

# NCUR Application

Name of Student: Jesse Larson

Class: Senior

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Department/Major:  
Biology

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Attach File: <http://>

**Title of Presentation:**

Comparison of Bacterial Communities of McNenny State fish Hatchery Source Water and Mature Salmon Egg Biofilms

**BHSU IRB, IACUC or Biosafety #:**

**Abstract:**

In this study, we compare the bacterial communities of source water at the McNenny State Fish Hatchery, Spearfish, SD with those of biofilms on mature eggs of landlocked Chinook salmon (*Oncorhynchus tshawytscha*), using Illumina sequencing of 16S rDNA libraries. Sanger sequencing was also employed on lab cultured samples from the source water and mature egg biofilms. The McNenny State Fish Hatchery has had difficulties raising Chinook salmon from eggs, which they procure from South Dakota's Lake Oahe. The cause of these difficulties has been linked to bacterial infection of the salmon eggs, after they are treated with antibiotics. The constituents of McNenny Hatchery source water sample and the mature egg biofilm samples were compared to one another to see if there were any shared operational taxonomic units (OTUs). Special attention was paid to the genus *Flavobacterium*, of which at least three species are known pathogens of fish (M. Touchon et al. 2011, *Appl. Environ. Microbiol.* 77: 7656-7662). The 16S rDNA data was analyzed using the software package CLC Bio. The 16S rDNA data indicated that the hatchery water bacterial community was composed mainly of Proteobacteria, while the biofilms on mature salmon eggs were dominated by Bacteroidetes, especially *Flavobacterium* species. There were three shared *Flavobacterium* OTUs between the McNenny Fish Hatchery water and the biofilms taken from the mature salmon eggs. While *Flavobacterium* species were a minor constituent of the hatchery water they were the largest constituent of the mature egg biofilms. The Sanger sequencing only identified species of *Flavobacterium*, from samples taken from the lab cultured bacteria.

**I certify that: My project is at or near completion and the abstract accurately represents my findings:**

Yes

### **Statement of Student Responsibilities:**

If my project is accepted for NCUR and I receive funding, I agree to:

- complete my project before departure
- make a trial presentation to my faculty advisor before departure
- present my paper/project at NCUR and attend other sessions
- all required IRB, IACUC and Biosafety approvals have been received
- give presentation at Black Hills Research Symposium (BHRS)
- Represent BHSU in a professional & responsible manner