

Trypanosoma cruzi PUF3 RNA-binding protein modulates genes linked to mitochondrial morphology and function

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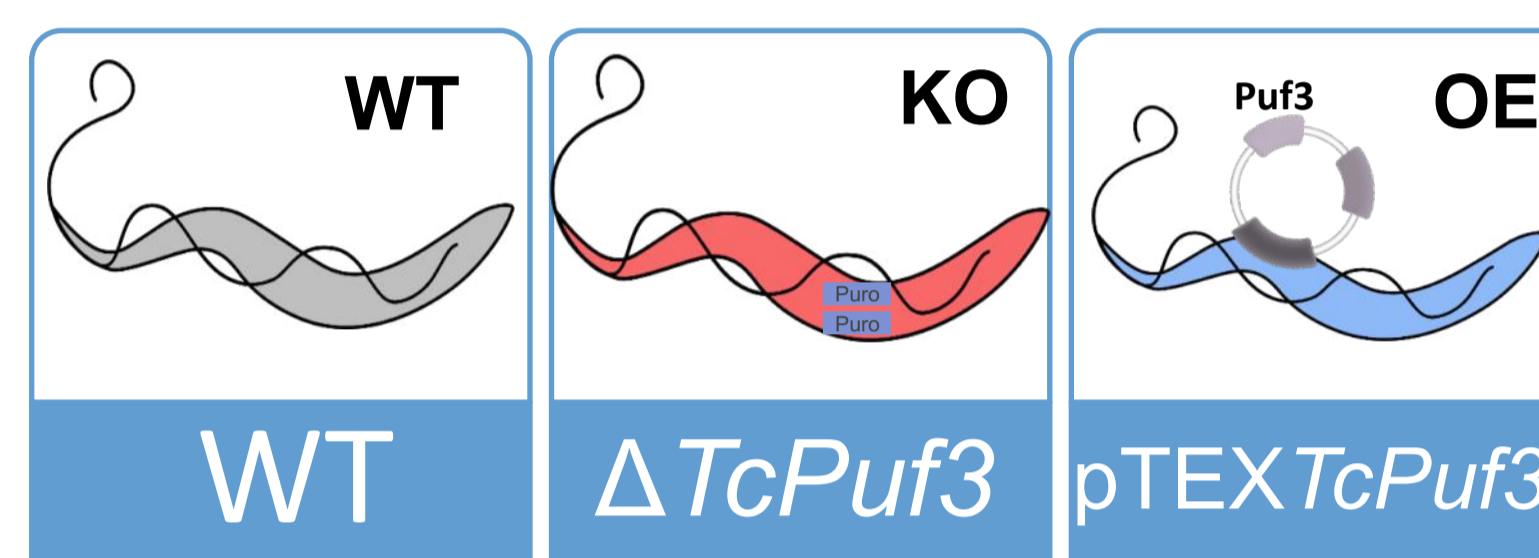
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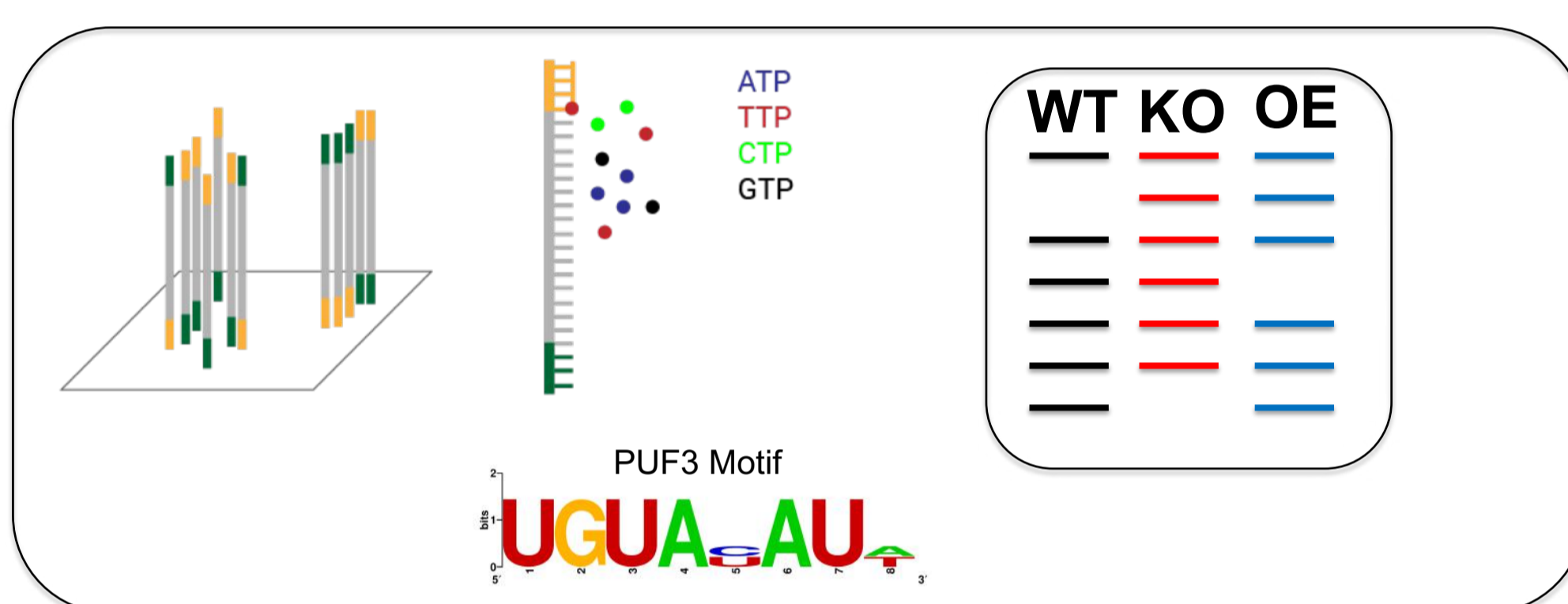
INTRODUCTION

