Age and Carbon Source Effects on Unsaturated Pseudomonas aeruginosa Biofilms. (S03-steinberger152603-Oral)

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Abstract:

Soil bacteria grow predominantly as biofilms in bacterially-produced exopolymeric substances. We studied the effect of carbon source and time on biofilm production of intracellular and extracellular polymers. Biofilm bacteria did not exhibit a lag phase but grew more slowly than liquid culture bacteria. Carbon source (glucose or hexadecane) did not affect growth rate, suggesting a diffusional limitation. Total DNA, protein, and carbohydrate were higher for glucose- versus hexadecane-grown biofilms. After 50 hours, growth slowed in glucose-grown biofilms and there was a shift to higher protein and carbohydrate relative to DNA. Both hexadecane- and glucose-grown biofilms contained large amounts of extracellular DNA and protein. The percentage of the total DNA, protein, and carbohydrates that were extracellular increased with time for glucose-grown but decreased for hexadecane-grown biofilms. Our data is consistent with a conceptual model of slow, dynamic net growth of biofilm bacteria. We hypothesize that extracellular biopolymers may supplement external nutrients to biofilm cells in environments like soil.

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