TTO NEWS

Introducing the TTO

Bridging the gap between research and commercialisation

Award-winning innovations

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
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Newsletter of the Technology Transfer Office of the University of Pretoria

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Introducing the TTO Newsletter

Lawrence Baloyi
Head: Contract Research and Innovation Support

With the promulgation of the Intellectual Property Rights from Publicly Financed Research and Development Act, there is now a Technology Transfer Office (TTO) in almost every research institution, dedicated to identifying, protecting and exploiting intellectual property for the benefit of all people.

The University of Pretoria (UP) supports and funds various breakthrough developments. Over the last couple of years, it has seen more research contracts , patent filings, new South African and foreign patents granted and patent licences than ever before. This signifies the many ways in which UP collaborates with other research institutions.

Industry plays a vital role in the creative process: industry partners work with researchers to pilot their technologies and transform their discoveries into public goods and marketable products. The TTO nurtures these relationships, working hand-in-hand with researchers.

In the spirit of assisting South Africa to build a sustainable economy, UP nurtures a culture of creativity that ensures that our research output continues to address some of the country's challenges.

This publication illustrates some of our successes. We hope that our activities will make a meaningful contribution to the growth of the economy and the lives of the people of the Republic of South Africa.

Introducing the TTO

The Technology Transfer Office (TTO) of the University of Pretoria resides within the Department of Research and Innovation Support (DRIS).

TTO staff members are willing to assist with any queries (from left): Stanly Ehlers, John Visagie, Simon Thanyani, Khangwelo Rathogwa, Refilwe Ngoato, Musa Masia and Lawrence Baloyi

Should you require assistance with the development and commercialising of your intellectual property, please contact one of the following members of the TTO:

Mr Lawrence Baloyi
Head: Contract Research and Innovation Support
Tel 012 420 5303
Email lawrence.baloyi@up.ac.za

Ms Refilwe Ngoato
Manager: Technology Transfer
Tel 012 420 4568
Email refilwe.ngoato@up.ac.za

Mr John Visagie
Manager: Industry and International Research Partnerships
Tel 012 420 2263
Email john.visagie@up.ac.za

Dr Simon Thanyani
Manager: Contract and Innovation Support
Tel 012 420 xxxx
Email simon.thanyani@up.ac.za

Mr Musa Masia
IP Legal Advisor
Tel 012 420 xxxx
Email musa.masia@up.ac.za

Ms Stanly Ehlers
Administrative Assistant (Contract Research and Innovation Support)
Tel 012 420 4960
Email Stanly.ehlers@up.ac.za

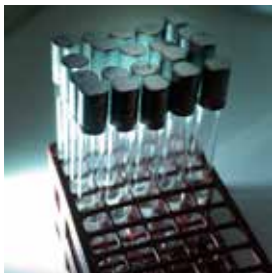
Mr Khangwelo Rathogwa
Administrative Assistant (Industry and International Research Partnerships)
Tel 012 420 xxxx
Email khangwelo.rathogwa@up.ac.za

The TTO supports researchers at the University by providing an enabling environment to further the utilisation of their research in the market by licensing and technology transfer or by establishing strategic industry partnerships. It provides staff and research groups at the University with the following support:

- It coordinates processes, systems and structures to facilitate the transfer of UP-created discoveries into new products and services for public use and benefit, including invention disclosures, evaluation and selection of intellectual property (IP) management, licensing and the provision of legal and financial support services for such activities.
- It provides support for legal, financial and project management services for IP activities, such as patenting, and licensing.
- It facilitates the formation of "spin-off" companies by assisting with due diligence, financial and legal services, business plans and feasibility studies.
- It develops and implements commercialisation strategies.
- It provides commercialisation services that include identifying and securing initial seed funding, recruiting management teams and securing first-round venture funding.
- It ensures the effective management of the University's new venture portfolio, thereby securing meaningful third-stream income.
- It develops marketing strategies for new inventions, including preparing marketing material, identifying and making contact with potential licensees and closing the deal.
- It selects the form of agreement, option, patent licence, copyright licence and materials licence, and prepares ready-to-sign standard agreements.
- It monitors agreement and performance, maintains relationships, and attends to legal issues in the event of breech or non-performance.
- It involves itself in equity investments and negotiation, sits on the boards of directors, and participates in business-related matters.

