

RESEARCH CAPACITY DEVELOPMENT **REGIONAL GRANT HOLDERS CONFERENCE** 2025



**FUNDING
FOR IMPACT:**
Fostering Capacity
Development
Partnerships for
Innovation
Leadership



Table of Contents

Message from the Divisional Manager	3
Message from the Executive Director	5
Message from the SAMRC President	6
Programme Directors and Conference Chairpersons	8
Keynote Speakers	9
Organising Committee	13
Overview of Funded Projects	14
Programme	20
Research Capacity Development Initiative Principal Investigators	25
Mid-Career Scientist Programme	33
Early Investigators Programme	37
Extramural Postdoc Programme	45
RCDI-Nested Scholarship Programme	52
RCDI UK-Staff Development Programme	60
Students Using RCD Grants for Research Expenses	65
Abstract Reviewers	93



Message from the Divisional Manager



Dear grant beneficiaries, postgraduate student beneficiaries, research administration staff, and colleagues. Greetings to all our emerging researchers!! Sanibonani, Dumelang, Ndaa (Aa), Goeie more, and Good morning!!

On behalf of the South African Medical Research council, it is a great pleasure to welcome you to the 2025 SAMRC Division of Research Capacity Development (RCD) Regional Beneficiary Conference, themed "Funding for Impact: Fostering Capacity Development Partnerships for Innovation Leadership."

In May 2024 the SAMRC RCD Strategic Stakeholder consultation meeting, which assessed the past 10 years performance of RCD programmes, recommended that RCD have regional beneficiary meetings which include research intensive and under-resourced institutions in order to encourage and establish collaborations between them. This led to our inaugural RCD Regional Beneficiary Meeting in KwaZulu-Natal in 2024, the current 2025 meeting in Gauteng, and there is already interest expressed from universities in the beautiful Eastern Cape Province to host our next meeting.

The purpose of the regional beneficiary meeting is for RCD to assess progress with your projects, but importantly, we need to know:

- *Are we adequately supporting our beneficiaries?*
- *Is there anything else we could be facilitating (excluding additional funds) to maximize your chances of success, e.g. access to facilities, collaborators, training etc.*
- *Do you have any suggestions for improving our funding programmes.*

I am here to listen to your input with regard to the above.

This year's event brings together emerging, early and mid-career researchers from eight partner institutions from the Gauteng, Limpopo and the North-West provinces to form part of a dynamic community driving health research excellence in South Africa. It means that this conference is your platform to showcase your work, share insights, and very importantly, to strengthen your professional networks. I encourage you to use this opportunity to connect with peers, identify potential collaborators, and engage with experts and SAMRC leadership.



For your information and further action, RCD is currently having the following opportunities available. Please attend the session tomorrow if you are interested in applying for these:

- RCDI-PI for UNIVEN, UL, UFH and UNIZULU
- Intramural Postdoc Program
- Extramural Postdoc Program
- Biostatistics Capacity Development Scholarship Program
- Mid-Career Scientist program

Thank you to the organising committee, especially the RCD team who worked tirelessly with our colleagues from SMU Research Office to make this event a success. To our conference chairpersons and programme directors (Professor Nwabisa Shai and Professor Larry Obi), session chairs, keynote speakers, facilitators, and reviewers—thank you for sharing your expertise and contributing to the professional growth of our beneficiaries.

I thank you for attending and thank the Vice-Chancellor of Sefako Makgatho Health Sciences University, Professor Tandi Matsha, for providing a wonderful venue for our meeting on their campus. It is heart warming to see SAMRC collaborations growing with SMU students also being the first cohort being trained in state of the art molecular biology techniques at the newly inaugurated CATIR facility at the SAMRC Pretoria campus; of which you will hear more from Professor Johan Louw. In addition, RCD was recently invited by Professor Seheri, Director of the Research Office at SMU to exhibit our scholarship programmes at the university recently. These are the collaborations that will grow research.

May this gathering inspire new partnerships, bold ideas, and continued success as we work together to strengthen South Africa's health research capacity.



Dr Abeda Dawood
Research Capacity Development
Divisional Manager



Message from the Executive Director



It is an honour to extend a warm welcome to all our valued grant holders attending the South African Medical Research Council's (SAMRC) Division of Research Capacity Development (RCD) Regional Beneficiary Conference for 2025.

We gather under the theme "Funding for Impact: Fostering Capacity Development Partnerships for Innovation Leadership." Through our grant programmes, the SAMRC continues to invest in building a strong and sustainable foundation for health research in South Africa. These programmes are designed to fast-track and transition early-career and midcareer scientists into independent research leaders—individuals who will drive innovation, lead impactful collaborations, and contribute meaningfully to solving our most pressing health challenges.

This year's conference provides a unique opportunity for our RCD grant beneficiaries to share their research, exchange ideas, and connect with fellow scientists and experts. It also offers a platform for dialogue with the SAMRC leadership, including our President, as we collectively explore strategies to strengthen research capacity through partnerships, mentorship, and collaboration.

We are proud to host participants from Sefako Makgatho Health Sciences University, North-West University, the University of Limpopo, the University of Venda, the University of Johannesburg, the University of the Witwatersrand, the University of Pretoria, and the Tshwane University of Technology. Each institution represents a vital node in our national research ecosystem, and together, we continue to advance excellence, equity, and innovation in health research.

As we reflect on the progress made and look ahead to new opportunities, I encourage all our beneficiaries to make the most of this platform—to engage, to learn, and to inspire one another. Our collective efforts today will shape the future of South African science tomorrow.

A handwritten signature in black ink that reads "M Mulder".

Dr Michelle Mulder
Grants, Innovation and Product Development
Executive Director
RCD Line Executive



Message from the President and Chief Executive Officer



It is with great pride that I welcome you to the 2025 South African Medical Research Council's Research Capacity Development Regional Beneficiary Conference. This year's theme, "Funding for Impact: Fostering Capacity Development Partnerships for Innovation Leadership," reflects our shared commitment to strengthening the research ecosystem and nurturing the next generation of scientific leaders in South Africa.

Time to Adapt to a New Funding Era to Foster Capacity Development Partnerships for Innovation Leadership: why and how?

At the beginning of the year, five years after the start of the COVID-19 pandemic and its setbacks, while going through recovery, South Africa's health research system has again stood at a critical crossroads. Global funding dynamics are shifting, with recent USAID and NIH funding cuts impacting HIV, TB, and other public health research programmes across the country. These developments highlight a sobering reality: our scientific future must rest on strong, sustainable, and locally driven innovation ecosystems.

At the South African Medical Research Council (SAMRC), we are responding with purpose and vision.

In response to the recent funding cuts from the United States, the SAMRC has acted swiftly to safeguard South Africa's vital health research enterprise. Working closely with the Department of Science, Technology and Innovation, we welcomed the establishment of the Science, Technology and Innovation Funding Working Group to coordinate a national response. We launched an emergency Request for Applications to provide bridging grants to researchers affected by the cuts, supported by a R132 million allocation from the South African government and additional commitments from philanthropic partners such as the Bill & Melinda Gates Foundation and the Wellcome Trust. Through these collaborative efforts, we are ensuring that critical research, infrastructure, and human capital are protected, and that South Africa's scientific progress continues despite the challenges.

Through our Research Capacity Development division, we have developed a suite of funding mechanisms that support every stage of the research capacity pipeline –from postgraduate training to independent leadership. Our aim is to strengthen human capital, institutional systems, and research impact for the long-term health of our nation.

In this changing environment, we must embrace innovation leadership as the cornerstone of capacity development. Our funding models and partnerships must not only sustain research but drive solutions that improve lives, reduce inequality, and advance health justice. It is now critical that we move from grant dependency toward strategic collaboration, innovation, and knowledge translation.

A Message to Our Researchers

To PhD Students:

You represent the next generation of South African scientists. Use every opportunity to build solid research foundations, network beyond your discipline, and seek mentorship actively. Your training today is not only for a degree—it is for national transformation.

To Postdoctoral Fellows:

This is your time to sharpen your research identity. Build a clear, independent scientific niche and pursue interdisciplinary collaborations. Translate your findings into innovation and societal impact.

To Early Career Investigators:

You are the bridge between promise and leadership. Strengthen your proposal-writing, project management, and mentorship skills. Build partnerships that last—and don't wait for leadership to find you; lead from where you are.

To Mid-Career Scientists:

You are the pillars of continuity and mentorship. Guide others, shape institutional strategies, and champion sustainable research ecosystems. Your experience positions you to influence not just your field, but the future direction of South African science.

Looking Ahead

Under the theme "Funding for Impact: Fostering Capacity Development Partnerships for Innovation Leadership," this conference offers a platform to connect, reflect, and collaborate. This year, we welcome participants from Sefako Makgatho Health Sciences University, North-West University, the University of Limpopo, the University of Venda, the University of Johannesburg, the University of the Witwatersrand, the University of Pretoria, and the Tshwane University of Technology.

As the global funding landscape evolves, our collective resolve must strengthen. The SAMRC will continue to invest in people, partnerships, and programmes that ensure South Africa remains a leader in health innovation and scientific excellence. It is now high time for all researchers to seize this moment to turn challenge into opportunity—to ensure that South African science not only endures global shifts but thrives through resilience, innovation, and leadership.



Prof Ntobeko Ntusi
South African Medical Research Council,
President and Chief Executive Officer



Programme Directors and Conference Chairpersons

Prof Nwabisa Shai

Professor Nwabisa Jama Shai is the Unit Director of the Gender and Health Research Unit at the South African Medical Research Council and holds an honorary position at the University of the Witwatersrand School of Public Health. She has more than 25 years' experience in gender-based violence (GBV) prevention research and practice, co-leading in the design, adaptation, and evaluation of interventions in South Africa and globally.

Her work includes four randomized controlled trials, numerous mixed-methods studies, around the development of evidence-based behavioural prevention interventions focused on GBV, HIV, parenting, families and youth livelihoods.

Prof. Shai is passionate about translating evidence into policy and practice, co-developing South Africa's first National Strategic Plan on GBV and Femicide and the Integrated National Femicide Prevention Strategy. Committed to transformation, she has supervised and mentored emerging scientists, including from historically disadvantaged backgrounds and institutions. She has contributed to shaping global strategies on violence prevention, including as a member of the national Violence Prevention Forum advancing uptake of evidence based violence prevention programmes.



Prof Lawrence Obi

Prof Larry Obi has served as the Deputy Vice Chancellor, Academic Affairs and Research in two, Walter Sisulu University, Mthatha (2008-2012) and the University of Fort Hare (2012-2017) He, at various times, acted as Vice Chancellor in both Universities. Prior to this, he was Head of Department, Deputy Dean, Director, Dean, Acting Executive Dean in different universities.

He is currently the Dean of Science and Technology, Sefako Magkatho Health Sciences University, Pretoria. He was a member of the World Health Organization (WHO) Expert Committee on Campylobacters and Campylobacteriosis, the Board of the National Health Laboratory Service (NHLS) and currently a Section Editor and Editorial Board Member of the African Journal of Laboratory Medicine. Prof Obi was the Chairperson of the Council on Higher Education (CHE) panel for the Institutional Audits, University of Mpumalanga and a Member of the Committee for the establishment of two new universities in South Africa: Ekurhuleni and Hammanskraal.

He served as visiting Professor to the Medical School, Makerere University, Uganda; Medical School, University of Malawi, Malawi and Medical School, Tohoku University, Sendai -City, Japan. He has published widely, supervised several postgraduate students and presented scientific papers at local and international conferences. He has attracted research grants from various funding agencies, nationally and internationally. He was invited to present the 2016 International Guest Lecture at the Minnesota State University, Minnesota, USA. He is a rated researcher and a member of the Academy of Science of South Africa.



Keynote Speakers



Dr Thandi Mgwebi

Group Executive for Global Partnerships and Business Development, NRF

Dr Mgwebi has held key leadership roles in higher education and research, including serving as Deputy Vice-Chancellor for Research, Innovation, and Internationalization at Nelson Mandela University

(NMU) and Deputy Vice-Chancellor for Research and Innovation at Tshwane University of Technology (TUT). Thandi has played a pivotal role in shaping South Africa's higher education and research landscape. She was the founding Executive Director of the South African Research Chairs Initiative (SARChI) at the NRF and has contributed to national policy development, including her engagements with the Council on Higher Education.

She holds a PhD in Medical Cell & Developmental Biology from the University of Cape Town (UCT) and has furthered her expertise through management programs at the University of Stellenbosch Business School (GSB) and the University of Melbourne, specializing in Management Development and Tertiary Education Management. As part of her PhD work, Thandi spent significant time at MRC Centre for Neurobiology at University College London (UCL) during her PhD. She also completed a postdoctoral fellowship at UCT's Institute of Infectious Diseases and Molecular Medicine.

Beyond academia, she has contributed to global dialogues on research and sustainability. Thandi is actively involved in driving equitable partnership modalities and driving intra-Africa collaboration. Through her leadership and strategic vision, she continues to drive impactful research and innovation initiatives on both national, regional and international platforms.

Prof Pascal Bessong

Pascal Bessong holds a PhD in Microbiology and a Master of Science in Medicine in Bioethics and Health Law, with training in South Africa, France, and the United States. His research focuses on molecular microbiology for global health, with strong emphasis on human capital development, and community involvement.

He has successfully supervised /co-supervised 58 doctoral and master's students. Pascal Bessong is currently a Research Professor and Director of the SAMRC-UNIVEN Antimicrobial Resistance and Global Health Research Unit, and Director of the Institute for Pathogen and Global Health Research at the University of Venda.

He is an elected member of the Academy of Science of South Africa, a B-2 rated scientist of the National Research Foundation, a Visiting Scholar at the Center for Global Health Equity, University of Virginia, an Honorary Professor at the School of Health Sciences, University of KwaZulu-Natal, and a recipient of the SAMRC 2023 Gold Merit Award for outstanding scientific contributions to health research. Professor Bessong is an Associate Editor of the South African Journal of Science.





Mr Will Rohde

Will Rohde is a visionary AI growth executive and founder of QuantaHub2, LLC, with over two decades of transformative leadership across healthcare, life sciences, and emerging technologies. With a career spanning Fortune 100 companies, government agencies, and cutting-edge startups, he has architected go-to-market strategies responsible for over \$350 million in contract wins. Will brings deep expertise in Artificial Intelligence, Cybersecurity, and Digital Health, having advised the FDA, HHS, NIH, and more on advancing next-gen solutions in Adversarial and Agentic AI. As a former professional beach volleyball player turned entrepreneurial trailblazer, he blends precision, agility, and innovation in every arena he enters. Passionate about societal impact, Will led the development of an AI-powered model to help combat the opioid epidemic demonstrating his commitment to data-driven change that saves lives.

Prof Keo Motaung



Professor Keo Motaung is a leading Biomedical Scientist, Full Professor, and Chair Holder of the FALF-FREF-NMU Research Chair in

Entrepreneurship and Financial Inclusion at Nelson Mandela University. She is also the Founder and CEO of Global Health Biotech (PTY) Ltd.. With over 26 years of experience in higher education, her work bridges research, innovation, commercialisation and entrepreneurship especially in empowering women in STEAMI (Science, Technology, Engineering, Arts, Mathematics, and Innovation).

A passionate researcher and mentor, Professor Motaung is known for transforming scientific discoveries into real-world solutions. Her company, Global Health Biotech, is best known for La-Africa Soother, a plant-based anti-inflammatory ointment developed from her pioneering research into medicinal plants and musculoskeletal injuries. Her work exemplifies the integration of indigenous knowledge and biotechnology for accessible, sustainable healthcare.

She serves in national leadership roles including Chairperson of OWSD South Africa, Board Member of the Technology Innovation Agency, Chairperson of the EDHE Community of Practice for Entrepreneurship Research, and Chair of NIPMO's Advisory Board. Research Fellow at the School for Data Science and Computational Thinking at Stellenbosch University, reinforcing her commitment to interdisciplinary, data-driven innovation. Professor Motaung continues to influence policy, foster inclusive innovation ecosystems, and champion gender equity in science making her a transformative force in South Africa's knowledge economy. For her ground-breaking innovation, she has received recognition from a wide spectrum of institutions because she has thrown the gauntlet in bridging the gap between science, commercialisation and entrepreneurship.





Prof Johan Louw

Prof Louw has been actively involved in diabetes research for over 35 years, specialising in disease prevention, the development of plant-derived therapeutics, and foetal programming. In 2006, his research led to a joint

development agreement with ZADEC for innovation funding of R120 million, resulting in five international patents, the identification of protein markers for early detection of type 2 diabetes, and the development of two therapeutic compounds for its treatment. In 2019, he was honoured with the Intellectual Property Creator Award from the Department of Science and Technology and the National Intellectual Property Office.

In 2021, Prof. Louw was appointed Senior Director of the Centre and Platforms Office, providing strategic leadership across various SAMRC platforms. In 2022, he received the SAMRC Presidential Award for Capacity Development, becoming the first recipient of this distinguished accolade. He leads a multidisciplinary team and actively collaborates with numerous local and international research organisations. Prof. Louw has published over 130 scientific articles and holds four patents. He represents the SAMRC on the Management Committee of the Global Alliance for Chronic Disease.

Prof Louw worked closely with Cell Vivo to bring optimised 3D cell culture technology to South Africa, establishing a foundation for cutting-edge cellular research. He is also the project lead for the first-of-its-kind intervention clinical trial of green rooibos extract, exploring its therapeutic potential in metabolic disease management.

He has also established the Centre for Advanced Training and Innovative Research in collaboration with Thermo Fisher Scientific and the Department of Science, Technology and Innovation. This facility provides hands-on training in genomics-based methods, including Sanger and next-generation sequencing, for students and researchers from previously under-resourced institutions.

Dr Refiloe Eunice Zwane



Dr Refiloe Eunice Zwane is a seasoned research manager with experience in academia, industry, and public sector research management. She holds a PhD in Science from Stellenbosch University

an MSc in Chemical Engineering from the University of Cape Town, and a Postgraduate Diploma in Business Administration. Since 2017, she has served as Senior Programme Manager in the Vice President's Office at the SAMRC, where she leads the operations of the Extramural Units Portfolio.

Her earlier roles include Innovation Specialist at The Innovation Hub where she led efforts to identify, develop, and strengthen strategic partnerships to drive innovation and commercialisation within the bioscience sector. She also held a position as Research Scientist at Sappi Southern Africa where she worked as a Research Scientist and made significant contributions to the development of the current company's sugar biorefinery process. She has also contributed to national and international committees on research strategy and funding.



Dr James Meiring

Dr Meiring is the manager of the Ratings and Awards Unit, which is part of the Thematic Research Support and Advancement (Them-ReSA) Directorate at the National Research Foundation (NRF).

With over 12 years of experience in research management, James holds a master's in Cardiology from UCT and a PhD in Environmental Biology from Heinrich Heine University, Germany. His postdoctoral work in Germany focused on nanoparticle effects on the liver, followed by research at Stellenbosch University on cardiac myopathy and insulin regulation.

James began his NRF career in 2012 and later led the development of research instruments as a director for eight years.

His enthusiasm for science and its potential to positively impact society is evident. He views the review of funding proposals as a vital pathway to achieving meaningful outcomes. His passion for science has led him to volunteer for unique research projects, including the Caudwell Research project at University College London (UCL), where he studied the effects of hypoxia on the human body at the base camp of Mount Everest, Nepal. Additionally, he participated in a month-long experiment in a Mars-like environment in the Utah desert of the United States. During weekends, James avails his time to an NPO that assists the destitute, needy and vulnerable individuals, and assists with coordination of food distribution in the Pretoria area.

Mr Goodtime Moja

Goodtime Moja is an admitted Advocate of the High Court of South Africa and an Arbitrator. He is affiliated with several professional bodies and currently serves as an In-House Legal Advisor at the South African Medical

Research Council. Goodtime holds a Bachelor of Laws (LLB) degree from the University of the Witwatersrand and a Master of Laws (LLM) degree from the University of Cape Town.



Mr Philip du Plessis

Mr. Du Plessis is the Divisional Manager overseeing the Project Management Accounting Office, which includes the Management Accounting, Pre-Award, and Post-Award Offices. The Management

Accounting Office handles JDE project requests, prepares monthly management accounts and annual budget documents, coordinates audits, and ensures implementation of recommendations. The Pre-Award Office manages funding opportunity identification, proposal budget reviews, administrative compliance, and all pre-award documentation and approvals for externally funded projects. The Post-Award Office oversees project budget uploads, funder invoicing, financial reporting, project audits, monthly financial reviews, and the close-out of completed projects.



