세미나 초록

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발표 주제	Dynamic Nuclear Polarization: Sensitivity Boost for Magnetic Resonance Spectroscopy and Imaging
발표 내용	One of the most crucial analytical tools for studying chemistry and biology is magnetic resonance (MR) research. It offers comprehensive details on molecular interactions in addition to the structures of macromolecules and small compounds. Due to the weakZeeman splitting of the nuclear spin energy states, which causes MR's intrinsic low sensitivity, extended signal averaging times or high spin concentrations are frequently needed. Many techniques have been investigated to raise MR's sensitivity. Specifically, hyperpolarization of the nuclear spins can yield substantial signal increases. In comparison to thermal polarization, the MR signals of hyperpolarized samples are amplified by several orders of magnitude. Dynamic Nuclear Polarization (DNP) is a flexible method that may be used to polarize a wide range of nuclei at low temperatures in the solid state. After a dissolving stage, the method produces a liquid sample that is hyperpolarized. In a variety of scientific domains, including metabolic imaging and enzyme catalysis, extensive information has been obtained thanks to the ensuing signal augmentation. By examining protein-ligand interactions, real-time kinetic and mechanistic research for chemical reactions, and metabolic imaging for early-stage cancer detection, this lecture seeks to expand the applicability of DNP into new fields of chemistry and biology.