TTO celebrates World Intellectual Property Day

Frank Chapra once said, "Film is one of the three universal languages, the other two: mathematics and music." Each year, the writers, directors, crew, actors and producers of films work tirelessly to bring audiences worldwide brilliant films and they deserve to have their intellectual property respected.



World Intellectual Property (IP) Day is annually celebrated on 26 April. In recognition of this, the University's TTO partnered with the Companies and Intellectual Property Commission (CIPC) and the National Intellectual Property Management Office (NIPMO) to host a World IP Day Symposium on the University's Hatfield Campus on 24 April 2014.

This year, the theme for World IP Day was "movies – a global passion", which is why the symposium focused on copyright issues relating to the film industry. The day was filled with a variety of informative talks on intellectual property rights and their enforcement. The morning started with a talk by Ms Amanda Lotheringen, Senior Manager: Copyright and IP Enforcement at CIPC. She talked about creating a balance between the enforcement and awareness of IP rights. Ms Mavis Nyatlo, Director: Advisory and Support Services at NIPMO, presented a talk on commercialisation and the effective use of publicly financed research and development outcomes in the film industry. Prof Chris Broodryk from the University's Drama Department talked about the contribution of higher education institutions to the film industry.

Some 100 people from various companies attended the symposium and the campus radio, TuksFM, featured a segment on the importance of IP. The symposium played a big part in raising awareness of IP rights in the film industry.

Forging important partnerships with the USA

Refilwe Ngoato, the TTO's Manager: Technology Transfer, was fortunate to be selected from a competitive pool of candidates as a Massachusetts-South Africa Technology (M-SAT) Fellow. As a result, she spent five weeks in the USA during October and November 2013.

The M-SAT Fellowship brings together mid-level professionals in the technology, information technology and life sciences industries from South Africa and Massachusetts for a two-way exchange designed to strengthen professional skills and create mutually beneficial relationships.

Refilwe spent three weeks at the Massachusetts Institute of Technology (MIT) learning best practices in technology transfer and commercialisation. She spent her first week at Bentley University in Waltham, Massachusetts, where she attended lectures on the role of government in the US economy, entrepreneurship (the engine of the American economy) and the Massachusetts innovation economy. One of the things she learnt was that start-up companies have always been at the heart of America's economic success. Young companies that are five years old or younger account for the bulk of innovation and all of the country's net job creation.

Her last week in the USA was spent in Washington, where she attended the Professional Fellows Congress from 6 to 9 November 2013. The congress was attended by 239 fellows from 50 countries worldwide, and each fellow presented a poster. Refilwe's presentation compared South African technology transfer offices to technology transfer offices in the USA.

In February 2014, her MIT peer came to the University of Pretoria for two weeks. Together they organised a workshop on IP and research commercialisation.

Refilwe Ngoato
Manager: Technology Transfer

Raising awareness of technology transfer at Onderstepoort

Technology transfer is a critical part of the innovation process and, ultimately, economic growth. The University's TTO is dedicated to raising awareness of technology transfer and facilitating the technology transfer process.

On 14 August 2014, the research community at the Faculty of Veterinary Science had the opportunity to attend an IP and research commercialisation workshop at the University's Onderstepoort Campus. The TTO partnered with the legal firm Smit & Van Wyk and the Research Institute for Innovation and Sustainability (RIIS) to present this workshop. Smit & Van Wyk is a specialist legal practice dealing exclusively with patent and trademark law in South Africa, while RIIS aims to sustain and manage innovation in the working environment. It provides guidance and practical insight, and assists with planning and managing an uncertain future.

The workshop aimed to increase the level of IP protection and commercialisation awareness among the research community at the University's Onderstepoort Campus. Technology transfer helps to develop early-stage IP into tools for direct use by the research community or the public. That is why it is important to raise awareness of technology transfer within higher education institutions. Technology transfer ensures that the community experiences the economic benefit of IP commercialisation, while protecting the inventor's IP rights.

Encouraging invention disclosure

A workshop on IP and research commercialisation was presented in conjunction with the legal firm Spoor & Fisher and the MIT's Technology Licensing Office on 12 February 2014.