Organising Committee

Research Capacity Development



Dr Abeda Dawood
Divisional Manager



Dr Frederic Nduhirabandi
Programme Manager:
RCD Grants Portfolio



Ms Fallon Heinrich
RCD Grants
Intern



Ms Lutho Menyane
Review Coordinator:
RCD Grants



Ms Jo-Anne Engelbrecht
Chief Administrative
Officer



Ms Denéy Christians
Administrative
Officer

Other Stakeholders



Ms Kefiloe Masemola
SAMRC Conference Centre & Event Management
Senior Event Coordinator



Sefako Makgatho Health Sciences University



Overview of Participating Funded Projects

No.	Institution	Project title	Beneficiary
RESEARCH CAPACITY DEVELOPMENT INITIATIVE PRINCIPAL INVESTIGATORS			
1	UNIVEN	ADME polymorphism in tuberculosis from patients in healthcare facilities in the Vhembe District (abstract 1)	Afsatou Traore-Hoffman
2	SMU	Investigation of potential viral (HIV) inhibitors from <i>Erythrina caffra</i> : a South African medicinal plant (abstract 2)	Xavier Noundou
3	UL	Anti-cancer, Anti-diabetic, Anti-Obesity and Anti- inflammatory potential of plant extracts/plantderived compounds (abstract 3)	Vusi Mbazima
4	UNIVEN	Use of dialogue to uncover perceptions of the preconception care from women of reproductive age in the sampled districts of Limpopo Province (abstract 4)	Thivhulawi Malwela
5	UNISA	Partnering with the community in the management of childhood illnesses in Limpopo Province, South Africa (abstract 5)	Livhuwani Tshivhase
6	SMU	Enhancing the User Experience of a Perioperative Digital Health Tool for Information Exchange with Clinical Service Providers: A Qualitative Observational Study Using a Human-Centered Design Thinking Approach (abstract 6)	Hyla-Louise Kluyts
7	SMU	Identification of South African Plant-Based Bioactive Compounds as Potential Inhibitors against the SARS-CoV-2 Receptor (abstract 7)	Nqobile Monate Mkolo
MID-CAREER SCIENTIST			
8	UJ	Harnessing big heterogeneous data to evaluate the potential impact of HIV responses among key populations in South Africa: Updates from the Boloka Data Repository (abstract 8)	Refilwe Nancy Phaswana-Mafuya
9	TUT	Developing nutraceutical products for the management of obesity and diabetes: Evaluating the Effects of the Niselo® Sorghum Probiotic Drink among Mineworkers in South Africa	David Katerere
10	WITS	Safe caesarean birth techniques: protocol for a randomized factorial design clinical trial (abstract 10)	Mandisa Singata-Madliki

No.	Institution	Project title	Beneficiary
EARLY INVESTIGATORS PROGRAMME			
11	UJ	Evaluation of anticancer potential of nano-formulation of plant-based photosensitizers against Breast and Lung cancer cells (abstract 11)	Blassan George
12	WITS	Self-Amplifying RNA vaccines against <i>hepatitis B virus</i> (abstract 12)	Kristie Bloom
13	UJ	Enhancing Neural Differentiation in 3D Stem Cell Models Using Photobiomodulation: A Tissue Engineering Approach (abstract 13)	Anine Crous
14	WITS	Investigating the association of emotion regulation on substance misuse and sexual risk among South African adolescent boys: Findings from the Tsamaisano study (abstract 14)	Janan Dietrich
15	WITS	Investigating inflammatory mechanisms of increased risk of cardiovascular disease in women living with HIV (abstract 15)	Michael Zulu
16	NWU	Trajectories, Determinants, and Correlates of Mental Health in the PURE-SA Cohort (abstract 16)	Lusilda Schutte
17	UL	Methylation of <i>RARβ2</i> and Expression of <i>MCP-1/VEGF</i> as Prognostic Markers in Black South African Breast Cancer Patients (abstract 17)	Kgomotso Poopedi
EXTRAMURAL POSTDOCTORAL PROGRAMME			
18	TUT	Molecular networking in advancing ethno-pharmacological research of South African medicinal plants (abstract 18)	Efficient Ncube
19	UNIVEN	Early-Life Acquisition of Antimicrobial Resistance in a Rural Sub-Saharan African Community of Low Socio-economic Status: Insights from Infant Gut Resistome (abstract 19)	Justine Fri
20	UNIVEN	Enteric ESKAPE pathogens in a community of low socio-economic status in Limpopo Province, South Africa (abstract 20)	Idris Njange
21	WITS	Development of multivalent adenoviral vector and mRNA vaccines for a heterologous prime-boost strategy against monkeypox virus (MPXV) (abstract 21)	Tiffany Shenay Smith



No.	Institution	Project title	Beneficiary
22	NWU	Socioeconomic Differences in Nutrient Intake, Metabolite Profiles, and Blood Pressure: the African-PREDICT Study (abstract 22)	Michel Strauss-Kruger
23	UP	Functional Characterization of Tumour Biology in HIV and HPV-Associated Cervical Cancer: Insights into the Tumour Microenvironment (abstract 23)	Tebogo Marutha
RESEARCH CAPACITY DEVELOPMENT INITIATIVE – NESTED SCHOLARSHIP			
24	SMU	Dual Electrospray Ionization Mode Metabolomic Profiling Unravels Signature Metabolites of <i>Lippia javanica</i> and <i>Acorus calamus</i> (abstract 24)	Mmamudi Anna Makhafola
25	UNIVEN	Pharmacogenetics Investigation of Adverse Drug Reactions (ADRs) in First-Line anti-Tuberculosis Drugs in the Vhembe district of Limpopo, South Africa (abstract 25)	Rendani Musoliwa
26	UL	Synergistic effects of <i>docetaxel</i> and <i>kaempferol</i> co-treatment induce apoptosis via ROS mediated mitochondrial depolarisation, genotoxicity and G2/M arrest in MDA-MB-231 cells (abstract 26)	Tshwarelo Evidence Mohale
27	UNIVEN	Metabolomic and pharmacogenomic profiling of drug-sensitive and drug-resistant tuberculosis in a South African cohort (abstract 27)	Maphepele Sara Mashilo
28	UL	In vitro modulation of cisplatin-induced oxidative stress and inflammatory response (abstract 28)	Mante Dolly Kgakishe
29	UNIVEN	Application of <i>Anyplex™</i> and <i>Allplex™</i> assays in determining MTB/MDR/NTM patients in the Vhembe district, Limpopo, RSA (abstract 29)	Ntshunxeko Banda
30	UNIVEN	Investigating the risk factors of hypertension among pregnant women in the Limpopo Province (abstract 30)	Thizwilondi Madzaga
RESEARCH CAPACITY DEVELOPMENT INITIATIVE UNITED KINGDOM-STAFF DEVELOPMENT			
31	SMU	Workplace Mental Health Interventions for Academic Staff: A Systematic Review of Effectiveness and Feasibility (abstract 31)	Veena Abraham



No.	Institution	Project title	Beneficiary
32	SMU	Bioelectrical Impedance Vector Analysis in the Stabilisation of Severe Acute Malnutrition: A Pilot Study from Hospitals in the City Of Tshwane Metropolitan Municipality, Gauteng (abstract 32)	Tshegofatso Mogase
33	SMU	Mapping the Landscape of LGBTIQ+ Inclusion in Health Professions Education: A Scoping Review (abstract 33)	Atholl Kleinhans
34	SMU	Towards establishing a framework on decolonizing activity selection training in the occupational therapy curricula in the South African context (abstract 34)	Mahlako Makhubela
STUDENTS USING RCD GRANTS FOR RESEARCH EXPENSES			
35	UJ	The impact of Covid-19 on HIV clinic attendance among people living with HIV in Johannesburg, Gauteng Province: A cross-sectional study (abstract 35)	Ishmael Malatji
36	UJ	Factors associated with parental hesitancy toward Covid-19 vaccination of children aged 5–11 years old at uMzimkhulu Sub-district in KwaZulu Natal Province (abstract 36)	Thandi Ngobe
37	UJ	Dolutegravir-based antiretroviral treatment regimen administration by healthcare workers and associated factors in pregnant and childbearing age women living with HIV in selected KwaZulu-Natal facilities (abstract 37)	Cabangile Mtshali
38	TUT	Assessing Training Needs for The South African Hemp Farmer Industry (abstract 38)	Tshepo Lechaba
39	UJ	Retrospective analysis of factors associated with HIV viral load outcomes amongst patients on antiretroviral therapy in a selected district hospital in Gauteng Province, South Africa (abstract 39)	Sphiwe Mlondolzi
40	UNIVEN	The Association Between Climate Change and Birth Outcomes: A Correlational Study at Musina Hospital in Vhembe District, Limpopo Province (abstract 40)	Rolivhuwa Mudau
41	UJ	Effectiveness of digital tools in improving quality assurance outcomes of rapid HIV testing: A systematic Review (abstract 41)	Amanda A Mohlala



No.	Institution	Project title	Beneficiary
42	UJ	Perspectives of Men Who Have Sex with Men on HIV Testing Interventions in Ghana (abstract 42)	Kofi Atakorah-Yeboah Junior
43	UJ	Perspectives on the Usability and Feasibility of the Key Populations Unique Identifier Codes in South Africa's Routine Health Information Management System (abstract 43)	Mashudu Rampilo
44	UJ	Review of <i>Tenofovir</i> -induced Acute Kidney Injury Detection Methods in Sub-Saharan Africa: A Systematic Review (abstract 44)	KL Polori
45	UJ	Sexually transmitted infections programme evaluation in the primary healthcare facilities in Limpopo Province, South Africa (abstract 45)	Mohlago Ablonia Seloka
46	UNIVEN	Factors associated with condom use among circumcised men in South Africa: Evidence from the 2017 cross-sectional national survey (abstract 46)	Zine Carol Nkambule
47	UL	Investigating the Phytochemistry and Biological Activity of <i>Burkea africana</i> extracts (abstract 47)	Iliassou Mouafon Lah
48	UNIVEN	Integrating Machine Learning in HIV Testing Interventions in Gauteng Province, South Africa: Opportunities, Challenges, and Implementation Strategies (abstract 48)	Jaiteh Musa
49	UL	Prevalence, Transmission Dynamics, and Trends of Sexually Transmitted Infections in Sub-Saharan Africa: A Systematic Review (abstract 49)	Joy Mhlongo
50	UJ	Stakeholder Roles and Views in the Implementation of the Differentiated HIV Treatment Service Delivery Model Among Female Sex Workers in Gauteng Province, South Africa (abstract 50)	Lifutso Motsieloa



No.	Institution	Project title	Beneficiary
51	TUT	Mushroom Cultivation as a Tool for Rural Development in South Africa (abstract 51)	Phatho Ramantswana
52	UJ	Factors affecting the uptake of COVID-19 vaccine amongst people living with HIV at Esselen Clinic in Johannesburg, South Africa (abstract 52)	Melissa Tibatts
53	UJ	HIV Treatment Services among Men who have Sex with Men during Covid-19, Limpopo Province, South Africa (abstract 53)	Sebati, Ramakgahlela
54	UJ	Interventions for the Promotion of Consistent and Correct Use of Condoms with Condom-compatible Lubricants among Men who have Sex with Men in Ghana: A Qualitative Study Among Key Stakeholders (abstract 54)	Ratif Abdulai
55	UJ	Factors associated with sexually transmitted infection literacy among men who have sex with men and transgender people in Soweto: A machine learning approach (abstract 55)	Siyamayambo Claris
56	TUT	Evaluating the effects of Niselo® sorghum probiotic drink on diabetes among mineworkers in the North West and Limpopo provinces of South Africa: A proof-of concept study (abstract 56)	Rethabile Joyce Moshoeshe
57	TUT	Medicinal plant-derived nanoparticles against foodborne pathogens (abstract 57)	Manikandan Gurusamy
58	UJ	Antiretroviral therapy uptake and associated factors during the COVID-19 lockdown period among people living with HIV in a selected district of KwaZulu Natal, South Africa (abstract 58)	Nonhlanhla Princess Manzi
59	UJ	Factors associated with adherence to HIV pre-exposure prophylaxis among young women aged 18-30 years in Alfred Nzo District, Eastern Cape Province of South Africa (abstract 59)	Thabile Khumalo
60	TUT	Fungi-Derived Ingredients in Cosmetics and Skincare (abstract 60)	Khomotso Mmusi



DAY 1 - MONDAY, 20 OCTOBER 2025

08h30 - 09h00	REGISTRATION	
Session 1 Chairperson: Prof Nwabisa Shai	Venue: Pharmacy Building	
09h00 - 09h10	House Keeping: Prof Nwabisa Shai	
09h10 - 09h15	Welcome Address from the SAMRC's RCD Division: Dr Abeda Dawood	
09h15 - 09h25	Welcome Address from Sefako Makgatho Health Sciences University: Prof Tandi Matsha	
09h25 - 09h55	SAMRC President/CEO Address: Prof Ntobeko Ntusi	
09h55 - 10h25	Keynote speaker: Dr Thandi Mgwebi (Group Executive: Business Advancement of The National Research Foundation of South Africa) Partnerships for Impact	
10h25 - 10h45	TEA / COFFEE BREAK	
Session 2 Chairperson: Prof Lawrence Obi	Venue: Pharmacy Building	
10h45 - 11h00	Harnessing big heterogeneous data to evaluate the potential impact of HIV responses among key populations in South Africa: a capacity development endeavor	Prof Refilwe Phaswana-Mafuya /UJ (MCSP)
11h00 - 11h15	ADME polymorphism in tuberculosis from patients in healthcare facilities in the Vhembe District	Prof Afsatou Traore/UNIVEN (RCDI PI)
11h15 - 11h30	Anti-cancer, Anti-diabetic, Anti-Obesity and Anti- inflammatory potential of plant extracts/plant derived compounds	Prof Vusi Mbazima and Kgomotso Poopedi /UL (RCDI PI)
11h30 - 11h45	Use of dialogue to uncover perceptions of the preconception care from women of reproductive age in the sampled districts of Limpopo Province	Prof Thivhulawi Malwela/UNIVEN (RCDI PI)
11h45 - 12h00	Developing nutraceutical products for the management of obesity and diabetes: Evaluating the Effects of the Niselo® Sorghum Probiotic Drink among Mineworkers in South Africa	Prof David Katerere /TUT (MCSP)
12h00 - 12h30	Keynote speaker: Prof Pascal Bessong (Director: SAMRC-UNIVEN Antimicrobial Resistance and Global Health Research Unit) Strategic Research Development in a Resource-Constrained Environment: Engagement with the South African Medical Research Council	
12h30 - 13h00	LUNCH (Poster Presentations)	

Session 3 Parallel Session		Venue: Pharmacy Building				
	Session 3 A Chairperson: Dr Lindokuhle Ndlandla		Session 3 B Chairperson: Dr Kristie Bloom		Session 3 C Chairperson: Prof Mercilene Machisa	
13h00 - 13h15	Metabolomic and Pharmacogenomic profiling of drug- sensitive and drug-resistant Tuberculosis in a South African cohort	Dr Maphepele Sara Mashilo (UNIVEN)	Mapping the Landscape of LGBTIQ+ Inclusion in Health Professions Education	Mr Atholl Kleinhans (SMU)	Evaluating the effects of Niselo® sorghum probiotic drink on diabetes among mineworkers	Ms Rethabile Joyce Moshoeshe (TUT)
13h15 - 13h30	In vitro modulation of cisplatin-induced oxidative stress and inflammatory response	Ms Mante Dolly Kgakishe (UL)	Factors associated with parental hesitancy toward Covid-19 vaccination of children aged 5-11 years old	Ms Thandi Ngobe (UJ)	Perspectives on the Usability and Feasibility of the Key Populations Unique Identifier Codes in South Africa's Routine Health Information Management System.	Mr Mashudu Rampilo (UJ)
13h30 - 13h45	Pharmacogenetics Investigation of Adverse Drug Reactions (ADRs) in First-Line anti-Tuberculosis Drugs in the Vhembe district of Limpopo	Mr Rendani Musoliwa (UNIVEN)	Workplace Mental Health Interventions for Academic Staff: Review of Effectiveness and Feasibility	Ms Veena Abraham (SMU)	Assessing Training Needs for The South African Hemp Farmer Industry	Dr Tshepo Lechaba (TUT)
13h45 - 14h00	Towards establishing a framework on decolonizing activity selection training in the occupational therapy curricula in the South African context	Ms Mahlako Makhubela (SMU)	Dolutegravir-based antiretroviral treatment regimen administration by healthcare workers and associated factors in pregnant and childbearing age women living with HIV	Ms Cabangile Mtshali (UJ)	Review of Tenofovir-induced Acute Kidney Injury Detection Methods in Sub-Saharan Africa	Ms Ketlareng Polori (UJ)
14h00- 14h15	Bioelectrical Impedance Vector Analysis in the Stabilisation of Severe Acute Malnutrition: A Pilot Study from Hospitals in Tshwane	Ms Tshegofatso Mogase (SMU)	The Association Between Climate Change and Birth Outcomes	Ms Rolivhuwa Mudau (UNIVEN)	Investigating the risk factors of hypertension among pregnant women in the Limpopo Province.	Ms Thizwilondi Madzaga (UNIVEN)
14h15 - 14h30	Dual Electrospray Ionization Mode Metabolomic Profiling Unravels Signature Metabolites of <i>Lippia javanica</i> and <i>Acorus calamus</i>	Ms Anna Makhafola (SMU)	A retrospective analysis of factors associated with HIV viral load outcomes amongst patients on antiretroviral therapy	Mr Sphiwe Mlondolozzi (UJ)	Sexually transmitted infections programme evaluation in the primary healthcare facilities in Limpopo Province, South Africa	Ms Mohlago Seloka (UJ)
14h30 - 14h50	TEA / COFFEE BREAK					

Session 4 Parallel Session				
	Session 4 A Chairperson: Prof Janan Dietrich		Session 4 B Chairperson: Dr Michael Zulu	
14h50 - 15h05	Prevalence, Transmission Dynamics, and Trends of Sexually Transmitted Infections in Sub-Saharan Africa: A Systematic Review	Ms Joy Mhlongo (UJ)	Application of Anyplex™ and Allplex™ assays in determining MTB/MDR/ NTM patients in the Vhembe district, Limpopo, RSA	Ms Ntshunxeko Banda (UNIVEN)
15h05 - 15h20	Factors associated with Sexually transmitted infection literacy among men who have sex with men and transgender people in Soweto: A machine learning approach	Dr Claris Siyamayambo (UJ)	Factors associated with condom use among circumcised men in South Africa	Ms Zine Carol Nkambule (UJ)
15h20 - 15h35	Investigating the Phytochemistry and Biological Activity of <i>Burkea africana</i> extracts	Dr Iliassou Mouafon Lah (TUT)	Early-Life Acquisition of Antimicrobial Resistance in a Rural Sub-Saharan African Community of Low Socioeconomic Status: Insights from Infant Gut Resistome	Dr Justine Fri (UNIVEN)
15h35 - 15h50	Medicinal plant-derived nanoparticles against food borne pathogens	Dr Manikandan Gurusamy (TUT)	Socioeconomic Differences in Nutrient Intake, Metabolite Profiles, and Blood Pressure: the African-PREDICT Study	Dr Michel Strauss-Kruger (NWU)
Session 5 Chairperson: Dr Abeda Dawood		Venue: Pharmacy Building		
16h00 - 16h20	Keynote speaker: Will Rohde (Quantahub² AI Frameworks, USA) Transforming Health Research with AI: From Data to Discovery			
16h20 - 16h30	Training health care students on AI content creation: Prof David Katerere (TUT)			
16h30 - 16h40	Closing Remarks: Prof Nwabisa Shai			
17h30	Networking Dinner - Venue: Pharmacy Building, Postgrad Room, Sefako Makgatho Health Sciences University (SMU) Chairpersons: Prof Nwabisa Shai and Prof Lawrence Obi			
	CLOSING OF DAY 1			

DAY 2 - TUESDAY, 21 OCTOBER 2025

Session 1 Chairperson: Prof Lawrence Obi		Venue: Pharmacy Building	
09h00 - 09h05	House Keeping: Prof Nwabisa Shai		
09h05 - 09h20	SAMRC RCD Executive Line Address: Dr Michelle Mulder (SAMRC Executive)		
09h20 - 09h50	Keynote speaker: Prof Keolebogile Motaung (FALF/FREF /NMU) From Curiosity to Impact: My Journey in Science, Innovation, and Leadership		

09h50 - 10h20	Keynote speaker: Prof Johan Louw (Platform Director) Introduction to Centre for Advanced Training and Innovative Research (CATIR)	
10h20 - 10h40	TEA / COFFEE BREAK	
Session 2 A Chairperson: Prof Lawrence Obi	Venue: Pharmacy Building	
10h40 - 10h55	SAMRC RCD Funding Programmes	Dr Abeda Dawood (SAMRC RCD Division Manager)
10h55 - 11h10	SAMRC Extramural Unit Programmes	Dr Refiloe Eunice Zwane (SAMRC VP Office)
11h10 - 11h35	Overview of NRF Rating and NRF Funding Programmes	Dr James Meiring (Director: Reviews and Evaluations at The National Research Foundation of South Africa)
Session 2 B Chairperson: Prof Lusilda Schutte	Venue: Pharmacy Building	
11h35 - 11h50	Safe caesarean birth techniques: protocol for a randomized factorial design clinical trial	Prof Mandisa Singata-Madliki /WITS (MCSP)
11h50 - 12h05	Enhancing the User Experience of a Perioperative Digital Health Tool for Information Exchange with Clinical Service Providers: A Qualitative Observational Study Using a Human-Centered Design Thinking Approach	Prof Hyla Kluyts/SMU (RCDI PI)
12h05 - 12h20	Identification of South African Plant-Based Bioactive Compounds as Potential Inhibitors against the SARS-CoV-2 Receptor	Prof Nqobile Mkolo /SMU (RCDI PI)
12h20 - 12h35	Partnering with the community in the management of childhood illnesses in Limpopo Province, South Africa	Prof Livhuwani Tshivhase /UNISA (RCDI PI)
12h35 - 13h05	LUNCH (Poster Presentations)	
Session 3 Chairperson: Dr Kgomotso Poopedi	Venue: Pharmacy Building	
13h05 - 13h20	Investigating the association of emotion regulation on substance misuse and sexual risk among South African adolescent boys: Findings from the Tsamaisano study	Prof Janan Dietrich /WITS (EIP)
13h20 - 13h35	Investigation of potential viral (HIV) inhibitors from <i>Erythrina caffra</i> : a South African medicinal plant	Prof Xavier Noundou /SMU (RCDI PI)
13h35 - 13h50	Trajectories, Determinants, and Correlates of Mental Health in the PURE-SA Cohort	Prof Lusilda Schutte /NWU (EIP)
13h50 - 14h05	Self- Amplifying RNA Vaccines against Hepatitis B Virus	Dr Kristie Bloom /WITS (EIP)
Session 4 Chairperson: Dr Frederic Nduhirabandi	Venue: Pharmacy Building	
14h10 - 14h25	Understanding the SAMRC legal and contracting process	Mr Goodtime Moja (SAMRC Legal and Compliance Department)
14h25 - 15h20	Understanding the SAMRC financial processes: payment, budget form and management, financial report in line with SAMRC expectations	Mr Philip du Plessis (SAMRC Project Management and Accounting Office)

