Adult hookworm in the small intestine. Image: Dr John Croese, Prince Charles Hospital

DEVELOPING HOOKWORM-DERIVED BIOLOGICS FOR INFLAMMATORY BOWEL DISEASE

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BIOLOGICS AND VACCINES

Inflammatory bowel disease (IBD) affects over 80,000 Australians, with existing biologic therapies often expensive, ineffective, or causing adverse side effects. Researchers at James Cook University, led by **Prof Alex Loukas**, are exploring a novel approach using hookworm-derived proteins to suppress inflammation. With TIA's support, the team has successfully advanced the early preclinical development of three promising proteins with protective effects in a mouse model of colitis.

Through the Pipeline Accelerator scheme, the research team engaged with the National Biologics Facility (NBF) to produce the proteins of interest in an industry-relevant cell line and with a scalable bioprocess. Stability assessments provided key insights that helped refine the selection of two lead candidates for further development. This data was instrumental in supporting commercialisation efforts, giving confidence in the reproducibility of results and the feasibility of future scale-up of the candidates to support large-scale manufacturing under Good Manufacturing Practice conditions.

Macrobiome Therapeutics was spun out of James Cook University in early 2021 to develop these proteins and IP as novel anti-inflammatory biologics.

Further funding has been secured, including a $793,000 DARPA Embedded Entrepreneur Award and $1.8M from the CRC for Northern Australia, Tegmen Fund and JCU. Future collaboration with NBF may include cell line development and bioprocess optimisation, with plans to engage additional facilities for validation studies and toxicity testing. By enabling key steps in this research, TIA's support has accelerated the path toward a new class of biologic therapies for IBD, bringing potential new treatment options closer to patients.

> "The TIA voucher program was invaluable to us in securing further investment in our R&D program by providing third party validation and CMC data from a very well-regarded institution. We had a great experience with TIA, and found their work was timely, reliable, and offered huge bang for buck. We will definitely work with them again!" **Prof Alex Loukas**

Impact:

TRL 1 | TRL 2 | **TRL 3** | **TRL 4** | TRL 5 | TRL 6 | TRL 7 | TRL 8 | TRL 9