It aimed to introduce researchers to the benefits of technology transfer, since some researchers are reluctant to disclose their inventions. One of the presenters was former UP researcher, Dr Linda Meyer, who left UP to focus on her company, MABU Casing Soils. She developed a soil that supports sustainable mushroom production, and succeeded in commercialising it with great success. MABU Casing Soils is now producing casing soil on a commercial scale. The title of Dr Meyer's presentation was "From research to commercialisation". The workshop encouraged some of the attendees to disclose their inventions to the TTO. Some 50 researchers attended the workshop. As a specialist law firm, Spoor & Fisher covers all aspects of IP law, including patents, trademarks, copyright and designs, related litigation, commercial transactions, due diligence and portfolio management.

The mission of the MIT's Technology Licensing Office is to benefit the public by moving the results of MIT's research into societal use via technology licensing. The TTO's collaboration with institutions like MIT could provide it with opportunities to improve its methods of identifying potential patents and facilitating technology transfer.

Success stories

Bridging the gap between research and commercialisation

Each successful technology transfer project has the potential of making a significant contribution to growth and innovation in South Africa. One such project is the mushroom casting soil project, which was successfully commercialised earlier in 2014.

After eight years of research at the University of Pretoria, sugar cane bagasse was used to develop a mushroom casing soil that is a suitable replacement for imported peat soil. The South African Mushroom Farmers' Association (SAMFA) and the Technology and Human Resources for Industry Programme (THRIP) funded the project. Sugar cane bagasse is the fibrous remnants that remain after sugar cane is crushed.

The University of Pretoria patented the process of manufacturing the mushroom casing soil in South Africa, Australia, Brazil, China, the European Union, India and New Zealand. A private company, MABU Casing Soils (Pty) Ltd, was established to manufacture soil on a commercial scale. MABU Casing Soils holds an exclusive licence to commercialise this patented innovation and has recently acquired a site near Bapsfontein in Gauteng. It has been in full production since August 2014.

According to Dr Linda Meyer, Managing Director of MABU Casing Soils, the mushroom casing soil is 100% natural, cost-effective, eco-friendly, and allows sustainable mushroom growing, which was not previously possible. Dr Meyer was previously employed as a researcher in the University's Department of Microbiology and Plant Pathology. Apart from mushroom casing soil, her specialities include plant pathology, mushroom diseases and disease epidemiology.

Peat soil is an expensive import product and recognised fossil fuel, and its extraction causes irreversible damage to peat bogs and wetlands abroad. Peat is an accumulation of partially decayed vegetation or organic matter that forms slowly over thousands of years. These ecosystems are hotspots of biodiversity and home to many endangered species. Consequently, the horticultural industry is under considerable pressure to stop using peat soil. In an attempt to alleviate this pressure, MABU Casing Soils has been doing research in the horticultural, seedling and hydroponic industries.

The Technology Innovation Agency (TIA) allocated technology development funds to the company to enable it to "bridge the gap" between research and commercialisation. With TIA's financial help and business support, MABU Casing Soils increased the volume of soil processing.

The company was nominated for the Gauteng Accelerator Programme (GAP) Biosciences Awards at the Innovation Hub in December 2013.

Dr Linda Meyer

"I was very excited and proud when we were announced runners up. Since then, our experience at the buzzing Innovation Hub has been inspiring. We have met a lot of extremely positive and proactive people," says Dr Meyer.

Apart from the R300 000 prize money that the company received, it is incubated by Maxum business support. The Maxum incubation programmes provide an enabling environment where start-ups from the knowledge-intensive sectors are fast-tracked to compete in the global village.

MABU Casing Soils is thankful for the mushroom industry's input and assistance. SAMFA initiated the research in 2002 and has supported UP, the research and MABU Casing Soils with countless trials and advice ever since.

According to Dr Meyer, MABU Casing Soils is dedicated to contributing to a sustainable future for South Africa through its commitment to environmentally responsible practices and the production of high-quality peat-free products.

The TTO wishes to congratulate Dr Meyer on a job well done.

mabu
mushroom casing soil

Success stories

Rhino database brings poachers to justice

With the western black rhino extinct, the southern black rhino critically endangered and the poaching rate of white rhinos higher than the birth rate, countless initiatives aim to combat the poaching crisis in South Africa. The Faculty of Veterinary Science at the University of Pretoria and the Castle Lager Boucher Legacy Project have joined forces to build a valuable DNA database of South African rhinos in an attempt to curb poaching.