The RNA-binding PUF proteins are post-transcriptional regulators found throughout the eukaryotic domain that control the stability and translation of transcripts through the binding to specific recognition sequences in the 3' untranslated regions (3'-UTRs) of mRNAs. Few PUF proteins have been characterized in *Trypanosoma cruzi*. Considering that the control of gene expression in this parasite is mainly at the posttranscriptional level, further studies are needed to determine the functional depiction of the PUF family. Here, we characterized the PUF3 protein by knocking out and overexpressing the gene in *T. cruzi* epimastigotes and studied different genetic and biological features.

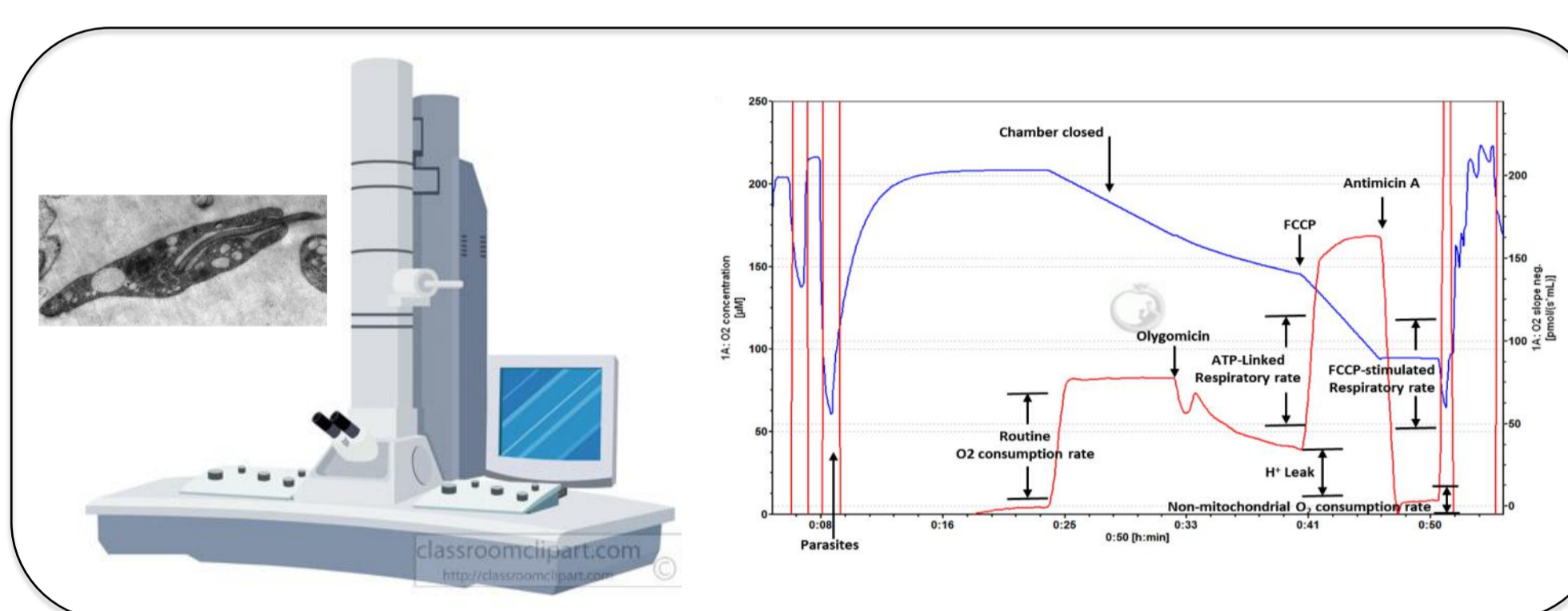
METHODOLOGY



