Characterisation of whipworm host defence peptides: novel opportunities for parasite control?

Host defence peptides (HDPs) are those with antimicrobial and/or immunomodulatory activity that helminths use to modulate their environment to promote survival within the host. Computational HDP prediction pipelines have identified 183 HDP-like peptides encoded by *Trichuris* (whipworm) species, which include *T. trichiura*, the causative agent of the neglected tropical disease, trichuriasis, *T. muris,* a naturally-occurring mouse parasite which also represents a tractable laboratory model for human trichuriasis, and *T. suis*, which infects pigs and is an economic concern for the livestock industry. *Trichuris* species reside within the colon and caecum of their mammalian hosts and are therefore live in close contact with the gastrointestinal microbiota and immune cells, both of which *Trichuris* is known manipulate to promote its own survival. Our unpublished data suggest that at least 10 of the 23 HDP-like peptides tested (prioritised based on their similarity to HDP-like peptides from other nematode species) have antimicrobial properties, while 3 induced significantly higher IL-6 production from classically activated macrophage-like cells compared to sham stimulation and a further 2 induced higher IL-10 production. Future work will identify and characterise HDPs in homogenates and host-facing biofluids collected from the mouse and human whipworm species and assess their potential as vaccine candidates.