Instrumental presentation

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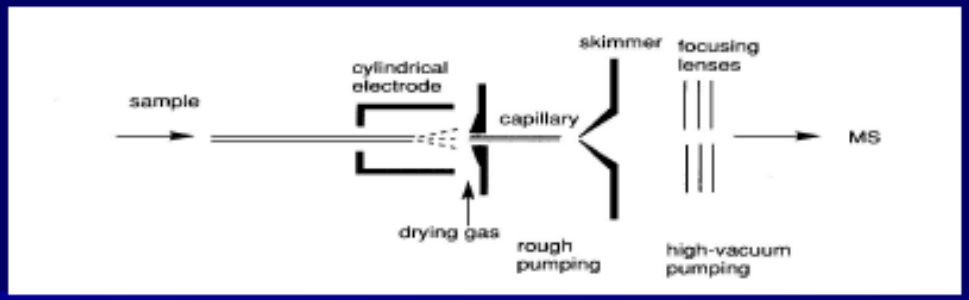
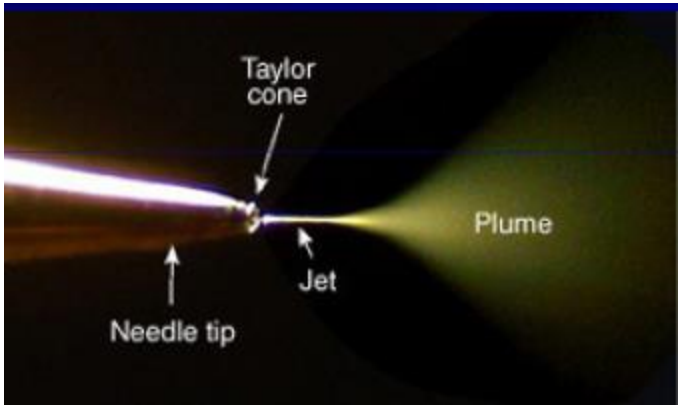
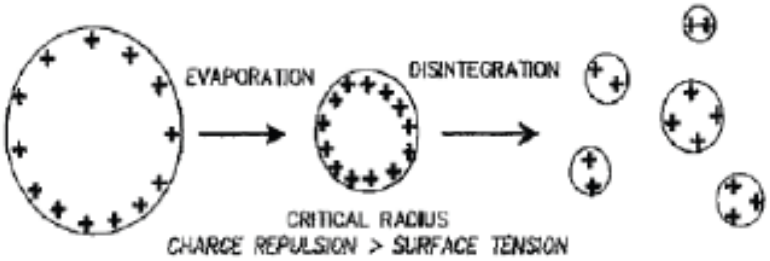
Electrospray Wings for Molecular Elephants



- Electrospray is produced by applying a strong electric field to a liquid passing through a capillary tube with a weak flux.
- Desolvation by gas flow (N_2) or gentle capillary heating (100-300 deg C).
- Ions are mostly preformed in solution before desorption.
- It is good for both small and large molecules.
- Produces mostly multiply protonated ions.
- Very low energy transfer process.

Looking inside Electrospray

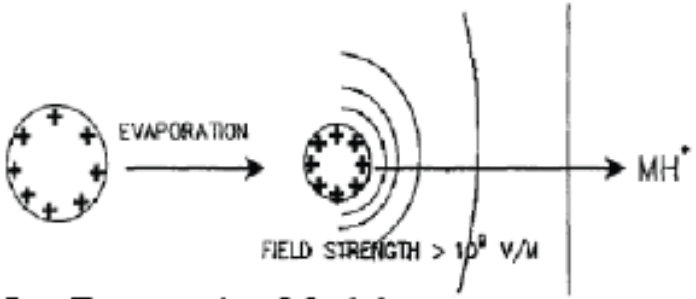




Charged Residue Model (CRM) proposed by Dole

The CRM suggests that electrospray droplets undergo evaporation and fission cycles, eventually leading progeny droplets that contain on average one analyte ion or less

