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On 27 and 28 February 2018, NEPAD SANBio/BioFISA II hosted the annual event with the theme *Finding solutions through technology innovations* at the CSIR International Convention Centre in Pretoria, South Africa. The event brought together researchers, students, entrepreneurs, public sector officials and investors from around southern Africa and all over the world, for two days of networking, pitching sessions and information-sharing.

The two days celebrated the achievements of the BioFISA II programme to date, while highlighting the many challenges still to be overcome in southern African innovation in the biosciences. Sessions included discussions on available funding from both the public and private sector, challenges of running a bioinnovation startup, advantages and barriers to entry in turning biosciences research into enterprises, and inspiring stories from successful innovations in Africa and elsewhere.

On the sidelines, SANBio-funded enterprises displayed their products and courted investors, venture capitalists searched for new endeavours to fund, and several agreements were made, including an MoU between SANBio and an equipment network called Seeding Labs.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>AWIEF</td>
<td>Africa Women Innovation &amp; Entrepreneurship Forum</td>
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<td>CSIR</td>
<td>The Council for Scientific Industrial Research</td>
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<td>DST</td>
<td>Department of Science and Technology</td>
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<td>FemBioBiz</td>
<td>Women Bioentrepreneurs Acceleration Programme</td>
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<td>FNB</td>
<td>First National Bank</td>
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<td>I4F</td>
<td>Insects for Food, Feed and Fertilisers</td>
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<td>IKS</td>
<td>Indigenous Knowledge Systems</td>
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<td>IP</td>
<td>Intellectual Property</td>
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<td>LAS</td>
<td>La-Africa Soother</td>
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<td>MDR TB</td>
<td>Multi-Drug Resistant Tuberculosis</td>
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<td>NBA</td>
<td>National Biotechnology Authority of Zimbabwe</td>
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<td>NCRST</td>
<td>National Commission on Research Science and Technology</td>
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<td>NEPAD</td>
<td>New Partnership for Africa’s Development</td>
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<td>NFTRC</td>
<td>National Food Technology Research Centre</td>
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<td>NISTI</td>
<td>National Institute of Science Technology and Innovation</td>
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<td>RSTI</td>
<td>Research, Science, Technology and Innovation</td>
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<td>SAB</td>
<td>South African Brewery</td>
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<td>SADC</td>
<td>Southern African Development Community</td>
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<td>SAIS II</td>
<td>Southern African Innovation Support Programme</td>
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<td>SANBio</td>
<td>Southern Africa Network for Biosciences</td>
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<td>SME</td>
<td>Small-to-Medium Enterprise</td>
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<td>STIYF</td>
<td>Science Technology Innovation Youth Fund</td>
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<td>USPTO</td>
<td>United States Patent and Trademark Office</td>
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<tr>
<td>VC</td>
<td>Venture Capital</td>
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<td>ZIM</td>
<td>Zimbabwe Institute of Management</td>
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<td>ZIMDEF</td>
<td>Zimbabwe Manpower Development Fund</td>
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It is with great pleasure and satisfaction that I present this report on the 2nd SANBio/BioFISA II Annual Event, held in Pretoria from 27-28 February 2018.

There is growing evidence of a diverse Research and Development culture in the region as shown by the calibre of the scientists produced and their research publications. Recent analysis of researchers conducting R&D in sub-Saharan Africa, however, show that the higher education and government sector still conducts the lion’s share of research with relatively low numbers of researchers in the not-for-profit and private sectors.

Regrettably, only a negligible number of technologies transition from R&D in the higher education and public sectors into the marketplace, a limiting factor on the R&D productivity of the National System of Innovation (NSI).

It is therefore imperative that SANBio and like-minded organisations put energy into increasing the conversion of intellectual capital from R&D organisations into successful ventures and enterprises.

The 2018 SANBio/BioFISA II Annual Event was premised on igniting conversations on how entrepreneurs could be supported to get products to the user. Using different experiences from Europe, Africa, USA and Asia, the annual event explored how Africa could effectively translate research results into products that impact health and nutrition of citizens and improve the productive outputs of agricultural and bio-industrial efforts on the continent.

It is no secret that the growing economies of sub-Saharan Africa and southern Africa in particular would benefit from adding commercial value to indigenous resources, including the rich flora and fauna of our region. The event highlighted the importance of Research, Development and Innovation in context in the African environment, where indigenous knowledge is solving problems in communities, and holds promise to develop communities and reduce inequality in future.

