

## New insights into *Serratia marcescens* pigment regulation

Bryant U. Trejo<sup>1</sup>, Perla E. Alvarado<sup>1</sup>, Orlando E. Flores<sup>1</sup>, Miguel A. Becerril<sup>1</sup>,  
Faviola I. Tavares<sup>2</sup>, Angel Andrade<sup>1</sup>

<sup>1</sup>Departamento de Microbiología, Facultad de Medicina, Universidad Autónoma de Nuevo León, Av. Francisco I. Madero s/n, Monterrey, Nuevo León, CP 64460, <sup>2</sup>Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León, Av. Universidad s/n, San Nicolás de los Garza, Nuevo León. CP 66455  
E-mail: angel.andradet@uanl.edu.mx

*Serratia marcescens* (Sm) is a ubiquitous bacterium of medical and biotechnological importance. As an infectious agent, Sm is recognized as an opportunistic human pathogen. On the other hand, some Sm strains synthesize compounds with biotechnological value, including the linear tripyrrole red pigment, prodigiosin (2-methyl-3-pentyl-6-methoxyprodiginine). Prodigiosin is reported to exhibit antifungal, antibacterial, antimalarial, and anticancer activities. The biosynthesis of prodigiosin is tightly regulated and occurs primarily in the later stages of bacterial growth. A large set of genes (*pigA-N*) are responsible for its biosynthesis. Although the production of prodigiosin in certain *Serratia* strains was originally associated with AHL- or AI-1-mediated quorum sensing (QS), recent genome sequencing has revealed that most Sm strains encoding the *pigA-N* genes lack a *luxI* homolog. This suggests that the regulation of pigment production is not necessarily linked to AI-1.

We have previously characterized some pigmented Sm clinical isolates. Here, using the Sm HU2228 strain, a pigmented *luxI* isolate, we explore the contribution of LuxS (AI-2 synthase), and molecules related with AI-3 signalling prodigiosin production. Induction of prodigiosin was observed in presence of the cross-reacting AI-3 molecule, norepinephrine, but not by epinephrine. Similarly, swarming motility and proteolytic activity were increased by norepinephrine. A histidine kinase was identified as the likely receptor responding to norepinephrine. Moreover, preliminary data suggest that the accumulation of AI-2 after overproduction of LuxS negatively impacts pigmentation in Sm HU2228. Experiments are currently underway to generate a Sm HU2228 *luxS* mutant strain in order to evaluate the contribution of AI-2 to pigment production and other phenotypes.