Chemistry of Contrast Media

Small Molecules

Hyperpolarized MR Probes

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Learning Objectives:

- Understand the physical process of hyperpolarization
- Understand timescales for HP experiments
- Be able to design a basic molecular imaging experiment based on the available substrates
- Be able to differentiate between the effects of flux and pool size

Dissolution dynamic nuclear polarization (DNP) has demonstrated the ability to identify disease and aberrant metabolic function in a variety of *ex vivo* and *in vivo* systems. The technology provides the highest MR sensitivity when operating at the lowest achievable temperatures and higher magnetic field strengths (3.35 -7 T). The enhanced sensitivity provided by DNP allows the tremendous chemical selectivity of 13C MR to observe multiple steps in a reaction pathway. Taken together these factors produce a powerful molecular imaging modality.

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