

# Department of Research and Innovation

Departement Navorsing en Innovasie Kgoro ya Dinyakišišo le Tšweletšopele

2021

ANNUAL REPORT

TECHNOLOGY TRANSFER OFFICE



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# UP TECHNOLOGY TRANSFER OFFICE

#### A snapshot of UP's TTO

The University of Pretoria (UP) strives to be a university that is known for its international competitiveness and local relevance through continuous innovation. UP's Technology Transfer Office (TTO) aims to ensure that its internal and external stakeholders, as well as its clients, receive an elevated level of service. The TTO is committed to contributing to economic growth within South Africa, with positive social impact in the country and beyond its horders

#### **Contents**

Looking back at 2021

2

TTO's performance



**Workshops** and other events



**Human Resources** 



**Finances** 



## Looking back at 2021

As the country entered the second year of lockdown restrictions imposed by the ongoing COVID-19 pandemic, universities were driven to innovate more. Their need to transform is necessary to stay in the game. The University of Pretoria (UP) is no exception. Guided by its overarching vision, UP 2025, UP approached the year under review by embarking on its last five-year strategic plan leading to 2025 and beyond.

Researchers continued to come up with new inventions, even though most of the University's staff members were working from home. Fortunately, UP was able to deal swiftly with change, and the pandemic enabled it to become a leader in hybrid teaching and learning that innovatively combines contact and online modes. This is in line with the University's vision to be a leading research-intensive university in Africa, recognised internationally for its quality, relevance and impact.

This annual report covers the progress of the University's Technology Transfer Office (TTO) for the period 1 January 2021 to 31 December 2021. It responds specifically to the capacity development requirement of the two funding agreements with the Department of Science and Innovation, under the National Intellectual Property Management Organisation (NIPMO).

This annual report demonstrates the TTO's good performance and relevance to society, focusing on invention disclosures received, patent applications filed, and workshops attended and organised in 2021.

During the year under review, the TTO strived to ensure that its internal and external stakeholders, as well as its clients, continued to receive a high level of service, despite the nationwide pandemic. It sustained its commitment to help develop economic growth within South Africa, and to make a social impact around the world.

This year marked the TTO's 13th year of existence. During this year, it received 16 invention disclosures and filed 36 patent applications. This was an increase on the previous year. It also filed four PCT patent applications and three trademark applications, registered three trademarks in South Africa and signed three license agreements. As the number of PCT applications filed in 2021 was lower than the previous year, there will be fewer PCT national-phase filings in 2022 and early 2023. Several meetings with researchers took place, some of which resulted in new invention disclosures. The TTO Manager, Refilwe Ngoato, met virtually with researchers due to the pandemic and lockdown restrictions to encourage them to participate in technology transfer.

Since the beginning of the nationwide lockdown, the TTO has seen an increase in the number of research contracts signed. The income generated was more than that received in previous years, which is an indication that, despite the pandemic, researchers are continuing with their groundbreaking work.

Other activities concluded during the period under review included induction workshops and Intellectual Property (IP) and Research Commercialisation workshops to increase awareness of IP protection and commercialisation among UP's research community, and to increase the number of invention disclosures and patents filed. Due to the pandemic, the annual World IP Day celebration took place virtually on 6 May 2021. Staff members attended virtual conferences such as the conference of the Southern African Research and Innovation Management Association (SARIMA), the Innovation Summit and the BioAfrica convention.

The TTO continues to see its internal stakeholders as its most important stakeholders. It is therefore crucial to organise meetings with researchers in the different faculties on an ongoing basis to accelerate a culture change and increase the number of invention disclosures.

The ongoing positive relations that have been established with researchers have been crucial to growth and have improved the overall quality of the disclosures the TTO receives. Meetings were also held with external stakeholders to try and understand their needs and establish good relations, as successful and meaningful technology transfer is demand driven.

As part of its marketing strategy, the TTO produced a newsletter and an annual report in 2021 despite the pandemic. Telling stories of how its activities touch and benefit people's lives around the world is important to the University.

The TTO's future plans include continuing to market its services to inventors who need assistance at research induction workshops, IP workshops and departmental seminars and symposiums. It is hoped that this will increase the number of invention disclosures. It also hopes to raise more funds to provide university researchers with a stronger incentive to encourage them to proceed along the route of commercialisation.

The TTO has continued to benefit from the tremendous support it receives from NIPMO, and gratefully acknowledges the organisation's contribution.

