

FACULTY OF HEALTH SCIENCES

DEAN: PROFESSOR SA MADHI MBBCh MMed PhD (Witwatersrand) FCPaeds(SA) MASSAf RSSAf TWAS CBE

Doctor of Philosophy

AGARWAL, Priyanka

Pharmacology

THESIS: Targeting cytochrome bc1 of *Plasmodium falciparum*

This thesis addressed the global challenge of drug-resistant malaria by designing and evaluating novel antimalarial compounds targeting the *Plasmodium* mitochondrial cytochrome bc1 complex. Through a combination of *in silico* and *in vitro* approaches, diverse chemical scaffolds, including naphthoquinone-triazole hybrids, were evaluated for binding affinity and inhibitory activity against atovaquone-resistant *Plasmodium* parasites. The innovative use of molecular modelling, along with pharmacokinetic and toxicity profiling exemplifies the power of computational tools in early-stage drug discovery, contributing significantly to the development of safer, more effective antimalarial therapies.

Supervisors: Professor RL van Zyl and Dr CJ van der Westhuizen

AMISSAH NYARKO, Alberta

Physiotherapy

THESIS: Development of a protocol for holistic paediatric burns management, Korle Bu Teaching Hospital, Ghana
The study developed guidelines for holistic paediatric burns management at the Korle Bu Teaching Hospital, Ghana. Using a four-phase mixed methods design, the study reviewed medical records, qualitatively explored the experiences of patients and their caregivers, perspectives of healthcare providers, and engaged rehabilitation experts through a modified Delphi process. The guidelines for holistic paediatric burns management consists of 40-item context-specific recommendations to guide paediatric burn care in Ghana. The study thus contributes significantly to improved multidisciplinary management of paediatric burns in low-resource settings.

Supervisors: Dr N Benjamin-Damons and Dr S Pilusa

BABALOLA, Olukemi Solabomi

Public Health

THESIS: Effectiveness of training programmes for, and assessment of, quality of care provided by community health workers undertaking comprehensive care in low- and middle-income countries

This study examined community health workers' (CHWs) training programmes for comprehensive care in low- and middle-income countries. Training experiences, effectiveness, assessment methods, and their utilities were explored through two systematic reviews, as well as validation and cross-sectional studies. In two South African provinces, a validated tool identified factors influencing CHWs' performance. To enhance CHW performance, the study recommended better integration of training programmes covering the wider comprehensive care scope, alongside ongoing performance assessment, multi-layered support systems, and adequate financial investment.

Supervisors: Professor F Griffiths and Professor J Goudge

BENNIN, Fiona Alison

Paediatrics

THESIS: The home environment and play: The co-creation of an intervention aimed at increasing participation in infant play in a low-income community in Johannesburg, South Africa

In Soweto, a mobile health programme was co-created and tested to help mothers understand the importance of play for their babies. The PLAY study moms embraced the idea and changed how they viewed active play, giving their little ones opportunity to move and explore. While overall health literacy scores didn't shift, the trial revealed how much potential lies in supporting parents and if technological hurdles and resource limitations can be overcome, the impact for children's development could be game-changing.

Supervisors: Dr A Prioreshi and Professor S Norris

BHIKA, Akaashni Nareschandra

Anatomical Sciences

THESIS: The effect of binge-alcohol consumption on the development of adolescent Sprague Dawley rat mandibles
This study investigated the effects of binge alcohol exposure on the development of the mandible in adolescent Sprague Dawley rats to mimic alcohol abuse by adolescents. The methodology included microtomography, osteometry, tensile testing, cytoarchitecture analysis, and immunohistochemistry. The results showed that alcohol adversely impacts mandibular bone growth, particularly in female rats. Several structural and cellular bony tissue changes were observed to persist even after a period of abstinence from alcohol exposure.

Supervisors: Dr D Pillay and Professor AO Ihunwo

BRIEL, Sonia

Physiotherapy

THESIS: An evidence-based assessment model for the comprehensive assessment of the Scapulohumeral Complex

An assessment model for the scapulohumeral complex, using measurable evidence-based outcomes was established with the current study using a mixed-method design. A significant contribution to the assessment of the scapulohumeral complex specific to the physiotherapy profession was established with the current study. Based on the findings of this study, key modifiable musculoskeletal factors contributing to the biomechanical and arthrokinematic stability of the scapulohumeral complex were included in the comprehensive assessment model for the scapulohumeral complex.

Supervisor: Associate Professor C Brandt

CANTRELL, Sarah Jane

Paediatrics

THESIS: The impact of maternal mental health on synchrony in mother-infant interactions

This research examined how maternal mental wellbeing shapes bonding moments with infants. Through interviews and frame-by-frame video analyses of eye contact and facial expressions, the study found mothers with mild depression were far less likely to turn shared moments into smiles, with stress and isolation eroding trust. Despite difficult living conditions, mothers showed determination to connect. Findings emphasize the importance of culturally sensitive support that nurtures hope and emotional connection during the first 1,000 days of life. This study was conducted in Soweto, South Africa.

