

Turning Virulence on and off in *Staphylococcus Aureus*

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The ability of bacteria to coordinate group activity at particular phases of growth is essential for many fundamental processes such as competence, bioluminescence, biofilm formation, and virulence. This feat is achieved by quorum sensing signaling mechanisms that allow an individual bacterium to sense the density of the entire population of which it is a member. *Staphylococcus aureus* and *Staphylococcus epidermidis* are dangerous, opportunistic pathogens that are continually developing resistance to multiple antibiotics. Expression of virulence factors in these organisms is regulated by a complex network of many genetic loci, including one quorum sensing system termed the *accessory gene regulator (agr)*. In this lecture, I will discuss our ongoing efforts to understand the molecular aspects of the *agr* response, including the mechanism of signal transduction and the design of global inhibitors of the process.