

Séminaire SOLEIL

# Amphiphilic and acidic $\beta$ -sheet peptides ; from design at nanometer scale to functional biomaterials

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Invitée par Philippe FONTAINE

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Séminaires

The interest in advancing our abilities to fine-tune molecular systems, with precisely engineered molecular properties, is common to researchers studying nanostructured bio- and other materials. Based on progress in understanding protein structure and activity at nanometric-scale resolution various polypeptide biomaterials have been designed.

In our studies we utilize mainly amphiphilic and acidic  $\beta$ -sheet peptides, designed in bottom-up approach, to form self assembled ordered monolayers at air water interface, and fibrillar structures and hydrogels in solutions.

Structural analysis revealed that these peptides form two-dimensional crystals that may undergo elastic bending deformations, at the level of the unit cell, under two-dimensional isotropic stresses applied on monolayers films.[1,2] These  $\beta$ -sheet structures have been utilized as templates for studying heterogeneous nucleation of calcified minerals.[3]

The peptides may be triggered to generate self-supporting hydrogels at near neutral pH values relevant for various biological applications. The hydrogels may be tailored to efficiently deliver drugs and better mimic bone extracellular matrix.[4,5]

Functionality was also demonstrated in  $\beta$ -sheet monolayers which were designed to enhance adsorption of solutes towards biosensors applications.[6]

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3. Segman-Magidovich, S., Grisaru, H., Gitli, T., Levi-Kalishman, Y., Rapaport H. *Adv. Mater.* **2008** 20, 2156-2161.
4. Rapaport, H., Grisaru, H., Silberstein, T. *Adv. Funct. Mater.* **2008** 19, 2889-2896.
5. Zarzhitsky, S., Rapaport, H., *J. Colloid Int. Sci.* **2011**, 360, 525-531.
6. Yaakobi, K., Liebes-Peer, Y., Ariel Kushmaro, Rapaport, H., Langmuir **2013**, 29, 6840-6848.

**Ce séminaire sera suivi d'une pause-café**

Formalités d'entrée : accès libre dans l'amphi du Pavillon d'Accueil. Si la manifestation a lieu dans le Grand Amphi SOLEIL du Bâtiment Central, merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).

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