RESEARCH CONTRACTS & INNOVATION

synergy

INNOVATION AT UCT 2021

synergy

“the combined power of a group of things when they are working together that is greater than the total power achieved by working separately: Team work at its best results in a synergy that can be very productive”

You must have seen the word Synergy on the front cover of this booklet. Its is a word used in a variety of contexts, whether it be in business, sports, science or education, and was expressed beautifully in a short work by Robert McNeish back in 1972 entitled, *Lessons From the Geese*. McNeish listed five lessons, of which the first reads as follows:

As each goose flaps its wings, it creates an "uplift" for the bird that follows. By flying in a V formation, the whole flock adds 71% more flying range than if each bird flew alone.

The whole is greater than the sum of the parts.

This is also very true to successfully commecialise - in the broader sense of the word - the inventions made by researchers within an innovation community. Tom Hockaday in his book University Technology Transfer: What It Is and How to Do It, came up with the term Innovation Community, and he explained that he preferred this term, rather than the more commonly used Innovation Ecosystem, to describe what is needed for success. A community works towards a common goal, while there are a lot of wins/losses in an ecosystem. For success you need a common goal and synergy.

The starting point for us in this synergy are the inventors here at UCT who are pushing the boundaries of science. We have since the first edition, which was published back in 2010, largely focused on this group in our articles.

Other important partners are our service providers e.g. Patent Attorney firms, Law firms and other external professionals who provide support and consulting services. These people are in flight with us on this journey and are rather our friends than just service providers. Another group is individual experts who volunteer their services and provide critical support for our activities and we thank and acknowledge them below.

Funding is an integral part of the path from invention to market and in this regard an important partner is the University Technology Fund. It needs to be noted too that the relationship would not have been possible without the buy-in and support of UCT's senior management.

The glue that keeps these groups together is the staff of RC&I and more specifically the Innovation group. From the beginning to the end of the process, our staff engage with our partners, connecting people and projects to bring innovations to market.

With the support of the National IP Management Office, we were able to make five new appointments during 2020, which has allowed us to be in a position where we have internal expertise over the whole process, from valuing an invention to valuing an investment arrangement in a spin-off company. The articles in this edition will try to expose the role that the RC&I team has played in the innovation / commercialisation process, to provide insight into our activities, approaches and resources.

We hope you enjoy this year's edition of Innovation at UCT.

Piet Barnard

Director: RC&I

With thanks...

There are a number of people and funders who make a valuable contribution that supports our innovation activities, the people generally doing it pro bono.

INTELLECTUAL PROPERTY ADVISORY COMMITTEE (IPAC)

IPAC makes the decisions regarding UCT Evergreen Fund investments, recommends the appointments to spin-off companies and needs to deal with the often urgent issues that arise in the life of fledgling start-ups. The committee provide guidance and steer policy development in the innovation space, striving for best practice. IPAC meets five times a year, excluding ad hoc meetings and round-robin decisions.

Prof Sue Harrison: Deputy Vice Chancellor: Research & Internatiolisation (Chair)
Dr Reno Morar: Chief Operating Officer
Mr Hardy Maritz: Acting Executive Director: Finance
Mr Guy Harris: External Member

PRIVATE EQUITY ADVISORY GROUP (PAG)

PAG comprises a group of experts in the entrepreneurship and private equity investment space who advise both RC&I and IPAC on investments made by the UCT Evergreen Fund into spin-off companies. They propose deal structures and draw on their experience and sector knowledge. PAG meets between three and four times a year.

Mr Chris Derksen (Chair)
Mr Guy Harris
Mr Gasant Orrie
Mr Hardy Martiz

INNOVATION BUILDER FUND INVESTMENT COMMITTEE

UCT provides a budget to support technology development and innovation to mature the UCT IP portfolio. The Innovation Builder Fund Investment Committee (formerly the TIA Seed Fund Steering Committee) awards up to R500,000 to projects. The committee comprises UCT representatives with different technical expertise, aligned with our technologies as well as external members who have technology development and/or start-up company experience. The committee is chaired by Piet Barnard, Director: RC&I and there are currently 22 active projects. Funding is tranched and project progress (monitored by the RC&I team) is reported on at committee meetings, which are held quarterly.

Dr Caryn Fenner (external)
Prof Kit Vaughan (external)
Prof Tania Douglas
A/Prof Melissa Densmore
Prof Neil Ravenscroft
Mr Abu Adams

UCT-APPOINTED DIRECTORS AND SHAREHOLDER REPRESENTATIVES

Whilst numerous individuals are appointed as Directors to a variety of UCT companies and trusts, the list here only includes people who are appointed to spin-off companies that are commercialising IP developed through UCT research. Appointments are only permitted when UCT holds above a threshold equity amount of equity in a company.

Prof Petro Terblanche Strait Access Technology Holdings
A/Prof David Prilaid DroneSAR
Prof Susan Kidso: Antrum Biotech
Mr Guy Harris Cape Bio Pharms
Dr Ntokozo Mthembu Cape Catalytix
Mr Tony Pick Elemental Numerics
Dr Makhapa Makhafola HyPlat
Ms Zanele Mbatha HyPlat
Prof Jack Fletcher HyPlat
Dr Sharon Blair HyPlat
Dr Susan Winks Registree
Tebogo Lefifi PST Sensors

DEPARTMENT OF SCIENCE & INNOVATION (DSI) NATIONAL INTELLECTUAL PROPERTY MANAGEMENT OFFICE (NIPMO)

RC&I is in the second year of our fourth NIPMO-funded capacity development project. This has been a key enabler to establishing the RC&I technology transfer operation at its current level. The funding has supported new positions, that once trialed have been adopted by UCT, as well as a range of awareness-raising activities focused on both IP as well as the marketing of technologies. Support is provided to facilitate RC&I's engagement with industry and commercial partners in a variety of modes, including expos.

NIPMO also provide a 50% rebate of expenses incurred by UCT in the protection of our intellectual property portfolio. This greatly extends the ability that UCT has to support this important activity. The support of NIPMO on a number of levels is gratefully acknowledged.

