

Biomolecular Nuclear Magnetic Resonance Spectroscopy

BASIC CONCEPTS OF NMR

- **How does NMR work?**
- **Resonance assignment**
- **Structural parameters**

**Reading: Chapter 22 in *Protein and Peptide Drug Analysis*
“Solution Structure Determination of Proteins by NMR”**

Nuclear Spin

- Nuclear spin angular momentum is a quantized property of the nucleus in each atom
- The nuclear spin angular momentum of each atom is represented by a nuclear spin quantum number (I)
- All nuclei with even mass numbers have $I=0,1,2\dots$
- All nuclei with odd mass numbers have $I=1/2,3/2\dots$
- NMR is possible with all nuclei except $I=0$ (e.g. ^{12}C), but $I=1/2$ has simplest spin physics

Biomolecular NMR → primarily ^1H , ^{13}C , ^{15}N (^{31}P)

Spin 1/2 Nuclei in a Magnetic Field

