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mRNA decapping by an ApaH-like phosphatase in trypanosomes

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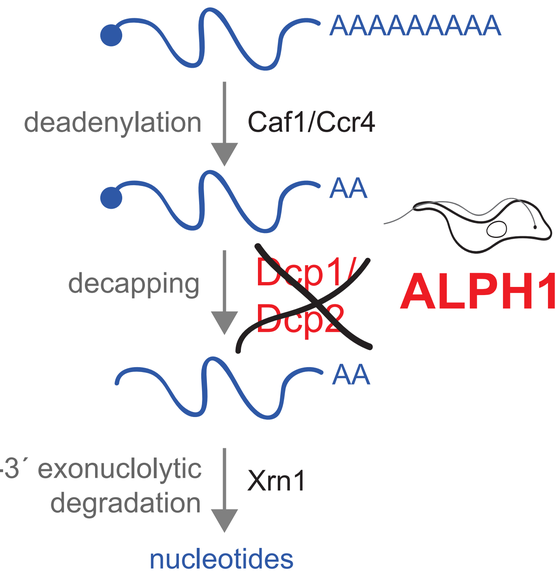
Background

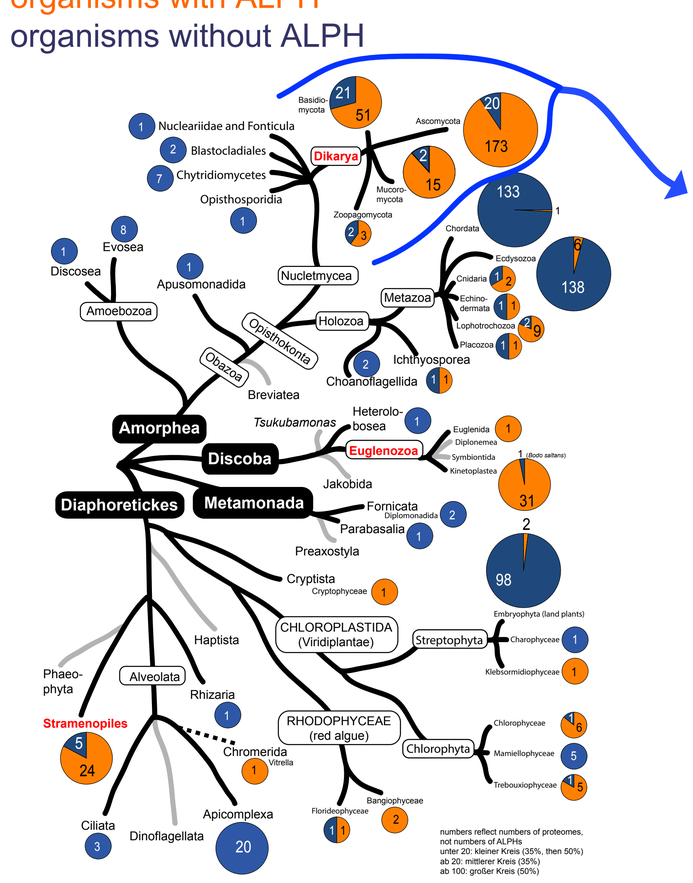


mRNA decapping is usually done by the nudix domain protein Dcp2 of the Dcp1/2 complex.

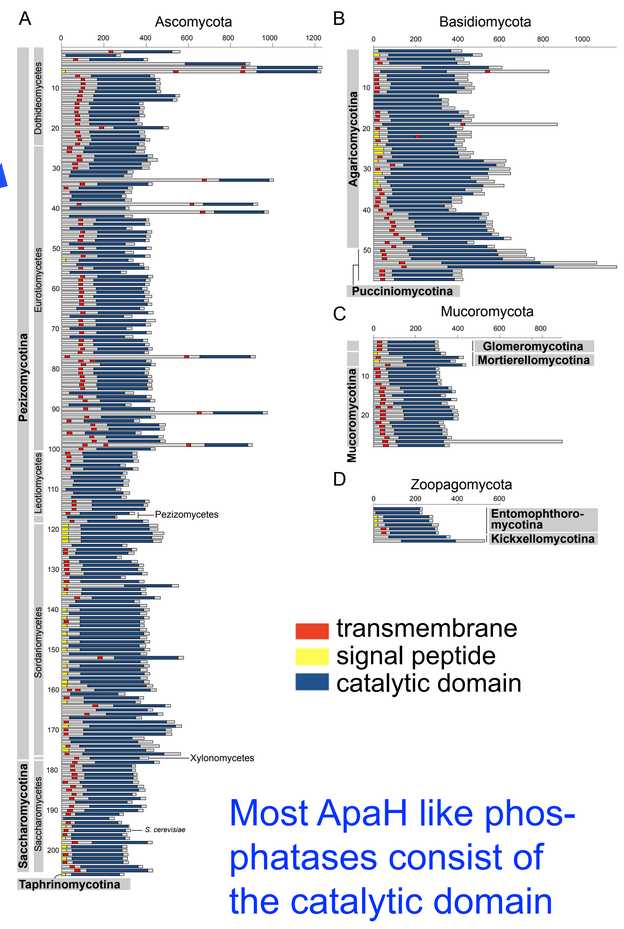
Kinetoplastida are the only eukaryotes with no homologues to Dcp1/2.

