Production of the Red Pigment Prodigiosin in *Serratia marcescens* Using Fed-Batch Bioreactors

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Abstract: Prodigiosin is a red, linear tripyrrole compound that is produced as a secondary metabolite by several families of bacterial species including some strains of *Serratia marcescens* (*S. marcescens*). Prodigiosin was first isolated as a pure form in 1929 and has since been show to have strong immunosuppressive, antibacterial antimycotic, anticancer and antimalarial activity. For this reason, prodigiosin has received much attention from researchers in the recent years. Numerous studies have shown to prove the above stated functions of prodigiosin. Although prodigiosin has numerous attractive qualities there is minimal knowledge in the extraction process of prodigiosin from bacterium. This research project aims to design and develop a bioprocess whereby prodigiosin could be produced and extracted in a fed-batch bioreactor. In this project, *Serratia marcescens* is cultured on semi-solid media using standardized cell culture techniques and used to inoculate the bioreactor for production and extraction of prodigiosin. A fed-batch reactor was proposed for this due to past report on prodigiosin production and due to its overall simplicity. This reactor system allows optimum production using a simplistic design that could be produced easily at minimal cost and allows careful monitoring of the culture media. The results of this project will enhance our knowledge of prodigiosin production and may facility commercial scale production in the future.

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