Supervisors: Dr A Prioreshi and Professor R Pearson

CARRIM, Maimuna

Clinical Microbiology and Infectious Diseases

THESIS: Understanding carriage and transmission of *Streptococcus pneumoniae* through a community cohort study in South Africa

Through longitudinal, community-based research, this candidate explored how respiratory viruses, HIV infection, and host factors influence *Streptococcus pneumoniae* (pneumococcus) colonization and the nasopharyngeal microbiome. The findings showed that RSV infection increases pneumococcal colonization density and that influenza infection disrupts microbial composition in the nasopharynx, particularly among children and people living with HIV. This research provides new insights into viral-bacterial interactions and informs prevention strategies aimed at reducing severe respiratory illness in high HIV prevalence settings.

Supervisors: Dr N Wolter and Professor A von Gottberg

DU PREEZ, Robin

Anatomical Sciences

THESIS: Neuroprotective effects of simvastatin pre-treatment against alcohol-induced brain damage in adolescent mice

This thesis investigated the neuroprotective potential of simvastatin against alcohol-induced brain damage during adolescence, a period of heightened vulnerability to neurotoxicity. Using a mouse model, the study examines oxidative stress, neuroinflammation, and neurogenesis in the hippocampus and prefrontal cortex through biochemical and histological analyses. Simvastatin mitigates alcohol-related neurotoxicity via antioxidant and anti-inflammatory mechanisms, with sex-specific effects. The findings provide insight into simvastatin's potential as a candidate for targeted neuroprotective interventions during critical stages of brain development.

Supervisor: Associate Professor OI Olateju

ERZSE, Agnes

Public Health

THESIS: Accelerating progress on maternal and child nutrition by addressing social needs in urban South Africa
This thesis developed a social needs framework to explain persistent malnutrition in Soweto, where services exist but are unevenly used. Social needs, distinct from structural determinants, are requisites identified by mothers that shape their ability to benefit from services. Using mixed methods, the study identified six needs limiting the use of eight services perceived as important for nutrition and prioritized five interventions to address them. The approach bridges gaps between upstream and immediate responses, offering a lens to improve mothers' ability to benefit and reduce nutrition inequities.

Supervisors: Professor N Christofides, Professor C Desmond, Professor K Hofman and Professor M Barker

EVANS, Jonathan James

Human Genetics

THESIS: Exploring the extent and impact of genetic mosaicism in African populations

This thesis implemented advanced bioinformatic pipelines to characterise genetic mosaicism in two distinct African cohorts. Novel candidate pathogenic mosaic variants were identified in South African children with developmental disorders. Mosaic chromosomal alterations driving clonal haematopoiesis were detected in ageing African adults, with notable geographic and demographic variation. This study is the largest characterisation of genetic mosaicism in continental Africans to date, with novel insights into genetic variation and disease aetiology in underrepresented populations, advancing equity in genomics research.

Supervisors: Professor Z Lombard and Dr N Carstens

KALINJUMA, Aneth Vedastus

Public Health

THESIS: Transition dynamics and treatment outcomes among HIV-positive patients of Ifakara, Tanzania: A comprehensive analysis for optimizing the existing longitudinal cohort data

This thesis investigated the transition dynamics and virologic outcomes among HIV-positive patients enrolled in care at the Chronic Disease Clinic of Ifakara, Tanzania. The research demonstrated an increased proportion of ART initiation and improved treatment outcomes over time. However, high rates of loss to follow-up and re-engagement were observed over the years and it was common in the beginning. The application of longitudinal methods has revealed the underlying distribution of engagement in care over time and areas that require mitigation.

Supervisor: Associate Professor K Otworld

KENMOGNE, Vanelle Larissa

Surgery

THESIS: High-throughput drug repurposing for precision medicine in the treatment of leukemia in South African patients

Leukemia remains a major therapeutic challenge, especially in resource-limited settings. This study employed high-throughput screening of FDA-approved drugs on patient-derived cells to identify effective treatment options. Irinotecan and nilotinib demonstrated potent and synergistic effects on immune modulation and cell viability. Integrating flow cytometry and molecular docking, the research provided insight into molecular interactions and variability in drug response, contributing to the development of personalized leukemia therapies in South African patients.

Supervisors: Professor P Fru, Dr D Balaji Thimiri Govinda Raj, Professor E Nweke, and Dr M Takundwa

KHAMBULE, Lungile

Chemical Pathology

THESIS: Screening and diagnosis of gestational *diabetes mellitus* in an African population

This multi-centre prospective study investigated methods for screening and diagnosis of gestational *diabetes mellitus* (GDM) in South Africa, where risk factor-based testing fails to detect many cases. The study compared the performance of glucometers, fasting plasma glucose (FPG) and selected biomarkers to the gold standard, the oral glucose tolerance test (OGTT). Results demonstrated that FPG had high sensitivity (94%) and specificity (100%) and could reduce unnecessary OGTTs by 77%. Moreover, valine, showed potential as an early-pregnancy biomarker for GDM screening.