15h20 - 15h40	Awards	Dr Abeda Dawood, DVC SMU Prof Dini Mawela, and Dr Frederic Nduhirabandi
15h40 - 15h55	Vote of Thanks Closing Remarks	Prof Nwabisa Shai/Organising Committee

CLOSING OF DAY 2

POSTER PRESENTATIONS		
Dr Michael Zulu/ WITS (EIP)	RCD01	Investigating inflammatory mechanisms of increased risk of cardiovascular disease in women living with HIV
Dr Kgomotso Poopedi/ UL (EIP)	RCD02	Methylation of <i>RARβ2</i> and Expression of MCP-1/VEGF as Prognostic Markers in Black South African Breast Cancer Patients
Dr Tiffany Smith/ WITS (Extramural Postdoc)	RCD03	Development of multivalent adenoviral vector and mRNA vaccines for a heterologous prime-boost strategy against monkeypox virus (MPXV)
Dr Tebogo Marutha/ UP (Extramural Postdoc)	RCD04	Functional Characterization of Tumour Biology in HIV and HPV-Associated Cervical Cancer: Insights into the Tumour Microenvironment
Ms Tshwarelo Evidence Mohale/ UL (RCDI Nested)	RCD05	Synergistic effects of docetaxel and kaempferol co-treatment induce apoptosis via ROS mediated mitochondrial depolarisation, genotoxicity and G2/M arrest in MDA-MB-231 cells.
Dr Efficient Ncube /TUT (Extramural Postdoc)	RCD06	Molecular networking in advancing ethno-pharmacological research of South African medicinal plants
Dr Idris Njanje /UNIVEN (Extramural Postdoc)	RCD07	Enteric ESKAPE pathogens in a community of low socio-economic status in Limpopo Province, South Africa
Dr Melissa Tibatts (UJ)	RCD08	Factors affecting the uptake of COVID-19 vaccine amongst people living with HIV at Esselen Clinic in Johannesburg, South Africa
Mr Ishmael Malatji (UJ)	RCD09	The impact of Covid-19 on HIV clinic attendance among people living with HIV in Johannesburg, Gauteng Province: A cross-sectional study
Ms Amanda Mohlala (UJ)	RCD10	Effectiveness of digital tools in improving quality assurance outcomes of rapid HIV testing: A systematic Review
Mr Kofi Atakorah-Yeboah (UJ)	RCD11	Perspectives of Men Who Have Sex with Men on HIV Testing Interventions in Ghana
Mr Musa Jaiteh (UJ)	RCD12	Integrating Machine Learning in HIV Testing Interventions in Gauteng Province, South Africa: Opportunities, Challenges, and Implementation Strategies
Ms Lifutso Motsieloa (UJ)	RCD13	Stakeholder Roles and Views in the Implementation of the Differentiated HIV Treatment Service Delivery Model Among Female Sex Workers in Gauteng Province, South Africa.
Ms Phatho Ramantswana (TUT)	RCD14	Mushroom Cultivation as a Tool for Rural Development in South Africa
Ms Sebati Ramakgahlela (UJ)	RCD15	HIV Treatment Services among Men who have Sex with Men during Covid-19, Limpopo Province, South Africa
Mr Ratif Abdulai (UJ)	RCD16	Interventions for the Promotion of Consistent and Correct Use of Condoms with Condom-compatible Lubricants among Men who have Sex with Men in Ghana: A Qualitative Study Among Key Stakeholders
Ms Nonhlanhla Princess Manzi (UJ)	RCD17	Antiretroviral therapy uptake and associated factors during the COVID-19 lockdown period among people living with HIV in a selected district of KwaZulu Natal, South Africa
Ms Thabile Khumalo (UJ)	RCD18	Factors associated with adherence to HIV pre-exposure prophylaxis among young women aged 18-30 years in Alfred Nzo District, Eastern Cape Province of South Africa
Ms Khomotso Mmusi (TUT)	RCD19	Fungi-Derived Ingredients in Cosmetics and Skincare

Abstracts: Research Capacity Development Initiative – Principal Investigators

1. ADME polymorphism in tuberculosis from patients in healthcare facilities in the Vhembe District

Authors: **Traore AN***, Mashilo MS, Banda NT, Mthembu JNT, Magwalivha M, Musoliwa R, Rikhotso MC, Kachienga LO, Mavumengwana V, Madala NT, Kinnear CJ and Potgieter N.

Authors' affiliation:

Department of Biochemistry and Microbiology, Faculty of Sciences, Engineering & Agriculture, University of Venda, Thohoyandou 0950, South Africa.



Background: Tuberculosis is caused by *Mycobacterium tuberculosis* and is categorized into Multidrug resistance (MDR) and Extensive drug resistance (XDR). Resistance to at least isoniazid and rifampicin is known as MDR TB. XDR TB is resistant to isoniazid and rifampicin and fluoroquinolones, including capreomycin, kanamycin, amikacin. Several studies on drug-resistant tuberculosis have been conducted in South Africa; however, there are limited studies that have reported on the prevalence of DR-TB among patients receiving treatment in the northern region of South Africa.

Methods: A total of 156 patients receiving treatment were enrolled in the study since September 2022 (156 samples each for sputum and blood). A questionnaire was administered to identify the risk factors associated with TB. After pre-treatment with NALC-NaOH, DNA was isolated from sputum samples and Genomic DNA extraction was done using QIAamp® DNA Mini Kit. Detection of resistance was done using the Allplex™ MTB/MDR/XDR PCR assay. NGS was performed to detect SNPs linked to TB susceptibility.

Results: From the 156 patients enrolled in the study, 60% were male, 38% of patients were still TB positive while 6,8% had resistance TB; 21% of the patients had bacterial co-infection and 58% of them were HIV positive. Several risks factors were identified including host factors such as HIV, diabetes, Asthma and hypertension as well as environmental factors such as use of public transport, dusty working environment and sharing of rooms. Additionally, 4 SNPs linked to TNF- α and 10 SNPs linked to ADME were successfully sequenced.

Conclusion: The study found a 6,8% prevalence of resistance and plausible correlation between risk factors, TNF- α , ADME and TB were observed. More studies

investigating the prevalence and the pharmacogenetic aspect in the population are required in the study region of Limpopo.

Keywords: Cytokine, polymorphisms, risk factor, SNPs, TB

2. Investigation of potential viral (HIV) inhibitors from *Erythrina caffra*: a South African medicinal plant

Authors: **Xavier Siwe Noundou** and Bienvenu Tsakem

Authors' affiliation:

Department of Pharmaceutical Sciences, School of Pharmacy,
Sefako Makgatho Health Sciences University, Ga-Rankuwa,
Pretoria, South Africa Background



Background: The natural substances derived from various parts of the medicinal plants, such as leaves, roots, bark, and seeds, have been used in traditional medicine systems across cultures to treat a wide range of ailments. Over time, scientific research has validated the therapeutic potential of many of these compounds, leading to the development of modern pharmaceuticals. This study aimed to search for potential antiviral secondary metabolites from the South African medicinal plant *Erythrina caffra*.

Methods: Stem bark of *E. caffra* underwent an ultrasound-assisted extraction using a mixture of MeOH:CH₂Cl₂ (1:1), whereas the leaves were extracted with ethanol to obtain crude extracts. The extracts were subjected to liquid-liquid extraction to produce the non-polar and polar fractions. Pure compounds were isolated from open column chromatography of the fractions with silica gel and Sephadex. The structures of these compounds were determined with the help of spectroscopy (IR, UV-Vis, NMR) and spectrometry (ESIMS) methods. The cytotoxicity of the samples was performed using resazurin and crystal violet assays.

Results: Fourteen (14) compounds were isolated from the stem barks, while four (4) were obtained from the leaves. These compounds included one unreported cerebroside, one novel acyl stigmaterol glycoside, one ferulate, and one caffeate acyl, three flavonoids, three steroids, two phenolic acids, one triterpenoid, one fatty acid, alcohol, and one carotenoid. The preliminary cytotoxicity tests revealed that the two phenolic acids affected the viability of HaCaT, and NHEM-Ad while the crude extract of the stem barks together with its EtOAc fraction affected the cell viability. Furthermore the carotenoid, lutein equally affected the cell viability.

Conclusion: The isolated compounds from the stem barks of *E. caffra* are promising lead molecules. Our ongoing studies are focusing on the evaluation of the antiviral and anticancer potential of these compounds.

Keywords: *Erythrina caffra*, cerebroside, cytotoxicity, antiviral activities

3. Anti-cancer, Anti-diabetic, Anti-Obesity and Anti- inflammatory potential of plant extracts/plant- derived compounds

Authors: Mohale TE, Ramasenya GW, Kgakishe MD, Kgoadi T, Poopedi KW, Mampuru LJ and **VG Mbazima**

Authors' affiliation

Department of Biochemistry, Microbiology and Biotechnology,
University of Limpopo, Sovenga, 0727, South Africa



Background: Chronic low-grade inflammation is recognized as a significant contributor to various comorbidities, including type 2 diabetes mellitus and breast cancer. In this study, the anti-inflammatory and anti-cancer effects of *Ozoroa paniculosa* leaf water extract and *Momordica balsamina* extracts were investigated in breast cancer models. Specifically, the anti-cancer effects of *O. paniculosa* extract on MDA-MB-231 breast cancer cells in an obesity-mimicking microenvironment were examined, along with the anti-metastatic and nephroprotective properties of *M. balsamina* extracts in triple-negative breast cancer and cisplatin-induced nephrotoxicity models.

Methods: The cytotoxic effects were evaluated on MDA-MB-231 breast cancer cells, 3T3-L1 adipocytes, HEK-293 kidney cells, and RAW 264.7 macrophages using MTT, Muse® Cell Count and Viability, and CCK-8 assays. Cytokine modulation was assessed through cytokine and angiogenesis proteome profiler arrays, as well as ELISA. Anti-migratory, anti-invasive, and adhesion properties were examined using wound healing, transwell, and ECM adhesion assays, along with RT-qPCR and Western blot analyses. Apoptosis, DNA damage, oxidative stress, and nitric oxide production were analyzed by flow cytometry and Western blot.

Results: The results demonstrated that *O. paniculosa* extract selectively inhibited MDA-MB-231 proliferation, downregulated pro-inflammatory cytokines, and suppressed VEGF without affecting cell migration. The *M. balsamina* methanol extract was shown to reduce IL-6-induced metastasis through modulation of JAK2/STAT3/MMP pathways, while the *M. balsamina* aqueous extract was found to inhibit TNF- α secretion and downregulate pro-inflammatory cytokines in RAW 264.7 cells. Furthermore, cisplatin nephrotoxicity was mitigated by *M. balsamina* aqueous

extract through enhancement of antioxidant and anti-inflammatory responses, while the anti-cancer efficacy of cisplatin was maintained in MDA-MB-231 spheroids.

Conclusion: These findings highlight the potential of *O. paniculosa* and *M. balsamina* extracts to be developed as adjunct therapies in breast cancer treatment, warranting further preclinical validation

4. Use of dialogue to uncover perceptions of the preconception care from women of reproductive age in the sampled districts of Limpopo Province

Authors: Ndou NP¹, **Malwela T**¹, Maputle MS¹, Raliphaswa NS¹
Mabasa L³, Samie A²

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³Biomedical Research and Innovation Platform (BRIP), South Africa Medical Research Council, Tygerberg, P.O Box 19070, Cape Town 7505, South Africa



Background: Preconception care perceptions play an important role in determining how widely it is used and the process by which reproductive health care is sought. It is further noted that individual perceptions determine how information is received and utilized. Furthermore, perceptions can motivate women to change their behaviours toward preconception care. This study aimed to use dialogue to uncover the perceptions of women of reproductive age toward preconception care.

Methods: The study settings were clinics and Community Health Centers in the selected districts of Limpopo province. A qualitative exploratory design was used. Nonprobability purposive homogenous sampling was used to sample 51 women aged 19-35. Data was collected through 8 focus group discussions. Open coding was used to analyze qualitative data. Trustworthiness' was ensured through credibility, dependability, transferability, and confirmability. Ethical issues were adhered to.

Results: Data yielded two themes: pre-conception care being perceived as a valuable service and the potential challenges regarding the utilization of pre-conception care.

Conclusion: The results demonstrated that preconception care was viewed as valuable and that it should be prioritised. It is recommended that it is offered to all women of reproductive age.

Keywords: Preconception care, perinatal outcomes, perceptions, women of reproductive age

5. Partnering with the community in the management of childhood illnesses in Limpopo Province, South Africa

Author: Livhuwani Tshivhase^{1,2}

Authors' affiliation: ¹Sefako Makgatho Health Sciences University

²University of South Africa

Background: Despite the significant progress made in containing childhood morbidity and mortality, the attainment of Sustainable Development Goal 3 in sub-Saharan Africa remains challenging. Children under five years of age are reported to be dying in communities before accessing health-care services. Positive health outcomes can be realised through community involvement in the health management of children under five. The study was aimed at strengthening child health outcomes by fostering partnerships between communities and healthcare providers for the effective implementation of the Integrated Management of Childhood Illnesses (IMCI) in the Vhembe District, Limpopo Province.



Methods: A mixed-methods approach was employed, combining quantitative and qualitative data collection. Structured questionnaires were administered to parents and guardians of children under five to assess healthcare-seeking behaviour and knowledge of common childhood illnesses such as pneumonia and diarrhoea. Semi-structured interviews were conducted with professional nurses and parents or guardians to explore their experiences, perceptions, and challenges in implementing IMCI strategies.

Results: Key findings revealed several determinants influencing healthcare-seeking behaviour, including knowledge gaps, accessibility issues, and cultural beliefs. Nurses reported challenges in engaging guardians effectively, while parents and guardians shared both positive and negative experiences with healthcare services. The study also highlighted the importance of community partnerships with stakeholders in enhancing child health, with evidence of collaborative efforts contributing to improved outcomes.

Conclusion: Improving child health requires a holistic approach that includes educating parents and guardians, supporting healthcare providers, and strengthening community involvement. The findings underscore the need for policy makers and the Ministry of Health to prioritize and support community-driven initiatives that promote

child health services. It is recommended that similar studies be conducted in other districts within Limpopo Province to inform broader policy and practice.

6. Enhancing the User Experience of a Perioperative Digital Health Tool for Information Exchange with Clinical Service Providers: A Qualitative Observational Study Using a Human-Centered Design Thinking Approach

Authors: Charlé Steyl¹ Carl Johan Orre² Greg Foster³ Hanel Duvenage⁴ Michelle S Chew^{5,6} **Hyla-Louise Kluyts⁴**

Authors' affiliation:

¹Department of Anesthesiology Sefako Makgatho Health Sciences University, South Africa

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³Department of Information Systems, Rhodes University, South Africa³

⁴Safe Surgery South Africa

⁵Department of Anesthesiology and Critical Care, Biomedical and Clinical Sciences, Linköping University, Sweden

⁶Department of Perioperative Medicine and Intensive Care, Karolinska University Hospital Huddinge



Background: Perioperative patient-reported outcomes (PROs) provide patients with a structured way to share their surgical experiences with healthcare teams. While recognized for their value, PROs are seldom used in clinical practice due to limited evidence of impact on outcomes and clinician uncertainty. Digital tools offer potential for integrating PROs into workflows, but success depends on user-centered design. Safe Surgery South Africa developed the Perioperative Shared Health Record (PSHR), a secure web-based tool for patients to share health information and PROs with anesthetists and surgeons. Early implementation showed low uptake due to user experience challenges. This study explored factors shaping the PSHR user experience in a low- and middle-income country (LMIC) using human-centered design principles.

Methods: An observational qualitative study applied the five stages of design thinking: empathize, define, ideate, prototype, and test. Semi-structured interviews were conducted with postoperative patients in public and private sectors, including those with and without PSHR experience. Thematic analysis followed Braun and Clarke's six-phase framework, structured with Karagianni's Optimized Honeycomb model. A

problem statement guided ideation, and paper prototypes were refined and tested through observation, interviews, and validated usability questionnaires.

Results: Twenty-two patient interviews were conducted; seven had used the PSHR. Patients emphasized the need for connection, feedback, and support through their surgical journey. Lengthy questionnaires were acceptable when perceived as meaningful. Low-fidelity mock-ups evolved into paper prototypes tested with five participants, highlighting trust, communication, and user-friendly design as critical. Feedback loops and clinician engagement were key motivators for sustained use. Usability scores demonstrated excellent usability and high satisfaction across most domains.

Conclusion: Digital tools such as the PSHR can enhance communication and support person-centered perioperative care by embedding PROs into workflows. Human-centered design ensures usability and contextual relevance, offering a pathway to sustainable adoption of digital health interventions in LMICs. Future research should examine clinical integration and impacts on patient-centered outcomes.

7. Identification of South African Plant-Based Bioactive Compounds as Potential Inhibitors against the SARSCoV-2 Receptor

Authors: **Nqobile Monate Mkolo**¹, Clarissa Marcelle Naidoo¹, Rose Kadye², Chikwelu Lawrence Obi¹, Benson Chucks Iweriebor¹, Oyinlola Oluwunmi Olaokun¹, Earl Prinsloo² and Muhammad Sulaiman Zubair³

Authors' affiliation:

¹Department of Biology and Environmental Sciences, Sefako Makgatho Health Sciences University, Pretoria 0204, South Africa

²Department of Biotechnology, Rhodes University, Makhandla 6140, South Africa

³Department of Pharmacy, University of Tadulako, Palu 94118, Indonesia

Background: The expected progress in SARS-CoV-2 vaccinations, as anticipated in 2020 and 2021, has fallen short, exacerbating global disparities due to a lack of universally recognized "safe and effective" vaccines.

This study focuses on extracts of South African medicinal plants, *Artemisia annua* and *Artemisia afra*, to identify metabolomic bioactive compounds inhibiting the binding of the SARS-CoV-2 spike protein to ACE2 receptors.

Methods: The extracts were monitored for cytotoxicity using a resazurin cell viability assay and xCELLigence real-time cell analyzer. The Metabolomics approach for identification and quantification of bioactive compounds was used. Chemical profiling was performed using UPLC-MS/MS, orthogonal projection to latent structures



(OPLS), and evaluated using principle component analysis (PCA) models. Identified bioactive compounds were subjected to in vitro SARS-CoV-2 enzyme inhibition assay using standard methods and docked into the spike (S) glycoprotein of SARS-CoV-2 using Schrodinger® suite followed by molecular dynamics simulation studies.

Results: Cell viability assays revealed non-toxic effects of extracts on HEK293T cells at lower concentrations. Chemical profiling identified 81 bioactive compounds, with compounds like 6''-O-acetylglycitin, 25-hydroxyvitamin D₃- 26,23-lactone, and sesaminol glucoside showing promising binding affinity. Molecular dynamics simulations suggested less stable binding, but in vitro studies demonstrated the ability of these compounds to interfere with SARS-CoV-2 spike protein's binding to the human ACE2 receptor. Sesaminol glucoside emerged as the most effective inhibitor against this interaction.

Conclusion: This study emphasizes the importance of multiplatform metabolite profiling and chemometrics to understand plant extract composition. This finding is of immense significance in terms of unravelling metabolomics bioactive compounds inhibiting the binding of the SARS-CoV-2 spike protein to ACE2 receptors and holds promise for phytotherapeutics against SARS-CoV-2.

Keywords: spike (S) glycoprotein, angiotensin-converting enzyme 2 (ACE2), *Artemisia annua*, *Artemisia afra*, compounds.

Abstracts: Mid-Career Scientist Programme

8. Harnessing big heterogeneous data to evaluate the potential impact of HIV responses among key populations in South Africa: Updates from the Boloka Data Repository

Authors: **RN Phaswana-Mafuya**¹, E Phalane¹, C Siyamayambo¹, B Sebati¹, L Olifant¹, M Seloka¹, M Jaiteh¹, R Ratif¹, Katherine Rucinski³, Amrita Rao³, Kalai Willis³, Li Xiaoming⁴, Banky Olatosi⁴, Stefan D. Baral³

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Background: The Boloka Data Repository project aims to harness big heterogeneous data to evaluate the potential impact of HIV responses among key populations (KP) in South Africa. No specific centralized system to gather and monitor KP data for the purpose of HIV surveillance and programming exists in South Africa. We seek to build a centralized mechanism for collating available HIV-related data and relevant auxiliary data for key populations from 2000 onwards in Sub Saharan Africa.

Methods: Multiple engagement have been conducted with multi-sectoral stakeholders working on HIV and KP related research in South Africa to develop meaningful partnerships, to secure data and store it on the Boloka data repository (stage 1). Different data types of data were harnessed (stage 2), further filtered, screened, and harmonised to enable high quality analyses (stage 3). The collated data is stored on a cloud based repository (stage 4). The established repository will be made accessible for analysis using analytical methods attuned to the structure of the data (stage 5).

