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Poster

Functional characterization of Cyberlindnera jadinii* carboxylate transporters in *Saccharomyces cerevisiae

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Introduction

In *Saccharomyces cerevisiae*, two permeases are responsible for the uptake of carboxylates (CA) at the plasma membrane, Jen1p a monocarboxylate proton symporter (Major Facilitator Superfamily) and Ady2p an acetate permease (AceTr Family).

In *Cyberlindnera jadinii*, different uptake systems for CAs were functionally characterized however until now the genes encoding these transporters remain unidentified. In this work, CA transporter homolog genes from *C. jadinii* were identified and expressed in *S. cerevisiae*.

Materials and Methods

The *S. cerevisiae* strain W303-1A *jen1Δ ady2Δ*, lacking carboxylate uptake capacity, was used to express *C. jadinii* ScJEN1 and ScADY2 homologs. Genes were identified through sequence alignment and homology prediction and cloned in the p416GPD vector, under the control of a GPD constitutive promoter. GFP-fusions were used to determine protein expression and localization. Transport activity was determined through growth on different carbon sources and measurement of the uptake of labelled CAs, namely D,L-[U-¹⁴C] lactic acid, [2,3-¹⁴C] succinic acid and [1-¹⁴C] acetic acid.

Results

In *C. jadinii*, 6 genes homolog to ScJEN1 (Cjj23088, Cjj21966, Cjj22358, Cjj21989, Cjj21602, Cjj25129) and 4 genes homolog to ScADY2 (Cja24587, Cja20823, Cja20690, Cja20822) were identified. All proteins were expressed and localized at the plasma membrane. Regarding transporter specificity CJJEN1-6 and CJAD3 encode lactate transporters, CJAD1 and 4, lactate and acetate transporters, and CJAD2 encodes a lactate, acetate and succinate transporter.

Conclusions

In this work, we identified 6 CjJEN1 and 4 CjADY2 homologs that are functional carboxylate transporters in *S. cerevisiae*. All the CjJEN1 homologs are lactate transporters and CjADY2 homologs

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present different specificities. Further studies are underway to fully characterize these ten new plasma membrane transporters from *C. jadinii*.

References

Soares-Silva, I., et al. (2007). Mol Membr Biol. 24(5-6), 464-474.