UNIVERSITY TECHNOLOGY FUND

UCT is a Special Partner of the University Technology Fund (UTF) which was established by the SA SME Fund. We appreciate the ongoing support from both the SA SME Fund (Pre-Seed and Seed-stage investments) and the UTF for investing in UCT companies and technologies. The relationship with the UTF Fund Managers, Wayne Stocks and D'Niel Strauss has helped to shape the nature and direction of our spin-off companies as they review our pipeline of investment opportunities.

SOUTHERN AFRICAN RESEARCH & INNOVATION MANAGEMENT ASSOCIATION (SARIMA)

SARIMA launched a new "Expert in Residence" (EiR) programme that UCT has benefitted from this past year. The funding supported a review, by Mr Brian Goemans, of the medical devices under development at UCT from a 'regulatory' lens. Whilst detailed workshops were held with the inventors associated with particular devices, the devices were grouped and presented in a series of webinars allowing the UCT research community to learn about the classification of devices, the regulatory pathway and testing involved. The RC&I team also gained insight into the likely costs and timelines to get regulatory approval so that these can be built into future project planning.

CASE STUDY

High-tech, Sustainable Mari-/ Aquaculture

As global population growth continues to hurtle along at an unprecedented rate, land-based agriculture is under immense pressure to satisfy the increasing dietary demand for protein. Perfectly placed to bridge this gap, aquaculture has experienced a massive boom of its own over the past few years.

MariHealth solutions

MariHealth, a new UCT spin-out company, finds itself at the forefront of developing much-needed solutions to improve the health of cultivated marine life.

The company currently has two products that are ready to go to market: a probiotic for enhancing the health, survival and growth of hatchery-produced abalone, as well as proteomic biomarkers for measuring environmental stress in these farmed environments. Proteomics involves the systematic analysis of proteins that are present in cells at a particular time under certain conditions.

"All of this has to do with improving farm ecology and making the commercial production of aquatic animals more financially sustainable," explains Associate Professor Vernon Coyne, founder and director of MariHealth.

He is joined by co-founder Dr Sarah Carroll, whose PhD research forms the basis for the development of the proteomic biomarker, which has also become the focus of the company's commercialisation strategy.

"This year we decided to do a bit of a gear shift," says Carroll. "Among other things, I joined a venture accelerator programme through UCT's Graduate School of Business (GSB), which culminated in a demo day of ten ventures pitching to a panel of judges and investors."

Apart from the ever-present problem of funding (or lack thereof), Coyne says one of the biggest challenges MariHealh faces is convincing local abalone farmers of their products' value proposition. Currently, health management of the animals is not necessarily priority for these farms, who tend to take a reactive rather than proactive approach.

"Basically, they have to carry out a certain amount of mandatory testing or monitoring, which the government expects of them in order to maintain their license to farm," explains Coyne.

Instead of preventing diseases and improving the general health of the animals on the farm, the norm is to take

LESSONS FROM GEESE

FACT

As each goose flap its wings it creates an"uplift" for the birds that follow. By flying in a "V" formation, the whole flock adds 71% greater range than if each bird flew alone.

LESSON

People who share a common sense of direction and community can get where they are going quicker and easier because they are traveling on the thrust of one another.

"Lessons from Geese" was transcribed from a speech given by Angeles Arrien at the 1991 Organisational Development Network and is based on the work of Milton Olson.

action when a problem shows up in one of these mandatory tests.

"Our challenge is to try and convince them that what we are offering is something that can help in the long run," says Coyne. "It's like insurance. You don't know if there's a benefit to insurance until you actually need to claim for something."

Fortunately, Coyne and Carroll have not been left to navigate these murky waters on their own. RC&I's Francois Oosthuizen (Innovation Commercialisation Manager) and Dr Wasiu Afolabi (IP Specialist) have been ready to assist in various ways from the early stages of IP protection up until the present processes of product development, establishing a brand identity and company incorporation.

"MariHealth is a very good example of a technology being ahead of its market,"

says Niall Naidoo, RC&I New Venture Support Manager. "It's been a whole process to make the very technical science side of it accessible and communicating it in such a way that each farmer can recognise the benefit of it."

Oosthuizen, has been pivotal in helping shape the team's ideas around product development and linking with industry partners so that MariHealth can outsource the manufacture of the probiotic, feed production and proteomics testing. To develop the technologies, he has navigated accessing different levels of seed funding from within UCT and those provided by the Technology Innovation Agency, and most recently successfully attracting pre-seed funding from the University Technology Fund (UTF).

This bodes well for the company as it opens access to additional UTF funding that will support the business's growth. Oosthuizen has helped to refine the value proposition for each of the products and mentions "the initial nucleus for the business was the probiotic, but in reviewing Coyne's research group's activities and actively engaging with the market, the biomarkers were prioritised as the first product to market. Selecting which opportunity to support with limited resources is often a difficult problem to solve. Future products from current

research include a nascent pipeline of fish diagnostics and therapeutics that will target disease threats prevalent in various fish farming operations. This is important as it will ensure that MariHealth is not a one-trick pony, but rather has several product offerings under the health umbrella that are maturing over time, increasing the start-up's chance of success. A strong product pipeline rooted in deep industry knowledge is a vital component for investment purposes."