Progress to date: Several empiric, contextual, observational, and program datasets have been harnessed including open-access survey data, observational data from key populations' implementation science study, and routine data from the National Department of Health as well as programme data from HIV implementing partners.

More than 50 articles and conference proceedings have been published in peerreviewed journals. There are 30 MPH (14 graduated) and 12 PhD (seven to graduate in Oct 2025) students from designated groups that are directly and indirectly part of the Boloka Project. The work done has been disseminated in various scientific meetings/conferences, webinars and presentations across different institutions and scientific community.

Conclusion: The analyses on the Boloka data repository will improve our understanding of HIV responses among KPs and evaluate progress towards South Africa's National Strategic Plan for HIV, STIs and TB.

9. Developing nutraceutical products for the management of obesity and diabetes: Evaluating the Effects of the Niselo® Sorghum Probiotic Drink on Diabesity Among Mineworkers in South Africa

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The prevalence of diabetes and obesity ("diabesity") among South Africa's mineworkers is a growing public-health concern linked to poor diet, long working hours, and limited access to nutritious foods. The *Niselo® Sorghum Probiotic Drink* was developed as a functional beverage combining indigenous sorghum with probiotic cultures to enhance gut health, metabolic balance, and immunity.

This study forms the core of a broader research programme on nutraceuticals and natural-product innovation under the SAMRC Mid-Career Scientist Programme. Following provisional ethics approval and engagement with the Africa Health Care Group and Mine Health and Safety Council, a 12-week proof-of-concept study will be implemented at two mines in Limpopo and North West provinces. Twenty mineworkers will consume Niselo® daily, with pre- and post-intervention assessments of glucose, lipid profile, anthropometry, and gut microbiome composition.

The project integrates research capacity-building through a PhD student, three interns, and a postdoctoral fellow trained in good clinical practice and laboratory genomics.

The project achieved key milestones including provisional ethics clearance, institutional collaborations, and national exposure through presentations at the

CannaConnect Conference, Zimbabwe International Trade Fair, and National Science Week. Preliminary data and laboratory analyses support Niselo®'s potential to modulate glycaemic and lipid markers.

Spillover projects which have benefited from the MCSP include mushroom cultivation for fungi-derived cosmetic ingredients, bioprospecting of *Burkea africana* for bioactive compounds, and research and training in hemp and cannabis farming, extraction and clinical testing.

Niselo® demonstrates how indigenous crops and probiotics can provide affordable, evidence-based interventions for NCDs while advancing South Africa's bioeconomy, local manufacturing, and SDG 3 goals.

10. Safe caesarean birth techniques: protocol for a randomized factorial design clinical trial

Authors: **Dr Mandisa Singata-Madliki** ^{1,2}, Dr Catherine Mpehle ², Dr Katrin Middleton ², Dr Busiwe Majeke², Ms Elani Muller ¹ and Prof G Justus Hofmeyr ^{1,2}

Authors' affiliation:

¹University of Witwatersrand

²Walter Sisulu University



Background: The rate of Caesarean birth (CB) are increasing globally, with concomitant increase in caesarean morbidity and mortality. Major risks include haemorrhage in the current pregnancy and uterine rupture and placenta accreta spectrum in subsequent pregnancies. CB-related haemorrhage is the only cause of maternal mortality which has increased in recent years in South Africa. CB complications have been identified by The World Health Organisation (WHO) as a major global health problem.

Robust evidence is needed to guide practice. We propose a factorial design randomized feasibility trial to determine feasibility and provide preliminary efficacy data. The two interventions to be tested are: Interrupted versus continuous closure of the uterus and uterine artery clamping during uterotomy repair.

Methods: This is an investigator-initiated, non-commercial, non-regulatory, open label, factorial design randomized clinical trial. Individual randomization will be stratified by site.

Study procedures: Patients due for CB who meet the inclusion criteria will be fully counselled by a trained researcher, and if they agree, will sign informed consent to participate.

Factorial comparison 1. Interrupted versus continuous closure of the uterus: Observational studies report that interrupted suture of the uterus reduces the risk of subsequent scar rupture and placenta accreta spectrum compared with continuous closure. We will compare a reverse figure 8 single layer interrupted suture with continuous closure.

Primary outcome: Ultrasound-diagnosed scar defect or haematoma on discharge from hospital, assessed blind to group allocation.

Factorial comparison 2: Uterine artery clamping during uterotomy repair: Two small randomized studies have shown a reduction in blood loss with clamping of the uterine arteries after birth of the baby. If these findings are confirmed in a robust randomized trial, this simple innovation could impact CB blood loss on a large scale. The control will be routine CB technique without uterine artery clamping

Primary outcome: Measured intraoperative blood loss >500ml

Sample size: 400

SANCTR registration: DOH-27-07-2025-7444.

Abstracts: Early Investigators Programme

11. Evaluation of anticancer potential of nano-formulation of plant-based photosensitizers against Breast and Lung cancer cells

Authors: **Blassan P. George**, Paromita Sarbadhikary, Kave Moloudi, Mehak Zahra, Issac Baidoo and Heidi Abrahamse

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Background: Berberine (BBR) and Pheophorbide a (PPBa) are effective photosensitizers (PSs) for Photodynamic treatment (PDT) of cancer, but their preclinical and clinical application is limited by poor water solubility and low bioavailability. To overcome these challenges, this study employed different nanoformulations as a co-delivery platform to enhance drug delivery and treatment effectiveness in cancer therapy.

Methods: This study explores the synthesis and evaluation of green-synthesized gold nanoparticle–liposome hybrid system as a novel extract encapsulating PPBa (AuNPs-LIP-PPBa), against MDA-MB-231 triple-negative breast cancer cells. Characterization by UV-Vis, FTIR, HR-TEM, SEM, and EDS confirmed successful formulation and stability. In vitro studies revealed IC₅₀ values of 0.30 µg/mL (PPBa), 92 µg/mL (AuNPs), and 10 µg/mL (AuNPs-LIP-PPBa), with enhanced ROS generation, mitochondrial disruption, and both intrinsic/extrinsic apoptosis upon 660 nm laser irradiation. Additionally, BBR-loaded green silver nanoparticles (BBR-Green AgNPs), biosynthesized using *Senna didymobotrya*, showed dual-functionality in MCF-7 breast cancer cells.

Results: Characterization indicated successful BBR conjugation with colloidal stability in biological media. PDT at 470 nm at a light dose of 5 J/cm² showed enhanced cytotoxicity (IC₅₀ = 1.35 µg/mL) and morphological damage, confirming photo-activated efficacy. Further, two liposomal nanocomplexes, Lipo@AuNPs@BBR and Lipo@AuNPs@PPBa, were synthesized via thin-film hydration for PDT in A549 spheroid (3D) lung cancer cells. Characterization confirmed successful co-loading of AuNPs and PSs in respective nanoparticles. Post-PDT (15 J/cm²), both nanocomplexes significantly reduced ATP, increased LDH, and induced apoptosis (IC₅₀ = 80 µg/mL for BBR; 60 µg/mL for PPBa). Early and late apoptosis rates reached 56.4% and 21.4% (BBR) and 40.7% and 17.7% (PPBa), respectively. Gene and protein

expression analysis confirmed upregulation of apoptotic markers including BAX, cytochrome c, and p53.

Conclusion: These findings underscore the potential of green-synthesized metallic nanoparticles, liposome-based nanocarriers in improving PDT outcomes through targeted delivery, enhanced ROS generation, and modulation of apoptosis. The biocompatibility, photostability, and efficacy of these formulations support their future application in preclinical cancer therapy.

12. Self-amplifying RNA vaccines against hepatitis B virus

Authors: Samudh, N., Kairuz, D., Neves, K., Ely, A., Arbuthnot, P.,
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Background: Vaccination against Hepatitis B virus (HBV) remains the most effective means of preventing infection. However, currently available subunit vaccines targeting the small surface antigen (SHBsAg) fail to elicit protective antibodies in certain individuals. In addition, subunit vaccines are ineffective at eliciting Th1 cytotoxic immune responses which are required for eradication of intracellular pathogens should the humoral immune response fail to prevent infection.

The aim of this project was to develop more immunogenic vaccines against HBV by targeting the large surface antigen (LHBsAg) and using the self-amplifying RNA (saRNA)-based vaccine platform to elicit both Th1 and Th2 type immune responses.

Methods: SaRNAs encoding SHBsAg or LHBsAg were synthesized by in vitro transcription. Expression of antigen was confirmed by transfection of cells and enzyme-linked immunosorbent assay (ELISA). BALB/c mice received either 1 or 5 micrograms of saRNAs formulated with ionisable lipid nanoparticles, or a commercially available subunit vaccine, administered intramuscularly as a 4 week prime-boost regimen. Humoral immune responses were examined by HBV neutralisation assays and antibody subtype ELISAs. Antigen-specific T-cell responses were measured using a bead-based multiplex assay and intracellular cytokine staining of HBV-peptide stimulated splenocytes.

Results: SHBsAg was expressed and secreted from transfected cells, however, LHBsAg was expressed but retained intracellularly. Both candidate vaccines elicited



neutralising antibodies comparable to the subunit vaccine however saRNA-based vaccines elicited balanced amounts of IgG1 and IgG2a type antibodies whereas the subunit vaccine elicited predominantly IgG1 type antibodies. Both candidate vaccines elicited HBV-specific cytotoxic T-cell responses and cytokines involved in cell-mediated immune responses which were not observed in mice that received the subunit vaccine.

Conclusion: saRNA-based HBV vaccines provide enhanced humoral and cellular immunity against infection, with possible therapeutic applications. Inducing secretion of LHBsAg by incorporation of a signal peptide may elicit improved immune responses and is currently being investigated.

13. Enhancing Neural Differentiation in 3D Stem Cell Models Using Photobiomodulation: A Tissue Engineering Approach

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Africa



Background: Embryoid bodies (EBs) and neurospheres are critical three-dimensional (3D) aggregates that function as fundamental models in tissue engineering and regenerative medicine. These structures replicate early embryonic development and are essential for differentiating stem cells into neuronal lineages. Nonetheless, existing in vitro differentiation methodologies necessitate more enhancement to augment efficiency and reproducibility. Photobiomodulation (PBM), a non-invasive light therapy, has emerged as a viable approach to augment stem cell proliferation, differentiation, and mitochondrial function.

Methods: This work examined the impact of photobiomodulation (PBM) at 825 nm and 525 nm wavelengths at fluences of 5 and 10 J/cm² on the differentiation of immortalised adipose-derived stem cells (iADSCs) into neural embryoid bodies (NEBs) and neurospheres in a three-dimensional culture system. Morphological evaluation, viability assays, metabolic profiling (LDH, ATP, ROS), and gene/protein expression of brain and stem cell markers were conducted.

Results: PBM at 825 nm with 10 J/cm² markedly augmented NEB size, viability, and proliferation, concurrently diminishing cytotoxicity. CD44 and SOX2 were elevated early in all treatment groups, signifying maintained stemness. The neural precursor

marker Nestin and the intermediate filament protein GFAP exhibited significant expression at 825 nm with an energy density of 10 J/cm², whereas neuronal development was validated by the increasing expression of NeuN and β -Tubulin III. PBM also influenced mitochondrial function, resulting in elevated ATP during initial proliferation stages and steady ROS levels, indicating enhanced cellular resilience without oxidative stress.

Conclusion: These findings underscore the effects of PBM on neuronal differentiation, which is dependent on wavelength and fluence, hence affirming its promise as an effective instrument in neural tissue engineering for regenerative therapies.

Keywords: Photobiomodulation (PBM); Neural differentiation; Adipose-derived stem cells (ADSCs); 3D cell culture; Tissue engineering

14. Investigating the association of emotion regulation on substance misuse and sexual risk among South African adolescent boys: Findings from the Tsamaisano study

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Background: Emotion regulation, which is the ability to manage emotions, supports resilience and healthy relationships, and reduces mental health risks. Adolescence is critical for developing emotion regulation skills, amid identity development and social stress. However, most research in African contexts overlooks emotion regulation processes among adolescent boys. We investigated emotion regulation and its association with risk behaviours among adolescent boys including persons living with HIV (PLHIV), in Soweto.

Methods: Tsamaisano was a longitudinal study (2020-2023) exploring links between violence and HIV risk among adolescent boys. Participants completed weekly mobile phone surveys and in-clinic surveys at baseline and one-year follow-up. Measures included Bandy and Moore's Self-Regulation Questionnaire to assess emotion regulation, the CRAFFT screening tool to evaluate substance misuse, and questions on sexual risk behaviours, including condom use, multiple sexual partners, and engagement in risky sex. Analyses used logistic regression for cross-sectional associations and generalized linear mixed models for longitudinal associations of emotional regulation, controlling for age and HIV status.

Results: From the analytic sample (n=488), the mean age was 16.5 years, with 50.2% (n=245) living with HIV. Emotional regulation scores did not differ by HIV status. Higher emotion regulation was associated with reduced odds of substance misuse at baseline (OR=0.72, 95% CI: 0.59–0.88) and follow-up (OR=0.55, 95% CI: 0.44–0.68). At follow-up, emotion regulation predicted greater odds of condom use (OR=1.46 at last sex; OR=1.89 consistently) and reduced odds of multiple partners (OR=0.74) and risky sex (OR=0.75). Baseline emotion regulation predicted lower odds of sexual activity (OR=0.72) and higher odds of condom use (OR=1.39) over the study year.

Conclusion: These findings show that emotion regulation is a critical protective factor for healthy coping behaviours among adolescent boys in high-risk contexts. Emotional regulation is vital for improving mental health and well-being while reducing risk among vulnerable groups.

Keywords: Emotion regulation, mental health, boys and men, HIV/AIDS, sexual and reproductive health, South Africa

15. Investigating inflammatory mechanisms of increased risk of cardiovascular disease in women living with HIV

Authors: Koketso C. Mabatha¹, Noluthando Mdlalose¹, Marguerite Adriaanse^{2,3}, Natasha Taylor-Meyer^{2,3}, Sango Skelem^{2,3}, Wendy A. Burgers^{1,4}, Ntobeko, A.B. Ntusi^{2,3} & **Michael Z. Zuluz**^{4,5, #}

Authors' affiliation:

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Background: Women living with HIV are at higher risk of heart failure and sudden cardiac death. Damage to the heart takes the form of myocardial fibrosis and steatosis, characterized by collagen and fat deposition in the myocardium. Dendritic

cells, monocytes, and monocyte-derived macrophages play critical functions in the immune response to infections, homeostasis, and tissue repair. Consequently, disruption to their function may be linked to cardiovascular disease (CVD), since myeloid cells regulate extracellular matrix turnover, disruption of which leads to the accumulation of collagen and other extracellular matrix proteins in the myocardium. It is not yet clear how this may alter monocytes and macrophages in the cardiovascular system (CVS). The impact of chronic, Human Immunodeficiency Virus (HIV) infection and antiretroviral therapy (ART) on myeloid cell subsets is yet to be fully elucidated in women with HIV (WWH). Moreover, our understanding of the interplay between HIV infection, ART, and aging remains limited.

Methods: Our work is aimed at addressing this knowledge gap by performing targeted multi-dimensional analyses using blood and purified monocytes from women with chronic, treated HIV infection over the age of 35 years compared to their age and sex-matched, HIV-uninfected controls.

We hypothesize that myeloid cell dysregulation during chronic, treated HIV infection is associated with a higher risk of CVD in the later years of life.

Results: Therefore, we are designing and optimizing a multicolor flow cytometry panel to elucidate longitudinal phenotypic and functional changes in myeloid cell subsets. We will integrate these changes in myeloid cell subsets with changes in circulating immune mediators to better understand the etiology of myocardial fibrosis and steatosis in WWH. We expect to observe aberrations in myeloid cell phenotype, function and inflammatory mediators in WWH compared to uninfected, controls.

Conclusion: This work will identify potential targets for interventions to improve health outcomes in WWH.

16. Trajectories, Determinants, and Correlates of Mental Health in the PURE-SA Cohort

Title: Trajectories, Determinants, and Correlates of Mental Health in the PURE-SA Cohort

Authors: Schutte, L & Wissing, MP

Authors' affiliation:

Africa Unit for Transdisciplinary Health Research (AUTHeR), Faculty of Health Sciences, North-West University



Mental health poses a persistent challenge for individuals, families, and communities, and creates a major economic burden for countries, particularly in low-resource settings. To understand the development and impact of mental (ill-) health over the

lifespan and to develop strategically targeted prevention strategies, insight can be gained from rigorous interdisciplinary longitudinal epidemiological studies. To this end, the overarching aim of this study was to examine the mental health (from mental illness to psychosocial well-being) of ageing adults in low-resource South African settings in terms of prevalence, trajectories, social determinants, and physical health correlates. Specifically, this project added a mental health leg to the final wave of the South African arm of the multi-country, longitudinal Prospective Urban and Rural Epidemiology study (PURE-SA). Adult participants from four sites in South Africa responded to Setswana or IsiXhosa versions of questionnaires on stress, depression, anxiety, cognition, and psychosocial well-being. At the same time, data were gathered in the core PURE-SA project on various social and economic determinants and physical health. Findings include that several of the Setswana and IsiXhosa translations of the mental health and well-being instruments displayed good psychometric properties, supporting the use of the scales. The prevalence of depression and anxiety was very high based on data from screening tools, which echoed the concerns raised by community members and healthcare workers in our preparatory community engagement work. Mental health showed significant associations with both physical health and social determinants of health. Overall, the study highlights the prominence of mental health problems in the communities, but at the same time shows the presence of well-being and resilience despite challenging environments. Findings underscore the need for multi-, inter- and transdisciplinary approaches to studying and promoting health and mental health.

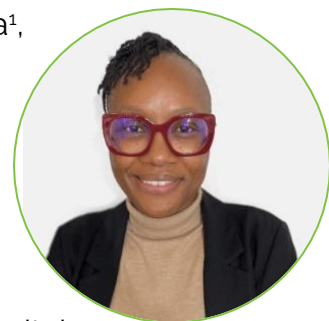
17. Methylation of RAR β 2 and Expression of MCP-1/VEGF as Prognostic Markers in Black South African Breast Cancer Patients

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Background: Monochemoattractant protein -1 (MCP-1) and vascular endothelial growth factor (VEGF) drive breast cancer progression and metastasis. Despite their

recognised roles, evidence on their biomarker potential in African populations remains scarce. This study aimed to quantify plasma MCP-1 and VEGF levels in breast cancer patients and assess their clinical utility as biomarkers.

Methods: A total of 45 samples were involved comprising of 5 healthy aged matched samples, 16 pre-chemotherapy and 24 post-chemotherapy samples. Samples were prospectively collected from five districts in Limpopo province, South Africa. Plasma levels of monocyte chemoattractant protein-1 (MCP-1) and vascular endothelial growth factor (VEGF) were determined by Luminex multiplex technology.

Results: The plasma levels of MCP-1 and VEGF were found to be significantly higher in the pre-treatment group than those in the patients with healthy group (MCP-1, $P < 0.001$; VEGF, $P < 0.0001$). Compared with the pre-chemotherapy group, the plasma levels of MCP-1 and VEGF in the post-chemotherapy group were significantly decreased (MCP-1, $P < 0.0001$; VEGF, $P < 0.0001$).

Conclusion: These findings suggest that MCP-1 and VEGF may serve as potential diagnostic and prognostic biomarkers for breast cancer in this population, warranting further validation in larger cohorts.

Keywords: Breast cancer, Luminex, MCP-1, VEGF, South Africa

Abstracts: Extramural Postdoctoral Programme

18. Molecular networking in advancing ethno-pharmacological research of South African medicinal plants

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Background: Molecular networking (MN) has emerged as a transformative approach in pharmacognosy, enabling comprehensive metabolite annotation and structural relationship mapping that overcomes limitations of conventional phytochemical techniques. This study addresses critical research gaps in three ethnomedicinally significant South African species: *Entada elephantina* traditionally used for gastrointestinal disorders and diabetes, *Oncosiphon* spp. employed against pneumonia and wound infections, and *Cissampelos capensis* valued for therapeutic applications of the central nervous system.

Methods: The study had three primary objectives: (i) determining intra- and inter-population chemotypic variation in *C. capensis* across geographical origins (Eastern vs. Western Cape) and plant parts (leaves vs. rhizomes), respectively; (ii) mapping diverse chemical classes in *E. elephantina* rhizome methanol extracts; and (iii) identifying antimicrobial bioactive compounds and species-specific chemotypic markers (flavonoids, sesquiterpenes, phenolic acids) for three *Oncosiphon* spp (aerial parts). UPLC-QToF-MS data from acid-base extracts (1 mg/mL) of *C. capensis* and methanol extracts (5 mg/mL) of *E. elephantina* and *Oncosiphon* spp. were processed to generate GNPS-based MN, complemented by antimicrobial assays (broth microdilution) and chemometrics (PCA, PLS-DA).

Results: For *C. capensis*, results revealed distinct chemotypes, with bisbenzylisoquinoline alkaloids dominating rhizomes in contrast to aporphine/proaporphine alkaloids in leaves, alongside clear provincial differentiation. In *E. elephantina*, molecular networking classified 39 metabolites as galloylated proanthocyanidin polymers and flavonoid glycosides, significantly expanding its

known phytochemical diversity. For *Oncosiphon* species, we identified: *O. suffruticosus* (flavonoid glycosides, e.g., kaempferol-3-O-rutinoside), *O. grandiflorus* (germacranolide sesquiterpenes), and *O. africanus* (phenolic acid derivatives) as chemotypic markers, with demonstrated antimicrobial activity (MICs: 2–8 mg/mL) against *Staphylococcus aureus* and *Streptococcus pyogenes*. This integrated approach demonstrates the ability of MN to: (1) classify phytochemicals; (2) facilitate species-specific marker discovery; and (3) directly link compounds to bioactivity.

