

Characterization of novel and essential kinetoplast components in *Trypanosoma brucei*.

The kinetoplast represents the defining feature of kinetoplastid protists. As a singular concentration of mitochondrial DNA, the successful replication and segregation of its intercatenated DNA maxi- and minicircles represent critical process to cell viability. From the MitoTAG study, we identified a selection of potential kinetoplast components, for which we use alternative epitope labeling to validate eight proteins as novel kinetoplast components. RNAi knockdown studies demonstrate the essential nature for several of these proteins, revealing aberrant growth and cell cycle phenotypes, accompanied by reductions in maxi- and minicircle abundance. Furthermore, we note an intriguing mitochondrial DNA accumulation phenotype demonstrated by one particular cell line knockdown, which additionally shows exceptional conservation throughout the trypanosomatid clade. This study represents the single largest discovery of proteins associated with this sub-cellular structure long considered to be an attractive drug target for this group of parasitic protists.