Supervisors: Professor J George, Professor N Crowther and Professor L Chauke

KHOFI, Lucy Mandisa

Public Health

THESIS: The gendering of the water-energy-food nexus in peri-urban and urban South Africa

This research advances a feminist political-ecology analysis of the Water–Energy–Food Nexus. Drawing on ethnographic research in Johannesburg and the Eastern Cape, the study reveals how structural neglect, slow violence, and gendered care work, key social determinants of health, shape hunger, wellbeing, and resilience. It links resource insecurity and intimate partner violence to health inequities, reimagining the Nexus through agency, care, and social justice. This is a joint PhD undertaken with the University of Amsterdam, in the Netherlands.

Supervisors: Professor L Manderson, Professor E Moyer and Professor A Bezuidenhout

KILIMA, Stella Peter

Public Health

THESIS: Social and economic consequences of pulmonary tuberculosis - perspectives of patients, their families, the community and healthcare providers who care for TB patients in Mbeya and Songwe Regions, Tanzania

This cross-sectional study, nested in the TB Sequel study, examined the social and economic impacts of pulmonary tuberculosis in Tanzania's Mbeya and Songwe regions. Drawing on perspectives from patients, families, survivors, and healthcare providers, it highlighted financial hardship, stigma, and limited access to care before, during, and after treatment. Despite free TB services, delayed care was common due to pre-diagnosis costs and social barriers, underscoring the need for more patient-centred, supportive, and accessible TB care interventions.

Supervisors: Professor D Evans, Dr G Mubyazi and Dr A Moolla

LEKHULENI, Cebile Natasha Nolwazi

Clinical Microbiology and Infectious Diseases

THESIS: Molecular characterisation and population structure determination of *Streptococcus Pneumoniae* in South Africa using Whole-Genome Analysis

This research used bioinformatics to investigate the impact of pneumococcal conjugate vaccines on invasive pneumococcal disease-causing lineages in South Africa. By analysing national surveillance genomes sequenced from over 4,600 pneumococcal isolates, the study revealed significant declines in vaccine-targeted lineages, while highlighting increases in non-vaccine type and antibiotic-resistant lineages after vaccine introduction. The findings demonstrate the value of genomic surveillance in delineating vaccine-driven population structure changes and may contribute towards improving public health strategies for controlling pneumococcal disease in South Africa.

Supervisors: Dr M du Plessis and Dr K Ndlangisa and Professor A von Gottberg

LORD, Sandy

Physiotherapy

THESIS: Recommendations for physiotherapist-delivered lifestyle interventions for patients with comorbid mental and physical health disorders

This doctoral study focused on enhancing physiotherapy practice in mental health by developing evidence-based lifestyle intervention recommendations for patients with mental disorders and comorbidities. Using a mixed-methods approach, this study incorporated a systematic review of literature, expert panel consultations, and focus group discussions with South African physiotherapists. The resulting recommendations aim to guide physiotherapists in delivering holistic, patient-centred care that addresses both mental and physical health needs, contributing significantly to the integration of mental health into physiotherapy practice in South Africa.

Supervisors: Dr V Naidoo and Professor K Mostert

MADUNA, Dumsile Nontoko

Paediatrics

THESIS: Determining synchrony of mother-infant non-verbal and movement behaviours using first-person observation and accelerometer data

This thesis used first-person head-mounted videos and wrist accelerometers to characterise non-verbal and movement synchrony in Soweto mother-infant dyads across 4 and 8 months postnatally. Findings demonstrate developmental shifts from mother-led to infant-led coordination and delayed emergence of behavioural synchrony relative to high-income cohorts. Additionally, the thesis identifies maternal employment as a key predictor of reduced synchrony. This research advances multimodal methods for low- and middle- income countries (LMIC) research and informs culturally sensitive, synchrony-focused early childhood interventions and policy.

Supervisors: Dr LH Nyati and Professor IT Nabney

MARSDEN, Joshua Patrick

Virology

THESIS: Antibody genetic diversity within an African population

This research examines the genetic basis of how antibodies bind to pathogens and signal the immune system. It characterizes variation through genetic sequencing of antibody genes in a South African population heavily impacted by HIV infection. The study uncovered novel gene variants, revealing significant undiscovered diversity. It also found gene duplications can enhance antibody production, and other variations may alter antibody function. This knowledge is crucial for developing vaccines and therapeutics tailored to the unique genetic diversity found within African populations.

Supervisors: Dr C Scheepers and Dr D Kitchin and Professor L Morris

MBOWENI, Nonkanyiso Ruth-Anne

Physiology

THESIS: The clinical and biochemical effects of atrial fibrillation on heart failure with reduced ejection fraction

This thesis presents a prospective observational study which employed multimodal characterisation of South African patients with heart failure with reduced ejection fraction (HFrEF), with and without atrial fibrillation (AF). Patients with HFrEF-AF showed a distinct clinical, echocardiographic, biomarker, and genetic profile with a more advanced disease phenotype and higher mortality. The study revealed sub-optimal uptake of guideline-directed medical therapy and anticoagulation among HFrEF-AF patients. These hypothesis-generating findings highlight a need for region-specific strategies to improve long-term outcomes in HFrEF-AF patients.

