Bacterial Quorum Sensing Biosensor

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Technology description

Summary

Researchers at The Ohio State University have developed a biosensor for the detection of bacterial autoinducer 2 (AI2) class of quorum sensing (QS) signal compounds. The OSU biosensor, designated mCLPY has applications for the rapid and selective quantification of the AI2 class of quorum sensors in vitro when used in conjunction with a small fluorometer. Quantification of AI2 quorum sensors levels provides a pathogen-specific mechanism to monitor the magnitude of bacterial infections in humans and animals.

The AI2 class of quorum sensing molecules has been shown to regulate pathogenesis by Escherichia coli (EHEC) serotype O 157:H7 the causative agent responsible for enterohemorrhagic or bloody diarrhea. Quantification of QS compounds produced by this organism could be used to monitor the state of infection and its control by various treatments. QS compounds also regulate biofilm formation in a concentration-dependent manner.

Given the central role these molecules play in a number of bacterial-mediated pathologies and in biofilm establishment, the development of technologies to specifically and quantitatively monitor the levels of QS compounds has great value for designing effective control strategies. In addition, QS-specific biosensors could be used to identify molecular mimics of QS compounds that may be used as pharmaceuticals to control bacterial pathogenesis.

Institution

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