The Summer Undergraduate Research Fellowship (SURF) Symposium
3 August 2017
Purdue University, West Lafayette, Indiana, USA

Regulation of DNA Synthesis: The Identification of New *Drosophila melanogaster* Cdc7 Regulatory Subunits

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ABSTRACT

Cell division cycle 7 (Cdc7) is an enzyme required for the initiation of DNA replication. Cdc7 cannot act alone requiring the binding of its regulatory subunit Dbf4 to perform its enzymatic function. Previous studies show that Dbf4 and Cdc7 are well conserved across eukaryotic organisms. Humans and *Xenopus* have multiple Cdc7 regulatory subunits, and recent studies suggest that *Drosophila melanogaster* might as well. Human Dbf4 was discovered because of its similarity to yeast Dbf4. It is possible that finding additional Cdc7 regulatory subunits in *D. melanogaster* could reveal related proteins in humans. As cancer is a disease caused by improper cell cycling, furthering our understanding of Cdc7 and the cell cycle regulation could lead to advances in cancer treatment. This study seeks to identify possible Cdc7 regulatory subunits by screening for *D. melanogaster* proteins that directly interact with Cdc7. The first goal was to use a Yeast 2-Hybrid assay to repeat results that indicated an interaction between Cdc7 and *Drosophila* Dbf4, known as Chiffon. This allowed for testing media and the effectiveness of the assay. While not preformed yet, screening will be completed using a Yeast 2-Hybrid assay to determine interactions between Cdc7 and proteins from a *D. melanogaster* cDNA library. Further testing will remove false positives. Any remaining plasmids be sequenced and identified by the sequence comparison software, BLAST. Our study will test for *D. melanogaster* proteins that interact with Cdc7, but once these proteins are found further experimentation will be required to confirm interaction and function with Cdc7.

KEYWORDS

Cdc7, cell cycle, regulation, protein interactions, Drosophila melanogaster, Yeast 2-Hybrid