

# SÉMINAIRES ET CONFÉRENCES



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## «Connecting Dots: Evolutionary Connectivity and Constraints on Evolution of New Enzyme Functions»

The diversity of catalytic activities catalyzed by members of an enzyme superfamily never ceases astonishing us. How have these diverse enzyme functions evolved? Although it has been postulated that enzyme functions within an enzyme superfamily evolved from a common ancestor, we have little known about evolutionary dynamics of expansion of the enzyme superfamily. I will present our recent efforts to enhance our understanding of evolution of enzyme functions within superfamilies. First I discuss about how seemingly unrelated catalytic activities observed in enzyme superfamilies are connected one to another through promiscuous enzymes. Second, I will present a series of experimental evolution to evolve enzyme functions in the laboratory. I will discuss molecular basis underlying functional transitions, e.g., molecular tinkering of active site residues and protein dynamics. Third, I will describe constraints in enzyme evolution, i.e., success of evolution can depend on initial genotypes. Finally, I will discuss about how we could improve our ability to design and engineer novel proteins and enzymes in the laboratory.



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**Pavillon Roger-Gaudry**  
**Salle : E-310**

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