#### **Invention disclosures**

The TTO received 16 invention disclosures in 2021. This is an increase in the number of invention disclosures received in 2020. The Faculty of Natural and Agricultural Sciences was more innovative than the other faculties, and submitted eight invention disclosures. This is the ninth year in succession that this faculty has submitted the highest number of invention disclosures.



16 Invention disclosurs received Patent applications filed PCT applications filed 5 Provisional patent applications filed Likence agreements signed International patents granted South African patents granted Trademarks filed

**Performance** at a glance

Trademarks registered

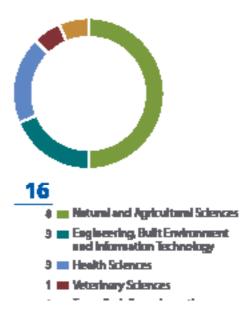
The Faculty of Engineering, Built Environment and Information Technology and the Faculty of Health Sciences submitted three invention disclosures each. The last two invention disclosures were from the Faculty of Veterinary Science and from a collaborative venture with inventors from the Faculty of Natural and Agricultural Sciences, the Faculty of Engineering, Built Environment and Information Technology, the Faculty of Economic and Management Sciences and the University Library. This shows that there is power in collaboration.

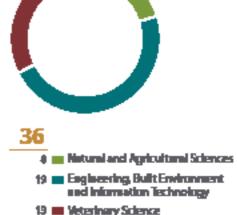
Invention disclosures received per faculty in 2021

# Patent applications filed and granted

The TTO filed 36 patent applications in 2021. This includes provisional patent applications (South Africa), PCT international and PCT national phase applications. Four PCT applications were filed, while previously filed PCT applications entered the national phase. Researchers from the Faculty of Engineering, Built Environment and Information Technology filed 19 patents, followed by 13 patents from the Faculty of Veterinary Science and eight from the Faculty of Natural and Agricultural Sciences. There were no new patent applications from the Faculty of Health Sciences.

Patent applications filed per faculty in 2021





#### Types of patent applications filed in 2021

Four PCT applications were filed in 2021. This is less than the number of PCT applications filed in 2020. Three South African provisional patent applications were filed, while two UK provisional patent applications were filed. A total of 27 national PCT applications were filed. Bioscience-related inventions continued to dominate UP's patent portfolio, followed by engineering-related inventions.

# Provisional South African patent applications

#### **Trademark applications**

The TTO filed three trademark applications in 2021, which compares well to the number filed in the previous year.

In addition, three previously filed trademark applications were registered.

**Finest Varsity Meals** 

Limitless logo

**South African Food Scale logo** 

Big on Skills under Pressure

Listen UP

**Performance and Attitude Focused** 

#### License agreements

Since the establishment of the TTO in 2009, the dominant route for the commercialisation of IP at UP has been licensing. Networking with partners in relevant companies took place during 2021, but was not as active as in previous years due to the pandemic. However, three license agreements were signed, which was more than in 2020. A number of negotiations took place for additional license agreements, so it is anticipated that more agreements will be signed in 2022.

# Three license agreements were signed in 2021:

1

Letago Pharmaceuticals for the "Euclea Natalensis" patent (Prof Namrita Lall)

2

**Botanica Natural Products for** the anti-acne pharmaceutical composition (**Prof Namrita Lall**)

3

**INSIAVA** for research on aspects of hot carrier electroluminescent devices **(Marius Goosen)** 

 $\longrightarrow$ 

# License agreements

1

# LETAGO PHARMACEUTICALS

In South Africa, tuberculosis (TB) is the leading cause of natural deaths. This is despite the highly efficacious treatment regimen currently in the market.

The product that was licensed to Letago Pharmaceuticals is for an indigenous plant-based supplement for liver protection and immune support for the treatment of TB. It was developed by Prof Namrita Lall in the Department of Plant and Soil Sciences. It is believed that this product could improve TB treatment outcomes, which will potentially reduce the fatality rate from the disease in the country, with prospects globally. It will also enhance the local economy from agricultural farming and harvesting of the plants, as well as the production, manufacture, distribution and marketing of the product.

The potential target market of this product is divided into three segments:

- Non-alcoholic fatty liver disease and alcohol-induced liver disease clients
- TB patients
- Global exports of the plant extract

The plant from which this product is derived, *Euclea natalensis*, has been used in traditional medicine by many communities in South Africa, including the Tsonga, Shangaan, Venda and Zulu people, to treat several ailments, including chest complaints. Decoctions from parts of *E. natalensis* have been made to treat chest pains, bronchitis, pleurisy and asthma. It has also been used against leprosy.