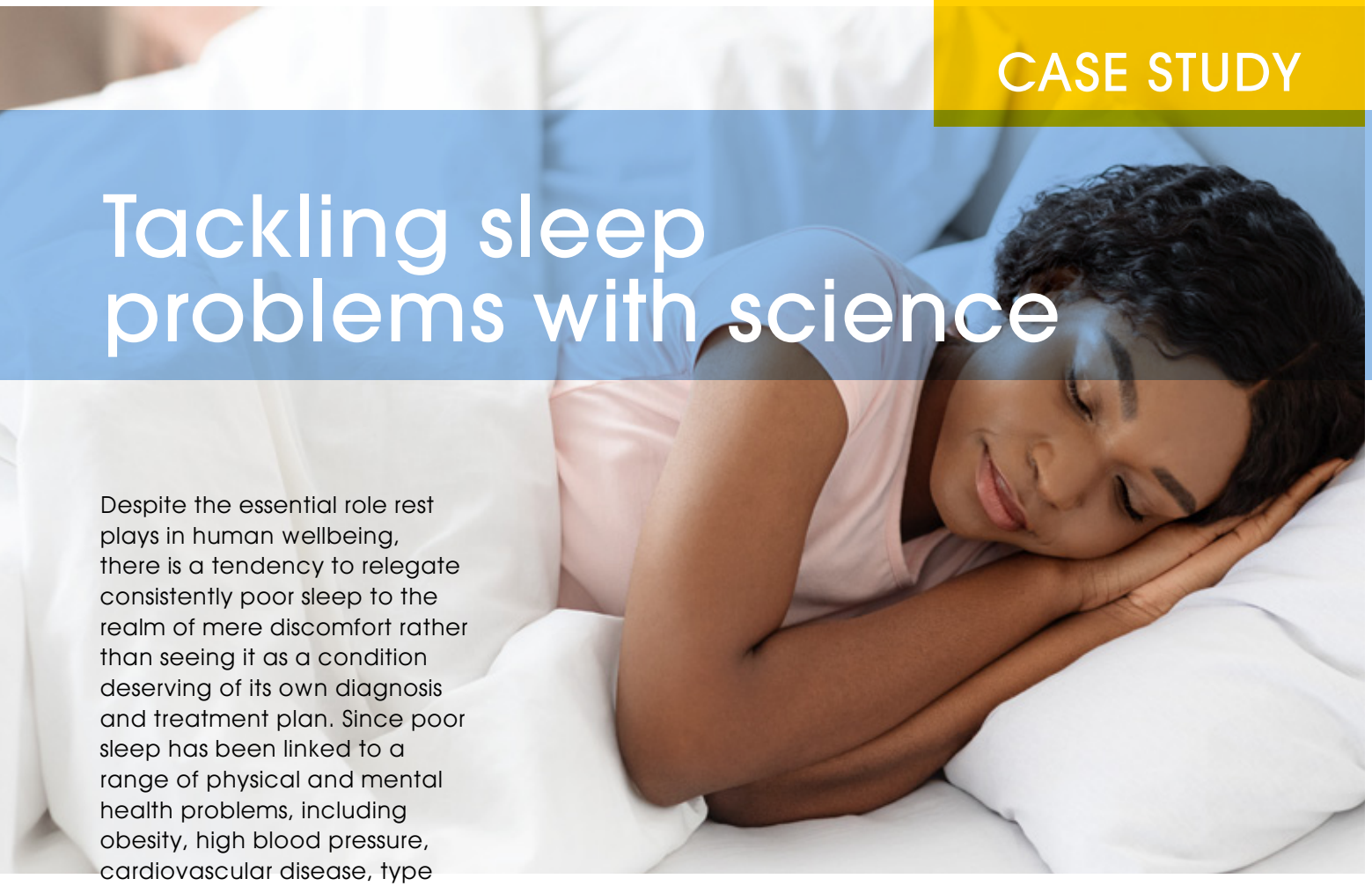
Emphasis has also been placed on the social impact the rollout of MariHealth's products can have in terms of increasing farm productivity and sustainability.

"There is a need to generate a sustainable and profitable aquaculture industry in the country," explains Coyne. "This, in turn, will obviously lead to increased employment in areas that used to be fishing villages but no longer have any fish available to them. If these farms are more profitable and productive, they would hire more people."

Carroll adds that they are specifically looking at creating jobs for women.

"We're hoping that farms can actually hire women from the local communities to assist in conducting the health tests that we are aiming to offer," she explains. "They will be paid by us and we will also train them to conduct the sampling."

Tackling sleep problems with science



Despite the essential role rest plays in human wellbeing, there is a tendency to relegate consistently poor sleep to the realm of mere discomfort rather than seeing it as a condition deserving of its own diagnosis and treatment plan. Since poor sleep has been linked to a range of physical and mental health problems, including obesity, high blood pressure, cardiovascular disease, type II diabetes, depression and anxiety, one has to wonder whether it isn't high time to take our circadian rhythms more seriously. A potential new spinout company called Sleep Science, currently being incubated within UCT, is doing just that by offering a range of services targeted at helping people improve their sleep.

"For most people, the default way to treat poor sleep is to go their GP and get a prescription for medication," says Dr Dale Rae, Director of Sleep Science and a senior UCT researcher in the field of sleep and circadian rhythms. "Unfortunately, nine times out of ten, that's the incorrect solution."

The epidemic of poor sleep first came to Rae's attention through research conducted by one the PhD students she was supervising.

"This got us thinking: we're scientists, we measure things. Why not measure sleep?" she explains. "Of

SLEEP SCIENCE
Optimise your sleep.

DR DALE RAE
Director of Sleep Science

course, the starting point for this would be having a place people can go to have their sleep assessed in order to understand their unique issues and find potential solutions."

And so, the idea for Sleep Science was born.

Sleep services

Currently, Sleep Science offers a bouquet of services that include sleep assessments and coaching, educational talks and workshops, and, most recently, developing screening tools for corporate companies to include in their employee wellness programmes.

Known as Sleep Checks, their one-on-one sleep assessments can be considered Sleep Science's flagship service.

Conducted remotely or in-person, Sleep Checks offer clients a deep-dive into the causes of their sleep problems and result in a comprehensive report, which includes a suggested coaching regime and/or a referral to a specialist.

Prior to the one-on-one assessment, which normally lasts about an hour, clients fill in an online questionnaire that gives the Sleep Science team insight into their specific sleep issue and medical history.

After completing the one-on-one session, they are given a small watch to wear for a week — sometimes two — which measures their sleep patterns, sleep timing, sleep duration and picks up sleep quality.

"The information from the questionnaire, the session we had with them and the watch measurements are integrated into a feedback report," says Rae. "We spend another thirty minutes with them discussing our observations, highlighting why we think the issues are and making recommendations."

Recommendations are different for every person and might involve onward referral to a specialist, such as a psychiatrist, ENT, endocrinologist, urologist, psychologist or dietician. To accompany this, as well as for cases that don't require specialist interventions, the Sleep Science team develops a special coaching programme focusing on behavioural and lifestyle changes.

"We've all been trained in something called Cognitive Behavioural Therapy for Insomnia, which is the gold standard way to treat insomnia," says Rae. "Since we aren't clinicians, we can't practice it and prescribe medication, but we use those principles in our approach to managing people."