The Onderstepoort Veterinary Genetics Laboratory (VGL) is a self-funded laboratory at the University's Onderstepoort Campus, which performs all microchipping and DNA testing of thoroughbred horses for the National Horseracing Authority of South Africa. It handles over 12 000 samples of various species every year. Since 2009, the VGL has been using its experience in this regard to research the viability of a rhino database.

Since its inception, the database, called RhODIS®, has grown to include over 13 000 rhinos. These include South African black and white rhinos from the national parks, provincial parks and private sector, as well as rhinos from Botswana, Kenya, Malawi, Namibia and Zimbabwe. Samples taken from poached horns are compared to samples from individual rhinos in the database in order to link these horns to individual poaching incidents. The aim is to assist law enforcement agencies to gather evidence to arrest poachers. The principle of the RhODIS® database is based on the Federal Bureau of Investigation (FBI) Combined DNA Index System (CODIS) of human DNA profiles. The rhino database was named after this system.

In December 2013, the Castle Lager Boucher Legacy Project raised R1.3 million to buy the Applied Biosystems 3500 genetic analyser. The Castle Lager Boucher Legacy Project was formed when Castle Lager partnered with Mark Boucher, the legendary South African cricketer, to help protect our rhino from extinction. The older Applied Biosystems 3130 machine was not forensically validated, but it is still used for the DNA profiling of other animals. The new machine, which is forensically validated, can analyse up to 24 samples a day, compared to the older model's eight samples a day. The Castle Lager Boucher Legacy Project presented the machine to the VGL on 28 August 2014, and it is used to provide a DNA profile of each rhino, which is added to the RhODIS® database.

RhoDIS® helps law enforcement agencies to understand trade routes better and to enable more effective poaching prevention. The more DNA profiles there are on the database, the more likely investigators will be able to identify the origin of the recovered horns. The VGL now routinely uses this method to individually identify rhino horn from stockpiles for security purposes and to link recovered horn to individual poaching incidents, thereby linking a horn trafficker to a poaching incident or a poacher caught with horns in his possession with the carcass of an individual rhino.

The stringent quality requirements of RhODIS® have extended to the collection of field samples to ensure that the integrity of any data used in court cannot be questioned. This has been done by developing and distributing a RhODIS® sample collection kit. The kit contains blood tubes, sample bottles for tissue and horn shavings, a disposable scalpel, drill bit, and gloves pre-labelled with barcoded labels and packed in a sealed container.

The evidence provided by the sample analysis and comparison to the RhODIS® database has led to the conviction and subsequent imprisonment of a Vietnamese man who tried to smuggle poached rhino horns. Two Mozambican citizens were also found guilty after being apprehended in the Kruger National Park. They were in possession of poached rhino horn that was linked to a carcass found in the park.

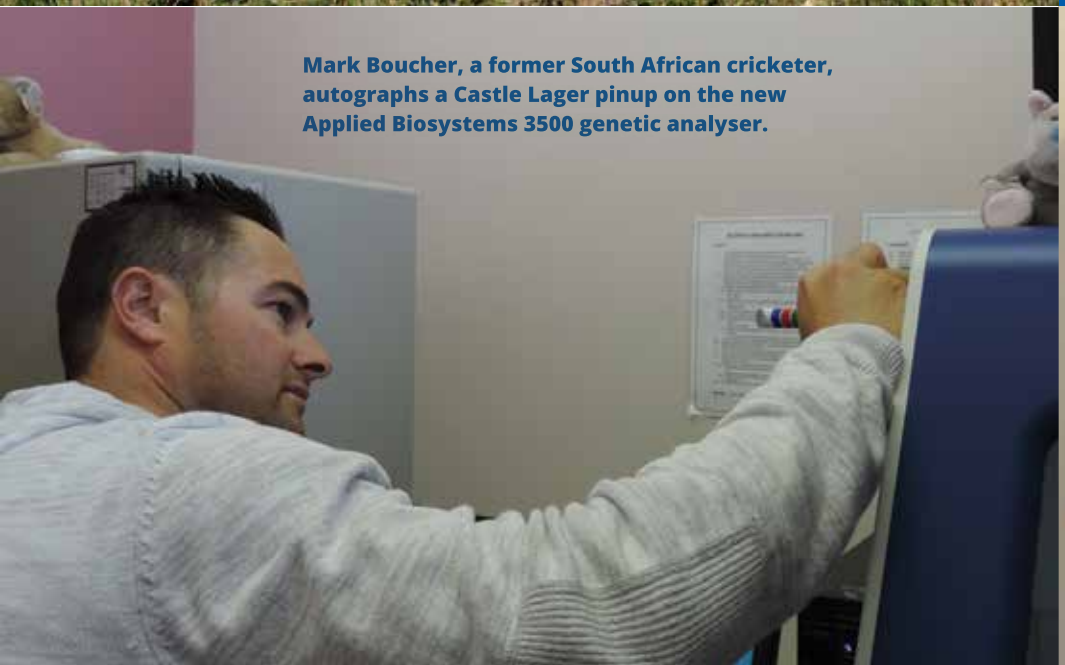
According to Save the Rhino International, at the beginning of the 20th century, there were 500 000 rhinos across Africa and Asia. This population fell to 70 000 by 1970. There are barely 29 000 rhino in the wild today. The organisation further states that large-scale poaching of the critically endangered southern black rhino resulted in a dramatic 96% decline from 65 000 individuals in 1970 to only 2 300 in 1993. Persistent efforts of conservation programmes across Africa resulted in black rhino numbers rising to a population of just over 5 000 in 2013.

