

DEMAX: The Deuteration and Macromolecular Crystallization Support labs for the European Spallation Source.

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For small angle neutron scattering (SANS), neutron reflectometry (NR), and neutron protein crystallography (NPX), using deuterated samples has numerous benefits. The molecules that are of most interest include proteins, lipids, fatty acids, small organic molecules, surfactants, and membranes. For SANS, NR deuteration is most commonly used to enable contrast variation, allowing scientist to selectively “match out” components of complexes. In NPX deuteration is used to boost weak signal-to-noise ratios, reduce the incoherent background due to hydrogen, improve neutron scattering length maps, and enable direct visualization of hydrogen bonds and solvent networks.

DEMAX is the ESS Deuteration and Macromolecular Crystallography support lab for chemistry, soft matter, and life science users of the European Spallation Source (ESS). DEMAX support will be available to all users of ESS instruments and includes chemical deuteration, biological deuteration, and large protein crystal growth.

We offer service for specific classes of deuterated inorganic or organic small molecules (e.g. pyruvate, trehalose, lactic acid), deuterated biomass/crude lipids/proteins, and access to our crystallization labs for large crystal growth. Access to DEMAX support is managed through a peer-reviewed, proposal-based system and is currently free of charge to user upon acceptance. For more details or information, researchers can contact us at [demax@ess.eu](mailto:demax@ess.eu).