

TITLE: *Staphylococcus* MOTILITY ON SEMI-SOLID AGAR

AUTHORS: COIMBRA, T. F. S.¹; GLATTHARDT, T.¹; LOPES, J. F. S.¹; DOS SANTOS, K. R. N.¹; ANTUNES, L.C.M.²; PENNA, B.³; FERREIRA, R. B. R.¹

INSTITUTION: ¹INSTITUTO DE MICROBIOLOGIA PAULO DE GÓES, RIO DE JANEIRO, RJ (AVENIDA CARLOS CHAGAS FILHO, 373, CCS, SALA I2-028, CEP 21941-902, RIO DE JANEIRO-RJ, BRAZIL);

²CENTRO DE REFERÊNCIA PROF. HÉLIO FRAGA, FUNDAÇÃO OSWALDO CRUZ, RIO DE JANEIRO, RJ (ESTRADA DA CURICICA, 2000, CEP 22780-194, RIO DE JANEIRO – RJ, BRAZIL);

³UNIVERSIDADE FEDERAL FLUMINENSE, NITERÓI, RJ (RUA PROFESSOR HERNANI MELO N.º 101, SÃO DOMINGOS - NITERÓI RJ - CEP: 24210-130)

ABSTRACT:

To many bacteria, motility is crucial for survival on different environments, as well as for pathogenesis. *Staphylococcus* is a genus that includes important pathogens that causes infectious diseases ranging from cutaneous abscess to invasive infections. These microorganisms have historically been regarded as non-motile. However, a few forms of motility were described for three species: *Staphylococcus aureus*, *Staphylococcus epidermidis* and *Staphylococcus xylosus*. The first type is called spreading, which is a passive form of motility, the second type is called comets formation, an active type of motility, and the third one involves the ejection of a few cells from the bacterial aggregate, called darting. Spreading results of the radial growing from bacterial colonies on semi-solid agar surfaces using only the cellular growth and bacterial surfactant production. In *S. aureus*, this phenomenon is known to be dependent on the *agr* quorum sensing system, which also regulates many important bacterial processes. The aim of this study was to describe the presence of motility in different staphylococcal species. For this, 70 staphylococci strains, including 10 different species, were selected, grown and spotted in TSB supplemented with 0,24% of agar. *S. aureus*, *Staphylococcus capitis*, *Staphylococcus lugdunensis*, *Staphylococcus pseudintermedius*, *Staphylococcus schleiferi* subsp. *coagulans* and *Staphylococcus schleiferi* subsp. *schleiferi* strains showed spreading significantly different from the negative control, indicating the ability to move across the semi-solid agar. However, only *S. aureus*, *S. pseudintermedius*, *S. schleiferi* subsp. *coagulans* and *S. schleiferi* subsp. *schleiferi* strains showed motility similar to a positive control strain. We also observed traces of motility on a few isolates of *Staphylococcus haemolyticus*, *Staphylococcus saprophyticus* and *Staphylococcus warneri*, however this phenomenon was not observed in all isolates of each of these species. On the other hand, *S. epidermidis* and *Staphylococcus hominis* isolates showed no signs of motility. The motility presented was dependent on experimental changes assessed, suggesting that growth conditions are important factors for surface motility. This phenotype was not previously described for most of the species we investigated here. Future studies must unravel the mechanisms behind the motility of this bacterial genus and their role in pathogenesis.

Key-words: *S. aureus*, *S. pseudintermedius*, *S. schleiferi* subsp. *coagulans*, *S. schleiferi* subsp. *schleiferi*, motility.

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