 2004
- Interesting new technologies, South African Institute of Chemical Engineers, 19 Feb 2004.
- Conference on African Material Research Society, University of the Witwatersrand, Johannesburg, South Africa, 8-11 Dec 2003
- 27th International Symposium on Controlled Release of Bioactive Materials, Paris, France, 9-13 Jul 2000. Poster presentation: “The effect of incorporating drugs on the free radical polymerization reaction of PEM/THFM and vice versa”
- 26th International Symposium on Controlled Release of Bioactive Materials, Boston Massachusetts, U.S.A, 20-25 Jun 1999. *Poster presentation “Chlorhexidine release from cyclic/heterocyclic methacrylate systems”.*
- 25th International Symposium on Controlled Release of Bioactive Materials, Las Vegas, Nevada, U.S.A, 21-26 Jun 1998. *Poster presentation “Water uptake and release in different solutions”*
- 24th International Symposium on Controlled Release of Bioactive Materials, Boston Massachusetts, U.S.A, 15-19 Jun 1997. *Poster presentation: “Release of chlorhexidine from methacrylate polymers”*
- 3rd International Congress on Dental Materials, Hawaii, 4-8 Nov 1997. *Poster presentation: “Water sorption studies of cyclic/heterocyclic methacrylates”*

PUBLICATIONS

Patents & invention Disclosure applications

- C Rubaka, JW Gathirwa, HM Malebo, **H Swai**, A Hilonga. Inorganic Nanocarriers: Surface Functionalization, Delivery Utility for Natural Therapeutics-A Review.
- L Kalombo, **H Swai**, B Semete, L Katata, P Chelule. Nanoparticle carriers for drug administration and process for producing the same. Patent Application Ref: PCT/IB2008/000012)
- B Semete, M Chuene, and **H Swai**, RNA aptamers specific to the macrophage mannose receptor for targeted delivery of therapeutics or diagnostic agents to macrophage or dendritic cells. (Invention Disclosure Ref: “PA152171-P Aptamer targeted drug delivery”)
- Dual application of Mycolic acids: (a) as ligand onto anti-tuberculosis drug-loaded nanoparticles for targeting infected sites and (b) use of antibody immunosorbent in TB serological diagnostic assay (in preparation)
- L Kalombo, J R Zeevaart, **H Swai**. Solid lipid nanoparticle radiopharmaceutical compositions
- L Kalombo, P Nkuna, P Melariri, **H Swai**. Microemulsion formulation and method of manufacture
- L Kalombo, L Katata, B Ramalapa and **H Swai**. Multiple layered nanoparticles for drug administration and process for producing the same

Conference Papers

- Mlalila, N., **Swai, H.**, Hilonga, A. and Kadam, D. M. (2015). Synthesis of silver nanoparticles for antimicrobial food packaging materials. Global Green Nanotechnology Conclave (*GiGaNTiC 2015*), 6-7 August, 2015, Ahmedabad, Gujarat, India

Book Chapter

- Mlalila, N., Hilonga, A., & **Swai, H.** (2017). Prospects of antimicrobial food packaging in developing countries: processing and food security perspectives. *Science within food: Up-to-date advances on research and educational ideas*, 211-222.

Information leaflets

- B Nyamboli, **H Swai** and R Hayeshi. 2011. CSIR/DST nanomedicine platform activities. Information flyer/leaflets used for knowledge dissemination and promotion of the public understanding of nanomedicine and the nanomedicine activities at the CSIR.
- B Nyamboli, **H Swai** and Y Lemmer. 2011. Encapsulation and Delivery Group fact sheet. Flyer/leaflets used to describe research activities of the research group.

Publications in preparation

- Effect of administration frequency of an oil in water adjuvanted (MF59) vaccine on antibody regulation in cattle. Vaccine
- Physicochemical characteristics of Pheroid – nanoparticle hybrid delivery system containing selected anti-TB drugs.

