

POLYSACCHARIDES PRODUCTION BY *PSEUDOMONAS* C-DI-GMP MUTANTS

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During the past decade, there has been a renewed interest in using *Pseudomonas aeruginosa* as a model system for biofilm development. Pseudomonads, and in particular *Pseudomonas aeruginosa*, are among the best-studied biofilm formers, due to the long history of study of these bacteria, their genetic tractability and the availability of the genome sequence (O'Toole, 2003). One of the most well studied biofilm component is matrix (extracellular polymeric substance). It is a complex of biopolymers, synthesized by microorganism in biofilm. It consists of polysaccharides, structural proteins, etc. Matrix plays an important role in biofilm architecture forming and separates biofilm from the environment. Among others matrix components are exopolysaccharides (EPS) that provides a viscous structure of matrix and allows evenly distribute unfavorable substances throughout the biofilm (antibiotics, disinfectants) (Fleming, 2010). It should be mentioned that biofilm formation is in direct proportion to the level of secondary messenger c-di-GMP biosynthesis.

Thus, the aim of our work was to study polysaccharides production of *Pseudomonas* strains. Mutant strains PAO1 100 Δ *wspF1* (overproduced c-di-GMP), PAO1 105 Δ *wspF* *pelA* *ps/BDL* (high level c-di-GMP), MPAO1 pJN2133 (has very low c-di-GMP) were used. *P. aeruginosa* PAO is a control strain.

Biofilm incubation was performed according to the Swift technique (Swift et al., 2000). Accounting results were a day, 3 days, 5 days and 7 days in the system biofilm-plankton. For polysaccharides staining congo red and alcian blue were used.

The results confirmed literature data on the intensity of biofilm formation and the level of polysaccharides biosynthesis. PAO1 100 Δ *wspF1* with overproduced c-di-GMP and makes lots of EPS (24 hours-1,899 optical units; 1,867 o.u.-3 days; 2,564 o.u.-5 days and 1,847 o.u.-7 days), MPAO1 pJN2133 (from 1,402 o.u.- 24 hours to 1,945 o.u. after 7 days), PAO1 105 Δ *wspF* *pelA* *ps/BDL* with overproduces c-di-GMP but low EPS level produced 0,642 o.u. after 24 hours to 1,590 o.u. after 7 days.

This is consistent with the known data and gives the prospect of further study of the biosynthesis processes, quorum sensing and the main matrix component – polysaccharides, considerable effort will be expended to acquire a more complete understanding of the biofilm matrix composition.