Moving from manual to automated reporting

Up until recently, Rae and her team were taking such a hands-on approach to their work, that all data input and reporting was still being done manually.

"Doing everything by hand obviously meant that we processing everything very slowly, which was holding us back from scaling up," says Rae.

This is where Niall Naidoo, RC&I's New Venture Support Manager, stepped in to help streamline Sleep Science's processes.

"We realised for this company to be sustainable, we need to digitalise everything," he explains.

After receiving several quotes exceeding R1m for the construction of a digital platform to capture data and generate reports, Naidoo eventually decided that there was no option but to take matters into his own hands.

As a part-time UCT lecturer, he has access to some of the brightest minds on campus and recruited two students from his fourth-year business science class to assist him with the project. Their goal was to build a digital platform to

automatically capture data from the sleep assessment process and compile a report based on the data.

"From a project perspective, it was perfect," says Naidoo. "We knew exactly what we were doing, we knew how to do it and we just nailed it! We built out this whole platform in six weeks."

Apart from gaining invaluable work experience in their field of expertise, the two students involved were also paid for their time and effort.

Creating a brand identity

Parallel to building the digital platform, Naidoo also assisted Rae and the team in establishing a fresh brand identity for Sleep Science, which included the development of a nifty new logo.

"Because sleep assessments and education are such a new concept, the brand really had to come at the same pace as the product, so that when people think of sleep, they think of Sleep Science," explains Naidoo. "Once we had the logo and the brand identity, it made life so much easier, because now we had a grasp on the look and feel, which enabled us to introduce the product to clients confidently."

"We absolutely love our new identity and wouldn't have been able to do that without the Innovation Builder Fund (IBF)," says Rae.

The IBF plays an important role in the RC&I funding eco-system where early-stage projects can be incubated by focusing on fundamental development and technological de-risking to better understand their commercial potential.

A bright future

"With Sleep Science, we're on the crest of a new wave," says Rae. "The discipline is so new that there aren't necessarily any career paths leading into it. So, one of our biggest challenges is training the people who we need to be our soldiers on the ground."

Fortunately, one of the benefits of being incubated in a university environment is that the next generation of sleep scientists aren't hard to find.

Currently, Rae supervises nine PhD students, of which four are actively involved in Sleep Science. Apart from training them to conduct one-on-one Sleep Checks with clients themselves, Rae also considers their individual strengths and helps them nurture it within the Sleep Science environment.

For example, two of the students who have shown a remarkable capacity for creativity and design have become Sleep Science's official social media managers, while another who is a naturally good organiser has taken on a variety of administrative roles.

"The idea is that once Sleep Science grows, we can take them into this company for post-doctoral employment," says Rae.

LESSONS FROM GEESE

FACT

When a goose falls out of formation, it suddenly feels the drag and resistance of flying alone. It quickly moves back into formation to take advantage of the lifting power of the bird immediately in front of it.

LESSON

If we have as much sense as a goose we stay in formation with those headed where we want to go. We are willing to accept their help and give our help to others.

"Lessons from Geese" was transcribed from a speech given by Angeles Arrien at the 1991 Organisational Development Network and is based on the work of Milton Olson.

Visit the Sleep Science website at https://www.sleepscience.co.za/

You can also find them on Facebook at https://www.facebook.com/www.sleepscience.co.za and Instagram at https://www.instagram.com/sleepscience_/

GIFT An integrative approach to technology commercialisation

In recent years, UCT has become something of a hub for research around the discovery of diagnostic biomarkers and development of reagents. Currently there are several research groups working on discovering biomarkers that could assist in diagnosing, among other conditions, tuberculosis, various cancers, cardiomyopathy and vaginal inflammation.

Research around the latter recently resulted in the development of a diagnostic device for the detection of asymptomatic inflammatory vaginal infections that predispose young South African women to HIV infection.

In 2010, two researchers from UCT's Division of Medical Virology, Associated Professor Jo-Ann Passmore and Dr Lindi Masson discovered that South African women were more likely to contract a certain type of vaginal inflammation, which could provide ideal conditions for HIV infection.

This finding led to the invention of the Genital InFlammation Test (GIFT), a lateral flow device that is capable of detecting both asymptomatic as well as symptomatic inflammatory vaginal infections via vaginal cytokine biomarkers. The low-tech, low-cost test can be done quickly and easily at the point of primary care or even at home.

Earlier this year, the team reached a significant milestone when they received a R62 million grant from the European and Developing Countries Clinical Trials Partnership (EDCTP) to refine the existing prototype and develop the implementation plan for GIFT in the existing clinical framework for managing STIs and BV in resource-limited settings.

Working closely alongside the team, Saberi Marais, Innovation Commercialisation Manager at RC&I has played a crucial role in helping the inventors reach these important

SABERI MARAIS, DR LINDI MASSON AND A/PROF JO-ANN PASSMORE

milestones along the route to market.

"The more integrated we are into the team, the more effectively we can do our job," says Marais.

He goes on to explain that being a part of the team allows an Innovation Commercialisation Manager to understand the specific challenges they are facing and come up with relevant solutions — whether that be in the realm of funding, training or access to local companies and services in his network.

"From the start, GIFT's inventors, students and project managers were very inclusive of me, which made the flow of communication and engagement easy. In hindsight, this also set us up well for working remotely during all the levels of lockdown," he says.

Apart from assisting the team in identifying and successfully applying for funding opportunities as well as mapping the intricate funding pipeline, Marais has also played a hands-on role in clearing a few tricky hurdles, such as finding a suitable local prototype development partner and dealing with trademarking issues, in conjunction with Tshepi Khahlu, IP Specialist. Read more about this in the article on Trademarks (pg. 10).

"We have real teams approach at RC&I," says Marais. "While I'm working with the inventors, Philip Hoekstra, (IP Manager) continues with IP maintenance and Tshepi continues with the trademarking. That really adds value to the project and, ultimately, UCT as an institution in the end."

An additional value-add that has come out of Marais's work with GIFT and a range of other inventors, is the idea to develop a communal platform that can assist UCT researchers in taking their diagnostic biomarker IP from concept to commercially viable product.

Still in its conceptualisation phase, the communal platform will aim to help bridge the gap between that exists between academia and industry.

