

## Ionization Methods



### ESI (Electrospray)

Soft ionization technique for biomolecules

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- Multiple charging states
- Direct coupling with LC
- Ideal for peptides and proteins



### MALDI

Matrix-assisted laser desorption

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- Crystallized with matrix
- Pulsed laser ionization
- High-throughput screening



### Nano-ESI

Enhanced sensitivity ESI variant

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- Ultra-low flow rates (nL/min)
- 10-100× more sensitive
- Limited sample volumes



### APCI

Atmospheric pressure chemical ionization

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- Small molecule focus
- Less polar compounds
- Complementary to ESI

## Method Selection

Choose based on: analyte properties, sample complexity, throughput requirements, and sensitivity needs