Supervisors: Professor M Maseko and Professor N Tsabedze

MCGIVERN, Kelly Berene

Forensic Medicine

THESIS: The behaviour consistency of serial murder offenders in South Africa

This research examined the crime scene behaviours of serial murderers in South Africa to empirically test the underlying principles of crime linkage, namely behaviour consistency and distinctiveness. The study's use of original police case files, encompassing both solved and unsolved cases, enhanced the ecological validity of its findings. The results offer valuable insights into which behaviours are most effective for linking murder cases, thereby strengthening the application of crime linkage in future investigations and legal proceedings of serial murder offenders.

Supervisor: Professor GN Labuschagne

MKHIZE, Siluleko Advice

Physiology

THESIS: Contribution of novel biomarkers to adverse cardiac remodelling and myocardial dysfunction in a rodent model of pressure overload

Biomarkers are measurable indicators of a biological condition. In hypertensive heart disease, novel biomarkers have been identified, yet their roles in disease development remain unclear. This thesis investigated pentraxin-3, RUNX-1, and microRNA-146a-5p in spontaneously hypertensive rats. Pentraxin-3 may reflect localized inflammation associated with hypertension without being involved in concentric hypertrophy. RUNX-1 may result in hypertension-induced reactivation of the foetal gene program, driving hypertrophic and fibrotic remodelling. Finally, microRNA-146a-5p may act as a counter-regulator of macrophage infiltration into the hypertrophic myocardium.

Supervisors: Professor F Michél, Dr A Manilall and Professor S Gunter

MOSANA, Mmahiine Christina

Physiology

THESIS: The potential prophylactic effect of moringa (*Moringa Oleifera* Lam.) Leaf extracts against fructose-induced metabolic dysfunction in early weaned female rats

This study explored the prophylactic effects of *Moringa Oleifera* leaf extracts in early-weaned female rats on high-fructose diets. Early weaning alone and with fructose caused metabolic dysfunction, hepatic steatosis, and renal damage. Two-week Moringa supplementation alleviated these effects, improving biomarkers of function and modulating genes involved in lipogenesis and fatty acid oxidation. Findings from this study demonstrate that Moringa is an accessible, cost-effective early-life intervention offering sustained multi-organ protection against metabolic, hepatic, and renal dysfunction even when administered for short-term post-weaning.

Supervisors: Professor T Nyakudya, Professor A Ndhlala and Professor KH Erlwanger

MPHAPHULI, Mashudu Theodore

Pharmacy

THESIS: A novel multi-component 3D-printed scaffolds for targeted bone tuberculosis therapy

This study developed a novel 3D-printed multi-component scaffold that incorporates bedaquiline-loaded PLGA nanoparticles for targeted bone tuberculosis treatment. The scaffold provides localized, sustained drug release along with bone regeneration, addressing the issues of poor drug penetration and systemic toxicity associated with traditional therapies. *In vitro* assays confirmed biocompatibility with over 85% cell viability, while *in vivo* rabbit femoral defect models showed significant bone regeneration and structural restoration. This innovative platform offers strong potential for clinical translation in bone TB therapy.

Supervisors: Professor YE Choonara and Professor P Kumar and Dr M Sithole

MTHOMBENI, Julian Qedizaba

Public Health

THESIS: Quantification and mapping of manganese deposition and associated histopathological correlates in the lungs of deceased mineworkers in South Africa

This study provides the first systematic quantification and anatomical mapping of manganese deposition in the lungs of deceased South African mineworkers, addressing a critical gap in understanding its respiratory effects. Using advanced analytical and histopathological methods, it was confirmed that manganese accumulates in the lungs, with distinct lobe-specific patterns, but no exposure-related tissue damage or correlation with brain manganese levels was found. The research findings provide important insight into manganese toxicokinetics and evidence to strengthen occupational health knowledge and protection for mineworkers.

Supervisors: Professor G Nelson and Professor B Racette and Dr N Vorajee

MUHAMMAD, Jelani

Physiology

THESIS: Potential of naringin in the prevention of sweetened alcohol-induced cardiometabolic derangements in adolescent Sprague-Dawley rats

There is an increasing consumption of sweetened alcoholic beverages, presenting a double burden of increased sugar and alcohol consumption. This study investigated the potential of naringin to prevent sweetened alcohol-induced cardiometabolic derangements in adolescent rats. The study revealed sexually dimorphic effects of sweetened alcohol consumption and naringin supplementation on cardiometabolic derangements. Females were more prone to sweetened alcohol-induced cardiometabolic derangements. Naringin supplementation ameliorated some of the sweetened alcohol-induced dysfunctions. Strategic use of naringin could decrease the prevalence of cardiometabolic disorders.