Preclinical studies have supported the traditional use of the plant against symptoms of TB. These studies showed the ability of the shoot extract to inhibit mycobacterial growth, stimulate an appropriate immune response and have a hepatic protective effect.

Due to the extract's significant results for hepatoprotective, immunomodulatory effects and antimycobacterial activity, it may prove to be effective to serve as an adjuvant for TB patients.

2

# BOTANICA NATURAL PRODUCTS

Customers in the pharmaceutical and cosmeceutical industry are showing an increasing preference for natural products. However, less than 1% of South African plants have been commercialised. A major obstacle is their diminished efficacy compared to their synthetic counterparts, commonly due to a lack of scientific validation and the adulteration of medicinal herbs.

The product that was licensed to Botanica Natural Products is for an anti-acne pharmaceutical composition developed by Prof Namrita Lall in the Department of Plant and Soil Sciences. This product is derived from *Plectranthus aliciae*. The licensee believes that the indigenous knowledge, scientific efficacy and quality control of Prof Lall's research will give it the competitive advantage to produce natural actives that compare with current industry standards.

The potential target market of this product includes the following:

- Tweens and teenagers over 12 years of age who suffer from acne
- Women over 25 who still suffer from acne
- Young adults and single-parent families

The current leading treatment for acne, benzoyl peroxide, has a range of adverse side effects, including redness, irritation, peeling of the skin and scarring, which diminish the primary function of the skin, which is to act as a barrier. It is also increasingly associated with antibiotic resistance. Some acne medications have even been linked to birth defects if used during pregnancy.

Molecular mechanism laboratory studies on this plant have revealed it to be antibacterial, antioxidant and anti-inflammatory, and to address features such as scarring, pigmentation, antibiotic resistance, sebum production, toxicity and mutagenicity.

The licensee's objective with the commercialisation of this product is to provide indigenous, scientifically proven, qualitycontrolled actives that safely and naturally solve the pains of end users, and in doing so, take them to an elevated level of wellbeing. 3

#### **INSIAVA**

INSiAVA is a private company established to commercialise the intellectual property (IP) of the University of Pretoria (UP). The existing IP and confidential information of INSiAVA related to its technology, research results and know-how will be used to conduct research as part of a doctoral study conducted by Marius Goosen in the Carl and Emily Fuchs Institute for Microelectronics in the University's Department of Electrical, Electronic and Computer Engineering.

INSiAVA is a spin-out company of UP that was originally founded to expand on and commercialise UP's patented silicon light emission technology and its applications. INSiAVA currently owns technology that includes patents, results from its in-house research and development programmes, and know-how that may support continued research in the field of silicon light emission.

This is also the field of Goosen's studies. As an employee of INSiAVA, Goosen will be relying on the company's existing IP to perform academic research in the field of use on aspects of hot carrier electroluminescent devices implemented in standard complementary metal-oxide-semiconductor (CMOS) processes and, more specifically, electroluminescent devices implemented in polysilicon layers of a standard CMOS process.

The field of use comprises the scientific and experimental analysis and characterisation of the electrical and optical behaviour of the licensed technology under various conditions.

The scope of Goosen's work is two-fold:

- Investigate polysilicon light emitters towards improved external power efficiency compared to bulk-based sources
- Utilise the polysilicon light emitters in standard CMOS processes to construct opto-isolators

The outputs of this research will further benefit both the University of Pretoria and INSiAVA.

# Workshops and other events

Workshops and other events organised by the TTO in 2021 included the Research Induction Workshop, the World IP Day celebration and the IP in Genetics workshop.

# Research Induction Workshop

The Research Induction Workshop for new UP researchers took place on the UP Campus on 9 April 2021. This is also referred to as the Early Career Academics Orientation Workshop. It was attended by over 40 researchers. Some of the attendees attended virtually because of the pandemic. The TTO Manager gave a presentation on IP and research contracts. This workshop takes place every year during the first and second semesters. The second workshop took place in November 2021 and was also attended by over 40 researchers.

#### **World IP Day**

Due to the COVID-19 pandemic, the TTO's World IP Day celebration took place virtually on 6 May 2021. In alignment with the theme, "IP and SMEs: Taking your ideas to the market", a sit-down was organised with HearX Group CEO, Nic Klopper. The HearX Group is the licensee for the mobile health hearing screening solution patent, which utilises pre-specified screening protocols on android software to assess hearing using automated sequences. Klopper inspired the attendees by sharing his experiences as an entrepreneur and how the invention reached the market. Ms Tshimangadzo Munyai, a representative of NIPMO, attended the virtual event.



