Comparative Assignment Two

James O'Reilly
Student Number: r0773125

Create a multiple sequence alignment and bootstrap a phylogenetic tree based on these fungal proteins.
The phylogenetic tree is given in Figure 1.

What are the functions of these yeast proteins?
The function of each protein was found on SGD and is given below:

- **YCL040W:** Glucokinase; catalyzes the phosphorylation of glucose at C6 in the first irreversible step of glucose metabolism
- **YDR516C:** Non-essential protein of unknown function
- **YFR053C:** Hexokinase isoenzyme 1; a cytosolic protein that catalyzes phosphorylation of glucose during glucose metabolism
- **YGL253W:** Hexokinase isoenzyme 2; phosphorylates glucose in cytosol; predominant hexokinase during growth on glucose

To which yeast protein is the Fusarium graminearum protein orthologous?
Hexokinase isoenzyme 2

Which function do you predict for FGSG_00500P0?
I predict it to be a hexokinase isoenzyme. A search on SGD confirms this.

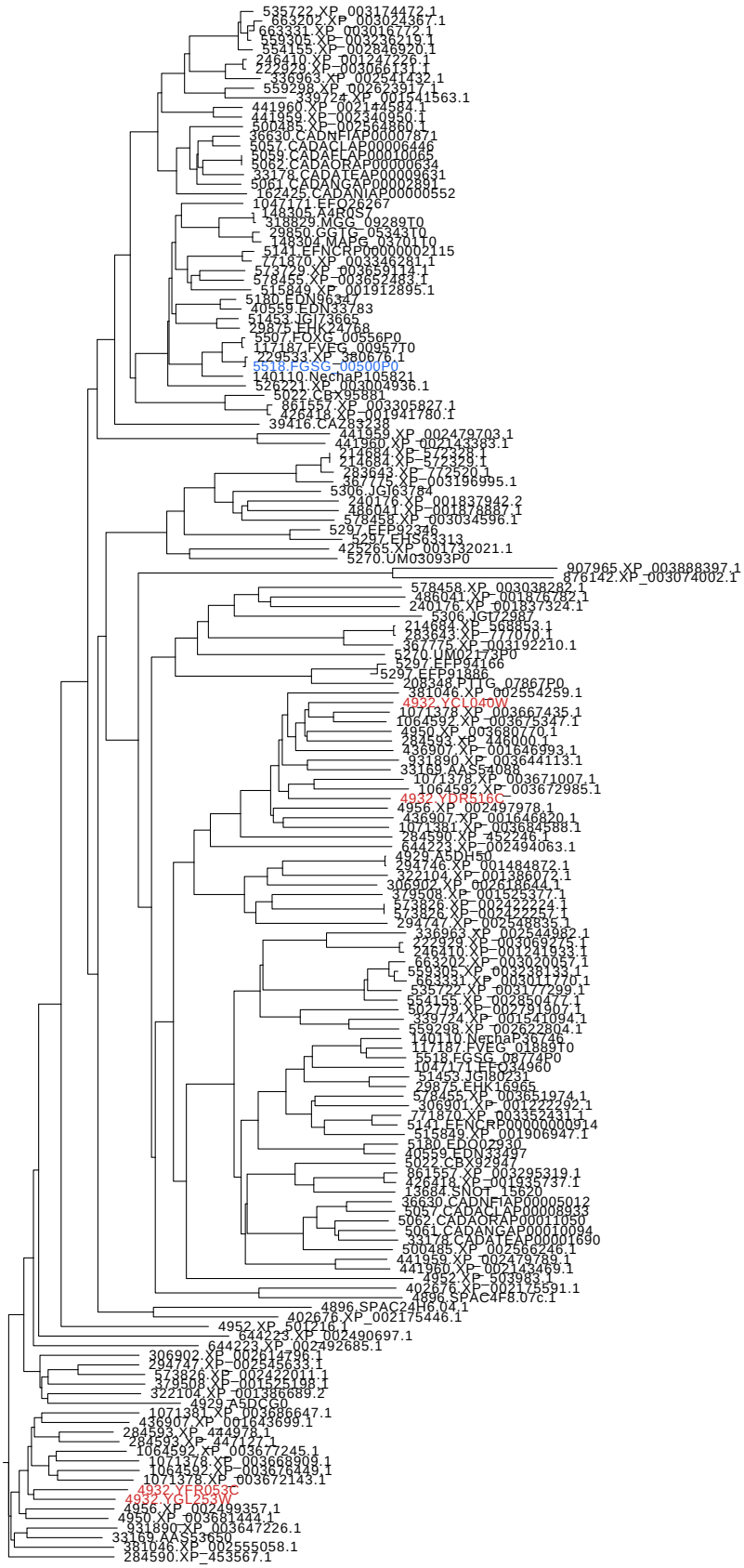

Figure 1: Phylogenetic tree. Saccharomyces cerevisae proteins are highlighted in red. The protein from Fusarium graminearum is highlighted in blue.