Supervisors: Professor KH Erlwanger, Professor L Mokotedi and Professor KG Ibrahim

MUKOSHA, Moses

Public Health

THESIS: Postpartum hypertension and vascular biomarkers among HIV-infected women with pre-eclampsia in Zambia

This prospective cohort research examined hypertension and vascular biomarkers in the HIV population previously diagnosed with pre-eclampsia. Findings reveal that HIV/ART increased the odds of persistent hypertension six months following delivery. Additionally, some vascular biomarkers were elevated among the women living with HIV, suggesting higher risk of a first cardiovascular event. Taken together these findings emphasize the importance of ongoing hypertension screening in the months following delivery, with an eye on continued care and treatment for women living with HIV.

Supervisors: Professor AM Hatcher, Professor W Mutale and Professor BH Chi

MULI, George Mutuku

Physiotherapy

THESIS: Epidemiology, functioning and reintegration into the community of patients with spinal cord injuries in Kenya

This study investigated the epidemiology, functional outcomes, and community reintegration of individuals living with spinal cord injuries in Kenya, in three phases. Findings indicate that young, working-age males were predominantly affected with the leading causes being motor traffic accidents and falls. Functional outcome was higher among incomplete injuries, whereas reintegration was hampered by environmental and societal barriers. The Delphi validation process underscored the importance of addressing these barriers through community support, promoting rehabilitation practices, and strengthening national rehabilitation policies.

Supervisors: Professor V Ntsiea and Dr N Benjamin-Damon and Dr N Tawa

MYEZA, Nonzuzo Praiseworth

Pharmacology

THESIS: An evaluation of the effects of metal complexes on cell death signalling networks in breast cancer cell lines. Organic copper and gold complexes were evaluated against treatment-resistant triple-negative breast cancer. They exhibited potent, selective cytotoxicity at low micromolar concentrations. Cell death occurred through intrinsic apoptotic signalling, mediated by reactive oxygen species accumulation and downregulation of inhibitor-of-apoptosis proteins (cIAP1, XIAP, and survivin), thereby establishing a pro-apoptotic environment. These findings identify copper and gold complexes as effective modulators of apoptosis and promising lead candidates for further preclinical development in the treatment of aggressive, therapy-resistant breast cancer.

Supervisor: Dr L Harmse

NAIDOO, Merusha

Human Genetics

THESIS: Epigenetic associations with sex hormone levels and cardiometabolic disease risk factors in pre- and post-menopausal women from West Africa

Menopause is defined by hormonal changes that are associated with increased cardiometabolic risk. The epigenetic mechanisms behind the regulation of sex hormones have not been studied before. This study investigated DNA methylation in genes associated with regulation of sex hormones in pre- and post-menopausal West African women through a streamlined protocol for targeted methylation analysis. While hormonal and cardiometabolic shifts were evident, no epigenetic associations were observed, indicating limited methylation influence on these candidate genes in West African women.

Supervisors: Professor M Ramsay and Professor N Crowther and Dr N Goolam Mahyooddeen

NETHATHE, Gladness Dakalo

Critical Care

THESIS: Aspects of the neuroendocrine stress response in patients with severe sepsis or trauma

This thesis explored adrenal dysfunction in critical illness, focusing on sepsis and traumatic brain injury. Through clinical studies, it examined free cortisol responses and glucocorticoid sensitivity. It also investigated mineralocorticoid insufficiency and introduced the novel concept of critical illness-related mineralocorticoid insufficiency. Finally, adjunctive steroid therapies were evaluated, advancing understanding of endocrine dysfunction and offering insights to guide therapeutic strategies for critically ill patients.

Supervisors: Professor J Lipman, Professor R Anderson, Professor C Feldman and Associate Professor J Cohen

NIETZ, Sarah Lena

Surgery

THESIS: Quality indicators of breast cancer surgery in South Africa

This research developed South Africa's first quality indicators for breast cancer care and benchmarked these within a cohort of 3,545 women. Results showed lower adherence to these indicators compared with international standards, particularly in radiation therapy, sentinel node biopsy, and breast-conserving surgery. Survival was strongly associated with several of these indicators. A tailored set of requirements for breast cancer centres was subsequently developed, providing a clear framework and step-by-step plan to improve breast cancer care in South Africa.

Supervisors: Professor P Ruff and Professor S Norris

NJOROGE, Nancy

Orthodontics

THESIS: An assessment of oral healthcare delivery to children with special needs at dental schools in South Africa. This mixed-methods study assessed oral healthcare delivery to children with special healthcare needs (CSHCN) at academic dental hospitals (ADH) in South Africa (SA). Findings indicated that CSHCN in SA experienced poor oral health, high unmet dental care needs and limited access to dental treatment. Challenges affecting dental services at ADH included service provision challenges, resource constraints, low patient affordability and organisational factors. The study proposed an integrated oral healthcare framework to enhance dental services for CSHCN in SA.

Supervisors: Professor P Hlongwa and Dr A Magan and Dr M Molete

NKERA-GUTABARA NDIMURUKUNDO, Claudine Kanyana

Human Genetics

THESIS: Snapshot of the gut microbial diversity of an urban South African population in relation to diet, lifestyle, health and socioeconomic status

This study provided the first detailed analysis of the gut microbiome in 220 urban professional South Africans, linking microbial diversity and function to socio-demographic and modifiable factors such as diet and lifestyle, and health. By generating a high-resolution, population specific baseline, this work addressed a critical gap in African microbiome research. It challenges eurocentric paradigms, links urbanization, diet and environment to microbial shifts, and underscores the value of integrated multi-omics to inform locally tailored public health interventions in rapidly urbanizing settings.

