CHRD 2024: Abstract Submission Form

Presenter Name
Jeongheum Jo

Presenter Status
Undergraduate Students

Role in the project
Perform Experiments
Analyze Data
Write Abstract

Research Category
Basic Science

Title
Emg1's Intrinsically Disordered Region Stabilizes the Protein and Interacts with Utp2

Background
Bowen-Conradi Syndrome is a rare genetic disorder in children. It is caused by a variant Emg1 protein, replacing aspartic acid with glycine. Emg1 is an essential protein in ribosome assembly. A structural analysis reveals that the N-terminal intrinsically disordered region (IDR) of Emg1 interacts with Utp2 for nucleolar localization.

Objective
We hypothesize that consecutive truncations of the N-terminal IDR of Emg1 would result in a loss of interaction with Utp2 due to the loss of protein-protein interaction surfaces.

Methods
Yeast two-hybrid plasmids encoding consecutive 5 amino acid truncations of the N-terminal IDR of the yeast Emg1 were tested in a yeast two-hybrid protein-protein interaction assay against the ribosome assembly protein Utp2. Positive control was full length, and the negative control was empty vector. The protein-protein interaction was monitored by growth in the absence of histidine based on the activation of histidine reporter. Western blotting was used to monitor the abundance of the Emg1 protein truncations.

Results
In our yeast two-hybrid analysis, we observe a steady decrease in growth, and thus protein-protein interaction, for the first 4 consecutive 5 amino acid truncations of the N-terminal IDR of Emg1. Further truncations resulted in no growth and thus the loss of protein-protein interactions. Western blotting analysis of the consecutive 5 amino acid truncations of the N-terminal IDR of Emg1 shows a gradual decrease in protein abundance.

Conclusion
The decreased growth observed with the successive truncations of the N-terminal IDR of Emg1 supports the hypothesis that the IDR of EMG1 interacts directly with Utp2. Decreased abundance of the Emg1 IDR truncations by western blot analysis unexpectedly suggests that the IDR plays a role in protein stabilization and abundance.

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No

Authors

Name	Email	Role	Profession
Jeongheum Jo	JOJ84@brandonu.ca	Presenting Author	Undergraduate
Nicole Russel		Co Author	
Dr. Michael J. Charette	CharetteM@brandonu.ca	Co Author	Associate Professor