

POSITION DESCRIPTION

POSITION TITLE: PhD Student (Bioinformatician)— with 3.5 years stipend-equivalent

DIVISION / SECTION: Global & Tropical Health

TO APPLY: jacob.westaway@menzies.edu.au

ABOUT MENZIES:

With over 30 years of scientific discovery and public health impact, Menzies School of Health Research is one of Australia's leading institutes dedicated to improving Indigenous, global and tropical health.

The Global and Tropical Health (GTH) Division is committed to tackling key areas of public health concern, including malaria, tuberculosis, Rheumatic Fever, Rheumatic Heart Disease (RHD) and bacterial infections that impact on the health and wellbeing of people and communities across northern Australia and the Asia-Pacific region. GTH has established an ongoing zoonotic malaria research program since 2010 in Malaysia and from 2019 in endemic areas of Indonesia. The research program has a particular focus on the emerging monkey parasite *Plasmodium knowlesi* in Southeast Asia, and has encompassed the epidemiology, pathophysiology and treatment of this zoonotic malaria species. *P. knowlesi* is a major public health concern in Southeast Asia, where it has now become the most common cause of malaria in Malaysia and parts of western Indonesia. *P. knowlesi* can cause severe, life-threatening disease.

PhD SUMMARY:

Insights gained from genomic analyses of human malaria parasites have advanced our understanding of basic disease biology, drug resistance, malaria epidemiology, and molecular ecology. Technological advancements coupled with reduced costs in molecular and genomic tools are being leveraged across malaria elimination efforts, including large-scale (> 20,000 *P. falciparum* whole genomes), collaborative efforts to produce publicly available population-level whole genome data and the use of targeted sequencing approaches to monitor real-time genetic changes within malaria populations. Much of this work has been focused on the primary human-malaria causing parasites. However, as many countries approach the elimination of malaria caused by these species, other malaria parasites, including the understudied zoonotic *P. knowlesi*, are becoming a growing concern. Thus, part of our research program is using cutting-edge genomic and bioinformatic techniques to better understand the biology, ecology, and epidemiology of *P. knowlesi*. This work is conducted collaboratively with partners both overseas in Malaysia, Indonesia, Singapore, Thailand, Saudi Arabia, United Kingdom, United States and the Netherlands, and within Australia. Our genomic-centric program involves genome-wide association studies, population genetics, and tool development. Our goal is to contribute to the malaria elimination efforts in Southeast Asia.

There is an opportunity for a PhD student to undertake a bioinformatics project within our program of work on zoonotic *P. knowlesi* malaria. The student will play a key role in large-scale genomic analyses, drawing on their high-level computational and statistical experience to develop and modify appropriate genomic tools for analyses in *P. knowlesi*. This may include microhaplotype tool development, *P. knowlesi*-associated viral discovery in macaque hosts, and comparative analyses of parasites from human and macaque infections. The student will be supervised by a team of world-leading malaria researchers and bioinformaticians from the Menzies School of Health Research, The University of Sydney and James Cook University, and will work collaboratively within an international team. The research activities are the culmination of years of fieldwork and an unprecedented number of samples, as well as whole genome sequencing of the largest dataset of *P. knowlesi* isolates to date and genotyping of the first *P. knowlesi* infected human dataset. This is a great opportunity for a student looking to further develop their computational skills in applied bioinformatics.