THE BIOCHEMISTRY OF MOTILITY AND MORPHOGENESIS IN TRYPANOSOME PARASITES

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Trypanosomatid parasites have precise cell shapes that are defined by the possession and position of the flagellum, the basal body/kinetoplast complex and the organisation of a subpellicular cytoskeletal network of microtubules and filaments. These structures are able to be modulated in the life cycle so that parasites can adapt their shape and form to the particular pathogenic niche in the host or vector. Until recently, biochemical information on the molecular components of these structures has been lacking. We have now produced a proteomic description of many of these structures. Over 350 proteins can be recognised in our flagellar proteome. Reverse genetic analyses reveal the role of many individual proteins in particular structures or events such as flagellar motility, cytokinesis and flagellar pocket morphogenesis. There is a specific requirement for flagellar motility in bloodstream form parasites. To complement this molecular cell biology we have initiated a series of electron microscope tomography studies that reveal the process by which the basal bodies mature, dock with the membrane and construct the new flagellum and the new flagellar pocket. These morphogenetic processes involve large-scale movements in position of organelles and precise construction of new cellular pattern. This talk will present the proteomic data and will then analyse mutant phenotypes in the light of the EM tomographic representations of cell morphogenesis.
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