

## Winners of the 15<sup>th</sup> Cross Faculty Postgraduate Symposium 2024

<b>Masters Oral</b>		
<b>1<sup>st</sup></b>	2232089	Jessica Hurwitz - Science
<b>2<sup>nd</sup></b>	2174355	Keenan Ikking - Science
<b>3<sup>rd</sup></b>	1621192	Matilda Mbazo - Science

<b>Masters GradFlash</b>		
<b>1<sup>st</sup></b>	2090593	Kiara Naidoo - Science
<b>2<sup>nd</sup></b>	540008	Abnel Sanders Mutabasere – Health Science
<b>3<sup>rd</sup></b>	2151946	Ester Tshipamba - Science

<b>PhD Oral</b>		
<b>1<sup>st</sup></b>	801605	Nthabiseng Mathikge - Science
<b>2<sup>nd</sup></b>	1855391	Khanya Jaceni - Science
<b>3<sup>rd</sup></b>	1173641	Ruth Aaronson - Science

<b>PhD GradFlash</b>		
<b>1<sup>st</sup></b>	587747	Ateret Ben-David - Science
<b>2<sup>nd</sup></b>	1057889	Sarhana Dinat – Health Science
<b>3<sup>rd</sup></b>	1477491	Lindokuhle Magagula - Science

## Winners Profiles

### **Jessica Hurwitz (1<sup>st</sup>, MA Oral)**



I am completing my MSc in Biochemistry in the Protein Structure-Function Research Unit (PSFRU) in the school of Molecular and Cell Biology, Faculty of Science, at the University of Witwatersrand, South Africa. My project has focussed on both computational and experimental studies to determine protein-protein interactions between immune-regulatory proteins. I have used many techniques throughout my MSc to determine these protein-protein interactions. This has not only helped me master the scientific method, but has also helped build my research, communication, writing, presentation, and teaching skills.

Throughout my MSc I have worked as a teaching assistant, guiding the undergraduate students in Molecular and Cell Biology through their degrees.

Coming from a background of professional ballet dancing, I always had a deep interest in how the body works, down to the smallest details – leading me to biochemistry. I completed my BSc in Biology, with majors in Biochemistry and Cell Biology and Microbiology and Biotechnology, with distinction in 2021 at the University of Witwatersrand, Johannesburg, South Africa. I completed BSc Honours in Medical Microbiology, Department of Pathology, Faculty of Health Science, with distinction in 2022 at the NHLS, Stellenbosch University, Cape Town, South Africa. The findings of my BSc Honours project, looking at antibiotic resistance in pathogens causing urinary tract infections using bioinformatics and experimental work, was published in the African Journal for Laboratory Medicine (AJLM) in 2024.

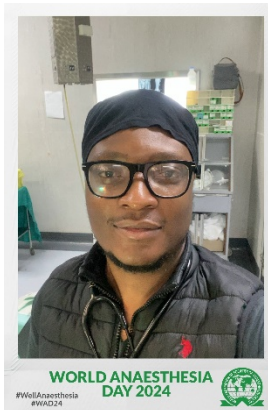
**Keenan Ikking (2<sup>nd</sup>, MA Oral)** completed his undergraduate and honours degrees in bioinformatics and is currently pursuing a Master's degree at the University of the Witwatersrand. His research focuses on alternative splicing, using long-read sequencing to study RNA isoform diversity. This approach offers greater detail in understanding gene variants compared to traditional methods.

He is also interested in the innate immune system, particularly pathways like RIG-I, and how they respond to viral infections. His work explores the regulation of these pathways through alternative splicing, with a focus on potential therapeutic targets, particularly in relation to diseases like COVID-19. Keenan's interdisciplinary research combines computational biology and genomics, contributing to advances in personalised medicine and immune system studies.



