

Publication

Bioluminescence imaging to study the promoter activity of hla of Staphylococcus aureus in vitro and in vivo

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Alpha-toxin (Hla, encoded by hla) is a major virulence factor of Staphylococcus aureus. The activity of the hla promoter was analyzed using luxABCDE on an integration vector. The phla-lux construct was introduced in S. aureus Newman and its isogenic sae and sigB regulator mutants. Promoter activity was monitored by bioluminescence in vitro and in the murine tissue-cage model. Hla promoter activity could be followed in real time at repeated time points of infection. The activation of hla in the sigB-deficient strain and the repression to background levels in a sae-deficient strain relative to hla expression in the wild type could be demonstrated in vivo. Subinhibitory concentrations of teicoplanin, imipenem and ciprofloxacin enhanced hla promoter activity in vitro whereas clindamycin and rifampicin did not. Our approach proved to be rapid and adequate to study promoter activity in vitro and in vivo under conditions where high bacterial numbers are reached.

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