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Characterizing the role of AIF4 in *Saccharomyces cerevisiae*

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ABSTRACT

Chromatin remodelers are important regulatory mechanisms that eukaryotic cells use to modify the structure of chromatin, which is made up of DNA and proteins. DNA wraps around histone proteins to make up chromatin. When these proteins are modified, the shape of the chromatin is altered. "Loosening" the chromatin structure by chromatin modifications allows for active gene expression whereas "tightening" or compaction of chromatin results in gene repression. Therefore the modifications on chromatin modulate gene expression in all eukaryotes. It has been shown that mis-regulation of chromatin remodelers contribute to various cancers. Understanding the biochemistry behind how chromatin associating proteins modify chromatin, and ultimately gene expression, can help provide insight into developing anti-cancer drugs. This study focused on characterizing AIF4, a chromatin associating protein. Since other chromatin associating proteins are known to be histone modifiers, we hypothesized that AIF4 is another chromatin remodeler. Many chromatin remodelers are found in protein complexes. These protein complexes have been shown to be important for the functions of chromatin modifying proteins. Therefore this study tested whether AIF4 interacts with other proteins. Purifying AIF4 and testing if it binds to the nucleosome will support the hypothesis that AIF4 is chromatin associating protein. Co-immunoprecipitation will be used to determine if AIF4 interacts with other proteins, indicating that AIF4 functions in a protein complex. However, we were unable to detect an interaction between AIF4 and known chromatin associating proteins. Future work will aim to determine whether AIF4 acts alone or is involved in a unique protein complex.

KEYWORDS

Saccharomyces cerevisiae, chromatin, gene expression, biochemistry, histone