Conclusion: The findings provide a robust framework for validating traditional uses and guiding drug discovery from these medicinal plants.

19. Early-Life Acquisition of Antimicrobial Resistance in a Rural Sub-Saharan African Community of Low Socioeconomic Status: Insights from Infant Gut Resistome

Authors: **Justine Fri**¹, Ompilela Netshivhazwaulu¹, Tendani Kutama¹, Pascal Bessong^{1,2}

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²Center for Global Health Equity, University of Virginia, USA.



Background: Antimicrobial resistance (AMR) is a major global health threat, yet prospective community-level data from rural sub-Saharan Africa remain scarce. *Escherichia coli*, a WHO-designated AMR priority organism, can be used as a proxy to study enteric bacterial AMR because it causes multiple infections requiring antibiotics, is less fastidious, and exhibits geographically variable resistance patterns. This study aims to characterise the infant enteric resistome in early life and to examine the influence of gut microbiota and potential drivers using *E. coli* as a proxy.

Methods: Infant–mother dyads are enrolled within 17 days of birth. Monthly infant stool samples and breast milk are collected, alongside metadata, prospectively. Stool samples undergo metagenomic analysis, and breast milk is analysed via LC-MS metabolomics. *E. coli* isolates are tested for phenotypic antibiotic resistance to guide therapeutic options.

Results: Preliminary analysis of 82 infant stool metagenomes from baseline and months 1–3 showed the abundance of gut resistome as early as the first weeks of life; however, differences between timepoints were not significant ($p > 0.05$). The total gut

resistome was dominated by ARGs encoding beta-lactams, followed by antibiotic-efflux and tetracyclines; this pattern was similar for the *E. coli* resistome.

Phenotypic profiles of *E. coli* isolated from infants at baseline revealed high resistance to ceftriaxone and cefotaxime (77.1% each), followed by aztreonam (74.3%), cefepime (68.6%), and trimethoprim-sulfamethoxazole (65.7%). Resistance to cefoxitin and ciprofloxacin was 48.6%, while gentamicin (40.0%), ertapenem (34.3%), and ESBL positivity (31.4%) were lower. In mothers, resistance proportions were similar for trimethoprim-sulfamethoxazole (65.7%), ertapenem (34.3%), and gentamicin (37.1% vs. 40.0%). Significantly higher resistance in children was observed only for aztreonam (74.3% vs. 60.0%, $p = 0.049$) and ceftriaxone (77.1% vs. 48.6%, $p = 0.026$). LC-MS metabolomics revealed 20 antibiotics in breast milk, spanning seven antibiotic classes.

Conclusion: Findings indicate early-life acquisition of AMR in communities of low socioeconomic status with high resistance to key beta-lactams and detectable antibiotic residues in breast milk.

20. Enteric ESKAPE pathogens in a community of low socio-economic status in Limpopo Province, South Africa

Authors: Idris Njanje¹, Adivhaho Semethi¹, Flody Muofhe¹, Justine Fri¹, Pascal Bessong^{1,2}

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Background: Antimicrobial resistance (AMR) is a critical global health threat, with low- and middle-income countries, including South Africa, facing greater challenges due to limited surveillance and intervention. Vulnerable communities of low socio-economic status are particularly at risk. While limited data exists on clinical ESKAPE pathogens (*Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter* spp.), community-level resistance remains understudied. This study aims to address this gap by investigating the prevalence and resistance profiles of enteric ESKAPE pathogens in a prospective mother-child cohort in Limpopo Province.

Methods: A longitudinal study is being conducted in Dzimauli, a low-income community in Limpopo, South Africa. Stool samples from 167 mothers-infant pairs are collected over 24 months to assess colonization and potential horizontal transmission of ESKAPE pathogens. Metagenomic sequencing is used to screen resistomes and guide target organism selection. Culture-based isolation and phenotypic antibiotic susceptibility testing are performed, followed by wholegenome sequencing of resistant isolates. Demographic and environmental data are integrated to identify risk factors for colonization and resistance.

Results and Discussion: Preliminary metagenomic analysis of 19 infant stool samples identified *Enterococcus faecium* and *Klebsiella pneumoniae* as the most abundant among ESKAPE pathogens, prompting their selection for further study. To date, 84 maternal and 167 infant stool samples have been processed, yielding 252 and 212 *E. faecium* isolates, and 50 and 97 *K. pneumoniae* isolates, respectively. Ongoing analyses include isolate confirmation, antibiotic susceptibility testing, and genomic characterization of antimicrobial resistance. Correlational studies integrating demographic and environmental data are also underway and will be reported. These initial findings offer valuable insight into early-life colonization and the potential for resistance transmission within a vulnerable community.

Conclusion: This study offers an important window into community-level AMR, highlighting early colonization by resistant ESKAPE pathogens in both mothers and infants. The findings will inform surveillance strategies and targeted interventions to curb the spread of AMR in resource-limited settings.

21. Development of multivalent adenoviral vector and mRNA vaccines for a heterologous prime-boost strategy against monkeypox virus (MPXV)

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(IDORI), School of Pathology, Faculty of Health Sciences, University of the Witwatersrand, Parktown 2193, South Africa

Background: Monkeypox virus (MPXV) is the causative agent of monkeypox disease (Mpox). In Africa alone, nearly 1,600 deaths were recorded between 2022 and 2024.

Currently, there are no Mpox-specific vaccines available and existing vaccinia virus-derived vaccines are only mildly effective against MPXV infection. The success of adenoviral vector (AdV) and mRNA vaccine platforms during the COVID-19 pandemic, demonstrated notable protection against infection. This highlighted their potential for safe and effective administration. AdV platforms offer large transgene capacity, high transduction efficiency and are also exceptionally thermostable, alleviating logistical constraints in low-resource settings. mRNA platforms boast ease of production, dosage control and efficient packaging into lipid nanoparticles (LNPs). AdV have not been explored for Mpox vaccine development; however, vaccines comprising LNP-encapsulated MPXV antigens-encoding mRNA have been developed and are progressing to clinical trials. Commercially available LNPs are expensive and inherently accumulate in the liver, which may result in unwanted toxicity.

Methods: To address this, our study incorporates novel, bio-renewable LNPs for safe and efficient delivery of mRNA. Immunogenic MPXV antigens-encoding B6, A35, H3, M1, and A29 have been selected and are currently being cloned into viral and mRNA expression vectors for vaccine development. Antigen expression will be characterised in cell culture by immunocytochemistry and western blot analysis. Subsequent immunogenicity studies will be conducted in murine models. A heterologous prime-boost regimen will be implemented with AdV priming followed by mRNA boosting. Viral vectors induce stronger cellular immunity, but weaker humoral response compared to mRNA vaccines. Therefore, by combining these platforms, we intend to provide a more robust immune response.

Conclusion: We anticipate that the heterologous combination vaccine will elicit strong humoral and cellular immune responses, offering a promising approach for Mpox prevention.

22. Socioeconomic Differences in Nutrient Intake, Metabolite Profiles, and Blood Pressure: the African-PREDICT Study

Authors: **Michél Strauss-Kruger** ^{1,2}, Marlien Pieters ^{2,3}, Tertie van Zyl ^{2,3}, Lebo F Gafane-Matemanie ^{1,2}, Adriaan Jacobs ^{1,2}, Esmé Jansen van Vuren ^{1,2}, Roan Louw ⁴, Carina Mels ^{1,2}

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Background: Socioeconomic status (SES) is fundamental in lifestyle behaviours and consequently health status. Food availability, accessibility, affordability, culture, social norms and desirability shape individual and population food consumption, and thereby the food metabolome. Dietary habits may contribute to the susceptibility of elevated blood pressure (BP). This study determined if dietary nutrient intakes outlined in hypertension management guidelines differed between SES groups and were related to BP. Data of 479 Black and 503 White participants (aged 20-30 years) from the African-PREDICT study were analysed. Nutrient intakes were determined using 24-hr dietary recalls. Twenty-four-hour BP was measured. Metabolites were analysed in spot urine using liquid chromatography-tandem mass spectrometry.

Results: Black participants within the low SES group consumed more plant protein than participants in the high SES group but had lower potassium excretion ($p < 0.05$). Neither plant protein intake nor potassium excretion were related to BP. Waist circumference, which increased with higher SES, was positively associated with BP. In White participants, the low SES group had lower total protein, animal protein, total fat, and saturated fat intake than participants in the high SES group. Total protein (Std $\beta = 0.104$), animal protein (Std $\beta = 0.077$), total fat (Std $\beta = 0.114$), and saturated fat (Std $\beta = 0.121$) were associated with 24-hr SBP (all $p < 0.05$), and waist circumference – the main predictor of 24-hr SBP. Additionally, animal protein was related to glycine (Std $\beta = -0.189$) and proline (Std $\beta = -0.137$), which in turn were inversely associated with BP.

Conclusion: Our study supports the notion of maintaining a healthy body weight to preserve BP. Emphasising this guideline among Black participants, particularly those from a high SES, may be an effective strategy for maintaining a healthy BP. In White participants, the consumption of lean proteins and unsaturated fatty acids should be promoted. Nutrient intakes of White adults from different SES groups are associated with metabolites linked to cardiovascular health.

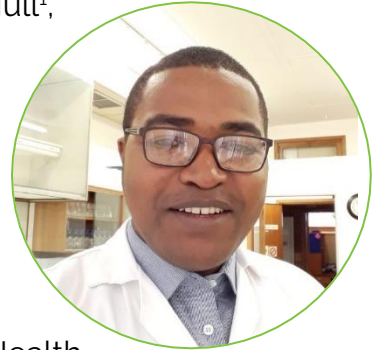
23. Functional Characterization of Tumour Biology in HIV and HPV-Associated Cervical Cancer: Insights into the Tumour Microenvironment

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Background: Cervical cancer remains a major public health burden in sub-Saharan Africa, particularly among women co-infected with Human Immunodeficiency Virus (HIV) and high-risk Human Papillomavirus (HPV) strains. HIV-associated immunosuppression accelerates HPV persistence and oncogenic progression, leading to more aggressive disease and poorer clinical outcomes. Despite this, the functional and spatial dynamics of the tumour microenvironment (TME) in HIV- and HPV-associated cervical cancer are not well characterised.

This forthcoming study will investigate the immune, stromal, and metabolic components of the TME in cervical cancer tissues stratified by HIV and HPV status.

Methods: Access to archived formalin-fixed paraffin embedded (FFPE) samples from a national pathology service is being processed, and experimental work will commence once approvals are secured. The TissueFax Digital Pathology Imaging System will be employed to generate high-resolution digital images for detailed morphological and phenotypic assessment. Complementary approaches, including Tissue Microarray (TMA), Spatial Mass Spectrometry (MS), and Multiplex Immunofluorescence (mIF), will provide spatially resolved molecular and cellular data (Once access is finalized with collaborators). Artificial intelligence-based digital pathology tools will be used to quantify biomarker expression and cellular interactions, enabling integrated molecular-spatial analysis of the tumour ecosystem.

Conclusion: By elucidating the structural and functional heterogeneity of the TME, this research aims to uncover novel biomarkers and immune evasion mechanisms that contribute to disease progression in HIV- and HPV associated cervical cancer. The findings are expected to inform the development of targeted therapies and precision oncology strategies tailored to high-burden, resource-limited settings.

Ultimately, the study seeks to advance understanding of cervical cancer pathogenesis in the context of co-infection and to contribute to reducing disparities in cancer outcomes.

Abstracts: RCDI-Nested Scholarship Programme

24. Title: Dual Electrospray Ionization Mode Metabolomic Profiling Unravels Signature Metabolites of *Lippia javanica* and *Acorus calamus*

Authors: **MA Makhafola**¹, NM Mkolo¹, CL Obi ¹, BC Iweriedor ¹, CM Naidoo¹, OO Olaokun¹, E Prinsloo² and MS Zubair³

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²Department of Biotechnology, Rhodes University, South Africa,

³Department of Pharmacy, University of Tadulako, Indonesia.



Background: Medicinal plants such as *Lippia javanica* and *Acorus calamus* are commonly used in traditional medicine; however, their metabolic signatures and safety profiles are not well understood. Although metabolomics has enhanced phytochemical analysis, few researchers use dual electrospray ionisation (ESI⁺/ESI⁻) modalities to understand metabolite diversity. This study fills this gap by using dual ESI metabolomics to identify species-specific metabolic networks and connect them with cytotoxicity, bridging phytochemical analysis and biosafety evaluation.

Methods: Metabolomic profiling was performed using UPLC-MS in both ESI⁺ and ESI⁻ modes to capture complementary metabolites. The resazurin cell viability assay was used to determine cytotoxicity in HEK293T cells. Therapeutic safety margins were evaluated using dose-response curves ranging from 7.81 to 250 µg/mL. Multivariate statistics distinguished metabolic fingerprints between species and ionisation mechanisms.

Results: Dual ESI metabolomics revealed diverse species-detailed patterns, where ESI⁺ mode highlighted primary metabolites such as amino acids, lipids, nucleotides in both *Lippia javanica* and *Acorus calamus*, while ESI⁻ favourably detected secondary metabolites (phenolic/flavonoid derivatives). Cytotoxicity assays confirmed dose-dependent viability reduction (>125 µg/mL), with *Acorus calamus* displaying higher

sensitivity (62.5 µg/mL in fluorescence assays). Both plants retained >80% viability at lower doses (7.81–31.25 µg/mL), suggesting therapeutic applicability.

Conclusion: This study highlights the effectiveness of dual ESI metabolomics in identifying metabolites in medicinal plants. By combining ionization-mode-specific detection with cytotoxicity screening, we propose an ideal approach for prioritising phytochemicals with therapeutic potential while minimising toxicity risks. These findings call for standardised metabolomic approaches in ethnopharmacology to improve plant-based drug discovery and traditional medicine validation.

25. Pharmacogenetics Investigation of Adverse Drug Reactions (ADRs) in First-Line anti-Tuberculosis Drugs in the Vhembe district of Limpopo, South Africa

Authors: **Musoliwa Rendani**, NE Madala, N Potgieter, AN Traore

Authors' affiliation: University of Venda

Background: Tuberculosis (TB) remains a significant health challenge in South Africa, particularly in rural areas where adverse drug reactions (ADRs) and co-infections may compromise treatment success. This study assessed TB trends, treatment outcomes, the prevalence of ADRs, and the role of genetic variations in ADR development among patients on first-line TB therapy in the Vhembe District, Limpopo Province.



Methods: A mixed-methods design was used. Phase one involved a retrospective review of 562 TB cases from six clinics (2018–2023) to assess demographic patterns, HIV status, treatment outcomes, and TB prevalence. Phase two recruited 44 TB patients on first-line treatment. Participants were interviewed on ADR experiences, clinic reporting, and treatment adherence. Urine samples were analysed for bilirubin and other metabolites. Blood samples from 15 participants were genotyped using Mass ARRAY to explore associations between single-nucleotide polymorphisms (SNPs) and ADRs.

Results: TB treatment prevalence increased from 73.2% in 2018 to 77.4% in 2023, while poor outcomes declined from 26.7% to 22.6%. Among the 44 participants, 79.5% experienced at least one ADR. Common ADRs included rash and fatigue (20.5% each), body pain (18.2%), urine discolouration (13.6%), and eye sensitivity (11.4%). Despite this, 93.2% adhered to treatment; 6.8% reported ADR-related challenges. Only 38.6% reported ADRs to the clinic. Urinalysis showed elevated bilirubin (22.7%), ketones

(9.1%), and protein (9.1%). SNP rs2070673 (CYP2E1) was significantly associated with ADRs ($\chi^2 = 7.031$, $p = 0.030$), alongside other SNPs linked to urine abnormalities.

Conclusion: High ADR prevalence and potential genetic predisposition among TB patients suggest the need for integrating ADR surveillance, biomarker testing, and pharmacogenetic screening into rural TB programmes. These findings support policy efforts aimed at personalised medicine approaches, training of healthcare workers in ADR management, and expanded access to molecular diagnostics to improve treatment safety and success.

26. Synergistic effects of docetaxel and kaempferol co-treatment induce apoptosis via ROS mediated mitochondrial depolarisation, genotoxicity and G2/M arrest in MDA-MB-231 cells

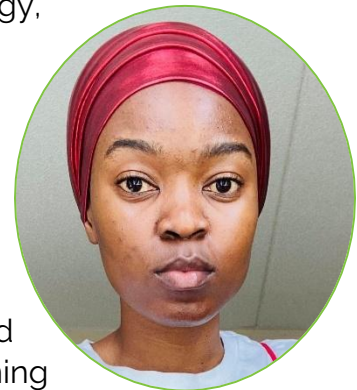
Author: **TE Mohale**¹, N Hlengwa², and VG Mbazima¹

Authors' affiliation:

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²Department of Biochemistry and Microbiology, University of Zululand, Kwa-Dlangezwa 3886, South Africa.

Background: Triple-negative breast cancer (TNBC) is the most aggressive subtype of breast cancer, lacking targeted therapy. Chemotherapy, particularly docetaxel (DTX), remains the primary treatment, however its potency is limited by multidrug resistance (MDR) and side effects. Combining drugs with different mechanisms of action offers a promising approach to overcome these issues. Hence, this study evaluated the combinatorial effects of docetaxel and kaempferol (KAE) in MDA-MB-231 TNBC cells.



Methods: The MTT assay was used to assess the effects of DTX and KAE, individually and in combination, on the viability of MDA-MB-231 cells. Combinatorial effects were analyzed using Combenefit and CompuSyn softwares. The effects of DTX, KAE, and their combination on morphological changes were assessed via AO/EB dual staining with fluorescence microscopy, while apoptotic cell death was determined using Annexin-V and dead cell assays. Mitochondrial membrane potential, ROS levels, cell cycle distribution, and DNA damage were analyzed using the flow cytometric Muse® MitoPotential, Oxidative Stress, Cell Cycle, and Multi-color DNA Damage Kits, respectively. **RESULTS:** The results demonstrated that both DTX and KAE exert cytotoxic effects on MDA-MB-231 cells, with DTX showing greater potency. Notably, their combination exhibited strong synergistic activity (CI = 0.26), leading to an

increase in the number of cells showing apoptotic morphological changes, such as chromatin condensation, nuclear fragmentation, apoptotic bodies, as well as presence of acidic vesicles and an increase in the percentage of cells undergoing apoptosis. Docetaxel and the combination induced significant mitochondrial membrane depolarization, DNA damage, elevated ROS levels, and G2/M phase arrest.

Conclusion: The study demonstrated that the DTX+KAE combination exhibits synergic effects in TNBC, improves the efficacy of each compound and induces apoptotic cell death. These findings highlight the potential of the combination as a potential therapeutic strategy to combat breast cancer.

27. Metabolomic and Pharmacogenomic Profiling of Drug-Sensitive and Drug-Resistant Tuberculosis in a South African Cohort

Authors: **MS Mashilo**¹, CJ Kinnear², N Potgieter¹ and AN Traoré¹

Authors' affiliation:

¹Department of Biochemistry and Microbiology, Faculty of Sciences, Engineering & Agriculture, University of Venda, Thohoyandou 0950, South Africa

²South African Medical Research Council Genomics Platform, Cape Town, South Africa



Background: Tuberculosis (TB), including multidrug-resistant (MDR) and extensively drug-resistant (XDR) forms, remains a global health challenge exacerbated by variable host metabolic and genetic factors influencing disease progression and treatment outcomes. This study aimed to comprehensively characterize the metabolomic profiles and pharmacogenomic landscape in TB, MDR-TB, XDR-TB, and non-tuberculous mycobacterial (NTM) infections in a South African cohort to identify potential pathways and genetic variants impacting drug response. Methods: Untargeted metabolomics was performed on patient samples using liquid chromatography-mass spectrometry (LC-MS) with data processed through centroid mzML conversion and analysed via MetaboAnalyst v5.0, MS-DIAL v5.1 tools for metabolite annotation. Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway analysis identified open metabolic pathways. Pharmacogenomic analysis focused on clinically relevant ADME genes, evaluating single-nucleotide polymorphisms (SNPs) via sequencing to define genetic variants in ABCB1, SLCO1B1, NAT2, CES1, CES2, AADAC, CYP24A1, CYP27B1, UGT1A1, and UGT1A9 genes. NAT2 acetylation phenotypes were predicted through genotypic haplotype combinations.

Results: The metabolomics analysis identified 13 known metabolites in MDR-TB and 31 in XDR-TB patients, revealing distinct metabolic alterations correlating with drug resistance severity and patient-specific profiles. Key impacted pathways included folate and one-carbon metabolism, sphingolipid metabolism, tryptophan metabolism, and fatty acid biosynthesis. Pharmacogenomics revealed a high prevalence of variants in CYP24A1, ABCB1, UGT1A9, and SLCO1B1 genes affecting drug metabolism and transport. NAT2 genotyping predicted diverse acetylator phenotypes with slow and intermediate acetylators predominating, suggesting variable isoniazid metabolism and potential differences in treatment efficacy and toxicity risk.

Conclusion: Integration of metabolomic and genetic analyses highlights complex host-pathogen interactions in TB and drug-resistant TB, underscoring metabolic pathway disruptions and genetic polymorphisms that influence drug response. These findings propose potential biomarkers for disease stratification and emphasize the need for personalized medicine approaches to optimize anti-TB therapy in genetically diverse populations. Further validation and functional studies are warranted to translate these insights into clinical practice.