**Matilda Mbazo (3<sup>rd</sup>, MA Oral)** is a Master's candidate at the University of Witwatersrand under the supervision of Professor Stefan Grab (WITS), Dr. Dave Thompson (SAEON Ndlovu Node), and Dr. Keenan Stears (University of North Dakota). She is passionate about Geographic Information Systems (GIS) and Remote sensing and how they tie into solving environmental problems, mainly caused by climate change. She completed her undergraduate studies in Geography and Environmental Sciences and assessed flood impact at the Hennops river using GIS during her Honours. Her Master's research, titled '*Quantifying the effects of multiple disturbances on tree density in a Marula-Knobthorn savanna*', makes use of remotely sensed data to assess the combined effects of extreme drought, fire frequency, and herbivory on tree density in a Marula-Knobthorn savanna ecosystem. The study will make use of existing replicated long-term fire manipulation trails in the Satara region of central Kruger National Park, examining fire-return intervals and exclusion of browsers, using GIS and RS tools to quantify the differences in tree density as a result of these factors in isolation and in combination. Matilda also works as an environmental consultant, providing expert guidance on projects related to environmental impact assessments, land use management, and conservation initiatives. Her passion lies in integrating academic research with practical applications to foster sustainable development and environmental stewardship.

### **Abnel Sanders Mutambasere (2<sup>nd</sup>, MA Gradflash)**



I am a Wits MBChB graduate with a particular interest in clinical research. I also hold a BSc. Med. Hons degree in Infectious diseases and Immunology. After completing my internship at Mafikeng Provincial Hospital, where I discovered my passion for Anaesthesia. I moved to Ireland for over a year before coming back to SA to pursue a specialisation in Anaesthesia. I am currently enrolled at Wits where I am completing my Master in Medicine degree in Anaesthesiology. My passion for anaesthesia stems from a strong belief that no one should have to endure pain. I thrive to take away pain whenever I can, like some modern-day medical empath.

### **Ester Tshipamba (3<sup>rd</sup>, MA Gradflash)**

I am an MSc student in the Faculty of Science, where I also completed my BSc and Honours degrees. Since 2022, I have been conducting research in the School of Molecular Cell Biology under the supervision of Dr. Eloise Van Der Merwe. My fascination with molecular science began early in my studies, driven by a curiosity



about how tiny molecular changes can lead to profound effects in living organisms. I have always been interested about the brain and am driven by a passion to understand the mechanisms behind neurodegenerative disorders and improve treatments for those affected.

This curiosity led me to focus on Alzheimer's disease (AD). For my MSc project, I am investigating the link between hypercholesterolemia and AD, particularly exploring novel therapeutic targets to prevent the disease. I was thrilled to attend this year's symposium where I had

the chance to communicate my research – *LDLR Upregulation: Unveiling New Targets in Alzheimer's Disease Prevention*.

Outside of the lab, I love exploring the outdoors, creating art, mentoring younger students, and staying inspired by the ever-changing landscape of scientific discovery. I am eager to embark on my professional journey and make meaningful contributions to the field of disease research.



**Ateret Ben-David (1<sup>st</sup>, PhD Gradflash)** is a Biochemistry PhD candidate specialising in enzyme engineering, with a focus on advancing green chemistry. Her research centres on nitrile hydratase (NHase), an enzyme with vast industrial potential for sustainable processes. NHase catalyses the conversion of nitriles into amides—crucial intermediates in industries such as pharmaceuticals, agrochemicals, and bioremediation. Ateret is working to broaden NHase's substrate specificity, a breakthrough that could revolutionise its application across multiple sectors. By enhancing the enzyme's functionality, her work aims to deliver cleaner, more efficient alternatives to traditional chemical synthesis, significantly reducing environmental impact.

Passionate about science and environmental sustainability, Ateret is committed to developing innovative solutions that integrate biotechnology and chemistry to address global challenges. Her approach blends rigorous experimentation with a strong emphasis on practical, real-world applications, ensuring her work holds both academic importance and industrial relevance.

She is supervised by Prof Ikechukwu Achilonu and Prof Dean Brady, both leading authorities in their fields. Under their mentorship, Ateret benefits from exceptional guidance and expertise, placing her in an ideal position to make impactful contributions to green chemistry and sustainable industrial processes.



**Sarhana Dinat (2<sup>nd</sup>, PhD Gradflash)**, a PhD candidate in Pharmaceutical Microbiology, Department of Pharmacy and Pharmacology, is focused on the gut pathogen *Helicobacter pylori*.