By stimulating conversations between the private sector, public sector and academia, and by growing the skills and capacity of potential entrepreneurs in the biosciences, we believe it is only a matter of time before we see emerging and maturing industries in biosciences sector start to have social and economic impact in our communities.

On behalf of NEPAD SANBio and all stakeholders, we would like to thank all who participated at the event and hope the readers will also enjoy this report.

Dr Ereck Chakauya
SANBio Network Manager
Background

The Southern Africa Network for Biosciences (SANBio) is a NEPAD Agency Flagship for collaborative research, development and an innovation platform aimed at addressing Southern Africa's challenges in health and nutrition. The Finnish-Southern African Partnership Programme (BioFISA II) is aimed at strengthening the NEPAD SANBio Network, and funding under BioFISA II is aimed to support and strengthen biosciences research and development as well as human capacity development in the Southern African Development Community (SADC) through the existing NEPAD SANBio Network. The current SANBio Member States are Angola, Botswana, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Lesotho, South Africa, Seychelles, Swaziland, Zambia and Zimbabwe.

In line with promotion of knowledge sharing, highlighting the work done by the SANBio network in the SADC region, and engaging with a variety of stakeholders, SANBio/BioFISA II hosted the annual event with the theme Finding solutions through technology innovations from 27-28 February 2018, at the CSIR International Convention Centre, Pretoria, South Africa.
Day 1: 27 February 2018

Plenary welcome

Chair of the SANBio Steering Committee, Dr Jonathan Mufandaedza, opened the event saying that in order for the NEPAD SANBio programme to be successful, important networks within the NEPAD region must be built.

Executive Director of the Biosciences Unit at the CSIR, Dr Boitumelo Semete-Makokotlela, congratulated the BioFISA and SANBio teams on their stellar work over the years. She laid the groundwork for the 2018 Annual Event by reflecting on the role of scientists in society, and asking the audience to always consider how they can commercialise life science technologies.

Chief Director of International Resources at the South African Department of Science and Technology, Dr Isayvani Naicker, talked about how South Africa and Finland have been working together since 2001, growing and strengthening the relationship. SANBio Network Manager, Dr Ereck Chakauya, set the theme of the gathering to commercialise knowledge by focusing on research and development in the biosciences sector of the region.

His Excellency Ambassador Kari Alanko of the Ministry for Foreign Affairs of Finland gave the keynote address, stressing the importance of building a bridge between innovation and biotechnology research as a theme for this year’s event. He used Finland as a good example: Finland is a leader of innovation in Europe with its great availability of innovators, researchers and engineers. He also mentioned the Women Bioentrepreneurs Acceleration Programme (FemBioBiz) launched in 2017 as an exciting project that supports Finnish commitment to promote gender equality.

“At the CSIR, we are reflecting on our relevance. How does the science we do address unemployment and social inequality?”

- Dr Boitumelo Semete-Makokotlela, Executive Director of the Biosciences Unit, CSIR
Session 2: Founder’s story: The good, the bad and the ugly of running a start-up in the biosciences

This session provided a forum to discuss best practices in different countries that can be applied elsewhere to maximise commercialisation potential.

Dr Sean Moolman of PowerOptimal said that scientists are usually reluctant to make money, and he emphasised that making money should be seen as a way to ensure the sustainability of the project, and as a way to bring about social change in the region. Dr Dougbeh Chris Nyan of Shufflex Biomed in the USA presented on the intricacies and difficulties of running a biosciences startup. The company is developing the novel Shufflex Multiplex Diagnostic Test Kit: a palm-sized device that can differentiate between infections such as HIV, HCV, ebola virus, TB, yellow fever, Lassa fever and others. He discussed numerous personal, scientific and bureaucratic challenges he has faced along his journey.

Mr Vincent Nowaseb of the National Commission on Research, Science and Technology said Namibia has been trying to increase commercialisation of research using legislation and policy. His government is working to get Namibia ranked 80th on the world rankings in innovation by the year 2022.

Ms Pauline Mujawamariya Koelbl of the African Innovation Foundation encouraged country representatives to strengthen investments and cooperation between their countries and organisations within the region, and asked attendees to identify problems in their own environments and societies that could be solved through innovation.

“I always say negative results are good - they tell you what you are missing. I wasn’t trying to be an entrepreneur but a good scientist.”

