

## NEWS RELEASE Eau de Sapiens



*Malaria affects 10% of the South African population each year. Source: Shutterstock.*

PRETORIA - Imagine the day when we can lure and trap mosquitoes with baits that are more attractive to the female mosquito than any human being? Imagine if we could drastically improve the control of malaria – which affects 10% of the South African population each year – and even eliminate it in the country?

This dream of the [University of Pretoria Institute for Sustainable Malaria Control](#) (UP ISMC) has also motivated analytical chemists to develop something more attractive than humans upon which mosquitoes can feed. For more than a decade, UP ISMC's analytical chemistry team has been researching human skin emanations with the goal of recreating chemical mixtures that mimic the scent of the most mosquito-attractive human being.

[Professor Egmont Rohwer](#), who initiated the project and works with team members [Dr Yvette Naudé](#) and [Dr Madelien Wooding](#) of the [Department of Chemistry](#) in the [Faculty of Natural and Agricultural Sciences](#), elaborates: "A novel silicone rubber skin-sampler, worn as a patch on the forearm for 30 minutes, was successfully developed to capture thousands of compounds accurately for later release and analysis by sophisticated, state-of-the-art

separation and identification techniques.”

This provides reliable skin-emission profiles that can be processed by computerised pattern recognition techniques, allowing for chemical fingerprinting of metabolites originating from the infective agent and clues for designing a better lure for mosquitoes.

“The best available mixtures thus far use up to 12 different compounds,” Prof Rohwer says. “We believe we require a lot more and that their relative concentrations – an aspect that has not received a lot of attention – would be crucial to provide the irresistible lure. This is a massive challenge and test for our team’s international reputation in the research fields of chromatography and mass spectrometry. Our scientists have successfully diagnosed tuberculosis by this means and have obtained promising results for the screening of malaria.”

Early results indicate that identifying latent cases might also be possible, which is important for malaria elimination as trans-border movement of asymptomatic carriers could be a significant reservoir of the *Plasmodium* parasite. Latent cases are carriers of malaria that show no symptoms but carry the parasite in the liver, spleen or bone marrow. Such cases are generally not found with the existing blood microscope test, the rapid diagnostic test, and the more sensitive and selective DNA-based tests.

### **Adding to the arsenal**

The most successful tools available to keep malaria at bay are insecticide-treated bed nets (ITNs) and indoor residual spraying (IRS). The latter refers to the annual spraying of long-lasting insecticides on indoor walls to target female mosquitoes that often rest here before biting humans for their blood meal. This is where transmission occurs. Consistent implementation of IRS requires enormous manpower and funding.

Another challenge to eliminating malaria in South Africa is the influx of citizens who come from neighbouring countries where there is a higher malaria risk and who may be asymptomatic carriers of the *Plasmodium* parasites. A cheap and successful chemical lure-based trap, together with efficient screening of trans-border visitors for malaria, would go a long way to eliminate the disease in South Africa.

The UP ISMC team considers their “magic scent mixture” to be a missing third partner of IRS and ITNs as they work towards ending malaria.

“Another heart-warming result of our published skin-analysis research is an invitation by a top US-based research group to participate in a unique programme in Zambia where mosquito-biting preference is studied in response to volatile scent profiles of a large group of people,” Prof Rohwer says. “The next challenge will be to extend our skin metabolic profiles technique to other species of mosquito (besides *Anopheles arabiensis*) and infective agents (beyond *Plasmodium falciparum*) to tackle other diseases spread by mosquitoes, such as Zika, chikungunya, West Nile and dengue fever.”

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*This story was originally featured in the [Re.Search](#) magazine. Check out [Issue 10](#) of the magazine, which details some of our work, from advancing the field of wound care to understanding supermassive black holes.*

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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 its Hatfield Campus in Pretoria. This 115-year-old institution is also one of the largest producers 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 with a [Faculty of Veterinary Science](#), which is ranked the best in Africa. UP has 120 academic departments and 92 centres and institutes, accommodating more than 56 000 students and offering about 1 100 study programmes. It has the most academic staff with PhDs (70%), NRF-rated researchers (613).

The 2025 Times Higher Education subject rankings placed UP first in South Africa in the fields of [Accounting](#) and [Finance](#); [Architecture](#); [Electrical and Electronic Engineering](#); Law; Sport Science; and Veterinary Science. UP's Faculty of Law has been ranked as the top law school in Africa for a remarkable eighth consecutive year.

Quacquarelli Symonds (QS) ranked the University among the top five in Africa, as part of their [2024 World University Rankings \(WUR\)](#). UP was the only South African university featured in the [2023 World University Rankings for Innovation \(WURI\)](#), falling within in the 101-200 range of innovative universities.

For more information, please go to [www.up.ac.za](http://www.up.ac.za)