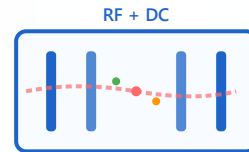


## Mass Spectrometry Basics



### Ion Generation

ESI / MALDI



### Mass Analysis

$m/z$  Separation



### Detection

Signal Processing

### Resolution & Accuracy



- High resolution: distinguish similar masses
- Mass accuracy: parts per million (ppm)
- Critical for peptide identification

### Scan Modes



- Full scan: entire mass range
- Selected ion monitoring (SIM)
- Data-dependent acquisition (DDA)

### Sensitivity



- Femtomole to attomole detection
- Dynamic range: 3-5 orders of magnitude
- Low abundance protein detection

### Applications



- Protein identification
- Quantification
- PTM analysis