Although conservation efforts were fruitful to an extent, poaching remains a threat to the rhino population worldwide.

From left: Alastair Hewitt, General Manager of Castle Lager and Sport Sponsorship at South African Breweries, Dr Cindy Harper, Director of the VGL, and Mark Boucher, former South African cricketer and wildlife enthusiast, next to the new genetic analyser.

Below: The Castle Lager Boucher Legacy Project aims to become a leading force in protecting our wildlife heritage, which is currently being threatened by the scourge of rhino poaching.

Mark Boucher, a former South African cricketer, autographs a Castle Lager pinup on the new Applied Biosystems 3500 genetic analyser.



Success stories

Developing a cure for opportunistic fungal infections

A novel antifungal agent that was developed at the University of Pretoria was recently nominated for the Gauteng Accelerator Programme (GAP) Biosciences Awards and awarded a runner-up prize at the South African Breweries (SAB) Social Innovation Awards.

Three UP staff members contributed to the development of a safe antifungal compound for the treatment of *candida albicans* infections. Prof Kobus Eloff and Dr Francien Botha of the Department of Paraclinical Sciences and members of the Phytomedicine Programme in the Faculty of Veterinary Science collaborated with Dr Candice van Wyk of the Department of Community Dentistry on this project. The antifungal agent was developed from indigenous sneezewood *(Ptaeroxylon obliquum)* trees.

The research team that contributed to the development of a novel antifungal agent.

Candida albicans is a fungus that forms a type of yeast in the human body. It is harmless in small amounts, but when the population gets out of control, it results in a yeast infection called Candidiasis. It causes opportunistic oral and genital infections in people worldwide. Candidiasis is commonly caused by, among other things, a diet high in sugar, antibiotics and a weak immune system.

The development of the new antifungal agent relates to a process of extracting antifungal agents from plant material. After several experiments, it was found that acetone leaf extracts of the sneezewood tree effectively fight Candidiasis. The tree is common in the east of South Africa and has a number of traditional medicinal uses. The tree's bark is made into a snuff that is used to relieve headaches, and an infusion is reported to be useful in the treatment of rheumatism and arthritis. The tree's powdered bark was used as a wash to kill ticks. Extracts from the tree have been thoroughly investigated and antifungal compounds isolated.

One of the compounds was a new compound that had never been found in plants until now. The team named it obliquumol. Obliquumol's activity was compared to that of amphotericin B, the most widely used antifungal agent in the world. It was found to be 27 times more active than amphotericin B.

Pharmaceutical companies, hospitals, pharmacies, doctors and nurses could use obliquumol to treat Candidiasis in affected patients. According to BCC Research, a leading market research company, the global market for human antifungal therapeutics reached nearly $11.6 billion in 2012 and $11.8 billion in 2013. This market is expected to grow to nearly $13.9 billion in 2018 with a compound annual growth rate of 3.2% over the five-year period from 2013 to 2018. In its report on the state of the antifungal market for 2014, the company states that there is critical need for new and more effective medicines, as fungi are becoming resistant to the approved compounds found in current medicines.

