14) PSU Nuclear Magnetic Resonance (NMR) facility

Equipment and Research Support Services

Rooms # 06 - 15, Chemistry Building

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The Penn State Nuclear Magnetic Resonance (NMR) facility provides cutting-edge NMR services to support research, education, and training across all PSU campuses and the surrounding Central Pennsylvania community. The facility currently houses ten high resolution NMR spectrometers with a range of capabilities: high-sensitivity cryoprobes for structural and dynamics studies of proteins, nucleic acids and their complexes, high-throughput sample changer (Bruker SampleXpress) for metabolomics and screening for drug discovery, solid state probes for biomolecules and materials, micro-imaging and diffusion. The magnetic fields range from 7 Tesla (300 MHz 1H frequency) to 20 Tesla (850 MHz 1H frequency). The NMR staff scientists are available to facilitate data acquisition and enable applications of advanced NMR experiments. The facility operates on an open access mode, 24/7. The following services are available through the facility: 1) instrument training, NMR data acquisition, processing and interpretation, 2) characterization of small molecules in a complex mixtures (metabolomics) from biofluids, cells, organs and tissues, 3) determination of atomic resolution three dimensional structures of important biological macromolecules in solution, 4) investigation of molecular motions from picoseconds to seconds and beyond that are important for understanding their functions, 5) unravel the underlying mechanism of biological function from molecular to atomic level, 6) characterization of protein-protein, protein-DNA and protein-small molecule interactions, 7) discovery and development of new and improved drugs, 8) characterization of newly synthesized small-molecules and isolated natural products, 9) characterization of solid samples by multidimensional and multinuclear NMR (29Si, 27Al, 31P, 13C, 11B, 2H, 1H, etc.), and 10) characterization of soft samples (cellulose, cells lysates, tissues, etc.).