Published in Journals

1. Charles, C. N., **Swai, H.**, Msagati, T., & Chacha, M. (2020). Development of a Natural Product Rich in Bioavailable Omega-3 DHA from Locally Available Ingredients for Prevention of Nutrition Related Mental Illnesses. *Journal of the American College of Nutrition*, 1-13.
2. Shadrack, D. M., **Swai, H. S.**, & Hassanali, A. (2020). A computational study on the role of water and conformational fluctuations in Hsp90 in response to inhibitors. *Journal of Molecular Graphics and Modelling*, 96, 107510.
3. Omarch, G., Kippie, Y., Mentor, S., Ebrahim, N., Fisher, D., Murilla, G., **Swai, H.** & Dube, A. (2019). Comparative in vitro transportation of pentamidine across the blood-brain barrier using polycaprolactone nanoparticles and phosphatidylcholine liposomes. *Artificial cells, nanomedicine, and biotechnology*, 47(1), 1428-1436.
4. Shadrack, D. M., & **Swai, H. S.** (2019). Solvent effects on molecular encapsulation of Toussantine-A by chitosan nanoparticle: A metadynamics study. *Journal of Molecular Liquids*, 292, 111434.
5. Kalombo, L., Lemmer, Y., Semete-Makokotlela, B., Ramalapa, B., Nkuna, P., Booysen, L.L., Naidoo, S., Hayeshi, R., Verschoor, J.A. & **Swai, H. S.** (2019). Spray-dried, nanoencapsulated, multi-drug anti-tuberculosis therapy aimed at once weekly administration for the duration of treatment. *Nanomaterials*,

- 9(8), 1167.
6. Kyaruzi, J. J., Yonah, Z. O., **Swai, H. S.** (2019). Mobile application development framework to support farming as a business via benchmarking: the case of Tanzania. *International Journal of Advanced Computer Research*, 9(45), 365-378.
 7. Kyaruzi, J. J., O Yonah, Z., **Swai, H. S.** (2019). Review of Agricultural and Rural Development System Models and Frameworks to Support Farming as a Business via Benchmarking: The Case of Tanzania. *International Journal of Computing and Digital Systems*, 8(6).
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 9. Charles, C. N., Msagati, T., **Swai, H.**, & Chacha, M. (2019). Microalgae: an alternative natural source of bioavailable omega-3 DHA for promotion of mental health in East Africa. *Scientific African*, e00187.
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 11. Biseko, E. Z., **Swai, H. S.**, Mbugua, R. W., Ndung'u, J. W., Chepng'etich, J., & Gathirwa, J. W. (2019). In vitro antiproliferative potential of *Annona senegalensis* Pers. and *Allophylus africanus* P Beauv. plant extracts against selected cancer cell lines.
 12. Sillo, A. J., Makirita, W. E., **Swai, H.**, & Chacha, M. (2019). Larvicidal activity of *Hypoestes forskaoilii* (Vahl) R. Br root extracts against *Anopheles gambiae* Giles. s, *Aedes aegypti* L, and *Culex quinquefasciatus* Say. *Journal of experimental pharmacology*, 11, 23.
 13. Shadrack, D. M., **Swai, H. S.**, Munissi, J. J., Mubofu, E. B., & Nyandoro, S. S. (2018). Polyamidoamine Dendrimers for Enhanced Solubility of Small Molecules and Other Desirable Properties for Site Specific Delivery: Insights from Experimental and Computational Studies. *Molecules*, 23(6).
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Book Sections/ Chapters

1. Mlalila, N., Hilonga, A., and **Swai, H.** (2017). Prospects of antimicrobial food packaging in developing countries: processing and food security perspectives. In: *Science within Food: Up-to-date Advances on Research and Educational Ideas* (A. Méndez-Vilas, Ed.). Formatex Research Center, Spain.
2. **Swai H.**, Chelule PK, Semete B and Kalombo L. (2008) Nanotechnology in Drug Delivery for Malaria and TB Treatment. A book chapter In: *Bionanotechnology: Global Prospects*. Reisner DE (Ed), Taylor and Francis Publishers, Boca Raton 2008.
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REFERENCES

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