

IFT train numbers drop rapidly after initiation from Leishmania promastigotes to amastigotes

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## Abstract

During their life cycle, Leishmania parasites dramatically change their morphology in response to the different environments they encounter. This is exemplified by the flagellum, which is long and motile in the promastigote form in the insect but extremely short in the amastigote form found inside the macrophage. Flagellum assembly occurs at its distal tip with material transported there by intraflagellar transport (IFT) trains. These trains are composed of multiple components, which form two main complexes – IFTA and IFTB that are associated with retrograde and anterograde transport respectively. The IFT system is required to assemble the long promastigote flagellum yet its role in flagellum disassembly is unclear.

We fluorescently tagged different IFT proteins with mNeonGreen and examined their movement during the differentiation from promastigotes to amastigotes by microscopy. We found that the number of IFT trains per micron dropped by nearly 50% within the first two hours of the initiation of differentiation and then remained stable for the rest of the time course. The onset of differentiation also resulted in a slight decrease in the speed of the trains in both directions, with an increase in the number of slow trains. Overall, this indicates that flagellum disassembly likely occurs due to a decrease in delivery of components by the IFT system coupled to the natural turnover rate at the tip.