

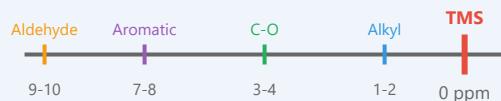
# NMR Fundamentals

## Nuclear Spin in Magnetic Field



$^1\text{H}$ ,  $^{13}\text{C}$ ,  $^{15}\text{N}$ ,  $^{31}\text{P}$  nuclei have spin  $1/2$

### Chemical Shift ( $\delta$ )



Electronic environment. ppm scale.

### J-coupling



Spin-spin splitting. Connectivity information.

### 2D NMR



→ Structure determination

### Biomolecular NMR



Solution state  
Dynamics info