

# Characterization of *Shewanella oneidensis* SO0839 transcription factor

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According to the CDC, 75,000 hospitalized patients died in the United States in 2011 due to nosocomial infections. Many of these infections give rise to biofilms, or aggregates of bacteria. Due to the composition of the biofilms, antibiotics have no effect on the innermost bacteria. One method to combat this is the use of compounds that inhibit biofilm formation. A candidate for this is the SO0839 protein found in the bacteria *Shewanella oneidensis*. SO0839 is a transcription factor that regulates bacterial growth. According to previous research, without this protein bacterial growth is inhibited. This work focused on optimizing expression of SO0839 and characterizing its DNA binding. Optimal expression was found when bacteria were grown in 500mL LB and induced at 25°C for 4 hrs. We then assessed the binding ability with and without acetyl coenzyme A, SO0839 cofactor, using fluorescence polarization assays (FA). FA help analyze the molecular interactions between the protein and the DNA. The FA showed that without the cofactor there is no observed binding. Further experiments include structural characterization of the protein via crystallization to help characterize mutations and the design of inhibitors for SO0839.

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