- Dr Dougbeh Chris Nyan, Shufflex Biomed

Prof Michael Wallach introduced the SPARK programme from Stanford University, which aims to promote bioscience research, international collaboration, and business development skills at universities around the world.
Dr Margo Bagley of Emory University focused on the importance of intellectual property, how so few of global patents are found in Africa and how fewer still are owned by African locals. Finally, Ms Ela Romanowska of WITS Enterprise (the University of the Witwatersrand’s technology transfer office) gave the audience some tips on how to move from lab to market. She closed off by saying that the secret to running a successful innovation business is in putting together the right team with the right attributes.

Several panellists talked about how the pharmaceutical industry has changed, with the biggest players ‘offloading’ much of the risk that comes with developing drugs onto startups.

“Get out of your research lab, speak to people in the market, hold interviews. Talk to people in disciplines that can help.”

- Ms Ela Romanowska, University of the Witwatersrand
Session 3A: New funding models: exploring the opportunities for spin-off and start-up founders

Mr Max Pichulik of Impact Amplifier in South Africa facilitated this session exploring how different funders can support startups and spinoffs in the commercialisation phase. On the panel were Mr Mikko Savolainen of Invesdor in Finland, a crowdfunding platform for investing in startups; Mr Eric Pol of The HWeb in Luxembourg and South Africa which invests early in African businesses, and grows the investment with the company; Mr Jaap Spreeuwenberg of Hivos Impact Investments in the Netherlands which invests in very small African startups with a potential to grow; and Mr Jackson Mwatha of Villgro, in Kenya, which incubates 15 startups, helping with business models, expertise and seed funding.

The panel agreed that there are many good opportunities available to scientists with great ideas, technologies and innovations, but the problem is the way these opportunities are packaged. Researchers need help with their business models, and education in pricing, unit economics, and marketing strategies before talking to investors. The panel all said they try to invest in the entrepreneur first, before helping with the business plan. The character of the entrepreneur is as important as their ideas or technologies. The panel also highlighted how trust goes both ways: it is important for the investor to know the company, its capacity to resist stress, and evidence of teamwork. The panel observed that companies run well because of the team, financials, market, and innovations. They said as investors they also look at marketing and branding, as well as the networks and community around the company, while keeping a close eye on global trends and values.

“We have made large investments in life science to build African countries because we want to see truly innovative companies with a pan-African and global ambition and potential.”

- Mr Eric Pol, The HWeb

The panel suggested that politicians and governments should be pressured to improve early-stage funding. The panel said African entrepreneurs often feel that if they have a white cofounder, they have a higher chance of being funded. They also mentioned that diversity has been shown to positively correlate with success for the business, and it has been shown that female entrepreneurs do better than males in crowdfunding as they are less prone to over-promise.
Dr Emmanuel Nepolo from the University of Namibia presented his idea to reduce the delays that patients experience while waiting for the test results of their Multi-Drug Resistant Tuberculosis (MDR TB) diagnosis. He proposed individualised treatment that involves resistance prediction of up to 10 genes involved in the development of TB strains, directly from sputum.

Ms Julia Kambunga from the University of Namibia presented a radical, indigenous solution to treating burn victims. She proposed the use of the Acacia mellifera, known as omungondo, which has burn treatment, antifungal and antibacterial activities. Kambunga proposed using extracts of the plant as an alternative, affordable burn treatment sourced from indigenous knowledge. She said that the use of an ointment from the plant will contribute positively to the economy by reducing burn injuries and deaths.

Mr James Makame of the University of Pretoria gave a pitch on Nutrifix, a company which he hopes will fight poor nutrition from over-diluted cereals fed to infants in southern Africa. He proposed a better protein versus flour balance in order to reduce over- and under-dilution of cereals for children. He has developed a porridge that removes the uncertainty associated with dilution, which he says will be cheaper and prevent the cost-saving measures caregivers take with the cereals.
Session 3C: Domestic resource mobilisation in SANBio member states

Ms Mmampei Chaba of the South African Department of Science and Technology (DST) facilitated this session, in which SANBio member states presented the funding available to researchers and entrepreneurs that are part of SANBio/BioFISA II projects. She introduced the session by discussing the funding situation for bioinnovation in South Africa, highlighting that it is not sustainable because it relies on international funding.

