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MEDIA RELEASE

New study clarifies nature of genetic admixture in South Africa's Afrikaner population

PRETORIA – A collaboration between researchers from the University of Pretoria (UP) and Uppsala University in Sweden has found some unexpected patterns of genetic admixture in South Africa's Afrikaner (white and Afrikaans-speaking) population.

The results of the study, titled *Patterns of African and Asian admixture in the Afrikaner population of South Africa,* were published earlier this year in the respected scientific journal BMC Biology. This research forms part of work by Professor Jaco Greeff (UP) on the genetic heritage of Afrikaners and Professor Carina Schlebusch and Professor Mattias Jakobsson (both from Uppsala University) on the history of human populations in general. These studies show how humans have moved and admixed over time, and that migration, mobility and admixture should be seen as a hallmark of our species rather than a new phenomenon.

Genealogies and private DNA tests show that modern Afrikaners' DNA reflects past admixture between European immigrants, slaves arriving from Africa and Asia, and local Khoe-San. In a study that is almost four times larger than similar studies, the researchers genotyped 77 Afrikaners at five million places in their genomes and found that, on average, 4.7% of their DNA has a non-European origin. Despite this small fraction, the vast majority of the sampled individuals, 76 of 77 (98.7%), had non-European admixture.

The non-European component is comprised of Khoe-San (1.3%), Asian (2.6%) and African (excluding Khoe-San; 0.8%) contributions. Further analyses showed some surprises: First, the small Khoe-San signal is a very common signal among Afrikaners and was present in 74 of the 77 men, even though only one marriage between a European and a Khoe-San was recorded at the Cape. This discrepancy can only be explained if there was gene flow between frontier farmers, *"trekboere"* (nomadic farmers), and Khoe-San women.

Second, despite being founded by a fairly small number of immigrants, Afrikaners have a similar degree of inbreeding to other Europeans. This can be explained by the variety of origins of European immigrants together with admixture with non-European groups.

The study also confirmed some historical observations. First, Afrikaners show West African ancestry rather than links to South African Bantu-speakers. This signal most likely stems from two slave ships from West Africa that arrived in 1658. Second, it confirms that European men preferred slaves from India for formal and informal relationships, since Asia contributed most of the non-European admixture. There is evidence that certain genetic variants were favoured by selection, for example several genes associated with diet, possibly indicating adaptation to modified or novel food sources.

This scientific paper is available here:

https://bmcbiol.biomedcentral.com/articles/10.1186/s12915-020-0746-1

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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