"The key thing here is to retain the know-how and people who are able to build these prototypes and run these platforms," concludes Marais.

LESSONS FROM GEESE

FACT

When the lead goose tires, it rotates back into the formation and another goose flies to the point position.

LESSON

It pays to take turns doing the hard tasks and sharing leadership, as with geese, people are interdependent on each other's skill, capabilities and unique arrangement of gifts, talents or resources.

"Lessons from Geese" was transcribed from a speech given by Angeles Arrien at the 1991 Organisational Development Network and is based on the work of Milton Olson.

What's the deal with trademarks?

"Registering a trademark or company logo is an important step when founding a spin-off company" says Tshepi Khahlu, IP Specialist. "Once it has been registered, exclusive use by its owner has been assured and legal action can be taken against anyone who infringes on this by using the same or a similar trademark. Trademarks need to be distinguishable and distinctive and on occasion, somebody has already registered a trademark that is the same as, or similar to the one that you are wanting to register and then its back to the drawing board!".

TSHEPI KHAHLU
IP Specialist

RC&I manages the registration and maintenance of trademark applications on behalf of UCT for spin-off companies as well as ones that relate to inventions or products that may be commercialised, whilst the Registrar's Office deals with UCT-related trademarks.

"Before filing the trademark, there are a series of steps we need to take," explains Khahlu. "Firstly, you need to conduct a search to see if the word you want to file is available. If it is, then the next step is to take the word, as well as the logo to our trademark attorneys to register." Once with the trademark attorneys, they will establish under which class to file the trademark. Trademarks can be lodged in one or a number of the 45 different classes, depending on the type of goods and/or services the commercial venture is set to represent.

"For the Genital InFlammation Test a lateral flow device that is capable of detecting both asymptomatic as well as symptomatic inflammatory vaginal infections, we wanted to register the mark "GIFT". Unfortunately, the mark was already registered and we had to seek permission from an existing trademark owner for us to use GIFT in the same health product-related class that they owned rights in, which they kindly agreed to. But in another case it meant totally renaming the company which took the name of its primary product.

The "Lumkani" fire detector started life as the "Khusela" fire detector, but prior to commercialisation it was discovered

LUMKANI
PROTECTING AGAINST FIRES

that Khusela, which means to protect, was already registered by a security firm for alarms and detectors and they wanted to retain their rights to the trademark, so the name needed to change. Best that this had been done ahead of market launch!" Khahlu smilingly says.

The trademarks registrar generally issues an examination report within 12 months, indicating the success or failure of the application and, in the case of the former, whether the trademark can be used unconditionally or subject to compliance with certain conditions/ restrictions. A trademark is valid for life subject to the continued payment of renewal fees every 10 years.

CONGRATULATIONS

Guy Harris

Congratulations to UCT IP Advisory Committee (IPAC) member, Guy Harris for being awarded the Vice-Chancellor's Medal during the Commerce Faculty's graduation ceremony on 12 July 2021.

A UCT alumnus and qualified CA, Harris is an enthusiastic supporter of RC&I, regularly attending events and taking a keen interest in various activities. He served as non-executive director for UCT spin-out company, Cape Bio Pharms as a member of IPAC and the Private Equity Advisory Group (PAG) that evaluated investment opportunities for UCT's Evergreen Fund.

Harris also volunteered to mentor a first-time director Dr Susan Winks after her appointment to the board of another UCT spin-out company, Registree.

Introducing UCT-appointed spin-off company directors

Since 2004, more than 25 products and services based on intellectual property (IP) developed at the University of Cape Town (UCT) have resulted in the establishment of spin-off companies. As an equity holder in a number of these companies, UCT is entitled to nominate a candidate to serve on the board.

UCT's Intellectual Property Advisory Committee (IPAC) usually seeks a person from within the university community (which may include alumni) with skills that are complementary to those of the founders and/or other directors of the spin-off, and typically have technical backgrounds relevant to the IP development. The criteria may, however, differ based on the individual needs of the various companies.

The IPAC recommendation regarding the appointment of a director is subject to the Vice Chancellor's approval. Although covered by UCT's professional indemnity insurance, these directorships are voluntary positions. UCT-appointed directors are non-executive and act as independent advisors and sounding boards for the company.

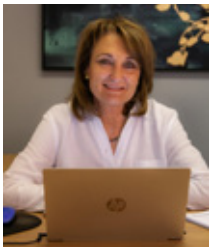
Below, we introduce you to four of our current directors: Dr Ntokozo Mthembu, serving on the board of Cape Catalytix; Mr Tony Pick, serving on the board of Elemental Numerics; Prof Petro Terblanche, serving on the board of Strait Access Technologies (SAT); and Dr Susan Winks, serving on the board of Registree Rocks.

Dr Ntokozo Mthembu

Asking tough questions and raising sensitive issues are part and parcel of a UCT-appointed director's role at a spin-off company. Or, as Dr Ntokozo Mthembu, Director of Cape Catalytix describes it: "[Having] to tell the emperor that he has no clothes on when the occasion so demands, and [getting] away with it." A mechanical engineer with more than 28 years' experience consulting in a diverse range of sectors, Mthembu is no stranger to helping companies shift boundaries and embrace change. Although he has only served on the board of Cape Catalytix for less than a year, he has been able to bring a fresh perspective in terms of suggesting changes to management that reflect South Africa's demographics more accurately and the addition of a marketing executive to drive sales.

Tony Pick

"The first part is knowing what you don't know." This is the advice Tony Pick, Director of Elemental Numerics, brings to the table whenever working with a start-up or spin-off company. After graduating with a degree in Chemical Engineering from UCT, he spent about six months working in his field and soon decided that conventional employment was not for him. He enrolled for an MBA, also at UCT, and after starting his first successful project management company, became a serial entrepreneur. As the UCT appointed Director for Elemental Numerics, he has played a crucial role in guiding governance, goal setting and being an impartial sounding board. "It's been an interesting acculturation — to understand how to bring this commercial and real-world approach to an academic environment," he says.



