MS037.O02

Small-angle neutron scattering for the study of biomacromolecular complexes

Frank Richard Gabel[1]
[1]*Institut de Biologie Structurale, Grenoble, France*
E-mail: frank.gabel@ibs.fr

I will present an overview over recently published work on large and challenging multi-subunit complexes by a combination of small-angle neutron scattering (SANS), crystallography and NMR. The examples presented will include a 470 kDa hetero-dodecameric TET aminopeptidase complex [1] and a 400 kDa Box C/D complex which regulates the assembly and function of ribosomes by chemically modifying (methylating) rRNA [2].
In both cases SANS, in combination with deuteration, was essential to determine the three-dimensional structures of the complexes by defining the respective positions of the individual protein (and RNA) partners within the complexes and by providing complementary structural restraints with respect to other structural biology techniques (crystallography, NMR and EM).
Finally, I will present an example that illustrates the capacity of SANS, in combination with advanced sample environments, to obtain time-resolved information of a macromolecular unfolding machine (PAN) and its substrate (GFP), during the active process at sub-minute time-resolution [3].
[1] Appolaire, A. et al. (2014) Acta Crystallogr D Biol Crystallogr. 70(Pt 11), 2983-2993.
[2] Lapinaite, A. et al. (2013) Nature 502(7472), 519-523.
[3] Ibrahim, Z. et al. (2017) Sci. Rep. 7, 40948.
Keywords: Small-angle neutron scattering, deuteration, contrast variation