CHRD 2022: Abstract & Poster Submission Form

Submitter Name
Courtney Geer

Submitter Email
cgeer1010@gmail.com

Presenter Status
- ○ Undergraduate Students
- ◉ Masters Student
- ○ PhD Student
- ○ Post-Doctoral Fellows
- ○ Residents
- ○ Non-Trainee

Research Category
- ◉ Basic Science
- ○ Clinical
- ○ Community Health / Policy

Role in the project
- ☑ Design
- ☑ Perform Experiments
- ☑ Analyze Data
- ☑ Write Abstract
- ☐

Title
SAM Supplementation Partially Rescues a Yeast Model of the Bowen-Conradi Syndrome Ribosome Assembly Disorder

Background

Bowen-Conradi Syndrome (BCS) is a lethal ribosome assembly disorder which presents with severe developmental delays, a failure to thrive, and death in infancy. BCS is exclusive to the Hutterite population (1/355 live births) and is due to an inherited D86G variant in the pseudouridine methyltransferase protein EMG1. This protein is responsible for methylation of a pseudouridine in the decoding P-site of the ribosome; a process requiring methyl group donation from the small molecule S-adenosylmethionine (SAM). Studies reveal that the loss of this modified pseudouridine leads to decreased protein synthesis.

Objective

We postulate that SAM supplementation will improve the growth defect seen in yeast cells recapitulating BCS.

Methods

We investigated the effects of endogenous SAM supplementation using a yeast model system of BCS with and without the ability to overexpress the SAM synthase, SAM2. A growth curve and accompanying western blot were used to investigate the growth of SAM-supplemented and un-supplemented WT and BCS yeast cells and to expose differences in protein translation, respectively. Differences in colony size were investigated via dot plate and colony size assay, with the latter followed by multifactorial analyses of variance.

Results

Un-supplemented BCS cells show decreased translational capacity (~30%) and colony size compared to un-supplemented WT cells. A 2.6-fold increase in growth of SAM-supplemented cells relative to un-supplemented BCS cells is seen by growth curve analysis. Additionally, SAM-supplemented BCS cells formed significantly larger colonies ($P < 0.001$) during the first few days of growth compared to their un-supplemented counterparts. Western blot analysis is ongoing.

Conclusion

BCS cells supplemented with SAM demonstrate partial growth rescue and an increase in colony size to WT or near-WT levels, supporting our hypothesis. Ongoing experimentation will further characterize the effects of SAM supplementation in BCS cells and the mechanism underlying the partially rescued growth seen in the growth assays.

Do you have a table/figure to upload?

○ Yes ⊙ No

Authors

- For each author, please click "**[+] Add Item**" and provide the author's information

Name	Email	Role	Profession
Courtney L. Geer	cgeer1010@gmail.com	Presenting Author	Other

J. Michael Charette	charettem@brandonu.ca	Co Author	Assistant Professor