University of South Bohemia

Faculty of Science

Department of Molecular Biology and Biochemistry


RNDr. Thesis

# YCF45 protein, usually associated with plastids, is targeted into the mitochondrion of *Trypanosoma brucei*

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Anotation:
YCF45 belongs to a family of proteins of unknown function usually located in the chloroplast of plants. Its highly conserved homologues were found in the genomes of several *Trypanosoma* and *Leishmania* species. $HA_3$-tagging of the YCF45 protein with the start codon as annotated in the Gene$^{DB}$ revealed its cytosolic localization in the cultured procyclic stage of *Trypanosoma brucei*. However, when a more upstream located start codon was used in another $HA_3$-tagged construct, the resulting protein was targeted to the mitochondrion. We propose that YCF45 was acquired by an ancestral trypanosomatid by horizontal gene transfer and in the absence of a plastid was re-targeted to the mitochondrion.

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I hereby declare that I did all work, summarized in this thesis, on my own or in collaboration with co-authors of the presented paper, and only using the cited literature.

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**Co-authors agreements**

We declare here that Jiří Týč contributed the major part to the publication "Týč J, Long S, Jirků M, Lukeš J, (2010). YCF45 protein, usually associated with plastids, is targeted into the mitochondrion of *Trypanosoma brucei*. MBP, in press"

Shaojun Long, PhD .....

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# YCF45 protein, usually associated with plastids, is targeted into the mitochondrion of *Trypanosoma brucei*

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## ABSTRACT

YCF45 belongs to a family of proteins of unknown function usually located in the chloroplast of plants. Its highly conserved homologues were found in the genomes of several *Trypanosoma* and *Leishmania* species. $HA_3$-tagging of the YCF45 protein with the start codon as annotated in the $Gene^{DB}$ revealed its cytosolic localization in the cultured procyclic stage of *Trypanosoma brucei*. However, when a more upstream located start codon was used in another $HA_3$-tagged construct, the resulting protein was targeted to the mitochondrion. We propose that YCF45 was acquired by an ancestral trypanosomatid by horizontal gene transfer and in the absence of a plastid was re-targeted to the mitochondrion.

*Keywords*: *Trypanosoma*, plastid, mitochondrion, targeting, YCF45, horizontal gene transfer.

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Short communication