Instead, they use an **ApaH like phosphatase (ALPH1)**, a protein of an ancient protein family from bacteria, closest related to the PPP type of protein phosphatases (Kramer, S. PLoS Pathog 13, e1006456 (2017)).

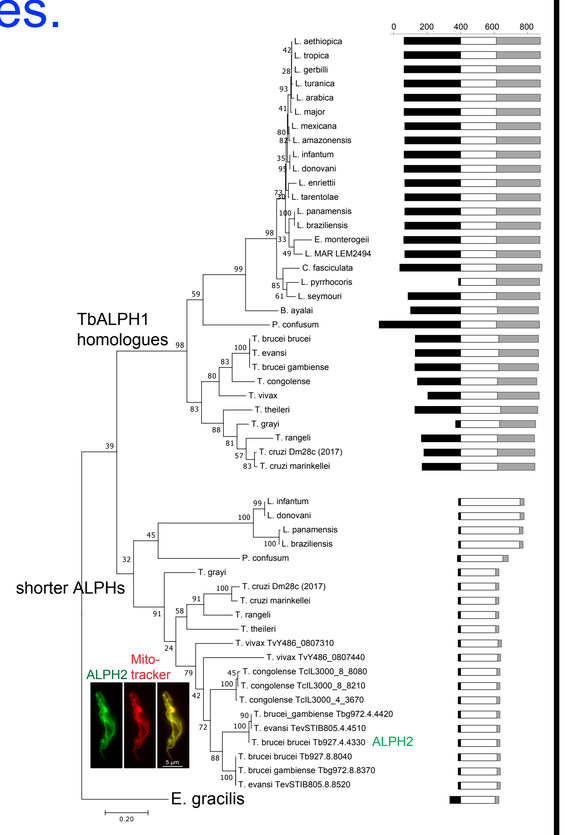
The usage of an ApaH like phosphatase as mRNA decapping enzyme appears restricted to trypanosomes.



ApaH like phosphatases are widespread throughout all eukaryotes in a patchy way.

