SWARMING MOTILITY IN *PSEUDOMONAS AERUGINOSA* C-DI-GMP MUTANTS

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Pseudomonas aeruginosa is a model organism for the study of bacterial social behavior, or «sociomicrobiology» (Parsek and Greenberg, 2005). There are two types of social behavior – biofilm formation and free cells (Davies et al., 1998). One of important factors for P. *aeruginosa* biofilm development is motility. Swarming in *Pseudomonas aeruginosa* is a third mode of surface translocation in addition to the swimming and twitching motilities. Swarming has been characterized as flagellar-assisted movement on a viscous surface, such as that found on solid medium containing low percentage agar (Giltner et al., 2006).

Cyclic di-GMP, second messenger in signal transduction for a wide number of bacteria is a unique molecule, is the key factor in the regulation of quorum sensing system action (Römling et al., 2013). Different quantity of c-di-GMP determines living forms of bacteria. It should be mentioned that swarming motility is inversely related to the level of c-di-GMP biosynthesis.

The aim of our study was to investigate the effect of different c-di-GMP biosynthesis level on *P. aeruginosa* swarming motility.

Cyclic di-GMP mutant strains PAO1 100 Δ *wsp*F1 (heightened level), PAO1 105 Δ *wsp*F *pel*A *psl*BDL (high level) and MPAO1 pJN2133 (low level) were used in experiment. *P. aeruginosa PAO* is a control strain.

Overnight cultures (2 µl) were sown on the center of the petri dish with 0.6% swarming agar medium. The results were observed for the zone of growth from the point of inoculation.

Revealed that the strain with heightened level of c-di-GMP biosynthesis (PAO1 100 Δ *wsp*F1) showed no swarming activity – 6 cm, PAO1 105 Δ *wsp*F *pel*A *psl*BDL – 8 cm, at the other hand MPAO1 pJN2133 swarming zone was 62 cm, *P. aeruginosa PAO* – 43 cm.

These results confirm the dependence of the swarming motility on the level of c-di-GMP biosynthesis in quorum sensing system.

Further quorum system study and modulation of *Pseudomonas* communication system with different levels of c-di-GMP biosynthesis is an urgent problem, because understanding these processes allows to manage them, which is of great benefit to medical and biotechnological processes.