Dr Martin Kebakile from Botswana said their National Food Technology Research Centre (NFTRC) has adopted numerous RSTI (Research, Science, Technology and Innovation) policies to facilitate more innovation in the country. Botswana has launched a National Innovation Fund to provide seed and early stage funding for technology-based start-ups and ventures as well as established companies with viable innovation concepts.

Dr Jonathan Mufandaedza of the National Biotechnology Authority (NBA) of Zimbabwe said the organisation funds projects aligned with research priorities of the country and tries to help entrepreneurs collaborate with research institutions.

Mr John Chongo of the Ministry of Higher Education in Zambia discussed the funds available for science, technology, and innovation initiatives, especially in bioscience, aimed at driving research and development in line with national development priorities. Another fund is supporting youth entrepreneurship in the sciences.

Ms Tessa Belle said the National Institute of Science Technology and Innovation (NISTI) in Seychelles was established in 2014 to coordinate research and promote science, technology and innovation, aiming to create an innovation-driven and knowledge-based economy by 2025.

“SANBio activities are much aligned with a number of national strategies and policies such as the South African National Development Plan.”

- Ms Mmampei Chaba, South African Department of Science and Technology
Session 4: Expert panel: Future of food

Dr Victor Konde of AEH Global in Ethiopia facilitated this session on the future of food and the role of bioscience innovation in food in Africa. He said the African continent has many divisions politically and economically, but thankfully the continent has the most youthful population in the world that can transcend the divisions. The panel discussed the challenges and opportunities that exist in Africa’s food future, including trends and potential pitfalls.

Dr Reetta Kivelä of Gold & Green Foods in Finland sees a future where people care much more about food and its role in health, and want to know more about what is in their food. She predicts that environmental catastrophes will nudge the world toward sustainable foods, which might mean reducing meat production and consumption in Africa and Europe.

Dr Bamidele Raheem of the University of Lapland in Finland said that Africa has the greatest amount of arable land in the world, and that a focus on food security will shift the global use of arable land toward the African continent. Dr Siya Ntutela of AfricaBio suggested that the continent could increase production through gene editing technology and employing smarter farming techniques such as seed rotation.

There was also a suggestion that food production would need to become more localised because of climate change challenges. Dr Ntutela suggested that the continent should focus on local crops, use the available technology and rely less on imported foods. African countries need to repackage indigenous food and make it more appealing to the market.

Africa must be more proactive in adopting and adapting new technologies, for the benefit of the continent. The continent should develop knowledge on technology and also train scientists to address Africa’s problems. The panel agreed that the engagement of communities, and particularly young people, in food production and processing is critical for Africa’s food future.

“There is plenty of funding available for the continent. The problem in Africa is who to fund - we just need good ideas.”

- Dr Victor Konde, AEH Global
We are here in this room because we know that the great challenges of this century require scientific solutions - that can be food, or access to water, power for growing cities, emerging diseases. At Seeding Labs our founding mission is to ensure that no matter where you are in the world, you get to be a full participant in science and innovation.

- Dr Boitumelo Semete-Makokotlela, Executive Director of the Biosciences Unit, CSIR

The partner countries and their organisations engaged in FemBioBiz Season 2 are The Guy Morel Institute and NISTI (Seychelles), AWIEF (South Africa), DEV Mozambique (Mozambique), m-HUB (Malawi), National Biotechnology Authority (Zimbabwe), WECREATE (Zambia), NCRST (Namibia), and the Botswana Innovation Hub (Botswana).
Session 6: Plenary address 2

Ms Zvikomborero Tangawamira of the BioFISA II Programme Unit reported on the achievements and lessons learned during BioFISA I and II. The BioFISA programme was funded by the governments of Finland and SADC in the period 2009 to 2012. The next phase of the programme, BioFISA II, started in 2012, covering 13 countries with a EUR 6.6 million budget over four years. In that time, the SANBio network has built capacity, entrepreneurship, and technical skills.

The BioFISA II programme aimed to support five flagship projects with R4.5 million each as well as support 10 seed projects, train 300 participants, bring two products to market, and to have 50% of the participants in the activities be women.

Unfortunately, fewer than expected innovations came out of the network, coming largely from universities in South Africa, Zimbabwe, and Botswana. Other obstacles included regulatory frameworks that delay bringing products from the lab to markets, and a lack of market testing or links to customers.

To start off the second day of the event, she then called two presenters to the stage to demonstrate what is currently happening in the kind of startups operating in the region’s innovation landscape.

