

Biofilm is a complex structure produced by bacterial cells which contain highly hydrated filamentous exopolysaccharides. Biofilm exists everywhere in our surroundings or nature. It creates for instance a sticky viscous structure covering the surface of stones or other solid objects underwater. The technology of sewage cleaning remediation is essentially dependent on the presence and function of biofilm producing bacteria. Adhered biofilm in medicine has usually negative consequences for patient health, hence, reduction of its role is a goal of researches in the field. Here biofilm first of all adheres and colonizes catheters or artificial joints or other implants and is a source of a chronic infection which limits the healing process or normal function of the implants. In cystic fibrosis patient biofilm production is also responsible for the fact that acute infection caused by *P. aeruginosa* could change within a few months in chronic infection when mucoid strain could be cultivated from the patient.

In my bachelor thesis I have analyzed clinical material and bacterial isolate of *P. aeruginosa* of a cystic fibrosis patient which dissociated into mucoid and smooth phenotype using light-, electron- and immunofluorescence microscopy. I have applied an original method using resuspended bacterial culture in solid agarose to process samples for electron microscopy which was finally not suitable for the microscopy. Biofilm in patient sputa and also extracellular substances from mucoid bacterial culture of *P. aeruginosa* could be proved using light microscopy and immunofluorescent microscopy. Smooth and mucoid isolates from the patient were identified by mass spectrometry as *P. aeruginosa*. Clonal analysis of the isolates confirmed that the isolates belong to one strain. The isolates differed in susceptibility to aminoglycosides. Paradoxically, the mucoid isolate 143M (M) was susceptible compared to resistant smooth isolate 142S (S).