Supervisors: Professor S Hazelhurst and Dr R Kerr and Dr J Naidoo

NOETH, Kayla Philippa

Virology

THESIS: Bionomics of *Anopheles* mosquitoes in Ehlanzeni District Municipality, Mpumalanga

This thesis examined the bionomics of *Anopheles* mosquitoes in Mpumalanga, focusing on historical abundance trends, pollution effects on *An. gambiae* breeding habitats, and the hormetic impacts of agricultural pollutants. Sub-lethal larvicide exposure influenced mosquito longevity and gut microbiota. Results showed systematic trends in vector bionomics and pollutant-induced hormesis with implications for insecticide resistance. The findings highlight key barriers to malaria elimination and conclude that refined surveillance and control strategies are essential to achieving elimination goals.

Supervisors: Dr SV Oliver and Dr G Munhenga

NYAMUPANGEDENGU, Kudakwashe Lazarus

Human Genetics

THESIS: Genetic impact on first line treatment to hypertension in black South Africans

Hypertension is the leading cause of cardiovascular disease and Africa carries the heaviest burden. Effective management is therefore crucial for improving health on the continent. This research investigated differences in response to hypertension medication between populations with different genetic ancestry. The study showed that despite deviating from national guidelines, hypertension management at primary health care level produces positive outcomes. The study also highlighted genetic diversity present in African populations and emphasizes further exploration with the ambition of population-specific tailored treatments.

Supervisors: Professor M Ramsay and Professor C Masimirembwa, Dr A May and Dr D Twesigomwe

OBERMEYER, Izel

Occupational Therapy

THESIS: Developing and evaluating a multimedia technology approach to surveying individuals with cognitive disabilities to promote person-centered practice

This study developed and evaluated a multimedia survey platform, Westchester Institute for Human Development (WIHD) EasySurvey (WES), to support self-reporting by individuals with cognitive disabilities. Co-designed with experts and end-users, WES integrates images, audio, and simplified layouts to enhance accessibility and independence. Findings showed that participants preferred WES over traditional tools, highlighting its potential to promote person-centered care and digital inclusion. The research contributes a practical, scalable solution for empowering voices often excluded from health and service feedback systems.

Supervisors: Dr D Franzsen, Dr J van der Linde and Adjunct Professor P Barnard-Ashton

OLANIPEKUN, Toluase Eniola

Physiology

THESIS: Tannic Acid as a dietary supplement for protection against metabolic disorders caused by sweetened alcohol intake in rats

This thesis examined tannic acid as a potential intervention for metabolic disturbances from sweetened alcohol consumption in adolescent rats. A voluntary gelatine-based model mimicking adolescent alcohol shot intake was used to assess metabolic, hepatic, and renal outcomes. Results revealed sex-specific vulnerabilities, with females more prone to visceral obesity, steatosis, oxidative stress, and glomerular changes. Tannic acid offered limited protection, improving hepatic oxidative stress in males only. The findings underscore the importance of considering sex differences in alcohol-related metabolic research.

Supervisors: Professor KH Erlwanger and Associate Professor OI Olateju

OSLER, Tabitha Simone

Human Genetics

THESIS: Genetic counselling, testing and clinical management of hereditary breast cancer in South Africa

This study determined the prevalence of pathogenic variants and variants of uncertain significance in susceptibility genes among South Africans with breast cancer, and evaluated the genetic counselling, testing, and subsequent clinical management pathways in affected women and their families. It also assessed the use of African genomic data to reclassify variants of uncertain significance in individuals of African ancestry. The study's findings have implications for future testing strategies and clinical management of hereditary breast cancer in South Africa.

Supervisors: Professor C Mathew and Professor M Urban, Dr J-T Brandenburg and Dr WC Chen

REDMAN-VIRA, Kirsten

Physiology

THESIS: Interaction between immune activation, sleep disturbances and circadian timing on cardio-metabolic risk in HIV positive patients

South Africa has the highest global burden of HIV. While antiretroviral therapy has improved life expectancy, people with HIV remain at increased risk for cardiovascular disease. Poor sleep contributes to weight gain, inflammation, and cardiometabolic risk. This research found that South African people with HIV had poor sleep quality and circadian misalignment (chronic jetlag) while poor sleep quality was associated with increased inflammation and higher cardiometabolic risk. Interventions to improve sleep may help alleviate cardiometabolic risk in people with HIV.