Prof Dexter Tagwireyi of the Zimbabwe Institute of Management (ZIM) discussed his discovery of the medicinal properties of the Boophone disticha plant, which had been considered poisonous. The plant has effects on anxiety and depression, and effects on the heart. Through a grant from the Zimbabwe Manpower Development Fund (ZIMDEF), he plans to register and test the medicine he developed.

Mr Gift Gana co-founded Dr CADx, a company developing a medical app that employs artificial intelligence to enhance medical imaging, currently an African challenge caused by poor diagnostic.

We want the SANBio network to be the best known network in biosciences in Africa.

- Ms Zvikomborero Tangawamira

Presenters:
Ms Zvikomborero Tangawamira, BioFISA II Programme Unit
Prof Dexter Tagwireyi, Zimbabwe Institute of Management, Zimbabwe
Mr Gift Gana, Dr CADx, Zimbabwe
Mr Ilari Lindy, SAIS II Programme Management Office, Namibia
Prof Michael Wallach, University of Technology, Sydney, Australia
accuracy and a shortage of radiologists. He plans to improve the accuracy of diagnosis on a number of diseases beyond cancer, including TB. His app has an accuracy of 84-88% for six diseases and he will compare it with the accuracy of doctors’ diagnoses come May 2018.

Mr Ilari Lindy spoke about the Southern Africa Innovation Support Programme (SAIS II), which is fostering entrepreneurship and innovation ecosystems in Southern Africa region. He announced that the Challenge Fund would be launched for March 2018. The initiative is backed by the governments of Finland, South Africa, Namibia, Botswana, Zambia and Tanzania and aims to bring products and services to excluded populations by investing in ‘local champions’ - the players that have already been there and are ready to take the next step.

Mr Cyril Lombard of the ABS Capacity Development Initiative discussed ABS-compliant Biotrade in Southern Africa, which wants to provide technical assistance to South African and regional value chains, and financial assistance to Small-to-Medium Enterprises (SMEs) to support innovation. They are also improving the regulatory environment through policy advice and technical support.

Professor Michael Wallach discussed the SPARK programme of Stanford University. He acknowledged that getting involved in bioinnovation is intimidating to young people all over the world because of a lack of funds, experience and guidance. Drug development has become very expensive for big companies, and no one is willing to take on the major financial risks involved. The SPARK programme aims to lower the costs of drug development with the realisation of the need for a world-wide network.

“'The right dose differentiates a poison and a remedy.'

- Prof Dexter Tagwireyi, Zimbabwe Institute of Management
Session 7A: The growth engine that took me from zeros to millions in a few years

In this session, entrepreneurs who took their ideas to market quickly shared their success stories.

Dr Reetta Kivelä’s Gold & Green Foods venture succeeded in just three years. In her home country of Finland food is also an environmental issue; she set out to fight climate change breaking the habit of meat consumption across the world. She developed a healthy, sustainable, convenient and affordable new processed food called pulled oats as an alternative to meat, made from oat and bean protein. Green & Gold Foods has expanded rapidly by relying on good quality food products, simple processes and rapid scaling-up.

Dr Nick Walker talked about NextBio – a biotechnology company that combines medicine, science and technology to create innovative products and services. The company has three divisions: the stem cells/biobanking division, the genetics division from preconception to postpartum, and the therapeutics division.

Dr Imogen Wright walked attendees through her journey with Hyrax Biosciences, which built software to analysis genetic data in HIV patients. The company built a platform where research customers could use a web-based interface to access drug resistance reports based on sequencing data.

The panel agreed that humility is important for an entrepreneur to succeed, as is a competent and diverse team.

“When a lot of people come to you with a problem, maybe it’s your job to come up with a solution.”

- Dr Imogen Wright, Hyrax Biosciences
Session 7B: Exploring business models on indigenous knowledge systems (IKS) & bioinnovation

This session was about exploring business models to industrialise indigenous products. Dr Aunkh Chabalala of South Africa’s Department of Science and Technology (DST) discussed the DST’s view of and plans for Indigenous Knowledge Systems. He talked about the importance of Ubuntu-based innovation, which requires trust and respect for all knowledge, and less of an emphasis on profit, as those who are driven by profits are less likely to respect nature.

