

New Possibilities for Structure Determination of Biomolecular Complexes

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New possibilities to analyse the structure of macromolecular complexes using small-angle scattering (SAS) of X-rays and neutrons are presented. SAS allows one to study the overall structure of native particles in solutions and to analyse structural changes in response to variations in external conditions. Recent progress in instrumentation and data analysis [1] significantly enhanced resolution and reliability of structural models provided by the technique and made SAXS a useful complementary tool to high resolution methods, especially powerful in the analysis of complex macromolecules. The latter mediate most of fundamental biological processes and the focus of modern structural biology is rapidly shifting towards their study.

Advanced approaches to analyze macromolecular complexes in solution using SAS will be presented including: *ab initio* low resolution structure analysis, rigid body refinement and addition of missing fragments to high resolution models, analysis of equilibrium mixtures and the use of contrast variation and specific deuteration in neutron SAS. Practical applications of the methods will be illustrated by recent examples.

[1] Svergun D. I., Koch M. H. J., *Rep. Progr. Phys.*, 2003, **66**, 1735.

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