

SL310 Cloning and Functional Characterization of Glucose Transporter Genes in the Yeast *Schizosaccharomyces pombe*

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The fission yeast *Schizosaccharomyces pombe* take up hexoses in symport with H⁺. The symporter exhibits a rather narrow specificity; only D-glucose and D-fructose as well as the non-metabolisable derivatives 2-deoxy-D-glucose(2DG) and transported[1]. D-gluconate is taken up in *S. pombe* by a distinct transport system independent of that for D-glucose[2]. Using D-gluconate as substrate we succeeded to isolate two D-glucose transport-deficient *S. pombe* mutants, *YGS -4* and *YGS -5*[3].

Ght 1 was the first identified gene in *S. pombe* involved in hexose transport. It was isolated by complementation of the mutant strain *YGS -5* using *S. pombe* genomic bank[3,4]. Our later observations from both kinetic and Southern blot analyses of *S. pombe* wild strain have suggested the existence of further related sequences in the genome[5]. Cloning of four additional genes, *Ght2*, *Ght3*, *Ght4* and *Ght5* confirmed our previous results and led to the recognition of a hexose transporters family in the fission yeast *S. pombe*. Secondary structure prediction of 10-12 transmembrane domains for each of the encoded proteins places the Ght proteins in major facilitator superfamily MFS [6]. Functional analysis by heterologous expression provide evidence for the contribution of Ght proteins to *S. pombe* transport physiology. Northern blot analysis and quantitative RT-PCR indicate that *Ght5p* is the predominantly expressed hexose transporter within this new family of transporters in *S.pombe*. The identification of this hexose transporters family further enabled reinspection of the previously described *S. pombe* D-glucosetransport deficient mutant *YGS-5* as being defective in *Ght 1* and *Ght5*.

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