South Africa has a great competitive advantage because it is the third most biodiverse country in the world with over 5 000 of the known 24 000 medicinal plant species. The DST has put a R4.4 million budget towards developing IKS in the country. Planned outputs from this fund include 60 commercial candidate products; 300 to 500 seasonal jobs per year; 250 Honours, Master’s, and PhD students; and 40 peer-reviewed articles and book chapters. Ms Shumi Pango of the DST said there is a long history of IKS policy in South Africa involving the advocacy and policy development office at the DST. There is currently an indigenous knowledge bill that is being reviewed in government to help protect indigenous knowledge and cultural expressions.

A few examples of IKS put to use in the SANBio network followed.

Ms Thandie Lebotse-Zulu of Botswana presented on the work being done at Blue Pride (Pty) Ltd, where they extract natural seed oil from marula kernels for the cosmetic industry. They have been working with communities and sharing their knowledge about the indigenous plant, using funding they received from SANBio, and have improved on the process of using stones to crush the marula kernels, by working with engineers to develop a marula crusher with SANBio’s help.

The Synmba project in South Africa and Botswana produces a sorghum-based beverage, which could tap into a multimillion-dollar industry in the region. With the high protein and energy content of sorghum, Dr Oluwaseyi Aboyade said the team is trying to reduce hunger and disease in the SADC region. The team has access to school feeding schemes in Botswana, and is looking to work with sports bodies due to the high protein content of their product.

Dr DMN Mthiyane of the University of Swaziland uses Melia azedarach foliage and oyster mushrooms to improve nutrition and milk production and control internal and external parasites in dairy goats.

"We stand on the shoulders of our ancestors. We are told that Africa is a dark continent, but the fact is Africa was the first in a lot of things.

" - Dr Aunkh Chabalala, Department of Science and Technology
Numerous startups pitched to a panel of funders and investors in the biosciences industry. The jury of panelists were: Ms Ntando Nodada (SAB Foundation), Ms Pauline Mujawamariya Koelbl (Africa Innovation Foundation), Ms Bernice Robbertse (Hivos Food and Lifestyle Fund), Mr Mikko Savolainen (Invesdor), Mr Eric Pol (The HWeb), and Mr Jordin Borer (Lucid Ventures).

Dr CADx started off the pitching sessions, talking about how they are improving healthcare using computer-assisted diagnostics. They are trying to help doctors make faster, more accurate and more cost-effective cancer diagnoses, as there is a shortage of radiologists in the SADC region.

Shufflex Biomed said infectious diseases are prevalent in tropical areas and healthcare workers have difficulty distinguishing particular infections. Their solution is a detection system that detects and distinguishes between multiple infections within 40 min, is easy to use, portable, and can target up to 21 diseases prevalent in Africa.

Global Health Biotech produces the La-Africa Soother topical ointment with anti-inflammatory properties. The panel commended the presenter, Prof Keolebogile Motaung, on her enthusiastic presentation skills.

Tezted Ltd said they were revolutionising the way tick borne diseases are diagnosed with a significant cost reduction for the patient. Tezted will charge five times less than their competitors, which have tests that check for one infection at a time.

Inqaba Biotec’s Ms Mischa Fraser presented on their genotype testing kit to solve the problem of current kits that fail to discriminate between individuals, which can result in false ‘not guilty’ verdicts in a sexual assault case. Their kit is much cheaper, more efficient, faster and provides greater discriminatory ability with fewer markers than other kits on the market.

Parceval’s Ms Avril Harvey presented on the idea of commercialising resurrection bush tea in Zimbabwe. She suggested that commercialising this tea can help rural development initiatives.

Sorghum Revolution Ltd aims to tackle the issue of poor nutrition in the SADC region with their revolutionary health biscuits made from sorghum. With a snack foods market of over R41 billion in the region, they told the panel that they are working to find retailers that will provide access to the consumers they are targeting.

Blue Pride Ltd’s Ms Mnguni Zulu gave an impassioned pitch on their natural oil extracted from marula kernels, and their plans to export to northern hemisphere markets in order to make much higher profits. With cosmetics showing growth due to the market looking for natural treatments for skin ageing, they have
big expansion plans attending expos all over the world to get higher prices for their oils.

Ms Palesa Teke forms one third of the **Healthily Baked** team, incubated by the National University of Lesotho where they make delicious sorghum biscuits that come in many flavours. They told the panel that they need funding to drastically increase their production to make over 500 000 packets a year.