Supervisors: Associate Professor K Scheuermaier and Professor N Crowther

REIS, Naeema Ahmad Ramadan

Physiotherapy

THESIS: Evaluation of the implementation outcomes of the framework and strategy for disability and rehabilitation for South Africa: An explanatory mixed-methods study

This study evaluated the implementation outcomes of South Africa's Framework and Strategy for Disability and Rehabilitation (FSDR) in Gauteng through an explanatory mixed-methods design. Drawing on document reviews, interviews, and focus groups, it explored provincial processes, stakeholder perceptions, and influencing factors. Findings revealed inadequate funding, workforce shortages, and weak intersectoral collaboration, but also highlighted advocacy efforts and community-based rehabilitation as enablers. Evidence-based strategies were proposed to strengthen policy implementation, enhance rehabilitation access, and advance disability rights in South Africa.

Supervisors: Dr S Pilusa and Dr N Benjamin-Damons

SADIQ, Mohammad Eitzaz

Internal Medicine

THESIS: The role of atherosclerosis in HIV-related stroke in South Africa

This study on stroke in people living with HIV revealed that atherosclerosis is not a prominent mechanism in a low-and middle-income country. This was achieved by studying non-invasive biomarkers of subclinical atherosclerosis (carotid intima-media thickness and aortic pulse-wave velocity) in patients with strokes of different aetiologies. Covert opportunistic infections, including varicella zoster virus, and cardioembolism remain prominent causes. The Immune Reconstitution Inflammatory Syndrome was novelly shown to result in stroke soon after commencement of antiretroviral therapy, despite excluding opportunistic infections.

Supervisors: Professor G Modi and Professor AJ Woodiwiss

SALLIE, Farhanah Nabilah

Physiology

THESIS: Investigating the molecular and neurobehavioral effects of monoamine antidepressants and ketamine in a rodent model of ACTH-induced HPA axis dysfunction

This study investigated how prolonged ACTH exposure disrupts the stress-response system and alters brain signalling linked to mood and behaviour. It further demonstrates how classic monoamine-based antidepressants and ketamine influence brain function and behaviour in the ACTH model. These findings help explain how chronic stress contributes to depression and how current treatments work to reverse its effects.

Supervisors: Professor S Baijnath and Professor A Millen

SELEMANI, Apatsa

Public Health

THESIS: Journal indexing and scientific impact of Africa's public health research: Current status, barriers, facilitators, and opportunities

This thesis examined the barriers and enablers of Africa's public health research indexing and impact through the post-colonial lens. Multiple methods including a scoping review, scientometric and analytical cross-sectional analyses, in-depth interviews and discrete choice experiment were adopted. It revealed structural inequalities in knowledge production and dissemination emanating from neo-colonialism, leading to limited influence of African literature in local and global public health discourse. Development of inclusive research evaluation indicators and establishment of context-specific indexing platforms are recommended.

Supervisors: Associate Professor J Igumbor, Professor O Uthman, Professor Y-F Chen and Dr K Wella

SHAMU, Patience

Wits Reproductive Health and HIV Institute

THESIS: Perceptions of long-acting HIV pre-exposure prophylaxis and preferences for service delivery among young women in tertiary institutions in South Africa

This study examined the HIV pre-exposure prophylaxis (PrEP) service delivery preferences of young women in two tertiary institutions in South Africa and identified which attributes of services were valued most. Students preferred long-acting injectable PrEP, which was compatible with returning for contraceptive services. They wanted PrEP delivered through campus clinics with short waiting times and sensitive healthcare providers for support in dealing with side effects. Students need to be able to access services during holidays from clinics where they live.

Supervisors: Professor S Mullick and Professor N Christofides

SHEHU, Asma'u Muhammad

Anatomical Sciences

THESIS: Gliogenesis in the male Japanese quail (*Curtonix japonica*) brain

The study explored gliogenesis across juvenile, subadult and adult developmental stages in the male Japanese quail brain. Using a combination of histology, immunohistochemistry, immunofluorescence and electron microscopy, the location and distribution of neural progenitor stem cells, astrocytes, oligodendrocytes, microglia and neurons showing dynamic age-related cellular progressive changes were established. These region-specific patterns of proliferation through maturation contribute to a better understanding of mechanisms of brain development and neural plasticity, a significant contribution to the fields of developmental and comparative neuroscience.

Supervisors: Professor AO Ihunwo and Associate Professor P Mazenganya

SIKHOSANA, Nombeko

Pharmacy

THESIS: Nano-embedded bioplatfrom for ocular delivery of genetic material

This project developed a targeted gene delivery platform for ocular application, providing an alternative to conventional viral vectors. The work demonstrated efficient delivery of large genetic constructs, sustained gene release, and robust gene expression *in vitro* using nanoparticles. Findings highlight the potential of engineered, non-viral systems to overcome limitations of traditional viral approaches, offering a safe, scalable, and effective strategy for ocular gene therapy. The study advances the design of targeted platforms capable of precise and durable genetic material delivery.

Supervisors: Professor YE Choonara, Professor L du Toit and Dr P Walvekar and Dr N Ally

SIMUYEMBA, Moses Chikoti

Public Health

THESIS: An Economic Evaluation of Zambia's Human papilloma virus (HPV) vaccination programme

This thesis assessed the cost and cost-effectiveness of Zambia's HPV vaccination programme delivered through school, health-facility and community-outreach models. Using a Markov model that incorporated HIV considerations, the study compared delivery efficiencies and long-term health outcomes. Findings provide critical evidence to guide national policy on sustainable HPV vaccination financing and optimised delivery strategies in low- and middle-income settings.