Prof Petro Terblanche

When it came to appointing a director for Strait Access Technologies (SAT), UCT had its sights set on someone with a wealth of experience working in the spaces of health technology, innovation and commercialisation. With a track record of successful strategic management of technology intensive organizations and the translation of research into innovation spanning more than 20 years, Prof Petro Terblanche was the perfect fit. "I was very excited to get involved with SAT, because of the profile the team has established over the last 12 years and the opportunities it has to grow," says Terblanche. Being a relatively well-established spin-off company, SAT hasn't required much guidance in terms of basic governance, but are instead in a phase where growth is their priority. During her first few months as director, Terblanche has been able to assist the team in reaffirming models and approaches and has also made promising inroads with relevant industry connections.

Dr Susan Winks

Although UCT often seeks to appoint directors who have a technical background relevant to the spin-off company in question, this isn't always crucial. Dr Susan Winks, Director of Registree Rocks can certainly attest to this. With a PhD in Chemistry from the University of the Witwatersrand, and an MBA from MANCOSA, Winks has carved out a career in the field of pharmaceutics and is currently Head of Research Operations and Business Development at UCT's Drug Discovery and Development Unit (H3D). "Registree is all about privacy preservation using a Trusted Execution Environment, and more recently the development of wallets for central bank digital currencies - a completely different space to my background!" she says. What she may lack in know-how, she however makes up for in experience — having previously worked for a biotech start-up company and currently holding another board position at a non-profit. "Early on, I aimed to add value by helping to structure and formalise the company," she says. "More recently, it's shifted gear and I act as a neutral sounding board for strategy development and long term planning." Susan has also benefitted from the training that UCT provides to new directors.

LESSONS FROM GEESE

FACT

The geese flying in formation honk to encourage those up front to keep up their speed.

LESSON

We need to make sure our honking is encouraging. In groups where there is encouragement, the productivity is much greater. The power of encouragement (to stand by one's heart or core values and encourage the heart and core of others) is the quality of honking we seek.

"Lessons from Geese" was transcribed from a speech given by Angeles Arrien at the 1991 Organisational Development Network and is based on the work of Milton Olson.

New Venture Support Internship launched

Earlier this year, RC&I launched its inaugural internship programme. The New Venture Support Internship offers UCT students the opportunity to gain work experience with one of the institution's spin-off companies.

Initiated by Niall Naidoo, RC&I New Venture Support Manager, the idea for the internship came about when a large corporate cancelled their long-standing graduate programme at the beginning of the year. The programme used to give about 20 to 30 Commerce Faculty students the opportunity to gain work experience with the company.

As New Venture Support Manager, Naidoo knew that several UCT spin-off companies were in dire need of human resources to work on aspects of the business that the core team didn't have capacity for. He also knew that this type of work required a measure of youthfulness, high energy and an eagerness to learn.

In short, it seemed logical for Naidoo to bring these two spheres of his professional life (having lectured in Commerce) together with the introduction of the RC&I New Venture Support Internship.

"Since it was something we had never done before, we had to familiarise ourselves with the concept of an internship, how to structure it and how to run it successfully," he says.

Focusing on the concept of internship as a form of experiential learning, it was decided to use, as the basis for the programme, the learning outcomes from Naidoo's Project Management course that he was lecturing part-time.

Pilot programme

The pilot programme was launched in March 2021 with an inaugural cohort of 12 students from the Project Management course. After being divided into teams, they were assigned to one of four spin-off companies / commercialisation ventures: Impulse Biomedical, Cape Catalytix, Sleep Science or the South African Medicines Formulary (SAMF).

Each entity had a different project the interns would focus on, and the students were placed based on their interests and strengths. Naidoo supervised their work and was also responsible for the outcomes.

The projects were diverse and included doing in-depth research on taking a new medical device to market later this year; developing a marketing strategy for a niche engineering product to be sold internationally; building a digital platform to capture data and compile reports automatically; and digitalising a medical database with a website and app.

"We work really hard during the internship and all the work that they put in is not wasted," explains Naidoo. "The company literally takes what they do and implement it in different ways."

Three-week internship block

The pilot programme proved to be so successful that the original cohort of 12 suggested doing it all over again during the three-week June vacation.

This time, however, it would be scaled to accommodate more interns from across campus. They marketed the opportunity through various channels, including UCT Career Services, relevant societies and Naidoo's lectures.

Having paid their dues during the pilot programme, a number of the original 12 interns took on project lead roles and had a direct part in selecting their teams through a rigorous interview process.

Apart from a few of the applicants who ended up taking other internship opportunities and some whose skillsets did not match this specific range of projects, all remaining (over 30 students) were accepted and placed on a project.

More than a resume boost

Although the New Venture Support Internship offers students an invaluable opportunity to gain the kind of work experience that would send their resume to the top of any future job application pile, it is also something of a masterclass in 'soft skills' such as teamwork and communication.

"During the internship, I had to do a board presentation, which was intimidating, but it also gave me the opportunity to develop my communication skills. I'm a lot more confident speaking to people now," says Benny Bilenge, who interned and then went on to become a project lead at Cape Catalytix.

Group projects have never ended that well for Jason Manganyi, who interned with Impulse Biomedical and then became a Project Lead for SAMF. The Project Leadership role also brought some new insights.

"As project lead, I actually learned how to collaborate with the team and we ended up having great chemistry."
"I'm no longer looking at the work as stuff I need to memorise to get good grades, it's more about where am I actually going to use this one day?" says Erika van der Merwe who was assigned to Manganyi's team for the SAMF project. Following their internships, a number of students have actually continued working with the companies they were assigned to on a part-time basis, while some have even gone on to receive exciting permanent job offers from elsewhere.

Accelerated learning with IREX/UASP Fellowship

Two RC&I team members were recently selected for the highly competitive International Research & Exchanges Board's (IREX) University Administration Support Programme (UASP). **Wasiu 'Afo' Afolabi** and **Tshepi Khahlu**, both IP Specialists at UCT were among 50 mid- to senior-level research management and knowledge transfer professionals drawn from global applicants to participate in the fellowship that spanned between October 2020 and June 2021.

Normally, in pre-COVID times, the United States-based fellowship would start off with two weeks of training in Washington DC, followed by a four-week placement at a top US university.

"It's like a highly efficient matchmaking programme," says Afolabi. "After the first two weeks, IREX match you with a US host institution based on the institutional reform objectives stated in your application and what you want to gain from the fellowship."

