Does *Trypanosoma congolense* prepare for transmission to tsetse flies in mammals similarly to *Trypanosoma brucei*?

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African trypanosomes are flagellated, extracellular parasites that cause disease in humans (sleeping sickness) and animals (nagana). Three species are common in sub-Saharan Africa: *Trypanosoma brucei*, *T. congolense*, and *T. vivax*. These parasites are digenic, requiring two hosts - a vertebrate host and the tsetse fly vector - to complete their life cycle. Like most vector-borne parasites, they undergo developmental changes to adapt to the differing environmental conditions encountered during transmission between hosts. These transitions are accompanied by alterations in gene expression and metabolism.

Most of our understanding of these developmental transitions comes from studies of *T. brucei*. Three morphological forms - slender, intermediate and stumpy forms – exist in the vertebrate host for this species, with stumpy forms primed for transmission to tsetse fly. In contrast, *T. congolense*, the most pathogenic African animal trypanosome, lacks the distinct morphotypes described in *T. brucei*. Nevertheless, both species differentiate into procyclics in the tsetse-midgut, despite the absence of the fly-preadapted morphologically stumpy forms in *T. congolense.*

Using single-cell RNA sequencing (scRNA-seq), we are characterising the transcriptome of *T. congolense* during development in mice. Specifically, cells enriched during the ascending and peak parasitaemia phases and in chronic infection have been characterised to identify potential transmission-adapted cells based on their gene expression landscape.

We identified transcriptomically distinct *T. congolense* subpopulations (clusters) in mice at different stage of infection. Cluster-specific enriched genes were identified that are potentially involved in *T. congolense* pathogenesis and developmental differentiation. These provide a foundation for the identification of marker proteins and for functional studies to establish whether *Trypanosoma congolense* prepares for transmission via specific developmental adaptations.