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Seminar

“IRTG: Soft Matter Science “

BACTERIAL BIOFILMS

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Thursday, October 25., 14h30

**« Amphithéâtre de l'Institut de Science des Matériaux
de Mulhouse »**

15 rue Jean Starcky, 68200 Mulhouse



Seminar

BACTERIAL BIOFILMS

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Abstract

Direct observations, in natural and pathogenic ecosystems, have shown that > 99% of bacteria grow in matrix-enclosed biofilms adherent to surfaces or interfaces. These sessile bacterial communities are the basic unit of metabolic activity in ecosystems, and the basic unit of pathogenicity in the chronic bacterial infections that now predominate in modern medicine in the developed world. Within these communities cells communicate by means of diffusible signals, and by means of signals enclosed in vesicles and complex tubular systems, so that the biofilm is a single functional unit within which metabolic and ecological relationships are highly organized and well coordinated.

Cells within biofilms express their genes in a pattern profoundly different from that used by single planktonic cells, so that they are highly resistant to antibacterial factors in their environments. When cells from biofilms are recovered, and spread on the surfaces of agar plates, few if any colonies develop, so culture methods are virtually useless in the detection and identification of biofilm bacteria. New methods have been developed for the study of bacterial biofilms, *in situ* in the ecosystems in which they live and function, and these methods have superseded culture methods for the study of these sessile communities in all ecosystems.