Keywords: ADME genes, Metabolites, Pathways, Personalised medicine, SNPs.

28. In vitro modulation of cisplatin-induced oxidative stress and inflammatory response

Authors: MD Kgakishe¹, KW Poopedi¹ and VG Mbazima¹

Authors' affiliation:

¹University of Limpopo, Department of Biochemistry, Microbiology and Biotechnology, Private Bag X1106, Sovenga, 0727



Background: Oxidative stress and Inflammatory response are major contributors to cisplatin-associated renal pathology. As such, targeting signal transduction pathways involved in these molecular processes such as Nrf2-ARE and TNF- α signalling may serve as potential ameliorative avenues. Medicinal plants are a superior strategic approach to complementary medicine, as they decelerate the pace of molecular and cellular processes during pathogenesis, thereby prolonging the human lifespan.

Method: This study explored the nephroprotective potential of a leaf aqueous extract of *Momordica balsamina*, a plant rich in bioactive metabolites, in cisplatin-treated HEK-293 cells. The effects of cisplatin and extract combinatorial treatments on the production of free radicals in HEK-293 cells were assessed using the nitric oxide (NO),

and oxidative stress assays, respectively. Additionally, superoxide dismutase (sod), catalase, malondialdehyde and cyclooxygenase 2 (COX-2) enzyme concentrations/activities were evaluated using the sod activity, catalase activity, malondialdehyde colorimetric (thiobarbituric acid method) activity and human cox-2 ELISA assays, respectively. The expression profiles of keap1, Nrf2, gpx3, IL-6, sod1, iNOS, and TNF- α proteins were assessed using Western blot.

Results: The combinatory treatments decreased ROS ($p < 0.0001$) and NO production, by upregulating Nrf2 protein expression and downstream antioxidant proteins sod1, and gpx-3. Additionally, sod and catalase enzyme concentrations/activities were increased significantly ($p < 0.01$) and in a time-dependent manner. This resulted in a time-dependent decrease in the content of lipid peroxidation marker malondialdehyde and a downregulation of the expression of prooxidants iNOS and keap1. While cox-2 enzyme production was differentially regulated, IL-6 and TNF- α ($p < 0.001$) protein expression profiles were decreased relative to cisplatin-only treatment.

Conclusion, the cisplatin-extract supplementation displayed significant nephroprotection, associated oxidative stress and inflammatory response amelioration.

29. Application of Anyplex™ and Allplex™ assays in determining MTB/MDR/NTM patients in the Vhembe district, Limpopo, RSA

Authors: **Ntshunxeko Thelma Banda**¹, Maphepele Sara Mashilo¹, Mpho Magwalivha¹, Mpumelelo Casper Rikhotso¹, Leonard Owino Kachienga¹, Musoliwa Rendani¹, Natasha Potgieter² and Afsatou Ndama Traoré¹

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²Executive Dean of the Faculty of Sciences, Engineering & Agriculture, University of Venda, Thohoyandou, 0950, South Africa.



Background: Hypertension is a global health challenge, including in South Africa. Though there are policies in place its prevalence is high; while its treatment and control remains low. Capricorn District has a highest maternal mortality resulting from hypertension. The objective was to investigate the risk factors of hypertension among pregnant women in Capricorn District.

Methods: A convergent parallel study was conducted among 586 pregnant women from age 14-49 years who were attending their antenatal services in the selected Capricorn District health facilities. Chi-square test and thematic analysis were used to analyse data. Approval of this study was obtained from the University of Venda Ethics Committee (FHS/23/PH/0604).

Results: The prevalence of hypertension was 126(21.50%) (CI 95%, 18.29% to 25.1%). Chi-square test results showed that hypertension was significantly associated with age ($P=0.00262$), family history of hypertension ($P=0.003$), unemployment ($P=0.04181$), type of cooking oil ($P=0.0436$), salt intake ($P=0.0111$), obesity ($P=1.664e-05$), classification of BMI ($P=5.765e-07$), chronic hypertension ($P=0.0000$), gestational diabetes ($P=0.0000$) and previous history of hypertension in pregnancy ($P=2.2e-16$). Hypertension awareness 61(48%), treatment 59(47%) and control 26(21%) was low. Majority of the participants had poor general knowledge on hypertension. Very few participants indicated that they get adequate health education during antenatal services. Poor knowledge of hypertension and preferred treatment influenced poor adherence to hypertension management (treatment and given health education).

Recommendations and conclusions: previous history of hypertension was a major risk of hypertension. Training of health staff, providing social support and providing hypertension information among pregnant women might help in prevention and management of hypertension in pregnancy. Majority of the participants had poor knowledge on hypertension. Implementation of hypertension awareness campaigns might enhance knowledge of hypertension among pregnant women.

Key words: Hypertension, Limpopo province, pregnant women, risk factors.

30. Investigating the risk factors of hypertension among pregnant women in the Limpopo Province

Authors: T Madzaga¹, T Malwela².

Authors' affiliation:

¹University of Venda

²University of Venda



Background: Hypertension is a global health challenge, including in South Africa. Though there are policies in place its prevalence is high; while its treatment and control remains low. Capricorn District has a highest maternal mortality resulting from hypertension. The objective was to investigate the risk factors of hypertension among pregnant women in Capricorn District.

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Recommendations and conclusions: previous history of hypertension was a major risk of hypertension. Training of health staff, providing social support and providing hypertension information among pregnant women might help in prevention and management of hypertension in pregnancy. Majority of the participants had poor knowledge on hypertension. Implementation of hypertension awareness campaigns might enhance knowledge of hypertension among pregnant women.

Key words: Hypertension, Limpopo province, pregnant women, risk factors.

Abstracts: RCDI UK-Staff Development Programme

31. Workplace Mental Health Interventions for Academic Staff: A Systematic Review of Effectiveness and Feasibility

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⁴Faculty of Health Sciences and Sport, University of Stirling, UK



Background: Mental health challenges among academic staff are rising globally, yet few evidence-based interventions exist that address the specific needs of this population, particularly in low- and middle-income countries (LMICs). This systematic review synthesised the effectiveness, feasibility, and implementation of individual-level workplace mental health interventions for university academic staff, informing future context-adapted models.

Methods: We searched five databases (PsycINFO, MEDLINE, Web of Science, SCOPUS, ERIC) for peer-reviewed studies published between 2003–2023. Eligible studies included any design evaluating the impact or implementation of individual-level interventions targeting mental health or well-being outcomes among academic staff. Quality was appraised using the Mixed Methods Appraisal Tool (MMAT) and the GUIDED framework.

Results: Seven studies met inclusion criteria, predominantly from high-income countries. Interventions ranged from mindfulness and stress reduction to coaching and structured psychological support. Short-format, individualised interventions were most feasible, especially when institutionally endorsed. Key facilitators included theoretical grounding, leadership support, and stakeholder engagement. Barriers included workload pressures, digital delivery challenges, and limited institutional integration. A significant gap in LMIC representation limits generalisability.

Conclusion: This review highlights the urgent need for scalable, culturally sensitive interventions tailored to academic staff, particularly within LMIC settings. Findings will inform the development of a co-designed intervention framework as part of a SAMRC-funded doctoral study. Embedding mental health into institutional policies, supported by leadership and adapted to local realities, is critical for long-term impact.

32. Bioelectrical Impedance Vector Analysis in the Stabilisation of Severe Acute Malnutrition: A Pilot Study from Hospitals in the City Of Tshwane Metropolitan Municipality, Gauteng

Authors: **Tshegofatso Mogase**¹, Annette Van Onselen², Nidia Rodriguez-Sanchez³ and Stuart Galloway⁴

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³Faculty of Health Sciences and Sport, University of Stirling, Scotland

⁴Faculty of Health Sciences and Sport, University of Stirling, Scotland



Introduction: Combating severe acute malnutrition in children is a major global health priority, as indicated by its inclusion in the Sustainable Development Goals. For it remains a major cause of childhood mortality in developing countries. Current management strategies of severe acute malnutrition often apply blanket approaches that overlook the diverse manifestations of the condition and the associated clinical risks. Bioelectrical Impedance Vector Analysis is a non-invasive method for assessing hydration and cellular integrity, yet its application in severe acute malnutrition is underexplored in this population. **Objective:** This study assessed the ability of Bioelectrical Impedance Vector Analysis to detect changes in hydration and cellular status over the first five days of inpatient stabilisation and explored its relationship with anthropometric indicators.

Methods: A prospective observational study was conducted in 64 hospitalised children aged 6 to 59 months with severe acute malnutrition. Bioelectrical Impedance Vector Analysis parameters, including total body water, phase angle, resistance, reactance, and a device-derived wellness marker, were recorded on Days 1, 3, and 5 of inpatient care. Changes were assessed using one-way ANOVA, and correlations between Bioelectrical Impedance Vector Analysis and traditional anthropometric markers were explored.

Results: Total body water declined from 78.04% on Day 1 to 67.74% on Day 5 ($p = 0.590$). The wellness marker improved significantly from 0.867 to 0.933 ($p = 0.006$). PhA, R, Xc, and Z impedance fluctuated but were not statistically significant. Correlations between Bioelectrical Impedance Vector Analysis and anthropometric measures were weak, indicating limited overlap between these assessment domains.

Conclusion: Bioelectrical Impedance Vector Analysis detected changes in hydration and a notable improvement in a cellular health marker during the early severe acute malnutrition stabilisation phase, changes that were not apparent from anthropometry alone. These results support its potential as a supplementary monitoring tool in severe acute malnutrition management. Larger studies are necessary to verify its clinical usefulness and to define reference ranges for paediatric populations.

33. Mapping the Landscape of LGBTIQ+ Inclusion in Health Professions Education: A Scoping Review

Authors: AV Kleinhans¹, K Kgarosi¹, T Haarstrup³, A Lentoor¹, I Uni², O Oladimeji¹

Authors' affiliation:

¹Sefako Makgatho Health Sciences University

²University of Stirling

³University of Manchester



Background: The inclusion of LGBTIQ+ students within health professions education is essential for advancing health equity and preparing future healthcare providers to meet the needs of diverse patient populations. Despite growing recognition of the importance of diversity and inclusion, there is limited comprehensive synthesis of how LGBTIQ+ inclusion is addressed in health professions education globally or within South Africa. This scoping review aims to map existing literature on the inclusion of LGBTIQ+ health professions students, focusing on educational environments, curricula, institutional policies, and support systems.

Methods: Using established scoping review methodologies, systematic searches were conducted across multiple databases to identify peer-reviewed articles, reports, and grey literature published in the last two decades. Studies included were those that addressed LGBTIQ+ health professions students' experiences, institutional inclusion practices, curriculum content related to sexual and gender diversity, or faculty and institutional perspectives on LGBTIQ+ inclusion. Data were charted and analysed thematically to identify key trends, gaps, and emerging themes.

Results: Preliminary results reveal a growing but uneven engagement with LGBTIQ+ inclusion in health professions education. Common themes include persistent curriculum gaps in LGBTIQ+ health content, the impact of heteronormative institutional cultures on student well-being, and the limited availability of dedicated support services. Few studies address experiences in historically disadvantaged universities or consider intersecting identities such as race and socioeconomic status. Notably, student-led advocacy and emerging institutional initiatives highlight promising pathways for transformation.

Conclusion: This review underscores a critical need for comprehensive, contextually relevant strategies to embed LGBTIQ+ inclusion across all levels of health professions education. Findings will inform educators, policymakers, and institutions aiming to foster safer and more affirming learning environments. By charting the current landscape, this scoping review contributes to the foundational knowledge necessary for advancing equitable health education and, ultimately, inclusive healthcare delivery.

Keywords: LGBTIQ+, health professions education, inclusion, scoping review, curriculum, student experience, diversity

34. Title: Towards establishing a framework on decolonizing activity selection training in the occupational therapy curricula in the South African context

Authors: **Mahlako Makhubela**¹, Prof Eunice Seekoe¹, Prof Jayne Donaldson², Prof Elelwani Ramugondo³, Prof Lieketseng Ned⁴ and Dr Frank Kronenberg³

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²University of Stirling

³University of Cape Town

⁴Stellenbosch University



Background: Occupational therapy (OT) theories, models and frameworks are generally developed in Western countries. The philosophical framework for OT in South Africa appears to have relied largely upon various models, predominantly stemming from Western and European origins, with only vague and fleeting references to African knowledge systems and philosophies. The above-mentioned theories, models and frameworks, which includes activity selection, are taught to students when training them to be OTs and to serve the diverse South African community.

The study aimed at developing a specific framework that can be used to decolonize activity selection training in the OT curricula in South Africa.

Methods: The study used a multiphase mixed methods design. The study was conducted in four phases. Phase one used a qualitative Mini-Case Studies design to describe the current practices regarding training of activity selection. Phase two of the study used a descriptive quantitative study to identify common practices regarding activity by OTs. Phase three used a qualitative descriptive design to describe the experiences of OT service users regarding activities used during their treatment. Phase four of the study will use qualitative Delphi method to develop a decolonized framework to guide activity selection.

Results: Phase one showed inadequate research and documentation in the OT curricula. One of the themes developed from the data was lecturer-driven activity selection training which indicated that the training depends largely on the lectures' knowledge, experiences and values. Phase two showed that 74.1% of the participants uses model when selecting activities was Vona du Toit Model of Creative Ability. 87.9% of the participants selected client centredness of the model to be the reason for using it rather than culture competence (selected by 44.8% of the participants) and client population suitability (selected by 39.7% of the participants). It was also shown that table-top activities are used often in treatment by 69% of the participants. 70.7% of the participants selected flexibility and adaptability as their reason for using the above mentioned types of activities for service provision. Phase three indicated that the service users purely follow instructions of the OTs and are not adequately consulted when selecting an activity for service provision. Most participants expressed that exercises were used to treat them rather than activities.

Conclusion: It is noticed from the above mentioned findings and results that though OT clinicians and educators rely on models and activities that promote client-centred approach, they do not consult with the service users.

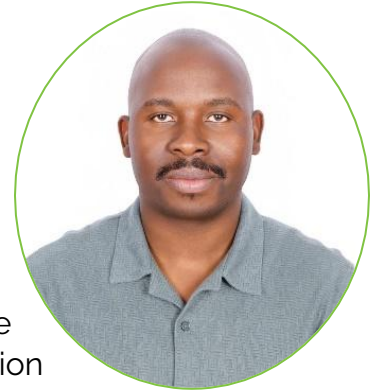
Abstracts: Students Using RCD Grants For Research Expenses

35. The impact of Covid-19 on HIV clinic attendance among people living with HIV in Johannesburg, Gauteng Province: A cross-sectional study

Authors: Ishmael Malatji¹, Edith Phalane¹ **Refilwe Nancy Phaswana-Mafuya¹**

Authors' affiliation:

¹South Africa Medical Research Council/ University of Johannesburg (SAMRC/UJ) Pan African Centre for Epidemics Research (PACER) Extramural Unit



Background: The Covid-19 pandemic has had negative impacts on health care services, such as access and utilisation HIV services. While South Africa has a substantial proportion of people living with HIV (PLHIV) and Covid-19 consequences, most research has primarily focused on Covid-19-related difficulties without including HIV. This study aimed to determine the impact of Covid-19 on HIV clinic attendance among PLHIV in Johannesburg, Gauteng Province.

Methods: A cross-sectional study design was utilised. The study included individuals aged 18 years and above, residing in South Africa and utilising the HIV public clinics in Region E, Johannesburg. The participants were selected using a multistage sampling technique. A self-administered closed-ended questionnaire was used to collect data. Descriptive statistics were used to summarize participant's characteristics. Fisher's exact test was used to determine the factors associated with the impact of Covid-19 on HIV clinic attendance. The level of significance was set at $p < 0.05$. All analyses were done using STATA version 18.

Results: Data from 480 PLHIV on ART was analysed and it was established that COVID-19 had limited impact on HIV clinic attendance. Most of the participants (98.5%) reported no dis while very few (1.7%) had challenges accessing clinics, and none experienced appointment cancellations. Of the HIV clinic services provided during COVID-19, most of the participants (99%) had access to ART collection. In addition, most of the participants (99.8%) got viral load testing, secondary HIV prevention, and social worker support. Furthermore, no significant correlation was established between demographic variables and the impact of COVID-19 on clinic attendance among PLHIV in Johannesburg.

Conclusion: The study found no significant impact of Covid-19 pandemic and its associated factors on HIV clinic attendance among the PLHIV in Johannesburg,

Gauteng Province. This underscores the resilience of HIV care systems during the pandemic.

36. Factors associated with parental hesitancy toward Covid-19 vaccination of children aged 5–11 years old at uMzimkhulu Sub-district in KwaZulu Natal Province

Authors: Thandi Ngobe¹, Edith Phalane¹, **Refilwe Nancy Phaswana-Mafuya¹**

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Background: Vaccines are the safest and most efficient way to prevent disease and death from a variety of paediatric infectious diseases. However, an increasing concern is parents' hesitancy towards vaccines, which can act as a barrier to vaccination for minors. Therefore, an understanding of parents' willingness and reluctance towards the administration of the Covid19 vaccine in children is necessary. This study aimed to determine the factors associated with parental Covid-19 vaccine hesitancy among children aged 5 to 11 years at St Margaret's Community Health Centre in uMzimkhulu Sub-district, KwaZulu Natal.

Methods: An analytical cross-sectional study was conducted among parents of children aged 5 to 11 years in the uMzimkhulu Subdistrict of KwaZulu Natal Province. A semi-structured questionnaire was administered amongst parents of children getting healthcare from St Margaret's Community Health Centre. The questionnaire collected information on the sociodemographic factors of the parents, access to health care, knowledge and perception towards Covid-19 vaccination. Descriptive statistics were used to determine the characteristics of the population. Bivariate and logistic regression analyses were used to determine the association between vaccination status and sociodemographic and perception factors.

Results: The prevalence of Covid-19 vaccination was 14.6% (n=51). Bivariate analyses revealed a significant association between vaccination status and age ($\chi^2 = 6.33$, $p = 0.042$), vaccination status and level of education ($\chi^2 = 16.86$, $p = 0.002$), and vaccination status and employment status ($\chi^2 = 43.18$, $p < 0.001$).

Conclusion: There was a low uptake of Covid-19 vaccine, influenced by both negative perception towards Covid-19 vaccine and sociodemographic factors.

37. Dolutegravir-based antiretroviral treatment regimen administration by healthcare workers and associated factors in pregnant and childbearing age women living with HIV in selected KwaZulu-Natal facilities

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Background: Integrase strand inhibitors, including Dolutegravir (DTG) – based antiretroviral treatment (ART) regimen is used as the first-line regimen for the management of HIV for adults. However, evidence is limited regarding its administration among pregnant and childbearing-age women in the context of South Africa, a country with a high HIV burden among the abovementioned population group. This study aimed to assess factors associated with DLT-based ART regimen administration by healthcare workers (HCWs) and associated factors in pregnant and childbearing age women living with HIV in selected KwaZulu-Natal facilities.

Methods: An analytical, cross-sectional study design was employed, including 172 medical officers who worked directly with the administration of DTG-based ART regimens in a selected facility in Kwa Zulu Natal Province. The HCWs were aged 18 years and above. Data were collected using a semi-structured questionnaire, focusing on the knowledge, practices, and attitudes of HCWs regarding the administration of DTG-based ART regimens for pregnant women and women of childbearing age living with HIV. Data were analysed using SPSS version 29. Chi-square tests were used to determine factors associated with the administration of DTG-based ART regimens. The statistical significance was set at $p < 0.05$.

Results: Of the 172 HCWs, 92.4% (n=159) prescribed DTG-based regimens to pregnant or childbearing age women. Gender ($p=0.009$), facility level ($p=0.001$), HIV/AIDS management experience ($p=0.043$), and refresher training on HIV clinical management ($p=0.001$) were associated with HCW's perceptions of neural tube defect risk in pregnant and childbearingage women who initiated or transitioned to DTG. Facility type was linked to the availability of DTG-based ART regimen ($p=0.047$), ease of prescribing DTG-based ART regimen ($p=0.010$), and HCWs' decision to administer DTG in pregnancy or intention to conceive ($p=0.022$).

Conclusion: Educational level, age, gender, facility type, training, and support were associated with HCW's competency in administering a DTG-based ART regimen to pregnant and childbearing-age women.

38. Assessing Training Needs for The South African Hemp Farmer Industry

Authors: Tshepo NM Lechaba, **and David R. Katerere**

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Background: The global resurgence of the hemp industry, driven by the decriminalisation of cannabis in many countries, offers significant socio-economic and environmental opportunities. In South Africa, there is growing interest in industrial hemp farming following the enactment of legislation in October 2021. However, the development of the hemp industry will be constrained by limited technical skills, regulatory complexity, and limited seed supply, among other factors.

We set out to assess the training needs of industrial hemp farmers in a baseline study from which strategic and specific interventions could be made.

Methods: The study employed a qualitative research design, wherein an electronic, structured questionnaire was distributed to various stakeholder groups to solicit their responses on training priorities, including business management, farming practices, pest control, and oil processing procedures.

Results: Sixty-nine people responded, with the majority (50.7%) emphasising the need for comprehensive training in all areas, including cultivation, processing, product development, regulations, entrepreneurship, and research.

Conclusion: Findings indicate a call for increased investment in training, enhanced stakeholder participation, and additional research to assess the long-term effects, which can be used to inform policy, education, and strategic planning for South Africa's hemp sector.