*Helicobacter pylori* infects up to 84% of South Africans and has been linked to numerous ailments, including gastric cancer, hypertension, and most notably, gastric ulcers. Conventional treatment regimens are increasingly failing, as *H. pylori* rapidly gains resistance to antibiotics. These antibiotics also cause dysbiosis to the naturally occurring gut microbiome. This study explores the use of South African traditional, alternative, and natural medicine to combat *H. pylori*. It presents the first anti-*H. pylori* potential of a comprehensive range of South African natural products, including bee products such as honey and propolis, and medicinal plants used traditionally for treating gastric ulcers. This study provides scientific validation for numerous natural products used in traditional medicine and is the first to show the positive effect many of these natural products have on the gut microbiome. This project shows the potential for effective, easily accessible, cheaper alternatives for treating *H. pylori* infections and related ailments.



**Lindokuhle Magagula's (3<sup>rd</sup>, PhD Gradflash)** research interests lie in the conversion of waste into energy, focusing on transforming waste into valuable resources to promote a sustainable economy. Her current PhD research focuses on developing affordable catalysts for the reduction of carbon dioxide (CO<sub>2</sub>), a greenhouse gas. Her research explores an innovative method of photo-electrocatalytic reduction to produce sustainable fuels.

Photo-electrocatalytic reduction is a process that mimics natural photosynthesis, but instead of producing glucose, as plants do, this artificial synthesis aims to convert CO<sub>2</sub> into longer-chain chemicals, known as C<sub>2+</sub> products, which can be used as fuels. The process uses light and electricity to drive chemical reactions that transform CO<sub>2</sub> into valuable products, providing a sustainable way to reduce carbon emissions while generating renewable energy.

A key aspect of the research is the use of nanoscale catalysts, where at least one dimension of the material is less than 100 nm. At this scale, metals display unique properties, such as the ability to tune the wavelength at which they absorb light, and the energy required to excite electrons. These tunable properties can enhance the efficiency of the CO<sub>2</sub> conversion process.

In South Africa, we emit 400 million tons of CO<sub>2</sub> annually, largely due to a heavy reliance on coal for electricity, cement production, and fuel combustion in transportation. By converting carbon dioxide into C<sub>2</sub>+ products for use as renewable fuels, Lindokuhle's work offers a potential solution to reduce CO<sub>2</sub> in the atmosphere. Additionally, the process uses sunlight, presenting a cleaner, more sustainable energy alternative that can help reduce greenhouse gas emissions and contribute to the global transition toward renewable and sustainable energy sources.

**Nthabiseng Mathikge (1<sup>st</sup>, PhD Oral)** is a South African experimental biologist at the



University of the Witwatersrand specialising in Entomology, focusing on the ecophysiology of scarab beetles. Under the supervision of Prof. Marcus Byrne, Dr Sivu Situngu and Dr Claudia Tocco, Nthabiseng is currently pursuing a PhD focused on the effects of elevated atmospheric CO<sub>2</sub> on dung beetle populations and is particularly interested in how this affects their body size, mortality rates, and developmental periods. Through this work, she aims to elucidate the mechanisms driving these adverse outcomes, with an emphasis on nutrient competition driven by insect-microbe interactions. This research has far-reaching implications for

understanding how climate change affects biodiversity and ecosystem functionality.

Beyond research, Nthabiseng is passionate about science communication and is actively involved in outreach to bridge the gap between scientific knowledge and public awareness. Outside the lab, Nthabiseng loves exploring the natural world and is always seeking to deepen her connection to the environment she studies.



**Ruth Aronson (3<sup>rd</sup>, PhD Oral)** is a dedicated senior PhD candidate at the University of the Witwatersrand, specialising in Molecular and Cell Biology, with a distinct focus on colorectal cancer and chemotherapy resistance. Her pioneering doctoral research centres on the innovative use of patient-derived organoids (PDOs) to model colorectal cancer, seeking to unravel the mechanisms of chemotherapy resistance and improve therapeutic strategies. Ruth is contributing to the first

successful culturing of colorectal cancer PDOs from a South African patient cohort. With a strong passion for advancing human health, Ruth is committed to pushing the

boundaries of cancer research and looks forward to contributing to personalised treatments that can transform patient outcomes globally.