Due to COVID-19, however, the 2020 fellowship had to take place virtually. The six weeks curriculum was spread out over the course of a few months to accommodate the professional responsibilities of fellows.

"I do think I was a bit disappointed that I couldn't go in person, because I think it would have made the whole experience much richer," reflects Khahlu. "However, if I had gone, there is nothing I would have gained outside of the social aspect of the institution. The programme was still run really well virtually and answered all the questions I had."

After completing her online module training, Khahlu was assigned to the University of Arizona's technology transfer office, Tech Launch Arizona. During the six weeks she spent with them, her focus was on having a series of conversations about their best practices in the face of change, strengthening stakeholder relationships and building a stronger brand for RC&I.

In her application, Khahlu had stressed the fact that RC&I had reached an inflection point with a rapidly growing team, and that she was interested in learning how to develop strategies for successful change management.

With the University of Arizona having reached a similar crossroads in 2013, they were identified as the best fit for Khahlu's learning objectives.

"My key takeaway from the time I spent with them, was that they work intentionally," says Khahlu. "Everything works with a strategy, which is clearly outlined so that everyone understands what activities need to happen and when."

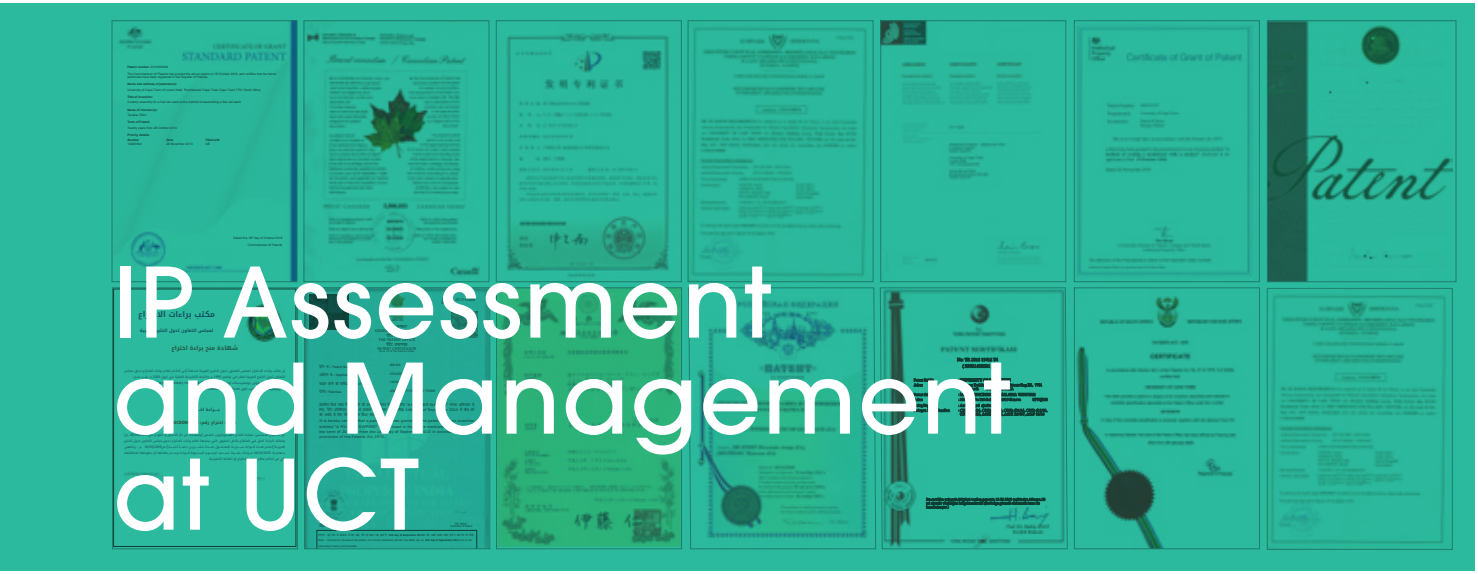
For his six-week immersion, Afolabi was placed at Rutgers University where he gained invaluable insight into their processes, but also had the opportunity to contribute some insights of his own. His objectives include how to be proactive within the university's invention community, optimising the IP management process at RC&I, strengthening stakeholder engagements and improving commercialisation prospects for UCT technologies.

"I was struck by how certain issues at another institution can seem so minute, because it's something we solved at UCT ages ago," he reflects. "And then, on the other hand, issues that are huge to us, have already been solved by them. It's great to be able to exchange this kind of knowledge."

Both Afolabi and Khahlu emphasised the fact that the fellowship provided an opportunity for accelerated development and learning.

"I think, had I not done this fellowship, I would have had to work another two or three years to gain this knowledge," says Khahlu.

"Apart from the self-growth and development aspect, for UCT to be able to equip two of its staff members with this knowledge is invaluable and a great win for the knowledge economy and the technology transfer profession in the country," says Afolabi. "The cost would have been really huge if we didn't have the fellowship."



IP Assessment and Management at UCT

When it comes to managing intellectual property (IP) in a university setting, there are a few strategic points in the patenting lifecycle where technologies need to be closely scrutinised in order to establish whether they are indeed a strong contender for the real-world market, and whether they could make socio-economic impact.

At RC&I a small, but versatile team of IP case managers typically serve as the first port of call for researchers looking to commercialise their inventions.

Led by IP Manager Philip Hoekstra, the team comprising IP Specialists Wasiu 'Afo' Afolabi and Tshepi Khahlu, play a crucial role in bridging various gaps in the patenting process. The team is ably supported by database administrator, Naseema Haffejee.

They have diverse technology backgrounds, but their secret to successfully managing their IP portfolios lies in continuous upskilling and keeping abreast of global best practices in technology transfer, a tried and tested flow of documentation and administration, as well as keeping open lines of communication with one another, the larger RC&I team, the inventors and their patent lawyers.

Invention disclosure assessment

The very first step in the process towards identifying and securing an IP right, or getting a technology patented is, of course, disclosure. It requires close scrutiny and rigorous assessment.

Typically, an inventor will reach out to RC&I to disclose their ideas or inventions. Technologies that are deemed to hold potential are distributed among the team for further assessment. As soon as a technology is assigned to one of them, they become the case manager. An Innovation Commercialisation Manager is also appointed at this point to the case.