Keywords: Hemp, Cannabis, Training and Development, Sustainable Farming

39. A retrospective analysis of factors associated with HIV viral load outcomes amongst patients on antiretroviral therapy in a selected district hospital in Gauteng Province, South Africa

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Background: Effective HIV viral load suppression is a critical marker of successful antiretroviral therapy (ART) and plays a central role in reducing HIV-related morbidity, mortality, and transmission. Despite widespread access to ART in South Africa, a significant proportion of patients continue to experience virological failure. The study sought to determine factors associated with VL outcomes among PLWH on ART in a selected district hospital in Gauteng.

Method: A retrospective cross-sectional analytical study was conducted using secondary data extracted on 339 from clinical records of PLHIV receiving antiretroviral therapy Odi Hospital. The study included PLHIV aged 18 years and older who had been on ART for at least 12 months and attended an ART visit between 2020 and 2024. Descriptive statistics were used to summarize patient characteristics, and bivariate and multivariate logistic regression analyses were performed to identify factors associated with HIV viral load outcomes.

Results: Of the 339 PLHIV, 56.3% (N=191) were female, 99.1% were adherent to treatment, and 78.2% had previously undergone an ART regimen switch. The PLHIV (82.9%) were on a Tenofovir/Lamivudine/Dolutegravir regimen, while 17.1% were receiving Abacavir/Lamivudine/Dolutegravir. PLHIV aged 50 years and older were more likely to achieve viral load suppression compared to those aged 18–29 years (AOR: 3.28; 95% CI: 1.11–9.66; p=0.031). In contrast, TB co-infection was significantly associated with reduced odds of viral suppression (AOR: 0.06; 95% CI: 0.01–0.79; p=0.032). No significant associations were found between viral load outcomes and gender, ART regimen type, liver or renal function markers, or BMI.

Conclusion: Older age was significantly associated with better viral load suppression, while tuberculosis co-infection markedly reduced the likelihood of viral suppression. These findings highlight the importance of targeted interventions for younger patients and integrated management of TB co-infection to improve HIV treatment outcomes.

40. The Association Between Climate Change and Birth Outcomes: A Correlational Study at Musina Hospital in Vhembe District, Limpopo Province

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Background: Ambient temperature is a significant cause of adverse health outcomes, especially for pregnant women. In Musina, temperatures have shown considerable variation over the years. The rate of premature births was notably high compared to other pregnancy complications, which could be attributed to exposure to high temperatures. This study aimed to determine the correlation between ambient temperature and birth outcomes in Musina Hospital in the Vhembe District of Limpopo Province.

Methods: This study employed a quantitative approach with a descriptive and correlational design. Data was collected from antenatal records of pregnant women, aged 14 to 40 years, who experienced pregnancy complications at Musina Hospital between January 2019 and December 2022. Purposive sampling was used to select the records of mothers who experienced complications during their pregnancies at Musina Hospital in the Vhembe District of Limpopo Province. The sample size was determined using the Krejcie and Morgan table (2006). A self-developed checklist consisting of multiple-choice questions was used to extract data from the records of pregnant women. The data were analyzed using R, Version 4.3.1 (R Development Core Team, 2023), and the results were presented in graphical format.

Findings: The findings revealed a consistent decrease in ambient temperature over the four years, with 2019 recorded as the warmest year. Despite this downward trend, high ambient temperatures, particularly during hotter seasons, were associated with negative birth outcomes. A significant number of pregnant women were affected by pregnancy-induced hypertension, while a high rate of premature births was recorded among neonates. These results indicate a clear relationship between elevated ambient temperatures and adverse maternal and neonatal health outcomes.

Conclusion: The study concludes that precautionary measures are essential to address the effects of climate variability. Educating pregnant women, especially those in high-risk areas, about heat exposure and strategies to mitigate its effects is critical in reducing temperature-related health risks.

Keywords: climate change, high ambient temperatures, foetal outcomes, maternal outcomes

41. Effectiveness of digital tools in improving quality assurance outcomes of rapid HIV testing: A systematic Review

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Background: Testing for HIV using rapid test devices determines HIV status and whether treatment and care are required. These rapid HIV tests are performed in non-laboratory settings where capacity building of health care workers (HCWs) is pivotal. The use of digital platforms such as e-learning has become more critical in enhancing quality and reliability. The aim of the review was to identify and describe digital platforms used to improve outcomes of quality assurance of rapid HIV testing.

Methods: A review of literature published from 2010 and onward was searched using electronic databases such as EBSCOhost, SCOPUS, PubMed Central, Medline and Cochrane Library. The approach was guided by the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines. A systematic review protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO) ID: CRD42024574306.

Results: Database searches identified 977 studies that were screened for abstracts using Covidence. A total of 15 full-text studies reporting on utilisation of digital platforms such as e-Learning and m-learning were selected for inclusion. Non-English literature before 2010 and not available in full text were excluded. More than 84% of the articles included were conducted in Sub-Saharan Africa and Asia and a few were in Americas and Europe. Most studies evaluated utilisation of e-learning as an interventions tool to train health professionals. The review identified views on valued aspects e-learning and mobile applications as a valued interactive learning tool leading to overall improved quality of HIV services. However, e-learning's potential is often restricted by existing socio-cultural norms, digital literacy disparities and geographical inequities in technology.

Conclusion: The review highlights the importance of considering the digital eco-system for e-learning interventions' success. Digital literacy, motivated HCWs and

adequate infrastructure demonstrated higher adoption of digital platforms leading to coordinated service delivery and improved quality outcomes.

42. Effectiveness of digital tools in improving quality assurance outcomes of rapid HIV testing: A systematic Review

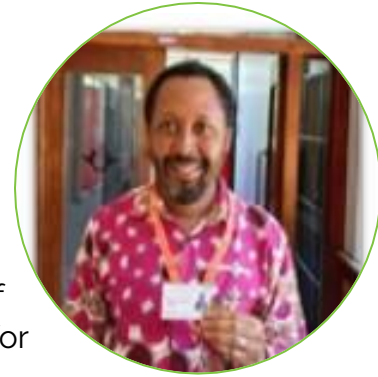
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Background: Men who have sex with men (MSM) in Ghana face disproportionate risks of HIV infection, compounded by legal, social, and cultural barriers that hinder access to testing and care. In response, a variety of HIV testing interventions including community-based testing, mobile outreach, peer-led services, and HIV self-testing have been introduced to improve coverage among this key population.

Methods: This exploratory study explored the MSM experiences regarding HIV testing interventions that were implemented before and during the COVID-19 pandemic period in Ghana. In-depth interviews were conducted with 17 MSM to understand awareness, accessibility, acceptability, and perceived outcomes of HIV testing services. The interviews were audio recorded, and transcribed verbatim. Atlas.ti version 24 was used to capture and organise the data. Thematic analysis was used to develop themes and sub-themes.

Results: The participants highlighted the critical role of peer educators in facilitating access and reducing stigma, with peer-led and community-based testing seen as the most acceptable and trusted approaches. HIV self-testing was especially valued for its privacy and convenience, while facility-based testing remained underutilized due to fear of discrimination. Major challenges identified included stigma, confidentiality concerns, legal risks, financial barriers, and inconsistent service delivery in rural areas. Despite these challenges, participants reported increased HIV knowledge, improved

linkage to care, and reduced fear of testing. Recommendations included expanding MSM-friendly services, enhancing public education, improving healthcare provider training, and addressing structural barriers.

Conclusion: The findings underscore the importance of inclusive, community-led strategies in achieving equitable HIV service delivery for MSM in Ghana.

43. Perspectives on the Usability and Feasibility of the Key Populations Unique Identifier Codes in South Africa's Routine Health Information Management System.

Authors: Mashudu Rampilo¹, Edith Phalane^{1,2}, Mmathapelo Ellen Peteke³, Regina Maithufi⁴, and **Refilwe Nancy Phaswana-Mafuya^{1,2}**

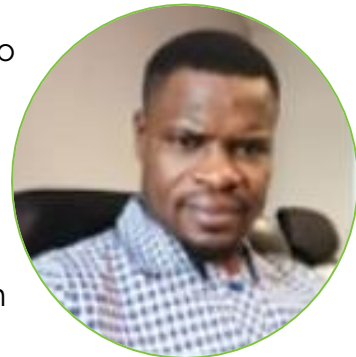
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Background: According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), key populations and their sexual partners accounted for approximately 70% of new human immunodeficiency virus (HIV) infections globally in 2021. Routine health information management systems often lack unique identifier codes (UIC) for key populations, which limits the ability to accurately monitor HIV trends, effectively allocate resources, and design targeted interventions for these populations.

Methods: A qualitative exploratory study was conducted using semi-structured interviews to gather participant perspectives on the usability and feasibility of the key populations' UIC tool in Tshwane 1 Health Sub-district. Interviews were conducted between 01 and 30 April 2025. All interviews were audio-recorded with consent, transcribed verbatim, and analyzed using thematic content analysis in ATLAS.ti 25 software. Study participants included two nurses, two counsellors, one data officer, and one linkage officer.

Results: The thematic analysis identified five themes: perceived benefits, ease of use, time efficiency, implementation barriers, and suggested improvements. Healthcare

providers noted that key populations' UIC improved data accuracy, enabled key populations-specific reporting, and supported patient tracking. It was seen as simple and efficient, though barriers included key populations' non-disclosure and the risk of duplicate entries due to manual processes.

Conclusion: The study concluded that incorporating a key population-specific UIC is crucial. It recommends implementing the UIC through biometric systems integrated with the national Health Patient Registration System (HPRS), along with providing sensitization training for staff to promote safe disclosure and strengthen patient trust.

44. Review of Tenofovir-induced Acute Kidney Injury Detection Methods in Sub-Saharan Africa: A Systematic Review

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Background: Tenofovir disoproxil fumarate (TDF) baseline antiretroviral therapy (ART) is central to HIV management in Sub-Saharan Africa. The TDF-induced acute kidney injury (AKI) is emerging as a significant concern, particularly affecting people living with HIV, including key populations. Traditional AKI biomarkers, including serum creatinine and estimated glomerular filtration rate, are often inadequate for detecting subclinical or early-stage kidney injury, especially in resource-limited settings.

Methods The protocol for the systematic review was registered on the International Prospective Register of Systematic Reviews (ID: CRD42024615351). The Preferred Reporting Items guided the review for Systematic reviews and Meta-Analyses (PRISMA) guidelines. A search strategy was developed using the Population, Intervention, Comparison, and Outcome framework, and a literature search was conducted for articles published between 2015 and 2025 using EBSCOhost, Science Direct, Web of Science, SCOPUS, PubMed Central, Medline, Google Scholar and grey literature.

Results: A total of 321 records were retrieved from six major databases. Removal of 83 duplicates, 238 studies were screened, and 82 were excluded based on title and

abstract. A full-text review of 156 articles excluded 119 that did not meet the inclusion criteria, primarily due to mismatched context, outcomes, or interventions. Thirty-seven studies were included in the final analysis. The findings reflect a broad spectrum of AKI detection methods used among People Living with HIV (PLHIV) in SubSaharan Africa, ranging from standard serum creatinine tests to emerging point-of-care (POC) diagnostics such as urine-based biomarker assays and urine protein-to-creatinine ratio measurements. Early evidence suggests that rapid tests offer improved sensitivity in detecting AKI at earlier stages compared to conventional laboratory-based approaches.

Conclusion: Effective management of Tenofovir-induced AKI in Sub-Saharan Africa calls for the integration of validated, scalable POC diagnostics into routine care. Continued research and local validation are essential to reduce ART-related morbidity and improve clinical outcomes among vulnerable populations.

Keywords: Tenofovir-induced Acute Kidney Injury, Diagnostics, Point-of-Care, Sub-Saharan Africa

45. Sexually transmitted infections programme evaluation in the primary healthcare facilities in Limpopo Province, South Africa

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Background: Limited evidence exists regarding the assessment of sexually transmitted infections (STI) programmes within primary healthcare (PHC) settings. This study evaluated the STI programme implemented in PHC facilities in Limpopo Province, focusing on its operations and delivery among key and priority populations (KPP) to bridge the knowledge gap.

Methods: A descriptive study to assess the STI programme in the PHC facilities was conducted. Five PHC facilities were purposefully selected, wherein the operational managers completed the World Health Organisation (WHO) STI assessment tool for programme evaluation. The programme data provided was for the year 2024. The appraisal rating scale was used to gauge the performance of each facility in

accordance with the WHO checklist tool. The data was analysed using STATA software version 18 to generate frequencies and percentages.

Results: There was a decline in syphilis screening in the third quarter of antenatal care (ANC) visits in all the facilities. There was a fluctuation in cervical cancer screening coverage throughout all the quarters in all the facilities among women living with HIV. Facility three had a few males who screened for male urethritis syndrome (MUS). None of the STI surveillance components were implemented in the facilities. Fifty per cent of the aetiologies were reported, including (first and third syphilis ANC visit test, and syphilis treatment). All the facilities obtained (100 %) regarding the reporting of new cases. Disaggregation of STI data by age and gender was available for MUS and cervical cancer screening.

Conclusion: There is a need to improve data disaggregation to encourage targeted approaches. Introduction of aetiological testing in PHC facilities to upscale diagnostic accuracy and the number of people on STI treatment is a significant need. This study recommends the extension of the syphilis screening to other KPPs to strengthen linkage to care and coverage.

Keywords: Limpopo Province, key and priority populations, programme evaluation, primary healthcare facilities, sexually transmitted infections

46. Factors associated with condom use among circumcised men in South Africa: Evidence from the 2017 cross-sectional national survey

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Background: Consistent condom use was found to be an effective prevention tool for preventing sexually transmitted infections (STIs), including HIV. However, there is a low level of condom use among men, particularly the circumcised ones in South Africa. This study aimed to determine the factors associated with consistent condom use among circumcised men.

Methods: A retrospective analysis of the 2017 South African National HIV Prevalence, Incidence and Behaviour Survey (SABSSM V) was conducted, with 757 circumcised men aged 15 years and older. Descriptive statistics were performed to describe the participants' characteristics. Bivariate and multivariable regression analyses were done to examine associations between male circumcision and condom use. All statistical analyses were conducted at a 95% confidence interval, with statistical significance set at $p < 0.05$ using STATA (College Station, TX, USA, software version 17).

Results: Most participants (35.8%) were aged 15–24 years, not married (85.2%), and with nearly half being unemployed (43.8%). Living in rural farms [aOR=0.42, 95% CI (0.20–0.91), $p=0.027$] and in Limpopo Province [aOR=0.36, 95% CI (0.16–0.80), $p=0.012$] show lower odds of condom use among circumcised men. Conversely, higher odds of condom use were observed among those who were sick or disabled and unable to work [aOR=2.30, 95% CI (1.17–4.15), $p=0.015$] and those who married between the ages of 30 and 35 years [aOR=1.32, 95% CI (1.15–1.50), $p < 0.001$]. Regarding age at first sexual intercourse, individuals who initiated sex at 15–19 years [aOR=0.46, 95% CI (0.25–0.85), $p=0.014$] and those above 20 years [aOR=0.45, 95% CI (0.27–0.77), $p=0.003$] were more likely to use condoms.

Conclusion: Socio-demographic, cultural, and behavioural factors were significantly associated with condom use among circumcised men aged 15 years and above in South Africa. Targeted context-specific strategies to promote condom use among men are crucial to prevent STI transmission.

47. Investigating the Phytochemistry and Biological Activity of *Burkea africana* extracts

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Background: The escalating threat of antimicrobial resistance necessitates the discovery of novel bioactive agents from natural sources. *Burkea africana*, a medicinal plant indigenous to Southern Africa, is traditionally acclaimed for its antimicrobial properties. Notably, its stem bark and roots have been widely used to manage cutaneous and subcutaneous parasitic infections, ulcers, wounds, and pneumonia.



Methods: In this study, we systematically evaluated the chemical composition, antimicrobial efficacy, and cytotoxicity activity of *B. africana* leaf and bark extracts obtained through sequential extraction with solvents of varying polarity.

Results: Key extracts, particularly those obtained with acetone and methanol, demonstrated significant antimicrobial activity against a panel of bacterial and fungal pathogens, including *Staphylococcus aureus*, *Escherichia coli*, and *Candida albicans*. Minimum inhibitory concentrations (MICs) ranged from 0.004–0.064 mg/mL, with leaf extracts exhibiting superior potency over bark extracts. Cytotoxicity evaluation using the Vero cell line revealed that both the leaf and bark extracts displayed significant toxicity results, and none of the extracts exhibited proliferative effects at higher concentrations, suggesting a favorable safety profile. HPTLC analysis revealed diverse phytochemical patterns, corroborating the presence of multiple bioactive constituents. Chromatographic isolation yielded 11 pure compounds, of which six have been structurally characterized via NMR and mass spectrometry.

Conclusion: These findings highlight the potential of *B. africana* as a source of safe and effective antimicrobial compounds, warranting further investigation and development for pharmaceutical formulation.

Keywords: *Burkea africana*, phytochemical analysis, antimicrobial activity, cytotoxicity, solvent extraction, HPTLC, bioactive compounds.

48. Integrating Machine Learning in HIV Testing Interventions in Gauteng Province, South Africa: Opportunities, Challenges, and Implementation Strategies

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Background: Conventional HIV testing approaches continue to fall short of overcoming barriers to HIV testing, especially among key and priority populations at higher risk of acquiring and transmitting HIV. Little is known about the stakeholders' perspectives on the integration of machine learning into HIV testing. This study explored the views and perceptions of key stakeholders regarding the opportunities, challenges, contextual considerations, implementation roadmaps, and strategic recommendations for integrating machine learning in HIV testing in South Africa.

Methods: We used an exploratory qualitative study design to explore the views and perceptions of 15 key stakeholders regarding the opportunities, challenges, contextual considerations, implementation roadmaps, and strategic recommendations for integrating machine learning in HIV testing in South Africa. The Consolidated Framework for Implementation Research was used to map the implementation roadmap for the results. The data was analysed using thematic content analysis.

Results: Four superordinate themes that emerged included perceived benefits, challenges, ethical considerations, and implementation strategies. The perceived benefits included enhanced testing quality, operational improvements, and expanded access. The challenges were related to infrastructure limitations, human factors, and systemic barriers. Ethical considerations included data protection challenges, human-AI interactions, and the regulatory framework. Implementation strategies highlighted were phased adoption, stakeholder engagement, and sustainable systems.

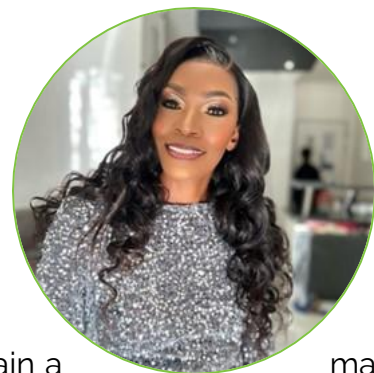
Conclusion: The study highlights an opportunity to benefit from the capabilities of machine learning to improve the uptake of HIV testing through risk predictions, HIVST, and accurate and advanced diagnostics. However, technological access, digital divide, resource constraints, privacy concerns, skill gaps, and staff resistance, among other barriers, were noted. The implementation design should include the perspectives of all the stakeholders involved in HIV testing to address human factors and ethical concerns. There is a need to equip these stakeholders with the necessary skills, resources, and guidelines to enhance the use of machine learning in HIV testing interventions, ultimately improving testing uptake.

49. Prevalence, Transmission Dynamics, and Trends of Sexually Transmitted Infections in Sub-Saharan Africa: A Systematic Review

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Background: Sexually transmitted infections (STIs) remain a major public health challenge in Sub-Saharan Africa (SSA), contributing to significant morbidity, HIV risk, and adverse reproductive health outcomes. Understanding the

prevalence, transmission dynamics, and trends of STIs is critical for effective intervention strategies.

Methods: This systematic review followed PRISMA guidelines to synthesize evidence on STI epidemiology in SSA from 2014 to 2024. We searched PubMed, Scopus, Web of Science, Google Scholar, and grey literature for studies reporting STI prevalence (syphilis, gonorrhea, chlamydia), transmission drivers (sexual networks, mobility, risk behaviors), and temporal trends. Additionally, we examined studies applying machine learning (ML) in STI surveillance. Two reviewers independently screened studies, extracted data, and assessed quality using the PICO framework.

Results: Of 1378 initially identified studies and exported to Covidence, 1149 studies were screened for title/ abstract, after 229 duplicate studies were removed. About 423 studies were screened for full text, and 91 studies met the inclusion criteria. Syphilis, Gonorrhea and Chlamydia prevalence varied widely across SSA, with higher rates among key populations. Syphilis remained prevalent in certain regions, while gonorrhea and chlamydia showed increasing antimicrobial resistance. Key transmission drivers included inconsistent condom use, transactional sex, and migration. Temporal trends indicated rising STI rates over the past decade, influenced by programmatic interventions and healthcare access. Few studies utilized ML for STI prediction, highlighting a gap in advanced surveillance tools.

Conclusion: STIs persist as a significant health burden in SSA, with disparities across populations and regions. Strengthened STI surveillance, targeted interventions for high-risk groups, and integration of ML-based approaches are needed to curb transmission and improve treatment outcomes.

50. Stakeholder Roles and Views in the Implementation of the Differentiated HIV Treatment Service Delivery Model Among Female Sex Workers in Gauteng Province, South Africa

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Background: Key populations (KPs), particularly female sex workers (FSWs), face significant barriers in accessing HIV-related healthcare services in South Africa. Structural challenges have historically hindered equitable HIV

treatment access, worsened by the Covid-19 pandemic. Overburdened clinics, staff shortages, and travel constraints disrupted HIV services and ART adherence. In response, the Differentiated Service Delivery (DSD) model was rapidly scaled up to decentralise care and improve treatment continuity.

