

Effect of a single *locus* deletion on global genome expression: the *ica locus* in *Staphylococcus* spp - a case study

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Recent technological advances have made it possible to study global gene expression in bacteria. Microarrays have emerged as the premier tool for studying gene expression on a genomic scale and have been used in a broad range of studies¹. *Staphylococcus epidermidis* and *Staphylococcus aureus* can form biofilms on medical devices. The major constituent of the biofilm matrix is the polysaccharide PNAG, synthesized by the proteins encoded in the *icaADBC* locus². A knockout of the *ica locus* in a biofilm-forming strain will cause that strain to lose its ability to form a biofilm. However, what is not known is the effect of the loss of the *icaADBC locus* on the overall gene expression by the bacteria. We used a strong biofilm forming strain of *S. aureus* and an isogenic *icaADBC* knock out and grew them under the same conditions (16H, TSB with 1% glucose, 37°C, 300rpm) after which we extracted the total RNA, and converted it to cDNA. We then labeled the cDNA with 2 different dyes, and hybridized the product on a microarray slide containing the genome of *S. aureus*. The microarrays were analyzed using an open source software (TM4)³. Data analysis verified that the majority of the genes were equally expressed by both strains, as expected. However, approximately 60 genes were differentially expressed between the wild type and the isogenic mutant, demonstrating that a deletion mutation within a single *locus* can influence the expression of many other genes in the bacteria.

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