

M001 Synchrotron Radiation Circular Dichroism (SRCD) spectroscopy – a new method for examining protein conformation and protein interactions

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Circular Dichroism (CD) spectroscopy is a well-established technique in structural biology. Synchrotron Radiation Circular Dichroism (SRCD) extends the utility and applications of conventional CD spectroscopy (using lab-based instruments) because the high flux of the synchrotron enables collection of data at lower wavelengths (resulting in higher information content), detection of spectra with higher signal-to-noise levels, and measurements in the presence of absorbing components (buffers, salts, lipids, and detergents). SRCD spectroscopy can provide important static and dynamic structural information on proteins in solution, including protein stability, secondary structures of intact proteins and domain constructs, the differences between wildtype and mutant and modified proteins, the identification of natively disordered regions in proteins, the examination of carbohydrate components of glycoproteins, and the processes of protein folding and membrane insertion and the kinetics of enzyme reactions. **It can also be used to effectively study protein interactions, including protein:protein complex formation involving either induced fit or rigid body mechanisms, as well as protein:lipid interactions in membranes and conformational changes associated with protein:ligand and protein:drug binding.** Thus this newly developing method has the potential for playing an important role in new types of studies of protein conformations and their complexes.

(Supported by grants from the BBSRC)