



The BRACE CENTRE FOR WATER RESOURCES MANAGEMENT

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BIOFILMS IN ENVIRONMENTAL AND BIOMEDICAL APPLICATIONS

Direct observations of bacteria growing in natural and engineered ecosystems have shown that they grow predominantly in slime-enclosed biofilms adherent to available surfaces. The sessile bacteria in these multi-cellular communities differ profoundly from floating (planktonic) cells of the same species, in the genes they express and therefore in their susceptibility to antibacterial agents, such as biocides and antibiotics. These sessile communities have also come to predominate in bacterial infections, especially those associated with medical and dental devices, and biofilm infections now account for 80% of bacterial infections treated by physicians in the developed world. As we study biofilms we find that the formation of these communities is controlled by chemical signals, which can be manipulated to prevent their formation or to promote their dispersal. These communities use electrically conductive “nanowires”, to conduct energy, and biofilm control strategies are being developed in which voltage clamps are used to suppress their deleterious activities. More recently we have discovered that bacterial cells can lyse, in a complex genetically controlled pattern, to form extensive (even macroscopic) structures that may then protect non-lysed cells from antibacterial forces in both natural and pathogenic ecosystems.

Dr. Costerton was raised and educated in Canada, where he taught at McGill and at the University of Calgary. His scientific contributions have recently been recognized by the award of a D.Sc. (honoris causa) by the University of Guelph, the award of the prestigious Killam Prize, and his election to the Life Sciences Division of the Royal Society of Canada. Dr. Costerton immigrated to the US in 1993 to become Director of the world leading Center for Biofilm Engineering at Montana State University, and has very recently moved to USC to establish the Center for Biofilms in the School of Dentistry. He has published > 600 papers in refereed journals, he is generally credited with the discovery that bacteria live predominantly in communities called “biofilms”, and is regarded by many as the founder of the new field of Biofilm Microbiology.

Monday, April 2nd, 2007, 2 PM

McGill Downtown Campus, Wong Building, Room 1020

EVERYONE WELCOME