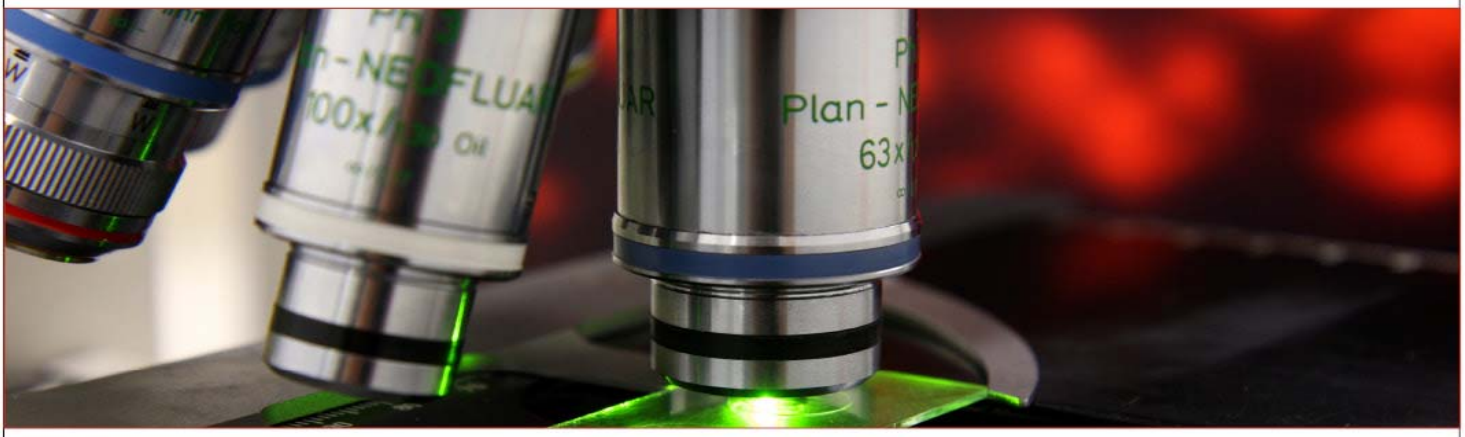
# SÉMINAIRES ET CONFÉRENCES



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## « Ice-Binding Proteins»

Ice-binding proteins (IBPs) were first discovered in marine fishes that need protection from freezing in icy seawater. This antifreeze role is also seen in overwintering terrestrial insects, where more potent IBPs evolved to help prevent freezing down to -30 °C. IBPs are widespread across biological kingdoms, and their functions include assisting plants tolerate freezing by inhibiting the recrystallization of ice. In at least one example an ice-binding domain has been incorporated into an adhesion protein that positions its marine bacterial host on the underside of sea ice in symbiosis with photosynthetic microorganisms. IBPs have remarkably diverse folds, which is consistent with their recent, independent evolution. These small proteins are freely soluble in water and yet bind irreversibly to ice – the solid state of water. IBPs have ice-binding sites on their surface that are typically flat, extensive, and relatively hydrophobic. It is thought that these sites organize water into an ice-like arrangement that merges with, and freezes to, the quasi-liquid layer next to the ice lattice. IBPs have many potential applications, as for example in organ transplantation, cryobiology, crop protection, and gas hydrate inhibition.

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