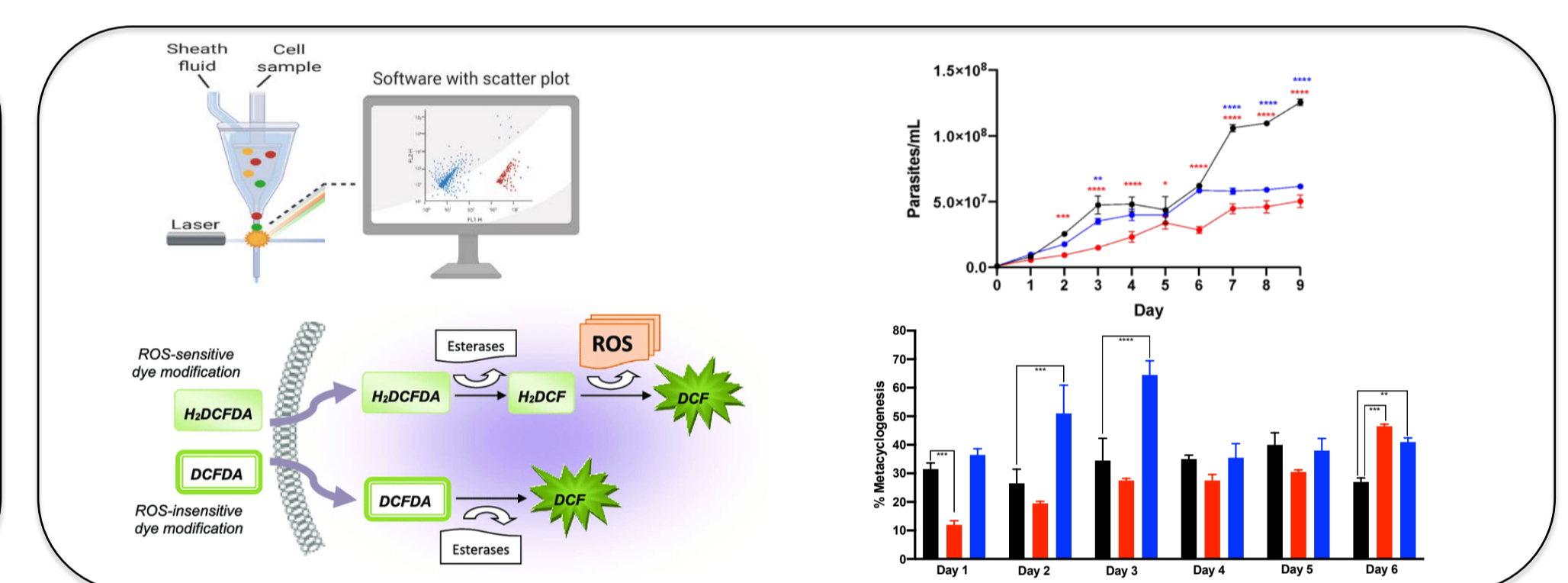
1. RNA-seq and bioinformatic analysis



2. TEM and cellular respiration by oximetry

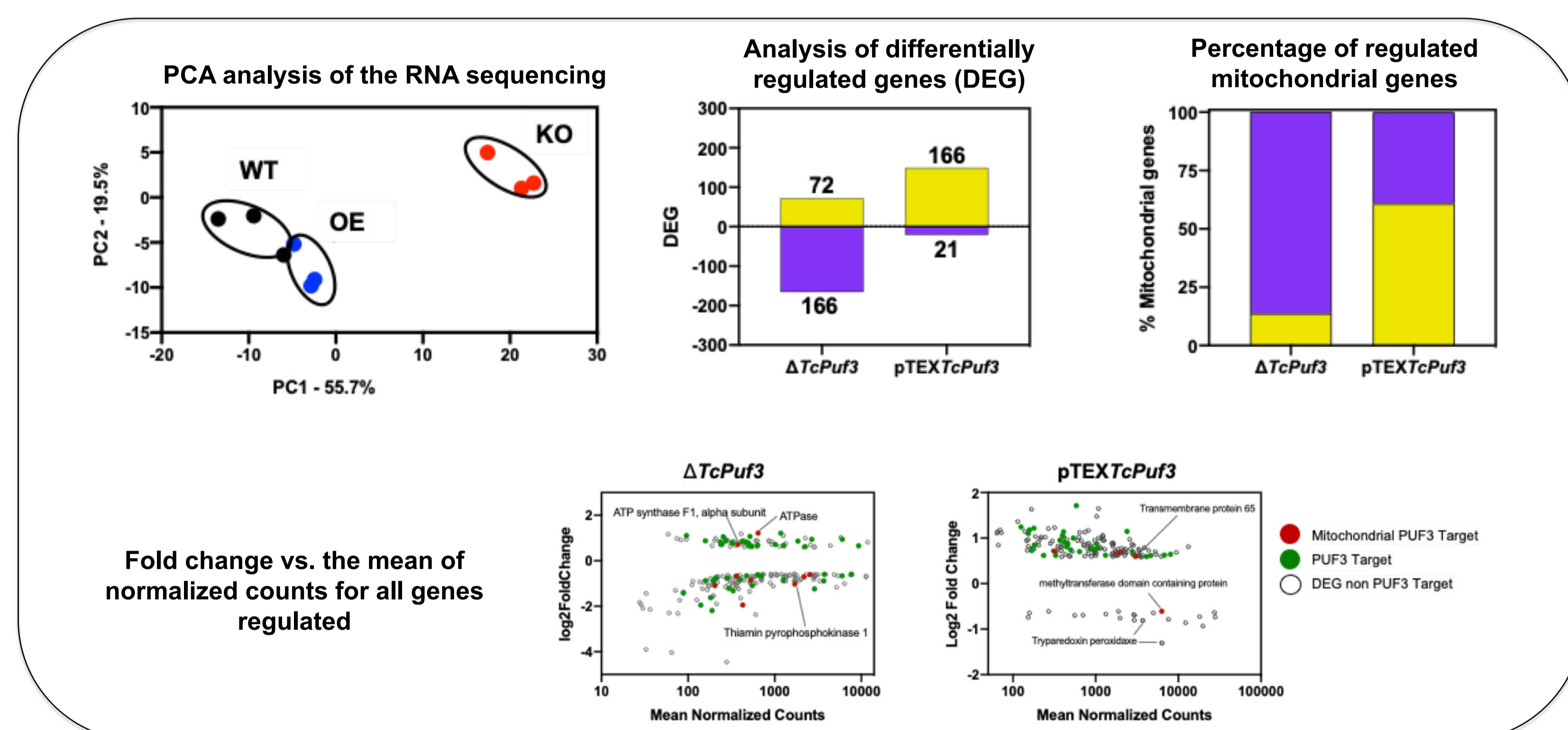


3. ROS and biological features

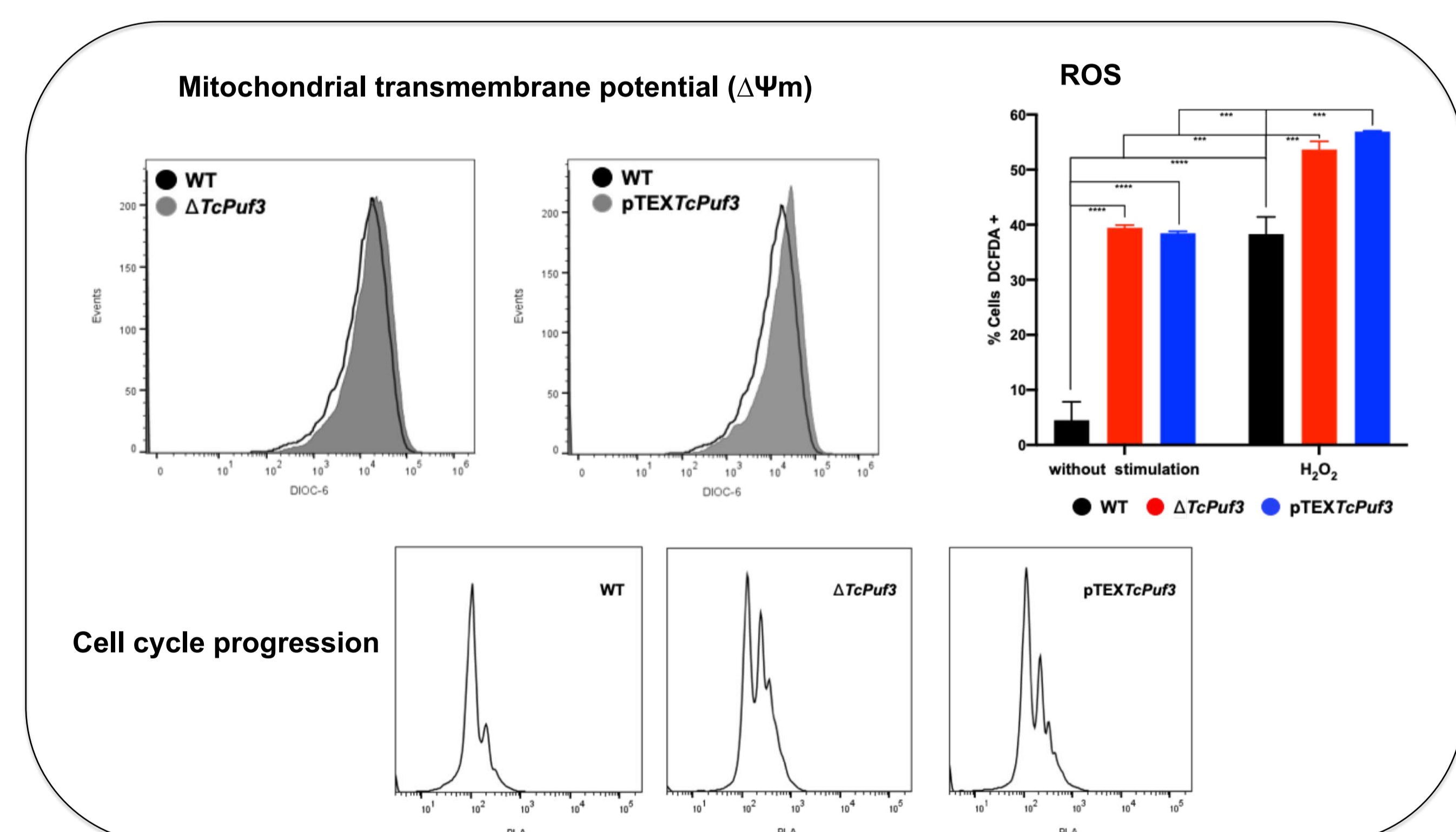


RESULTS

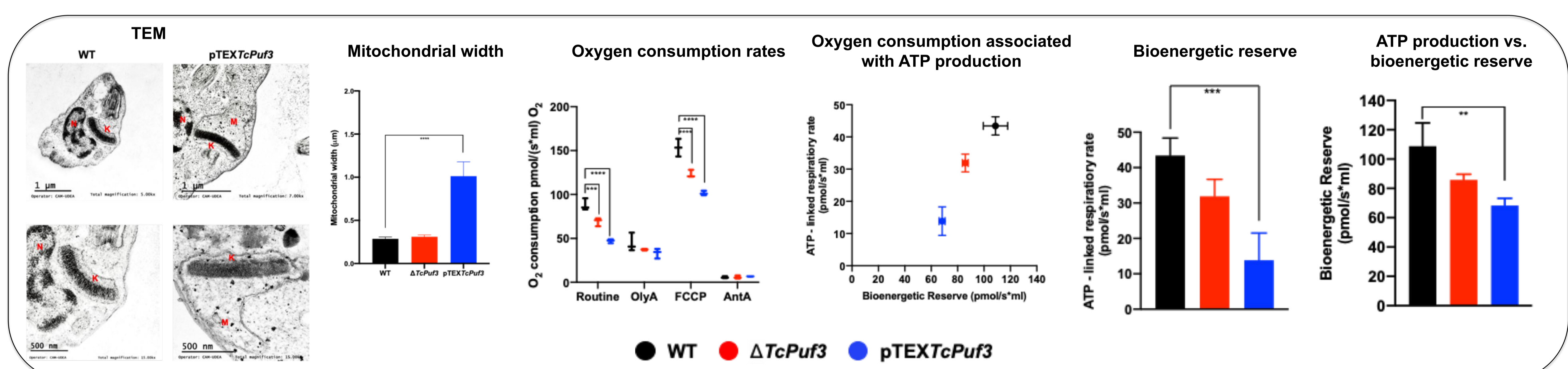
TcPUF3 changes the level of mRNAs of mitochondrial genes encoded in the nucleus



Changes in TcPUF3 expression affect ΔΨm, ROS production and growth



TcPUF3 affects mitochondrial morphology and cellular respiration



CONCLUSION

We characterized the PUF3 protein of *T. cruzi*, demonstrating that although it is not an essential protein, it strongly influences mitochondrial transcripts, where changes in expression significantly affect mitochondrial morphology and function.