**Synmba** want their cereal drinks to take over the non-alcoholic drinks market in the SADC region. Their competitive advantage is a filling drink high in protein, energy, and antioxidants. Operations Manager Mr Ramogoma Kaisara told the panel that they plan to use an existing brand to enter supermarkets in Botswana and eventually approach the government to supply them for their school feeding schemes.

**Producers of mealworms used for animal feed** by the year 2020. They told the panel that they beat the competition because they produce a unique and superior type of mealworm and that they plan to control the market of baby animal feed, which is of higher value.

Dr DNM Mthiyane of the **University of Swaziland** gave a presentation on using Melia azedarach forage and oyster mushrooms to improve nutrition, milk production and health in dairy goats. He mentioned how their goat feed has the effects of controlling internal and external parasites in the animals, which stems from long-held indigenous knowledge of the effects of Melia azedarach. They are addressing poor livestock productivity in sub-Saharan Africa caused by poor nutrition and parasites.

"Imagine being bitten by a tick. If you are not tested, you will not be diagnosed. And with no treatment, you could succumb to various tick-borne diseases."

- Dr Leona Gilbert, Tezted Ltd

**Moleifera Broiler Feed** pitched a solution for the unhealthy practice of feeding chickens broiler feed full of growth hormone, which can lead to high numbers of livestock deaths. They told the panel that they plan to reduce the losses caused by competitor feeds from 5% to 2% where their alternative and natural feed containing moringa is used.

**Smoothlife** introduced themselves as producers and suppliers of nutritious juices and smoothies that are natural, having no artificial colourants, flavours, or preservatives. They told the panel of investors that they plan to have a factory operational in 2019, and then have their products as popular as Coca-Cola in the region by 2021.

**Insects for Feed and Food (I4F)** presented themselves as a consortium of commercial partners in Malawi, South Africa, and Zimbabwe planning to be the leading producers of mealworms used for animal feed by the year 2020. They told the panel that they beat the competition because they produce a unique and superior type of mealworm and that they plan to control the market of baby animal feed, which is of higher value.

**Aegis Environmental** set out to solve the global food waste problem using the black soldier fly (*Hermetia illucens*). They plan to lower recycling costs with a more sustainable
product and later license their process to other players on the market. They told the panel that of the 10 million tons of wasted food in South Africa, they want to recycle 450 000 tons by 2025.

Sleek Foods’ Mrs Nkata Seleka talked about her company that produces localised condiments and vegetable products and provides them to fast food franchises such as KFC in Botswana, with plans to expand to South Africa and other SADC countries.

Austics asked the audience to imagine a world where overcrowding in hospitals has become a thing of the past and the referral process has been made much easier for the patient. They proposed to bring about this world with the use of their innovative medical instruments such as a stethoscope that records audio of a medical examination, which can then be shared digitally with other medical professionals.

Mozkubwika ended the pitching sessions with their plan to challenge the lack of diversity in food options in the snacks market. They presented their idea of making snack chips using banana peel, with plans to expand using micro franchising through communities in Mozambique.
Dr Boitumelo Semete-Makokotlela discussed the role of women in research and innovation in the biosciences. The winner of Season 1 of the FemBioBiz Accelerator Programme, Prof Keolebogile Motaung, then talked about her company Global Health Biotech and the many intricacies of entrepreneurship. She highlighted the need to train young people in business skills to address unemployment, and the need to think differently as an entrepreneur and as a scientist. She also discussed the product she developed: the La-Africa Soother (LAS) topical ointment, which offers athletes a natural anti-inflammatory ointment.

Ms Irene Ochem of the Africa Women Innovation & Entrepreneurship Forum (AWIEF) in South Africa said the organisation works on the economic empowerment of women through entrepreneurship. AWIEF looks at the many challenges women face such as poor access to markets and mentorship, and uses accelerator programmes, among other tools, to empower them.

Mr Patrick Shatamuka of WECREATE in Zambia said they are empowering women through an initiative started by the United States of America, called the Caterpillar Foundation. He said that they have a business model to train people with an emphasis on building teams, and work to move women into the formal business sector.

Mr Petrus Sebina of First National Bank (FNB) in Botswana said the bank wants to form partnerships with organisations such as the Botswana Innovation Hub, and help train women in financial literacy, especially in the food processing and tourism industries.

