

CYCLE DE CONFÉRENCES DE CHIMIE

*Avec le concours de : Manufacture Française des Pneumatiques MICHELIN
SIGMA Clermont
Institut de Chimie de Clermont-Ferrand (ICCF UMR 6296)
U.F.R. de Chimie*

Jeudi 5 juillet à 16 h

Amphi Rémi (site des Cézeaux)

Stéphane VUILLEUMIER

*Laboratoire Génétique Moléculaire Génomique Microbiologie - UMR 7156,
Université de Strasbourg*

Anaerobic bacterial degradation of dichloromethane: the return

Dichloromethane (DCM) is a widespread and highly toxic industrial solvent. Biodegradation of DCM in soils and aquifers occurs under both oxic and anoxic conditions, and our laboratory has elucidated many aspects of aerobic DCM degradation over the years. In contrast, bacterial dichloromethane degradation under anaerobic conditions, while of high importance for cleanup of chemical production sites, still remains elusive in terms of the genes, enzymatic mechanisms and metabolic pathways involved. After remaining dormant for two decades, the topic is currently enjoying a revival through recent and ongoing work in several laboratories worldwide.

We investigated *in situ* and *in labo* biodegradation of DCM in groundwater sampled from a former solvent-processing industrial site where DCM is found as a major co-contaminant of chlorinated ethenes and ethanes. Using carbon isotope enrichment factors of DCM obtained for aerobic and anaerobic degradation of DCM by reference strains, *in situ* biodegradation at the field scale could be evaluated. The results obtained so far highlight the relevance of laboratory microcosm studies in evaluating biodegradation potential and in guiding remediation approaches at contaminated sites. Investigations of the genomes of anaerobic DCM-degrading strains, currently under way, will also be helpful for this purpose.