# Characterization of AI-2 uptake pathway in E. coli quorum sensing circuitry

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While the quorum sensing phenomenon has been studied in a large number of bacterial species, many questions remain unanswered. Previous models have addressed aspects of population dynamics in Pseudomonas aeruginosa and Vibrio fischeri but no comprehensive model of autoinducer AI-2 uptake has been proposed. The AI-2 signal transduction network comprises several important network topologies including a positive feedback loop, an autoregulation motif and, a number of negatively regulated modules which make it particularly interesting. The complex interaction of these network motifs are not yet fully understood and can be further analyzed using stochastic simulations. My aim is to develop a computational model that captures the dynamics of quorum signal generation, receptor driven recognition, and AI-2 uptake. By combining the existing experimental data with comprehensive mathematical models, the relationship between basic cellular circuitry of quorum sensing and the phenotypical responses observed at the macroscopic scale can be elucidated.