Gauteng Accelerator Programme (GAP)

GAP Biosciences seeks to address the gap that exists between the prototyping and commercialisation of life science technologies by providing researchers with essential business skills. It is aimed at facilitating the commercialisation of bioscience technologies.

The first component of the programme is a two-day Business Basics Workshop. The second component is a Business Plan Competition. The winning team in the annual GAP Biosciences Awards receives business incubation, seed funding and mentoring.

The University is proud to acknowledge the nomination of the following research project for the GAP Biosciences Awards for 2014 (see article on page 10 of this publication):

- The development of a novel antifungal agent for the treatment of *candida albicans* infections (Prof Kobus Eloff, Dr Francien Botha and Dr Candice van Wyk)

The development of a novel TB diagnostic method by a research team at the University of Pretoria that will significantly decrease health workers' exposure, while collecting samples for diagnosis (see article on page 14), was the winner of this competition in 2013. The research team received seed funding of R500 000 and business incubation for their project.

Another research project of the University was also the 2013 runner-up in this competition (see article on page 6). A project to develop a mushroom casing soil that is a suitable replacement for imported peat soil earned the research team seed funding of R300 000 and business incubation support at the Innovation Hub.

The winners of the 2014 competition will be announced later in the year.

South African Breweries (SAB) Foundation Social Innovation Awards

The SAB Foundation aims to contribute to the economic and social empowerment of historically disadvantaged communities, primarily by means of entrepreneurship development. The Foundation focuses on improving the lives of women and youths in rural areas, as well as persons with disabilities. Since its launch in 2011, the SAB Foundation has invested in 40 social innovations.

The following research projects of the University of Pretoria were recognised at the SAB Social Innovation Awards ceremony on 30 October 2014:

- The development of a novel antifungal agent for the treatment of *candida albicans* infections was runner-up and received R500 000.
- The development of a novel hearing screening application for use on a cellphone was second runner-up and received R350 000.

Eighteen local innovations were shortlisted, and the winner received R1 million for upscaling and commercialising the innovation. The Foundation also awarded seed grants of R150 000 each and development grants of R100 000 for deserving innovations.

From left: Dr Candice van Wyk (Department of Community Dentistry), Refilwe Ngoato (Manager: Technology Transfer) and Dr Francien Botha (Department of Paraclinical Sciences) with the SAB Foundation Social Innovation Awards runner-up prize for the development of a new antifungal compound.

Success stories

Innovative smartphone application tests hearing anywhere, anytime

The novel hearScreen mobile application (app), developed by the team of Prof De Wet Swanepoel and Dr Herman Myburgh, has received a 2013/14 National Science and Technology Forum (NSTF)-BHP Billiton Award for an outstanding contribution to science, engineering and technology through research leading to innovation in a corporate organisation or institution. These awards recognise the best and most influential researchers in South Africa.

Prof De Wet Swanepoel (left) and Dr Herman Myburgh (right) with the hearScreen system and their NSTF-BHP Billiton Award.

The app has been selected as a second runner-up at the SAB Foundation Social Innovation Awards 2014 and received an investment of R350 000 to develop the invention.

The hearScreen app for cellphones is a hearing screening device that is easy to operate and can be used anywhere, anytime. It can replace the current expensive and bulky equipment that needs electricity to function, a resource that is not available at all schools in South Africa.

Prof Swanepoel, who is associated with the Department of Speech-Language Pathology and Audiology in the Faculty of Humanities, is the audiology expert who had the idea, and Dr Myburgh, a senior lecturer in the Department of Electrical,

From left: Lawrence Baloyi (Head: Contract Research and Innovation Support), Simon Thanyani (Contract Research and Innovation Support Manager), Prof De Wet Swanepoel (Department of Speech-Language Pathology and Audiology), Dr Herman Myburgh (Department of Electrical, Electronic and Computer Engineering) and Refilwe Ngoato (Manager: Technology Transfer) at the SAB Foundation Social Innovation Awards function.

Electronic and Computer Engineering in the Faculty of Engineering, Built Environment and Information Technology, provided the technical expertise.

The Android application was developed for an inexpensive phone (with a retail price of approximately R900), the Samsung Galaxy Pocket Plus. Three tones are played in each ear, and if the person does not hear one or some of them, he or she is referred to a professional audiologist, who will perform further tests and implement interventions, if necessary.

