



Stellenbosch

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saam vorentoe

Postdoctoral Fellowship (2024-2026)

Scope of Research:

A position for a postdoctoral fellow is available in the Host-Directed Therapeutics (HDTs) Group, Division of Molecular Biology and Human Genetics, Department of Biomedical Sciences at the Faculty of Medicine and Health Sciences, Stellenbosch University. This fellowship is suitable for individuals with a background in molecular biology, immunology or microbiology with a particular interest in animal tuberculosis and cancer. The successful candidate will participate in a range of *in vitro* and *in vivo* research projects focusing on tuberculosis and cancer.

The HDTs group have performed high throughput transcriptomic experiments in both primary mouse bone marrow derived and human blood monocyte derived macrophages and identified candidate genes that include IFIT2 and showed their efficacy as antimycobacterial. An International patent has been published with national phase applications in South Africa, USA and Germany. Further, we investigated the downstream contributors of the induced expression of IFIT2 in human macrophages infected with *M. tuberculosis (M.tb)* to understand its role in the intracellular killing of *M.tb*. We identified several DEGs and RT-qPCR data validated the AmpliSeq data. Based on follow up efficacy experiments we identified several gene candidates to be investigated as host-directed therapies. These genes are also positively correlated with the inhibition of cancer spread. We have confirmed efficacy employing non-viral gene vectors and now aim to develop non-toxic mRNA nanoparticles. For this endeavour, we will require mRNA of IFIT2 and other candidate genes with various structural permutations together with variations in the encapsulation materials to investigate and determine the best combination that has the least toxicity in human macrophage cell culture assays, yet maintain expression and efficacy in killing mycobacteria and inhibiting cancer. Further, toxicity studies will be performed employing animal models.

Responsibilities:

- Contribute significantly to the publication of research outputs by the research group
- Perform supervision duties for postgraduate students within the research group
- Write and submit funding proposals to facilitate sustainability of the research undertaken
- Conduct laboratory and animal work as part of ongoing research projects

Requirements:

- PhD in Molecular Biology/Immunology/Microbiology obtained within past 5 years
- Strong written and oral communication skills
- A background in cell-culture, PBMC isolation, qPCR, transcriptomics and animal models
- Experience in biosafety level 2 and 3 working practices

The Fellowship stipend will be based on the applicant's experience. The Fellowship is tenable for an immediate start (July 2024) and will run until June 2026. An extension may be possible, depending on satisfactory progress and availability of funds. Please note that postdoctoral fellows are not appointed as employees. Their fellowships are tax-free and thus not eligible for employee benefits.

Closing date:

15 June 2024

Enquiries:

Send a letter of application together with a comprehensive curriculum vitae to Prof Baker via email to brubaker@sun.ac.za