"At this stage of assessing the

technology, you have to do a really proper due diligence," says Afolabi.

"To assist us in this process, inventors are requested to provide a summary of the technology as well as details about the research team in the form of an IP Disclosure Form."

This information is then incorporated into RC&I's Invention Disclosure Assessment Form (IDAF) that provides a basis for the case manager's initial evaluation. It covers an assessment of the best mode of IP protection — generally by patenting, but not always — the rights / requirements of funders (often a funder may stipulate specific commercialisation requirements). The potential market for the technology is also evaluated to determine whether there will be commercial potential and/or societal benefit.

Once the form is completed, it is circulated to relevant members within RC&I for comment. If there is consensus about the technology's patenting potential, it is filed with the relevant attorneys who will then commence the patent drafting and application process.

Gate reviews

Although a patent application is a momentous occasion for the inventors, it is really just the beginning of the patenting journey. This first filing, also known as the 'priority filing', gives the inventors the green light for public disclosure, whether in the form of a journal article, thesis or conference paper. Following this, the patent enters a provisional phase of 12 months during which the inventors — with the guidance of case managers - are to decide what happens next.

"More time can be bought by filing a Patent Cooperation Treaty (PCT) application instead of going immediately to national phase," says Hoekstra. The PCT phase lasts 18 months and is followed by the National/Regional Phase. A patent is granted between two and seven years from that point. Both phases are preceded by important 'gate reviews' conducted by the case managers in conjunction with the broader RC&I team to reassess the technology.

Before each of these reviews, the case manager and an Innovation Commercialisation Manager compile a gate review report to be discussed during the Gate Review Meeting. The report summarises progress being made with patent examination and whether its likely that a patent may be granted, inventors include latest technology development milestones and future plans and the commercialisation strategy is outlined against market intelligence.

"With each successive gate review of a technology, we get more and more info and refine our view whether this is worthwhile to proceed or not," says Hoekstra. The review meeting attendees debate the merits of different countries in which to file a particular patent. The decision rests on several factors: where key manufacturing areas and markets are located and economics, i.e., cost of patenting vs. potential revenue from commercialisation of the technology.

Standing in the confluence between inventors, their technologies, examiners and the market, the job of a case manager certainly comes with its fair share of challenges. These are, however, minor in comparison to the rewards that come with assisting inventors in refining their technologies and reaching their patenting goals.

LESSONS FROM GEESE

FACT 5

When a goose gets sick, wounded or shot down, two geese drop out of formation and follow it down to help and protect it. They stay until it dies or can fly again. Then they launch out with another formation or catch up with the flock.

LESSON

If we have as much sense as geese, we will stand by each other in difficult times as well as when we are strong.

"Lessons from Geese" was transcribed from a speech given by Angeles Arrien at the 1991 Organisational Development Network and is based on the work of Milton Olson.

In Memorium

Professor Tania Douglas

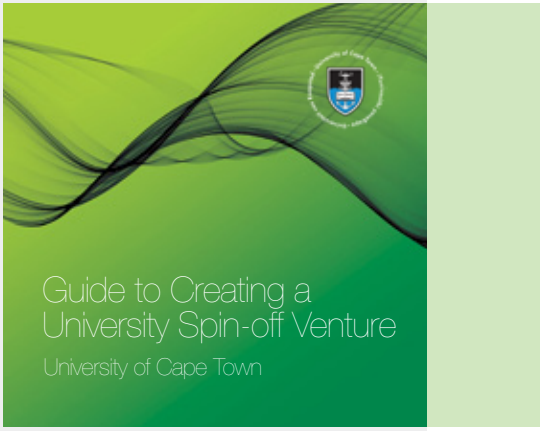
We are saddened by the loss of Professor Tania Douglas (51), who passed away after a long and courageous battle with breast cancer on 20 March 2021. Tania served on our TIA Seed Fund and Innovation Builder Fund Investment Committees, in addition to readily providing RC&I with additional support, e.g. on interview panels. She was a founder of spin-off company CapeRay Medical and was a key role player in developing the MPhil in Health Innovation. She held the prestigious South African Research Chair in Biomedical Engineering and Innovation and served as director of the Biomedical Engineering Research Centre.

Abdul (Taliep) Hattas

It was with heavy hearts that we had to bid a final farewell to our colleague and friend, Abdul Mutaulib Hattas (55) on 25 August 2021. Known to all as Taliep, he served as RC&I's senior finance officer from October 2019 up until his untimely passing. He will be fondly remembered as a soft spoken, kind and friendly presence in the office, whom many of his team members referred to as their 'work dad'. We keep his wife Nadeema; daughters Rufqah and Rafee-ah, along with their spouses; and grandson Maahier in our thoughts as they mourn his loss.

Streamlining Spin-offs

During 2021 we have really focused on making the creation of UCT spin-off companies as frictionless as possible. Two new Guides were produced to demystify UCT's processes around IP commercialisation, funding and how spin-off companies are created: *Guide to Creating a University Spin-off Venture*; and *Bridging the Gap - Guide to Innovation Funding at UCT*, both funded by NIPMO.



RC&I have worked with a local law firm, who has considerable expertise in the start-up company space, to develop a suite of standard legal agreements that can be customised by a specific spin-off company to meet their requirements, but at preferential rates. This ensures that the Shareholder Agreement and Memorandum of Incorporation are sound and make provision for the different modes of investment by, for example the University Technology Fund. UCT is also familiar with the agreements, which speeds up their review and streamlines the incorporation process, with CIPC registration also being handled by the law firm.

Proven vendors for other outsourced services such as web-design, branding, accounting, etc. have been identified so that spin-offs can readily obtain reliable support.

The role of Directors that are appointed by UCT to serve on spin-off company boards is becoming increasingly recognised in terms of the skills that they bring and an article on page 12 in this publication covers perspectives in this exciting space.

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RESEARCH CONTRACTS & INNOVATION

The Department of Science & Innovation's National Intellectual Property Management Office (NIPMO) is gratefully acknowledged for the financial support that it provides to RC&I for the production of this brochure as well as a host of other technology transfer activities and support to establish new posts and develop the capacity of existing staff.

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