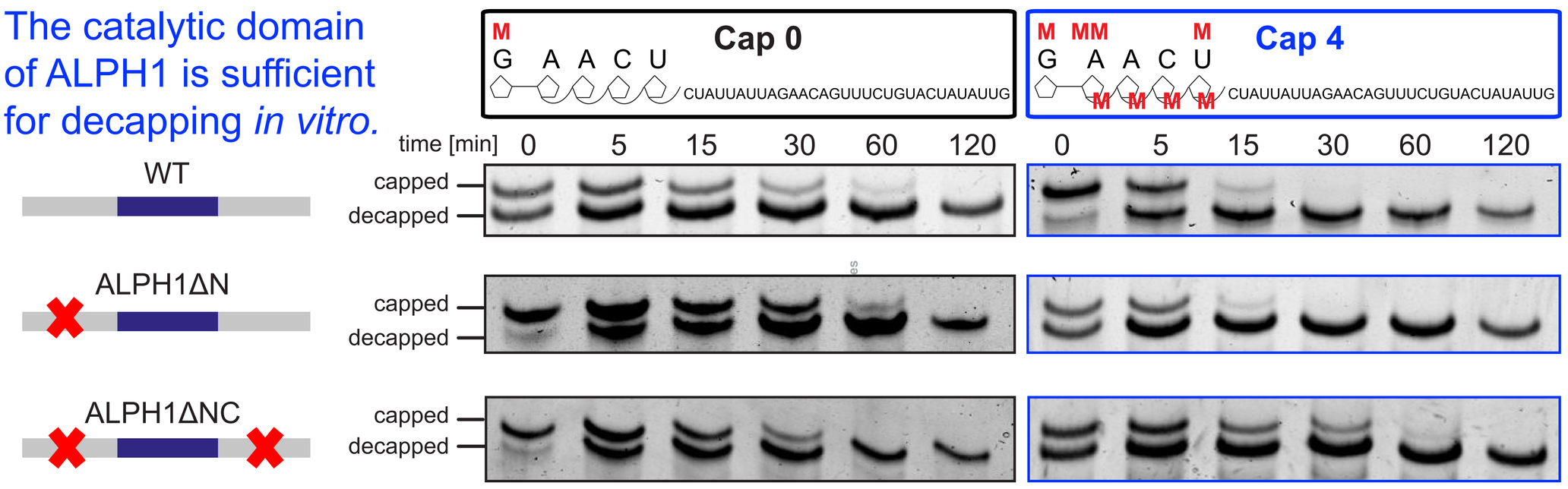


Most ApaH like phosphatases consist of the catalytic domain only, and are likely not cytoplasmic.

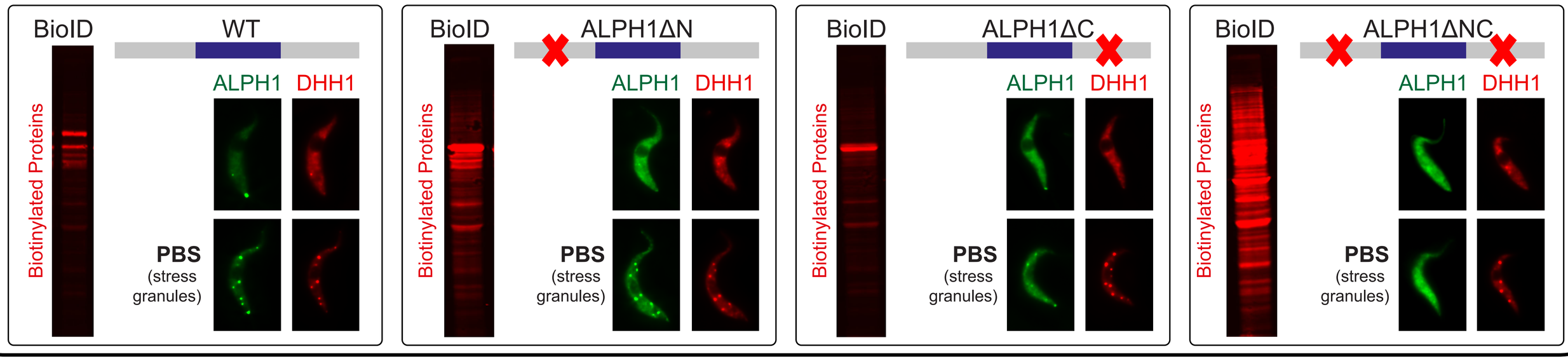


Kinetoplastida have two ALPH1 isoforms, but the ones without N- and C- terminal extension are likely not in the cytoplasm.

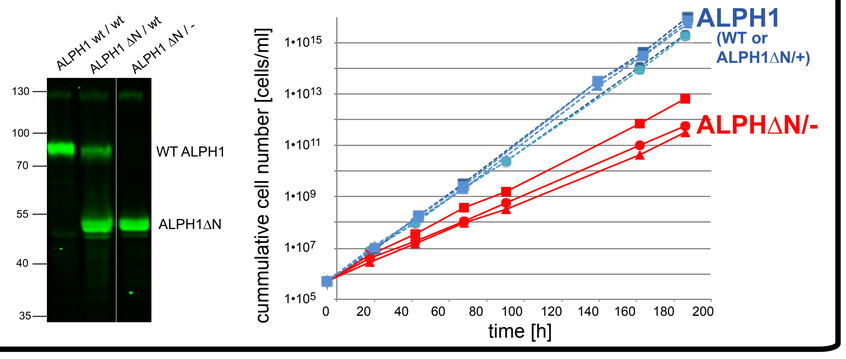
The catalytic domain of ALPH1 is sufficient for decapping *in vitro*.



The N and C-terminal extensions are important for ALPH1 localisation and protein interactions.



ALPH1 ΔN/- is viable, but BSFcells grow slower.



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