High Throughput Analysis of Stress Growth Response in *Shewanella oneidensis* MR-1

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Shewanella oneidensis MR-1 has shown extraordinary metabolic diversity through its use of variety electron acceptors. It can grow both aerobically and anaerobically, and can use nitrate, fumarate, sulfur compounds, and oxidized metals as electron acceptors. To study stress of *S. oneidensis* to nitrate, nitrite, and sodium chloride- this bacterium had to be made detectable to the Biolog Omnilog Phenotype Microarray™ system. The Omnilog machine uses digital imagery sensing technology to track changes in the turbidity of cultures growing in individual wells of a microarray plate over time. In order to determine generation times of *S. oneidensis*, the Omnilog was calibrated by correlating digital readings produced with cell and optical density measurements. The measurements on the Omnilog machine showed extraordinarily long lag phases of growth, coupled with short log phase growth and entrance into stationary phase extremely because in early stages of growth, *S. oneidensis* is opaque and scarcely visible in liquid media. Consequently, the Omnilog also posted unimpressive maximum digital unit readings once stationary phase growth had been reached To resolve this problem, a tetrazolium-based dye mix (Biolog, Hayward, CA). was added to the liquid cultures of *S. oneidensis*. The maximum digital units or optical density per well was 250-300, which is within the linear range of Omnilog. Subsequent growth curves had much shorter lag phases, longer log phase growth and eventual passage into stationary phase, conveying a better representation of bacterial growth. Use of the dye almost virtually eliminated the variation in the digital units from one reading to the next. This tetrazolium dye will be added to measure growth of *S. oneidensis* under nitrate, nitrite and sodium chloride stress.