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Protein deuteration extending structural characterisations by Small Angle Neutron Scattering with Contrast Variation

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Protein deuteration enables unique applications of neutron scattering to the life sciences, at both low and high resolutions. In recent years, the National Deuteration Facility at ANSTO have developed and published a robust and efficient method of recombinant protein deuteration.[1] Utilising this method enables us to routinely collaborate with life scientists by removing the difficulty of biomolecule deuteration from their needs for sample preparation to make best use of neutron scattering.

In this presentation I will highlight the essential role of protein deuteration in the structural characterization of previously poorly characterized "suppressor of copper sensitivity" proteins, as recently published.[2] Using this, and more recent work in progress, I will illustrate the value of small angle scattering as a complementary method to high resolution techniques so as to including disordered-to-ordered transitions that are frequently the basis for functional mechanisms in life and disease. Other applications of protein deuteration, for neutron reflectometry, neutron crystallography, and nuclear magnetic resonance, will be briefly explained.

References

[1] Robust high-yield methodologies for 2H and 2H/15N/13C labeling of proteins for structural investigations using neutron scattering and NMR
AP Duff, KL Wilde, A Rekas, V Lake, PJ Holden
Methods in enzymology (2015) 565, 3-25

[2] Disulfide isomerase activity of the dynamic, trimeric Proteus mirabilis ScsC protein is primed by the tandem immunoglobulin-fold domain of ScsB
EJ Furlong, HG Choudhury, F Kurth, AP Duff, AE Whitten, JL Martin
Journal of Biological Chemistry (2018) 293(16), 5793-5805

Speakers Gender

Male

Level of Expertise

Expert

Do you wish to take part in the poster slam

No

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