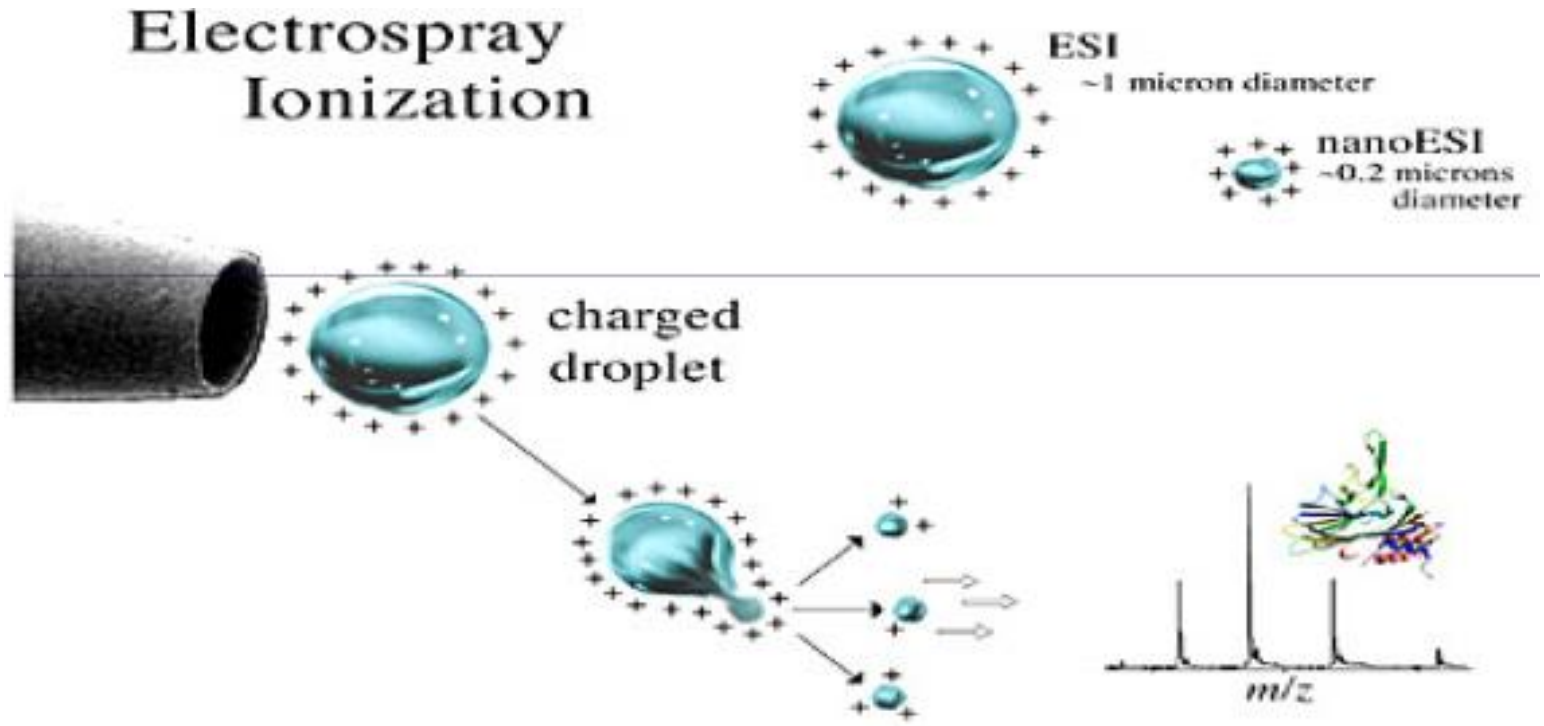
Both are currently accepted.



Ion Evaporation Model (IEM) proposed by Iribarne and Thompson.

The IEM suggests that as the droplet reaches a certain radius the field strength at the surface of the droplet becomes large enough to assist the field desorption of solvated ions

Ion Desolvation in ESI



Why is ESI so popular?

1. Proteins can be ionized without denaturization: non covalent, receptor-ligand complexes remain intact
2. Working directly from a dilute soln: 0.001-10mM, very good for catalyst systems (active species is found under such conditions)
3. Any polar solvent (H_2O, ACN, THF etc) suitable
4. Flow rates of nano to ul per min: direct sampling possible


Thank You!