Methods: Eight stakeholders were purposively selected and interviewed, comprising government officials, implementers, and sex workers' advocacy organizations. Transcripts were imported into ATLAS.ti version 22 and thematic analysis was used to explore the perceived impact of DSD models and associated successes and barriers in the current service delivery landscape. The interviews were conducted between 11 November 2024 and 12 March 2025.

Results: The study found that decentralization of DSD models improved access to services for FSWs. However, criminalization of sex work perpetuates fear and marginalization, while stigma and discrimination within healthcare settings remain significant deterrents to HIV treatment uptake. High mobility among FSWs also disrupts continuity of care, contributing to treatment interruptions and lack of data on loss to follow-up. Participants highlighted the need for legal reform, increased healthcare provider sensitization, and the integration of mental health and psychosocial support in HIV services. Peer-led interventions and digital health innovations, such as biometric systems and electronic medical records, emerged as promising strategies for enhancing patient tracking and retention. Nonetheless, the sustainability of DSD models is threatened by an overreliance on external donor funding and insufficient government ownership.

Conclusion: Achieving equitable healthcare access and improved HIV outcomes for KPs, especially FSWs, requires a multi-pronged, rights-based approach. This must include community engagement, structural and legal reforms, integrated support services, and sustainable financing mechanisms to ensure the long-term impact and scalability of DSD models.

51. Mushroom Cultivation as a Tool for Rural Development in South Africa

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Background: Africa is home to approximately 25% of global mushroom biodiversity, yet the continent accounts for only 0.4% of all mushroom sales worldwide and new products made from mushrooms. While Sub-Saharan Africa is increasingly aware of the economic potential of mushrooms, few studies have addressed commercial production and the status of local mushroom cultivation in the region. Commercial production of edible mushrooms in Sub-Saharan Africa grew modestly from 1990 to 2013, reaching nearly 5,000 tons annually, but the economic value remained below \$5 million. Fewer than 500 workers are employed in mushroom production facilities across all SSA nations. Major producers include Benin, Ghana, Malawi, Namibia, Swaziland, South Africa and Zimbabwe. The South African mushroom industry is having a steady expansion, fueled by rising demand for both fresh and value-added mushroom products. Mushrooms are nutritious and can be foraged from the wild, thus making them an important source of food. In addition, mushrooms can be grown in small spaces allowing for landless individuals to grow it domestically on a small. In addition, they also have medicinal purposes. Mushroom cultivation in Africa has the potential to offer an alternative solution to the numerous food security challenges faced by the African continent. Mushrooms have been recognized as a potential food source that can help reduce hunger and malnutrition while also benefiting the livelihoods. Additionally, it is viewed as ecologically friendly and sustainable farming. This work investigates the economic, social and environmental effects of mushroom farming as well as its implications for sustainable rural living in South Africa. Despite being a quickly expanding sector in South Africa, mushroom farming confronts a number of obstacles, such as farmer's lack of experience and knowledge, climate-related problems, and restricted market accessibility. However, there are many advantages to growing mushrooms, including better nutrition and food security, social cohesion and community development, women's empowerment, and environmental advantages. Programmes for training and capacity-building, better access to markets and financial services and infrastructure development are all necessary to fully fulfil the promise of mushroom farming in South Africa.

Keywords: Mushroom cultivation; eco-friendly; food security; nutrition; rural development.

52. Factors affecting the uptake of COVID-19 vaccine amongst people living with HIV at Esselen Clinic in Johannesburg, South Africa

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Background: People living with HIV (PLHIV) are prone to a dysregulated immune response to SARS-CoV-2 infection. Yet, little is known about the uptake of the coronavirus disease 2019 (COVID-19) vaccine among PLHIV in South Africa. This study aimed to determine the factors associated with the uptake of the COVID-19 vaccine amongst PLHIV at Esselen clinic in Johannesburg, South Africa.

Methods: An analytical, cross-sectional study design was employed, including 196 PLHIV aged 18 years and above, who were eligible to take the COVID-19 vaccine and accessing HIV services at Esselen clinic. A structured, self-administered questionnaire was used to collect data. Data analysis was done using STATA (College Station, TX, USA). Descriptive analysis was used to report the frequencies and percentages. Bivariate and multivariable analyses were utilized to determine the factors associated with COVID-19 vaccination, with a p-value of ≤ 0.05 and 95% confidence interval (CI).

Results: The study showed that 64.5% received at least one dose of a COVID-19 vaccine. The majority received either the Pfizer (50.4%) or Johnson & Johnson vaccine (48%), with local clinics being the most reported vaccination sites. The most significant factors associated with c=vaccination uptake were, being self-employed (aOR = 0.24, 95% CI: 0.10-0.60, p = 0.002), previous seasonal influenza (flu) vaccination (aOR=3.04, 95% CI: 1.13-8.15, p=0.027), perceived that vaccination is a good idea (aOR=0.08, 95% CI: 0.01-0.51, p=0.007) or could prevent COVID-19 (aOR=6.42, 95% CI=1.45-28.51, p=0.014) and having a concern about the effectiveness of the COVID-19 vaccine (aOR=2.50, 95% CI=1.17-5.37, p=0.019).

Conclusion: The findings highlight the significance of being prepared in public health and the necessity of continuous efforts to comprehend and enhance vaccine acceptance and confidence among PLHIV.

53. HIV Treatment Services among Men who have Sex with Men during Covid-19, Limpopo Province, South Africa

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Background: Men who have sex with men (MSM) are part of the key populations (KPs), which are susceptible to Human Immunodeficiency Virus (HIV) acquisition, transmission and disruptions to access HIV services. This study aimed to explore and describe the HIV interventions implemented among MSM during the Covid-19 lockdown in Capricorn District, Limpopo Province in South Africa.

Methods: This study followed an exploratory qualitative study design with a purposive sample of 16 men who identified as MSM. Data was collected through in-depth interviews, which were tape-recorded, transcribed verbatim, and captured on Atlas.ti version 24. Patterns from the created codes were formulated into themes/sub-themes guided by the Consolidated Framework for Implementation Research (CFIR).

Results: The MSM had a mean age of 27,9 years. Various constructs and domains of the CFIR framework showed that during the Covid-19 lockdown, MSM encountered disruption of HIV services. The response time was elongated, thus increasing the complexity of the intervention. Interventions were implemented to ensure continuity of services. These included tailoring the programme through a door-to-door strategy and offering resources to healthcare facilities to enable MSM to access antiretroviral therapy (ART) and related services.

Conclusion: The relative advantage of the MSM programme is its prioritisation of MSM, a group having one of the greatest HIV prevalence and incidence globally. This study has provided insights into the impact of the Covid-19 pandemic on MSM's access to HIV treatment services in Capricorn District, Limpopo Province of South Africa, and the need for implementation of differentiated service delivery (DSD) models, including leveraging existing measures. This is essential for future pandemic preparedness and contributions towards the 95-95-95 UNAIDS goals of ending HIV as a pandemic by 2030.

54. Interventions for the Promotion of Consistent and Correct Use of Condoms with Condom-compatible Lubricants among Men who have Sex with Men in Ghana: A Qualitative Study Among Key Stakeholders

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Background: Human immunodeficiency virus (HIV) infection continues to be a public health threat among Ghanaian men who have sex with men (MSM) despite advancements in prevention and treatment strategies. They are disproportionately affected by the HIV burden, with a prevalence rate 17 times higher than the general population (1.53%). Even though consistent condom use with condom-compatible lubricants remains one of the most effective strategies in HIV/STIs prevention, little is known about the interventions that promote consistent condom use with lubricants among MSM.

Aim: To identify interventions for the promotion of correct and consistent use of condoms with lubricants, examine user-and service providers ' challenges, and explore effective strategies to address the challenges among MSM and the providers.

Methods: This study utilised an exploratory design where in-depth face-to-face interviews were conducted among sixteen participants, including MSM, healthcare professionals, programme managers, and technical coordinators. Each interview lasted around 30 to 47 minutes, and all data were collected between April 7th and May 2nd, 2025. The interviews were recorded, and audio files were transcribed verbatim, reviewed, deidentified, and then captured on Atlas.ti version 24. A thematic content analysis was conducted to develop recurring themes, and sub-themes were formulated.

Results: The study identified interventions such as free distribution of condoms and lubricants, HIV risk-reduction counselling and education, free HIV testing services, and outreach programmes. The main challenges affecting service providers and MSM included stigmatisation, discrimination, criminalisation of same-sex sexual activities, human rights violations, inadequate government support, financial difficulties, not disclosing HIV/STIs status to sexual partners, skipping counselling and HIV education

sessions, partners' refusal to use condoms, and distribution challenges. Opportunities for improvement included legislative and policy reforms, adequate government support and applying differentiated delivery models for condom and lubricant distribution.

Conclusion: This study identified that while some interventions exist to ensure the consistency and correct use of condoms with lubricants among MSM in Ghana, significant barriers also persist at both the user and service providers' levels. Addressing these challenges is critical to improving access and uptake.

55. Factors associated with sexually transmitted infection literacy among men who have sex with men and transgender people in Soweto: A machine learning approach

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Background: Sexually transmitted infections (STIs) remain a major public health concern in Sub-Saharan Africa (SSA), particularly among key populations such as men who have sex with men (MSM) and transgender individuals.



This study aimed to (i) assess the level of STI literacy in this population, (ii) identify key demographic, behavioral, and structural predictors, and (iii) examine how literacy influences knowledge, attitudes, behaviours, and healthcare-seeking.

Methods: A retrospective observational mixed-methods design was applied to data from 1,240 MSM and transgender individuals in Soweto, South Africa. STI literacy was measured using a composite index derived from four indicators: receipt of STI counselling and results interpretation, number of information sources received, number of STI information sources known, and number of common STIs correctly identified. Scores ≥ 0.5 were categorised as high literacy, while scores < 0.5 indicated low literacy. Logistic regression and structural equation modelling (SEM) were used to examine associations and behavioral pathways, while seven machine learning algorithms, including Random Forest, Logistic Regression, and XGBoost, were trained

on labelled data (high vs. low literacy) to classify literacy status and identify the most influential predictors using SHAP analysis.

Results: Results showed that 28.1% of participants demonstrated high STI literacy. Positive predictors included younger age, prior STI testing, higher education, female gender identity, and personal STI history, whereas older age, unemployment, substance use, and frequent sexual activity predicted lower literacy. SEM highlighted STI testing as a cue to action and stigma, cost, and fear as barriers.

Conclusion: Grounded in Nutbeam's Health Literacy Framework, the Health Belief Model, and the Theory of Planned Behavior, these findings underscore how behavioral theory and machine learning can inform targeted, multi-level interventions. Addressing stigma, enhancing self-efficacy, and improving service access are crucial for advancing inclusive, theory-driven STI prevention strategies in SSA

56. Evaluating the effects of Niselo® sorghum probiotic drink on diabetes among mineworkers in the North West and Limpopo provinces of South Africa: A proof-of concept study

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Introduction: The rising prevalence of obesity and type 2 diabetes ("diabetes") in South Africa is a major concern, with mineworkers especially vulnerable due to long shifts, sedentary lifestyles, irregular meals, and dependence on energy-dense foods. Studies show 31% of mineworkers are obese and at high risk of diabetes, yet few nutrition interventions target their needs (Van Heerden, 2020). The Mine Health and Safety Act (MHSA) No. 29 of 1996 states that workers with uncontrolled diabetes or obesity-related complications may be deemed unfit, risking income loss or job termination. Sorghum (*Sorghum bicolor* L. Moench), or "*mabele*," is a climate-resilient indigenous grain rich in fiber, polyphenols, and the effect of PPAR- γ stimulation in managing hyperglycemia and adipogenicity (de Oliveira & de Alencar Figueiredo, 2024). This study evaluates Niselo®, a sorghum-based probiotic drink, as a culturally acceptable meal replacement for at-risk mineworkers.

Methods: This proof-of-concept, randomised, open-label, crossover, placebo-controlled will enrol 80 mineworkers (over 3 years) with obesity and/or type 2



diabetes, divided into three cohorts ($n=20$, $n=40$, $n=20$). Participants will consume Niselo® as a partial meal replacement or a maize-based placebo over 12 weeks, including a 4-week washout and followed by a crossover period. Baseline and post-intervention measures will include anthropometric indicators, glycaemic markers, and selected inflammatory and immune markers. A semi-structured quality-of-life survey will assess lifestyle habits. Provisional ethical approval has been granted (REC Ref #: HREC2025=06=011 (SCI).

Expected Results: It is expected that the sorghum-based drink will demonstrate feasibility and high acceptability within the mining environment, with favourable short-term effects on satiety and glycaemic response compared with the maize-based placebo.

Conclusion: This pilot study will generate preliminary evidence on the role of sorghum-based functional foods in occupational nutrition. Findings will inform the design of larger trials and contribute to sustainable, culturally acceptable interventions for diabetes prevention in mining populations.

57. Medicinal plant-derived nanoparticles against foodborne pathogens

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Review: The rapidly emerging science of nanotechnology has great promise for creating novel, environmentally responsible, and antibacterial food packaging solutions. Because of their remarkable physicochemical, biological, and antibacterial qualities, nanoparticles have attracted a lot of interest and are being used more and more in food packaging applications. The favoured technique for creating metal oxide, metal and bi-metallic alloy nanoparticles is plant-mediated biosynthesis. This environmentally friendly method is non-toxic, quick, easy, efficient and sustainable. In the production of nanomaterials, the use of plants and their various parts as stabilizing and reducing agents has attracted a lot of research interest, especially for food safety and biomedical applications. For the manufacture of nanoparticles, a wide variety of plant materials have been used, including leaves, latex, seeds, flowers, fruits, peels, bark, roots, and gum. The production of nanoparticles has also been done using medicinal plants as *Acalypha indica*, *Aloe vera*, *Azadirachta indica*, *Catharanthus roseus*, *Cinnamon zeylanicum*, *Euphorbia hirta*, *Jatropha curcas*, *Tinospora cordifolia* and *Vitex negundo*.

This research provides an overview of the current status of research on the application of medicinal plant-derived nanoparticles to fight foodborne infections. We emphasize the possibilities of these natural antibacterial and antifungal agents for food safety applications by talking about the synthesis, characterisation and its antimicrobial activity of nanoparticles made from several medicinal plants. Along with offering insights into possible future research directions and prospective uses in the food sector, the chapter also examines the mechanisms of action, benefits, and drawbacks of employing nanoparticles generated from medicinal plants as antimicrobial agents.

Keywords: Nanotechnology; Medicinal plants; Nanoparticles; Antimicrobial agents; Food packaging

58. Antiretroviral therapy uptake and associated factors during the COVID-19 lockdown period among people living with HIV in a selected district of KwaZulu Natal, South Africa

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Background: The COVID-19 pandemic might have disrupted the provision and utilisation of essential HIV services such as antiretroviral therapy (ART) initiation, retention and adherence for people living with HIV (PLHIV). This study aimed to assess ART uptake and associated factors during the COVID-19 lockdown period among PLHIV in a selected district in the KwaZulu Natal Province of South Africa.

Methods: A retrospective study design was conducted to analyse secondary national routine programme data from the Department of Health, iLembe District of KwaZulu-Natal Province. The aggregated data extracted from the District Health Information System (DHIS) data from January 2019 to December 2020 were analysed from four selected health facilities. Descriptive statistics were used to report the frequencies and percentages for HIV testing and ART adherence by Covid-19 period, gender and facility. Chi-square tests were utilised to determine the factors associated with HIV testing and ART adherence. Statistical significance was set at a p-value of ≤ 0.05 and a 95% confidence interval (CI). This study only included PLHIV on ART, aged 18 years and above, males and females across different racial groups, across all geographical locations and residing in the iLembe district, KwaZulu Natal Province.

Results: Most of the females (n=12,218 and n=14,274) were tested for HIV before and during COVID-19 than males (n=6,182 and n=9,189). There was a decline in the total number of HIV tests performed in 2020, within all four selected facilities, from n=23,463 in 2019 to n=18,400. The number of PLHIV retained on ART was n=261,178 before the COVID-19 pandemic and n=263,308 during the COVID-19 pandemic. Regarding the facilities, in Groutville clinic, 77,725 PLHIV were retained on ART before COVID-19 and 80,306 PLHIV during the COVID-19 period. Similarly, Shakaskraal Clinic and Groutville Clinic recorded a slight increase in the number of PLHIV retained on ART: 54,582 to 57,645 and 59,681 to 61,316, respectively. Furthermore, findings from the selected facilities showed a significant association between HIV tests by gender before Covid-19 in KwaDukuza Clinic (X^2 (df=1) = 6.37, p=0.013) and Groutville Clinic (X^2 (df=1) = 48.91, p<0.001).

Conclusion: There were no significant changes in ART uptake during the Covid-19 lockdown; however, HIV services such as HIV testing were affected. There was a decline in the number of patients who were tested for HIV during the Covid-19 lockdown period. The study found that more female patients performed HIV testing as compared to male patients.

59. Factors associated with adherence to HIV pre-exposure prophylaxis among young women aged 18-30 years in Alfred Nzo District, Eastern Cape Province of South Africa

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Background: There is limited information on factors that influence the uptake and adherence to oral pre-exposure prophylaxis (PrEP) among young women, especially in human immunodeficiency virus (HIV) burdened settings such as South Africa. It is therefore important to explore the facilitators and barriers to PrEP uptake and adherence among young women at high risk of HIV in Eastern Cape, South Africa. This study aimed to determine the prevalence and factors associated with PrEP adherence among young women aged 18 to 30 years in Alfred Nzo District, Eastern Cape Province of South Africa at St Patrick's Gateway Clinic.

Methods: The study employed an analytical cross-sectional design with a sample size of 133 young women who had utilised healthcare services in a selected health

facility in the Alfred Nzo district. Data were collected using a semi-structured, self-administered questionnaire and analysed using STATA (College Station, TX, USA, software version 18). Descriptive statistics were used to summarise the study characteristics, exposure, and outcome variables. Bivariate and multivariable analyses were conducted to identify factors associated with PrEP uptake and adherence. Statistical significance was assessed at a 95% confidence interval, with significant differences considered at $p < 0.05$.

Results: Of the 133 participants, the prevalence of PrEP adherence among young women aged 18-30 years at St Patrick's Gateway Clinic in Alfred Nzo District was 39.8% (n=53) (95% CI: 26.5%-54.0%). A multivariable analysis revealed that women who had not experienced PrEP side effects were 69% less likely to adhere to PrEP (aOR=0.31, 95%CI: 0.14-0.69, $p=0.004$). Behavioural factors such as alcohol use, multiple sexual partners ($p=0.33$), and condomless sex ($p=0.234$) were not significantly associated with PrEP adherence ($p=0.962$).

Conclusion: Adherence to PrEP remains a challenge among young women in South Africa. Several key determinants of PrEP adherence were identified, including not having experienced side effects and affected by PrEP stockouts. However, behavioural characteristics such as alcohol use, multiple sexual partners, and condomless sex were not significantly associated, possibly due to the inconsistent availability of PrEP and our small sample size. A follow-up study with a larger sample across various regions would generate more meaningful and generalisable results regarding the factors influencing PrEP adherence among young women in South Africa.

60. Fungi-Derived Ingredients in Cosmetics and Skincare

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Review: Fungi are a class of eukaryotic organisms that mostly live as saprophytes on dead and decomposing organic matter and are chemoheterotrophs in the ecosystem. Within the Mycota kingdom, fungi exhibit a great deal of diversity and complexity due to their vast variety of habitats, sizes, and morphologies. Recent production estimates suggest that there are 5.1 million distinct fungi species in nature. Fungi have recently become an important resource in contemporary biotechnology, with a wide range of uses in



various industries. For thousands of years, people have investigated the potential medical benefits of mushrooms. In addition to their nutritional uses, their capacity to generate secondary metabolites makes mushroom a valuable resource for many applications. The increasing consumer demand for cosmetics that enhance and cleanse the skin has led to a notable shift toward products perceived as healthier, environmentally friendly, and organic. Many techniques are being developed to lower the amounts of dangerous compounds in these items to address this. This was a narrative review conducted using published peer-reviewed scientific literature, patents, and cosmetic industry reports focusing on fungi and their bioactive metabolites relevant to cosmetic applications. Fungi are being studied for their potential in the cosmetics industry after centuries of use as a traditional source of naturally occurring bioactive compounds. A plethora of fungal items are being used in nutricosmetics and cosmeceuticals, and a great deal more are still to be discovered. The review identified a wide range of fungi including *Schizophyllum commune*, *Rhizopus* sp., *Aspergillus niger*, *Lentinula edodes*, *Ganoderma* sp., and *Pleurotus* sp., for instance, have different applications in cosmetics, including exfoliation, anti-inflammation, quicker skin renewal, and enhanced skin elasticity, as well as skin whitening. β -glucans, chrysophanol, and kojic acid are important active ingredients that boost the effectiveness of cosmetic products. Many functional claims are made for these products, such as anti-dandruff, skin lightening, anti-aging, moisturizing, anti-wrinkle, and anti-acne. Fungi represent an underexplored but highly promising source of natural ingredients for cosmetics and skincare. Their bioactive compounds can provide safe, sustainable, and multifunctional alternatives to synthetic ingredients. Further biotechnological advancements and clinical validation are required to unlock their full potential in nutricosmetics and cosmeceuticals.

Keywords: Fungi; Ganoderma; Cosmetics; Skincare; β -glucans; Anti-aging; Anti-wrinkle

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