

## Abstract

*Staphylococcus aureus* is a gram-positive pathogenic bacterium that regulates virulence factors production in response to changing environmental conditions. *S. aureus* cells evolved a complex regulatory network, including a number of regulatory proteins, transcriptional factors and two-component systems. One of the most important *S. aureus* regulatory systems is the Agr system (Accessory gene regulator) that perceives its own population density by sensing a „quorum-sensing“ signal in a form of autoinducing peptid (AIP). Agr system encodes a global regulatory RNAIII that regulates the expression of target virulence factors, which includes surface proteins as well as extracellular toxins and enzymes. The family of global protein regulators SarA and transcriptional sigma factor B also play a significant role in the regulation of *S. aureus* virulence. The production of virulence factors is also regulated in response to specific signals from extracellular environment by two-component-systems, which includes the regulator of exoprotein production SaeRS, the regulator of autolysis ArlRS and the regulator of respiratory response SrrAB.

**Key words:** *Staphylococcus aureus*, virulence factors, Agr, quorum-sensing, RNAIII, SarA, SigB