

CFP-RD2020 Summaries

20020401 ITG Antwerp, Belgium – Prof. dr. Johan van Griensven

SpatialCL project - Understanding the complexity of parasite-skin interactions in cutaneous leishmaniasis patients.

850.000 euros

Cutaneous leishmaniasis (CL) is a neglected skin disease caused by parasites that spread via the bite of an infected sand fly. Globally, around 1 million cases occur every year, mainly in children and poor populations. CL has a wide geographical distribution, with cases in sub-Saharan Africa, the Mediterranean region, the Middle East, Asia and South America. Although the disease is not lethal, disfigurement, scarring and stigmatization have devastating and long-lasting effects on quality of life. The disease is particularly severe in Ethiopia with a predominance of slow healing lesions found on the face.

Researchers of the Institute of Tropical Medicine (Belgium), the University of York (UK), the University of Maastricht (The Netherlands) and the University of Gondar (Ethiopia) will address the longstanding question why some patients with CL develop persistent and diffusely spread lesions while others only have controlled and self-healing lesions. This question has been challenging to address in the past as it requires understanding of multiple factors, including the type and virulence of the parasite, the immune status of the patient, metabolic activity in the affected tissue and the other intrinsic (e.g. blood vessels) and extrinsic (e.g. skin bacteria) influential factors.

This project brings together an interdisciplinary team to address this complex puzzle and exploits new technologies to visualize and study the parasite directly within the spatial context of the skin. By leaving the skin specimens from diseased patients almost untouched while reaching a resolution down to single cell level, the team will study changes in individual parasites and skin cells in almost real-life conditions. By understanding how these complex interactions differ between mild and severe patients, the researchers hope to identify ways in which new drugs might be used to steer the disease so that the clinical picture is limited to mild lesions or even prevented.

<https://www.who.int/leishmaniasis/en/>

20020403 QIMR Berghofer Medical Research Institute, Brisbane Australia – Katja Fischer PhD
Exploring the scabies-associated microbiota in a multi-country, observational cross-sectional study to understand the pathobiology of impetigo linked to scabies.

850.000 euros

Scabies is a highly contagious skin disease causing globally substantial morbidity and mortality. Particularly in the tropics, infection with parasitic scabies mites promotes opportunistic bacterial infections which can lead to severe kidney and heart disease. Very little is known about the links between mites and associated pathogens, but the downstream illnesses caused build up a significant public health burden worldwide. Scabies is a neglected condition, and consequently we have no vaccine or diagnostic tools and limited treatment options.

The biological science of scabies mites in relation to the complex disease they cause is poorly understood, due to an absence of molecular information on mite infestation, bacterial co-infection and the interactions thereof.

Our multidisciplinary and international team is leading biomedical research into the molecular biology of scabies globally. We have generated essential resources and datasets that underly the proposed research program. We will analyse the scabies associated microbiome, i.e. the combined genetic material of the microorganisms on and in scabies infected skin, including mites as well as other microbes inside the mites and within the mite burrows in the skin. We will provide quantitative, community-wide and longitudinal data sets that capture changes in the skin microbiota from infection through to parasite clearance after treatment. This will deliver fundamental insights into the interaction between the human host, the mites and the microbes coexisting with them, in particular bacterial pathogens. The project will provide a foundation for translational research, to develop novel therapeutics, intervention strategies and policies for the prevention and control of this insidious disease, focused sharply on enhancing human health and well-being in affected populations.

https://www.who.int/neglected_diseases/diseases/scabies-and-other-ectoparasites/en/