

**Regulation of Pcl6 and Pcl7 in a Glc7 pathway in
Saccharomyces cerevisiae.**

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ABSTRACT

GLC7 is an essential gene in *Saccharomyces cerevisiae* that encodes the catalytic subunit of protein phosphatase-1. *Glc7* is conditionally activated by phospho-Glc8, which is phosphorylated by the cyclin dependent kinase, Pho85, associated with Pcl6 and Pcl7 (two of its ten cyclins). Our goal was to determine the input(s) that regulate Pcl6 and Pcl7. This will provide us with valuable information about the conditional activation of *Glc7* by phospho-Glc8.

We determined Pcl6 to be more stable than Pcl7. We confirmed and discovered that Elongin C (Elc1) stabilizes both Pcl6 and Pcl7. A null mutation of *elc1* compromises the in vivo function of Pcl6 and Pcl7 in cell growth and in DNA damage response to 4-nitroquinoline oxide (4-NQO). Elc1 is found in two nucleotide excision repair complexes (NEF4 and Ela1 containing complex). We hypothesized that, Pcl6 and Pcl7 levels are induced by DNA damage and controlled by the Elc1 containing complexes. We discovered that the NEF4 and a non-Elc1 containing complex, NEF2, control the stability of both cyclins. Additionally, DNA damage is an input that controls the conditional activation of *Glc7* by phospho-Glc8.