

Investigating parasite cell biology in three dimensions

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Protozoan parasites from the genus *Trypanosoma* infect almost all vertebrate groups and are causative agents of disease in both livestock and human hosts. *Trypanosoma copemani* isolated from the brush-tailed bettong (*Bettongia penicillata*) in south-west Australia has been associated with marsupial declines and poor health. However, little is known of the life history or structural biology of *T. copemani*. Additionally, there is an overrepresentation of trypanosomes identified in mammals across Australia. The presence of trypanosome infection in birds throughout Australia has been reported on numerous occasions although, structural information on the trypanosomes of birds is limited. Therefore, we investigated *T. copemani* and the only *Trypanosoma* spp. previously isolated *in vitro* from an Australian bird called the currawong (*Strepera* spp.) - *T. sp. AAT*, using a combination of *in vitro* cell culture methods and high resolution focussed ion beam milling combined with scanning electron microscopy (FIB-SEM). This research assisted in documenting parasite biology by providing interesting information on avian and marsupial trypanosome morphology and organelle arrangement in three dimensions. The life history and structural differences between two genotypes of *T. copemani* and *T. sp. AAT* reveal a high level of plasticity in the mitochondrion and kinetoplast throughout trypanosome life cycles *in vitro*.

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