#### **IP in Genetics Workshop**

The TTO Manager gave a 40-minute virtual presentation on IP to 35 Genetics honours students on 17 June 2021. This was followed by a one-hour interactive session. A set of 20 questions was prepared that students were expected to answer. These included questions such as: Can a postgraduate student be a sole inventor at UP? What is the difference between a participant, an IP creator and a beneficiary? The workshop has been taking place since 2018.

# UP Library narrative presentation

The University Library asked the TTO Manager to prepare a recorded narrative presentation on technology transfer, IP and commercialisation for postgraduate students. This 30-minute presentation was posted on the University's intranet. Thus, whenever postgraduate students come up with inventions and they are not sure where to go for assistance in terms of IP protection, how they will benefit if they disclose the IP to the TTO or need any other information on IP, they will be able to go to the intranet and get most of the answers they need.

# IP and Research Contracts session

The TTO Manager was invited the deliver a presentation on IP and research contracts at the UP Management Programme, which took place in the UP's Sanlam Auditorium on 8 November 2021.



# **IP Management Dialogue** session

The TTO Manager was a panel member at the City of Tshwane's IP Management Dialogue session, also referred to as the eThinkFest Innovation workshop. The innovation dialogue took place in partnership with the Tshwane University of Technology, NIPMO, UP and the Human Sciences Research Council (HSRC).

#### **Meetings with researchers**

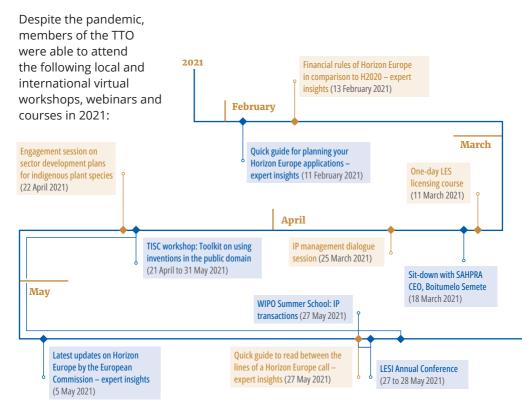
The TTO Manager conducted meetings with at least 10 researchers during the period under review with a view to increasing the number of invention disclosures received by the TTO. These meetings all took place virtually. It is hoped that face-to-face meetings can be resumed in 2022.

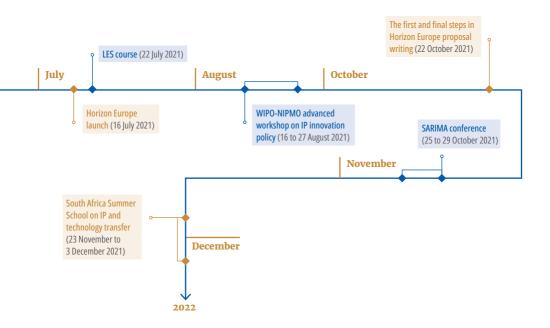
#### **Contracts and Innovation Support initiatives**

The TTO's Contracts and Innovation Support Manager, Dr Simon Thanyani, was invited to attend the Nanofilter Project Workshop in Zambia from 19 to 23 May 2021, where he shared his knowledge on IP and the commercialisation of research. The value of his inputs resulted in a second invitation to this country. Dr Thanyani also presented a lecture on IP transactions at the virtual summer

school of the World Intellectual Property Organisation (WIPO). He has been presenting this lecture at the summer school for the past few years. He furthermore attended a workshop on the drafting of Access and Benefitsharing contracts in Pretoria from 15 to 18 November 2021 and an information session on valorisation and contract training in Durbanville in the Western Cape from 26 to 28 November 2021.

#### Virtual workshops, courses and meetings





### **Human Resources**

The TTO's Senior Administrative Officer, Mashudu Nxumalo, resigned at the end of January 2021. She had been with the TTO for almost three and a half years. The TTO appointed an interim Senior Administration Officer, Edmond Makgaretsa, for a period of six months in accordance with the recommendation

of the University's Department of Human Resources. He joined the TTO on 1 March 2021. His contract was extended for a further six months, and has since been extended for another year.

The position of Commercialisation Coordination Officer is still vacant.

#### **Finances**

In 2021, the TTO's Capacity Development Grant was mostly used to pay the salaries of the IP Legal Advisor and the Administrative Officer. Workshop expenditure was low due to many of the events being attended virtually. There was an increase in the income generated from research contracts in comparison to the previous year.