Supervisors: Associate Professor L Chola and Reader R Wagner

SMYTH, Natalie Anne

Human Genetics

THESIS: Understanding the genetic basis of extreme levels of high and low LDL-cholesterol in African populations
This study investigated genetic contributions to LDL-cholesterol levels in Sub-Saharan Africans using data from the AWI-Gen cohort. Targeted sequencing of key genes involved in LDL-cholesterol metabolism identified both known and novel variants, while polygenic score analyses highlighted the limited predictive accuracy of existing models in different African populations. Together, these findings underscore the genetic complexity of dyslipidaemia in Africa and emphasise the need for ancestry-inclusive research to improve cardiovascular risk prediction on the continent.

Supervisors: Professor M Ramsay, Professor F Raal and Dr D Sengupta

STEIN, Christopher Owen Alexander

Bioethics and Health Law

THESIS: Acting without asking: An ethico-legal analysis of the problem of emergency care research with incapacitated adults

This thesis is a critical analysis of the ethical principle of respect for autonomy and the process of informed consent and the interactions of ethical decision-making and risk analysis in the emergency care research context. This is followed by an ethico-legal analysis of research on emergency care research with incapacitated adults. A novel categorisation of capacity with mappings to time-sensitive levels of informed consent modalities is presented with a set of conditions and framework for a waiver of informed consent.

Supervisor: Professor A Dhai

THABETHE, Nomsa Dududzile

Public Health

THESIS: Human health risk of exposure to fine particles (PM2.5) from the gold mine tailings in the community of eMbalenhle, South Africa

This study assessed the human health risks of exposure to PM2.5 among different population subgroups in eMbalenhle. Ambient PM2.5 monitoring at TSFs and community, dispersion modelling, source apportionment and Probabilistic Human Health Risk Assessment were conducted. The study indicated that some population subgroups experienced health risks despite PM2.5 concentrations being below the National Ambient Air Quality Standard (NAAQS). Although no direct link between health effects and TSFs was established, the study showed that compliance with NAAQS does not always guarantee public health protection.

Supervisors: Professor D Brouwer, Professor MD Masekameni and Dr TN Makonese

TLHABELA, Daphney

Nursing

THESIS: Factors influencing implementation of termination of pregnancy policy in Gauteng Department of Health - A multi-method study

This multi-method study identified the factors influencing the implementation of the termination of pregnancy policy in the Gauteng Department of Health. Several sets of data were analysed, guided by the policy framework of Walt and Gilson. Data showed that the provision of abortion services by TOP providers has a positive impact on the lives of the women seeking abortion care, but access is hindered due to limited resources and stigma which still remains and impacts negatively on the successful implementation of the TOP policy.

Supervisors: Dr S Armstrong and Professor S Schmollgruber

UJADDUGHE, Oriasotie Moses

Anatomical Sciences

THESIS: Evaluation of standards for sex estimation in Black South Africans using measurements derived from a three-dimensional Computed Tomography (3DCT) scan

This study addressed the need for accurate human identification within the context of violent crime in South Africa. Using computed tomography scan records, measurements were obtained from selected bones of contemporary black South Africans. The study evaluated the performance of existing sex estimation models and developed new population-specific models to improve the accuracy of forensic identification and support medico-legal investigations, contributing significantly to forensic anthropology and the administration of justice.

Supervisors: Professor OI Olateju, Professor MA Bidmos and Professor MA Spocter

UWASE, Aline

Public Health

THESIS: Factors associated with maternal dietary practices among pregnant women attending antenatal care services in the Southern province of Rwanda

This study investigated maternal dietary practices during pregnancy in Rwanda's Southern Province, where undernutrition and anaemia remain prevalent. Using a scoping review and a convergent mixed-methods study, it explored the factors associated with dietary practices, and the roles of male partners and healthcare providers. Findings revealed suboptimal dietary practices shaped by education, food insecurity, cultural norms, male partners' involvement and systemic barriers. Strengthening nutrition education, male involvement, and healthcare infrastructure is essential to improve maternal dietary practices and pregnancy outcomes in Rwanda.

Supervisors: Professor J Levin, Associate Professor E Nsereko and Dr N Pillay

ZHARIMA, Champion

Public Health

THESIS: The strategies to enable, and challenges faced with implementation of quality electronic health records in South Africa

This thesis examines barriers, facilitators, and strategies for implementing electronic health records (EHR) in South Africa, essential for achieving National Health Insurance goals. Using qualitative interviews with stakeholders, a case study, and a rapid review of global evidence, it identifies systemic, infrastructural, technical and leadership challenges. Findings emphasize the importance of integrated approaches that combine top-down leadership with effective bottom-up user engagement, while drawing on provincial successes to guide the development of a robust, interoperable national EHR system.

Supervisors: Professor J Goudge and Professor F Griffiths