The phones' microphones and the particular headset used with each phone also had to be calibrated with the phone.

Dr Myburgh had to obtain some knowledge in audiology in order to understand the signals involved in hearing tests, and then had to ensure that the signals are generated correctly according to specifications. The rise and fall time had to adhere to current standard specifications. The phones are calibrated at 70 dB HL at 1, 2 and 4 kHz to render accurate dB increments up or down.

The phones are consistent with regard to the calibration, which makes the calibration process easier. The headsets, however, present less consistency when calibrated, but the problem is solved by calibrating the phone and its particular headset together. Furthermore, to ensure accuracy and adherence to calibration standards, the phone and headset will have to be recalibrated annually.

Other than the traditional equipment, the hearScreen product can detect background noise and indicate this to the person who is conducting the test. The test will then be taken at a later stage, or it can be taken in another venue. This feature was created by using narrowband noise at different intensities and adding the mathematical calculations to take this into account with the software.

A huge benefit of the new technology is that the data of every screening can be uploaded to a central, secure database. Users will be able to access and monitor the data of their patients on their unique accounts.

A series of pilot projects in collaboration with various stakeholders is being done or is in the planning stage. The University's TTO filed a South African provisional patent application entitled "Audiometric device and method" on 30 September 2013. It will also file an international patent application under the Patent Cooperation Treaty (PCT) on 30 September 2014. In addition, the TTO filed a trademark entitled hearScreen on 19 December 2013 in classes 9 and 42.

Prof Swanepoel uses the hearScreen app to test the hearing of a toddler.

Awards

New TB diagnostic method wins award

According to the World Health Organisation (WHO), 8.6 million people fell ill with tuberculosis (TB) and 1.3 million died from the disease in 2012. When people with pulmonary TB cough, sneeze or spit, they propel TB germs into the air and a person could be infected after inhaling only a few of these germs.

Receiving the GAP Biosciences Award in 2013 are (from left): Prof Jan Verschoor of the Department of Biochemistry, Prof Anton Stoltz, Head of Infectious Diseases at the Steve Biko Academic Hospital, and Mr Carl Baumeister of MARTI TB Diagnostics (Pty) Ltd.

Research conducted at the University of Pretoria has resulted in the development of a novel TB diagnostic method that will significantly decrease healthworkers' exposure, while collecting samples for diagnosis. UP's Mycolic Acid Antibody Real-time Inhibition (MARTI) TB diagnostic team was the winner of the 2013 GAP Biosciences Innovation Competition. The team received R500 000 in seed funding and business incubation for this project. The team consists of Prof Anton Stoltz of the Department of Internal Medicine in the Faculty of Health Sciences, as well as Mr Carl Baumeister and Prof Jan Verschoor of the Department of Biochemistry in the Faculty of Natural and Agricultural Sciences.

The MARTI TB diagnostic focuses on a diagnostic method that uses a blood sample to detect TB at the point of care, regardless of the patient's HIV status, or whether the TB infection is inside or outside the lungs. The method requires as little as one drop of blood.

Until now, the primary diagnostic for TB was collecting sputum from persons who might be infected with TB. According to Mr Baumeister, co-inventor of the MARTI TB diagnostic, sputum collection is hazardous to healthcare workers and fellow patients. It is also difficult for HIV-positive patients and children to produce sputum samples.

The MARTI TB diagnostic technique is accurate in HIV-positive TB patients and detects active TB, regardless of its location in the body. The diagnosis technology was primarily developed by Prof Verschoor. Numerous capable postgraduate students and colleagues have assisted him with TB research since 1994. Prof Verschoor has published more than 51 scientific papers relating to this discipline and is the key inventor of seven TB-related patents.

The current MARTI technology is the subject of four new patent applications, the first of which was submitted in 2005. The latest will be submitted as a PCT application in 2014. The University has approved the founding of a new start-up company that will be the vehicle through which the MARTI technology will be commercialised. Mr Baumeister, one of Prof Verschoor's postgraduate students, was recruited to spearhead the venture, which is now known as MARTI TB Diagnostics Pty Ltd. This venture was selected to represent South Africa in the Swiss-South African Venture Leaders Programme in Switzerland in June 2014.