"We need to start incorporating entrepreneurship very early in our schooling system. For now I train my students to be better than me at entrepreneurship so they can be their own bosses."

- Prof Keolebogile Motaung, Global Health Biotech
Dr Nina Dudnik of Seeding Labs facilitated a session on how a lack of proper technology and infrastructure imposes limits on innovation, and how to address this issue.

Prof Kenneth Matengu of the University of Namibia said that a lack of infrastructure is limiting innovation in African universities, as training is too theoretical. He said such training fails to place centres of excellence as targets for investment. He also mentioned trust issues between industry, institutions of higher learning and the public sector. To counter this, he proposed leases and partnerships where university equipment programmes are aligned to industry needs.

Dr Louise Bezuidenhout of Oxford University said that developing countries face daily research challenges including all the time, effort, funds, and creativity needed to equip a lab. There is a need for stable and flourishing equipment networks in resource-constrained regions, that are not vulnerable to disruption when equipment breaks or is replaced. Her research has shown that core funding is not available for basic equipment, for repair and for acquiring reagents. She said that disrupted infrastructure networks can break down otherwise good research being done.

According to Dr Dudnik, the most needed and requested equipment from Seedling Labs includes microscopes, pipettes, centrifuges and balances, which all cost below $5000. She said that she is working with hundreds of private and public partners across the world, using a creative model that works outside of regular purchasing systems.

Prof Enock Jonathan of the Chinhoyi University of Technology in Zimbabwe is a beneficiary of the Seeding Labs programme. He said that when he was in Europe, he had no trouble accessing the equipment he needed but was shocked to find that this was not the case back home in Zimbabwe. His mantra changed from ‘publish or perish’ to ‘patent or perish’ and finally to ‘entrepreneur or perish’. He said that it is imperative that one be a creator, integrator and leverager of knowledge.

“The pipeline of future innovators is narrowed to only those with access to technology at early stages in their training. We need to explore this and other aspects of the ties between infrastructure and innovation.”

- Dr Nina Dudnik, Seeding Labs
Closing session:

SANBio Steering Committee Chairperson, Dr Jonathan Mufandadza, closed the 2018 SANBio event by saying that great ideas and refreshing insights were gained and that contributions were well noted. Throughout the event, potential funding arrangements were identified, and should be sealed into products and services in the future. He said that the Steering Committee had noted the problems that were identified, which they will work to find solutions for.

What is important is what we do with ideas to move to the next level – we must transform these good ideas into tangible goods and services.

- Dr Jonathan Mufandadza, SANBio Steering Committee
Take-home messages

The 2018 SANBio Annual Event was a successful and productive meeting that brought together many different players in the bio-innovation space in southern Africa. Attendees took part in a number of different activities and there were important messages for researchers, young entrepreneurs and business-people alike.

Firstly, it is important to get the right advice and guidance as a researcher going into business. Innovators should familiarise themselves with people already in business, which is a completely different world from academia, with different motivating factors and different measures of success. Small things like presentation skills and being able to structure a business plan go a long way in helping researchers enter and thrive in business. There is much to learn about the market and how things work, and what role a new product or service can play in filling a niche.

Another important theme was that researchers must be exposed to thinking and attitudes of entrepreneurship, through courses or practical exercises, at an early stage of their academic training. Gaining business and entrepreneurship skills means that researchers are prepared to grasp opportunities to develop or run their own businesses when they arise, which would make it easier for them to turn their ideas and their innovations into revenue.

Using indigenous knowledge systems (IKS) as a stepping stone for bioscience innovation in the SADC region is growing in importance, which presents fresh questions about the ethics of generating revenue using this knowledge. Working with local communities has helped researchers gather information about indigenous plants and potential products. Innovators have found it most beneficial to involve local communities in their process of converting local indigenous knowledge into revenue-generating products, which in turn empowers these communities.

Another major theme from the event was that there is no shortage of funding and entrepreneurship training opportunities available to researchers at all stages of a project, from an idea in the lab all the way to a product or service in the market. Importantly, funding often comes with mentorship, guidance or other business support, and incubators can help businesses grow to be attractive to bigger investors, and find more funding to grow their businesses.

Finally, researchers, innovators, and entrepreneurs in the biosciences need to remember the importance of their work, and the potential they hold to solve African challenges. Researchers should be aware that their work is necessary and as much as they are trying to make money, making a profit is just the best way to sustainably solve problems that research is identifying.