The *Cyberlindnera jadinii* carboxylate transporters Ady2 and Jen1 homologs are functional in *Saccharomyces cerevisiae*

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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*. The *S. cerevisiae* strain W303-1A *jen1*Δ *ady2*Δ, 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 versions 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-^{14}C] lactic acid, [2,3-^{14}C] succinic acid and [1-^{14}C] acetic acid.

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 are being expressed to uncover their subcellular localization and the characterization of transporter specificity is currently underway.

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

References

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