The team's first major objective is to raise funds to conduct the clinical validation trial. They hope to obtain a positive policy directive from the WHO to support the international implementation of the technology. The development of the MARTI TB diagnostic has come a long way under Prof Verschoor's guidance, but an equally long distance remains to be covered for its successful commercialisation.

Awards

Plant scientist receives Presidential award for medicinal research

On 27 April 2014, Prof Namrita Lall, an associate professor in the Department of Plant Science (Medicinal Plant Science) at the University of Pretoria, was awarded the highest South African honour, the Order of Mapungubwe (bronze), for her remarkable contribution in the field of medical sciences. The event took place at the Presidential Guest House in Pretoria.

Prof Lall also received the prestigious South African Women in Science Award from the Department of Science and Technology in 2011 for her outstanding scientific contributions to advancing science and building the knowledge base in the field of indigenous knowledge systems. She has also received numerous awards, including the prestigious Unesco-L'Oréal Women in Science Award in 2002.

She has developed novel assays for application in drug screening and analysis from botanical sources. Prof Lall is internationally recognised for her contributions to bioprospecting from traditional knowledge on medicinal plants. She has been focusing on scientifically validating the uses of plants for diseases such as tuberculosis, cancer, hyperpigmentation disorders and periodontal diseases. In this context, she has also demonstrated her commitment to various communities around the country by engaging them towards a better understanding of indigenous knowledge and by advancing phytomedicines towards conventional pharmaceutical products. Prof Lall is the co-inventor of three international and five national patent applications. In addition to this, she has authored seven book chapters.

Prof Lall is equally passionate about a future where products from indigenous plants will not only benefit companies and consumers, but also local communities. "I dream of seeing small factories in local communities where they can process the plants and produce the products themselves," she says.

Some examples of Prof Lall's skin products based on the active ingredients in South African indigenous plants.

Prof Lall is ranked in the top 1% of the global Essential Science Indicators (ISI) list of influential academics who write about pharmacology and toxicology.

Awards

Women in Science nominations for two of UP's natural scientists

The University of Pretoria celebrates the achievements of two of its young women researchers, who were nominated for the 2014 Women in Science Awards for their outstanding work. These awards are hosted annually by the Department of Science and Technology (DST) to reward outstanding female scientists and researchers, and to encourage younger women to follow in their footsteps.

The research of these two doctoral candidates in the Faculty of Natural and Agricultural Sciences, Cynthia Henley-Smith and Lungile Sithole, is focused on finding solutions for Africa's most pressing challenges and, as such, contributes to the local relevance of the University's research.

Cynthia, a PhD student in Medicinal Plant Science, is studying the biological activity of the lavender tree (*Heteropyxis natalensis*) against oral pathogens with a novel predictive method. Her research interest is the potential of indigenous plants to yield medicinal products, specifically for oral care. During her studies, Cynthia developed a novel method for determining the anti-adherence effect of plants on bacteria with a scanning electron microscope.

Recently, she successfully used a logistic response model to develop and test a novel approach to predicting the influence of multiple components on microbial inhibition. She holds two patents related to her research. One was obtained through the PCT and the other is a provisional South African national patent. Cynthia has also co-authored a book chapter and published two articles. She was invited to join the Golden Key International Honour Society in 2012, won the best master's or doctoral degree dissertation award at the Fanie de Meillon Postgraduate Symposium in 2012 and received the third prize in the Young Botanist category at the South African Association of Botany in 2010. She completed her BSc honours and master's in Medicinal Plant Science with distinction. She works as a part-time lecturer in Plant Science and Microbiology at the Midrand Graduate Institute.

Lungile, a PhD student in Biochemistry, is studying the use of bioanalytical and biophysical techniques in the detection and identification of dysregulated metabolites in HIV infection. The potential output of this research is the discovery and development of novel markers that could be used as indicators of HIV disease progression, which could guide treatment response. She obtained her BSc in Chemistry with distinction from Jackson State University in the USA in 2007, and received Research Initiative for Scientific Enhancement funding for her undergraduate research. She was placed on the President's and Dean's merit lists in 2005, 2006 and 2007. She co-authored several articles arising from the research done during her MSc studies in international peer-reviewed journals.

Lungile Sithole was nominated for her research on detecting metabolites in HIV infection.

Cynthia Joan Henley-Smith was nominated for her research on the medicinal value of indigenous plants, specifically for oral care.