Experimental report

08/10/2016

Proposal: 8-04-706 **Council:** 10/2012

Title: Dynamics studies on OPN 1-149, an intrinsically disordered peptide

Research area: Biology

This proposal is a new proposal

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Samples: OPN IDP
OPN CPN

Instrument	Requested days	Allocated days	From	To
IN5	5	3	22/02/2013	25/02/2013
IN16	5	4	24/02/2013	28/02/2013

Abstract:

Osteopontin (OPN) is an intrinsically disordered polypeptide, which sequesters amorphous calcium phosphate forming a type of calcium phosphate nanoclusters, under the correct conditions. These not only play essential regulatory biological roles but also present numerous potential applications, e.g. in the control of mineralisation of prostheses and implants, in the production of stable artificial biofluids or high calcium beverages and foods and in the new technologies of tissue engineering. We propose to compare by neutron scattering the respective thermal dynamics of free OPN (1-149) and of the nanoclusters. The data will provide important information on the relative flexibility and forces stabilizing the two structures.

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We used neutron scattering to investigate 5'-adenosine monophosphate (AMP) molecules organized by ammonium sulfate crystals.

Structures were characterized by diffraction on D16, and corresponding dynamics measured as a function of hydration on IN13, IN16B and IN5 to cover a timescale in the pico to nanosecond range. Several experimental difficulties were encountered and data analysis and evaluation are still under way.