Title:	CgCYN1, a plasma membrane cystine-specific transporter of Candida glabrata with orthologues prevalent among pathogenic yeast and fungi
Authors:	Bachhawat, A.K. (/jspui/browse?type=author&value=Bachhawat%2C+A.K.)
Keywords:	Candida albicans Candida glabrata Energy dependent Heterologous expression Kinetic study Lanthionines Organic sulfur Orthologues
Issue Date:	2011
Publisher:	The American Society for Biochemistry and Molecular Biology, Inc
Citation:	Journal of Biological Chemistry, 286 (22), pp. 19714-19723
Abstract:	e describe a novel plasma membrane cystine transporter, CgCYN1, from Candida glabrata, the first such transporter to be described from yeast and fungi. C. glabrata met15Δ strains, organic sulfur auxotrophs, were observed to utilize cystine as a sulfur source, and this phenotype was exploited in the discovery of CgCYN1. Heterologous expression of CgCYN1 in Saccharomyces cerevisiae met15Δ strains conferred the ability of S. cerevisiae strains to grow on cystine. Deletion of the CgCYN1 ORF (CAGL0M00154g) in C. glabrata met15Δ strains caused abrogation of growth on cystine with growth being restored when CgCYN1 was reintroduced. The CgCYN1 protein belongs to the amino acid permease family of transporters, with no similarity to known plasma membrane cystine transporters of bacteria and humans, or lysosomal cystine transporters of humans/yeast. Kinetic studies revealed a K m of 18 ± 5 μM for cystine. Cystine uptake was inhibited by cystine, but not by other amino acids, including cysteine. The structurally similar cystathionine, lanthionine, and selenocystine alone inhibited transport, confirming that the transporter was specific for cystine. CgCYN1 localized to the plasma membrane and transport was energy-dependent. Functional orthologues could be demonstrated from other pathogenic yeast like Candida albicans and Histoplasma capsulatum, but were absent in Schizosaccharomyces pombe and S. cerevisiae
URI:	https://www.sciencedirect.com/science/article/pii/S0021925820510491?via%3Dihub (https://www.sciencedirect.com/science/article/pii/S0021925820510491?via%3Dihub)
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