

FATTY ACID PROFILES IN PLANKTONIC AND BIOFILM *P. AERUGINOSA* CELLS WITH DIFFERENT LEVEL OF C-DI-GMP

M. GALKIN, A. SEMENETS, M. FINOGENOVA

Odessa National I. I. Mechnykov University, Ukraine;
e-mail: volandaron@ukr.net

Pseudomonas aeruginosa is a Gram-negative pathogen responsible for a variety of opportunistic infections, including chronic airway infections in patients with cystic fibrosis (CF). During the course of chronic infection, *P. aeruginosa* forms matrix-encased, surface-associated communities called biofilms. Biofilms are thought to contribute to persistence in the CF airway by contributing to evasion of the host immune response and antimicrobial therapy. Biofilm communities differ from planktonic bacterial cultures not only in terms of their metabolic activity but they also display stage-specific phenotypes during development and considerable spatial heterogeneity of physiological condition. Cells alter the fatty acid composition of their lipids to maintain membrane fluidity with varying environmental conditions. In this study, fatty acid profiles of biofilms versus planktonic cells of the *P. aeruginosa* with different level of intracellular c-di-GMP were compared.

Wild-type strain *P. aeruginosa* PA01 and strains with low (PA01 pJN2133) and high (PA01 Δ wspF1) level of c-di-GMP were used as test-organisms. We identified that not all fatty acids are included in each experimental *P. aeruginosa* strains. For example, undecanoic acid is part of the cellular wall of PA01 pJN2133 at a level of 0.11%. Tridecanoic acid is part of the cellular wall of PA01 Δ wspF1 at a level of 0.10%. Palmitic acid is present in each strain at high level, however, N alcohol (1-Hexadecanol) is present in only two strains PA01 (0.78%) and PA01 pJN2133 (0.61%). 12:1 3OH acid is present only in the mutant strains PA01 pJN2133 (0.79%) and PA01 Δ wspF1 (0.11%). γ -Linolenic acid present in wild-type PA01 (0.49%) and one mutant strain PA01 pJN2133 (0.38%). The levels of saturated fatty acids in planktonic cells of *P. aeruginosa* strains were: PA01 – 59.62%; PA01 pJN2133 – 59.42%; PA01 Δ wspF1 – 77.97%. Biofilm cells of this strains containing respectively 66.22%; 64.37% and 49.31%. The levels of unsaturated fatty acids in planktonic cells of *P. aeruginosa* strains were: PA01 – 40.3%; PA01 pJN2133 – 40.58%; PA01 Δ wspF1 – 22.01%. Biofilm cells of this strains containing respectively 33.78%; 35.62% and 50.78%. The fatty acid composition of different strains of *P. aeruginosa* was compared with the mobility of their cells.