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The Biological Deuteration Laboratory at Los Alamos. Benno Schoenborn, Tracy Ruscetti, Leighton Coates, Paul Langan, Biosciences Division, Los Alamos National Laboratory, NM.

A Biological Deuteration Laboratory has been established at Los Alamos Neutron Science Center (LANSCE), providing a service facility for users of the Protein Crystallography Station (PCS), who wish to deuterate or isotopically label biological macromolecules for neutron diffraction studies. The Biological Deuteration Laboratory and the PCS beam line are funded by the Office of Biological and Environmental Research of the U.S. Department of Energy.

Neutron diffraction is a powerful technique for locating hydrogen (H) atoms in biomacromolecules. However H atoms have a large incoherent scattering cross section that contributes to background scattering and noise and that reduces the intensity of neutron diffraction data. Replacing H atoms by their isotope deuterium (D) greatly reduces background and noise and enhances diffraction making smaller crystal sizes practicable (<1mm³) and increasing the quality and quantity of diffraction data. The co-development of a Biological Deuteration Laboratory for efficient molecular labeling allows users to make best use of the PCS. Deuteration services are free to users and are allocated through a peer review process. This poster describes the facility, some results from our user program, and provides information about access requirements.

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