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MEDIA RELEASE

UP professor part of international team conducting environmental research in Antarctica

PRETORIA – Professor Don Cowan, Director of the Centre for Microbial Ecology and Genomics at the University of Pretoria (UP), is part of a team of international scientists that has been awarded A$36 million (R429 million) to conduct research in Antarctica.

The funding from the Australian government has been granted to a Monash University-led research programme called Securing Antarctica's Environmental Future, which will conduct research to forecast environmental change across Antarctica and its impact on the region's biodiversity, deploy effective environmental stewardship strategies, and secure Antarctica as a natural reserve.

"This is a huge project, involving some 30 institutions in Australia and abroad – UP is the only South African university involved," says Prof Cowan, who is based at UP's Faculty of Natural and Agricultural Sciences. "This is a very exciting research initiative. It's leader, Professor Steven Chown, is at the forefront of Antarctic ecology and is the president of the Scientific Committee on Antarctic Research – the leading international body facilitating research in, from and about Antarctica. Prof Chown has assembled a very large, very strong international collaborative team, and it is a fantastic opportunity to be part of such a team."

The focus of the project is important for the future conservation of Antarctica, which is experiencing rapid climate change, with warming marine waters and melting terrestrial glaciers. The implications of climate change go far beyond the continent itself, with potentially serious global impacts such as a rise in sea levels and changes in ocean productivity.

Prof Cowan says the intention of the project is to "expand our understanding of the diversity of organisms – from microorganisms to higher eukaryotes – across the Antarctic continental and the sub-Antarctic zones, to investigate their bio-geographical distributions, and to assemble the data to inform future regional conservation strategies."

The project will also study trends in human activity in the Antarctic regions, particularly the growing tourism industry, as a major factor in future regional conservation strategies and policies. "Tourism brings hundreds of thousands of visitors to the continent annually," Prof Cowan says. "Although well controlled at present, uncontrolled tourism has the potential to directly or indirectly impact sensitive Antarctic biological communities – for example, by physical damage, disturbance, contamination or the introduction on non-indigenous species which may out-compete the local species."

Prof Cowan's research will focus on soil samples. He explains that terrestrial microbial ecology is the study of microorganisms in soil. "Such studies encompass many different aspects of microbiology: from microbial diversity (what is there?) and microbial function (what are they doing?) to adaptation (how do they survive?) and ecosystem servicing (how do they contribute to the ecosystem?)."

His team will use modern metagenomic methods to investigate various aspects of the structure and function of soil microbial communities in Antarctica – including bacteria, archaea, fungi, viruses and phage. “Research teams will visit different areas of the continent and the sub-Antarctic islands and undertake comprehensive sampling campaigns focusing on many taxa: the charismatic megafauna – penguins and seabirds – as well as plants, insects and microorganisms.”

He first visited Antarctica as an MSc student, where his role as a field assistant involved “carrying the heaviest packs and organising the camps”. “It was such a life-changing experience, that I vowed to somehow develop my academic career with a polar component,” he says. “Somehow my plan worked, and I have been working on Antarctic research for the past 21 years. I have visited the continent some 15 times to perform experiments and take samples for laboratory analysis.”

Over the years, his research has expanded beyond Antarctica. “My interests in the microbial ecology of extreme environments have led me to many of the world’s deserts, to the depths of the Pacific Ocean, to remote parts of China and South America and, most recently, to the Canadian High Arctic.”

Prof Cowan finds microorganisms fascinating, whether in the environment (terrestrial microbial ecology), in a medical or clinical context, or in biotechnology. “In terrestrial environments, microorganisms contribute to critical processes such as carbon dioxide sequestration, soil health, plant growth and performance, and bioremediation. Over the past 30 years, modern molecular biology has revealed that the diversity of species and function of microorganisms are much greater than ever imagined.”

– ENDS

For interviews with Prof Don Cowan please email Prim Gower at Primarashni.gower@up.ac.za or call 083 229 9011.

ABOUT THE UNIVERSITY OF PRETORIA

The University of Pretoria (UP) is one of the largest contact and residential universities in South Africa, with its administration offices located on the Hatfield Campus, Pretoria. This 112-year-old institution is also the largest producer of research in South Africa.

Spread over seven campuses, it has nine faculties and a business school, the Gordon Institute of Business Science (GIBS). It is the only university in the country that has a Faculty of Veterinary Science, which is ranked top in Africa, and overall has 120 academic departments, as well as 92 centres and institutes, accommodating more than 55 000 students and offering about 1 100 study programmes.

UP is one of the top five universities in South Africa, according to the 2019-2020 rankings by the Center for World University Rankings. It is also ranked among the top 100 universities worldwide in three fields of study (veterinary science, theology and law), and among the top 1% in eight fields of study (agricultural sciences, clinical medicine, engineering, environment/ecology, immunology, microbiology, plant and animal sciences and social sciences).

In June 2019, the annual UK Financial Times Executive Education Rankings once again ranked GIBS as the top South African and African business school. The University also has an extensive community engagement programme with approximately 33 000 students involved in community upliftment. Furthermore, UP is building considerable capacities and strengths for the Fourth Industrial Revolution by preparing students for the world beyond university and offering work-readiness and entrepreneurship training to its students.

As one of South Africa's research-intensive universities, UP launched the *Future Africa Campus* in March 2019 as a hub for inter- and transdisciplinary research networks within UP and the global research community to maximise 4IR innovation and address the challenges and stresses our continent and world are facing. In addition, UP also launched the Javett Art Centre in September 2019 as a driver of transdisciplinary research development between the Humanities and other faculties. In 2020, UP will launch Engineering 4.0. as a hub, not only for Smart Cities and Transport, but also to link the vast resources in technology and data sciences to other faculties via Future Africa. These initiatives are stimulating new thinking at the frontier of 'science for transformation'.

For more information, go to www.up.ac.za