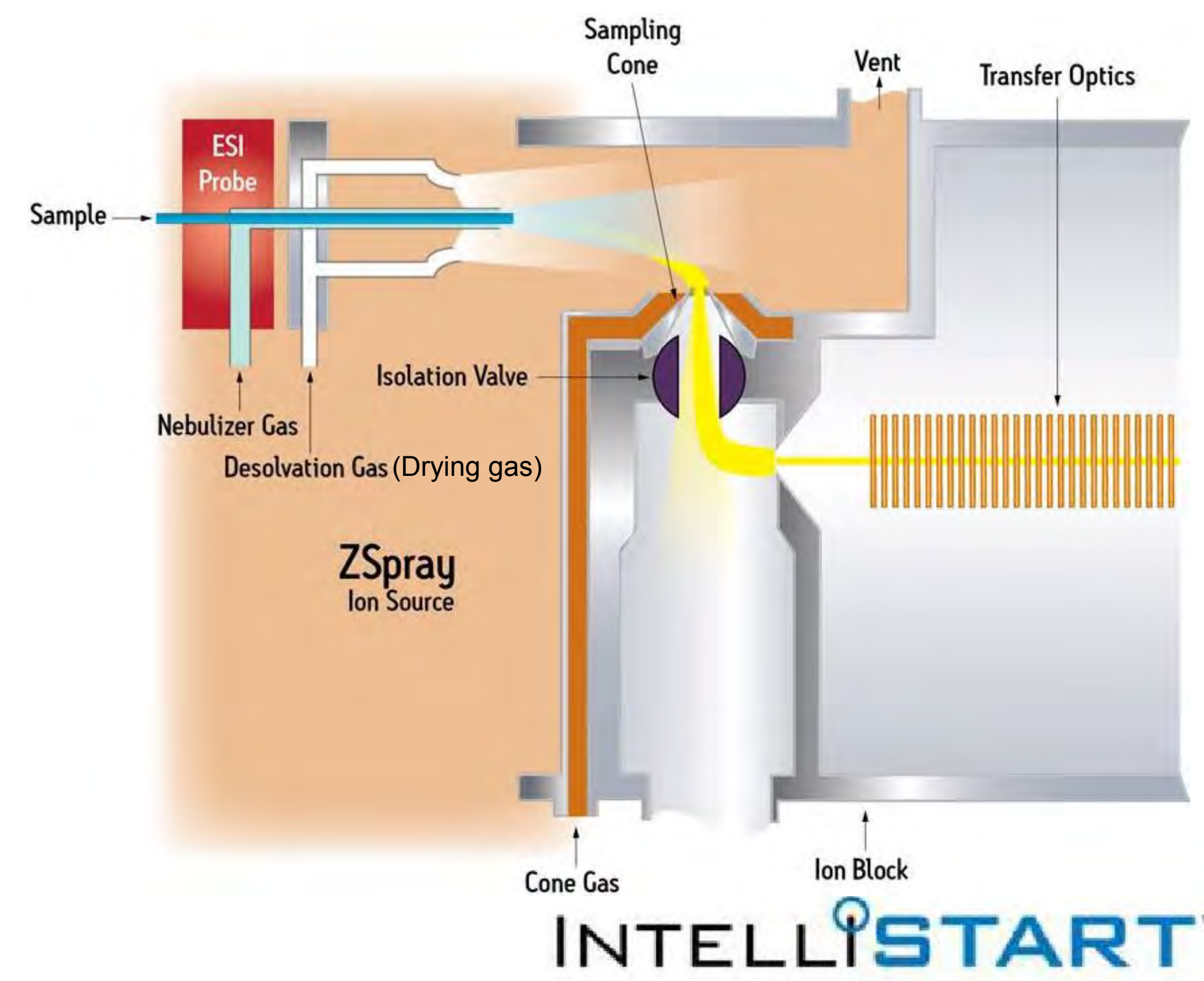


# Waters Xevo G2-xs Quadrupole Time-of-Flight (Q-TOF MS)

## University of Alabama Mass Spectrometry Facility



**ESI Source**

**Capillary:** 2-4 kV

**Sample Cone:** 25-100 V

**Source Offset:** 25-100 V

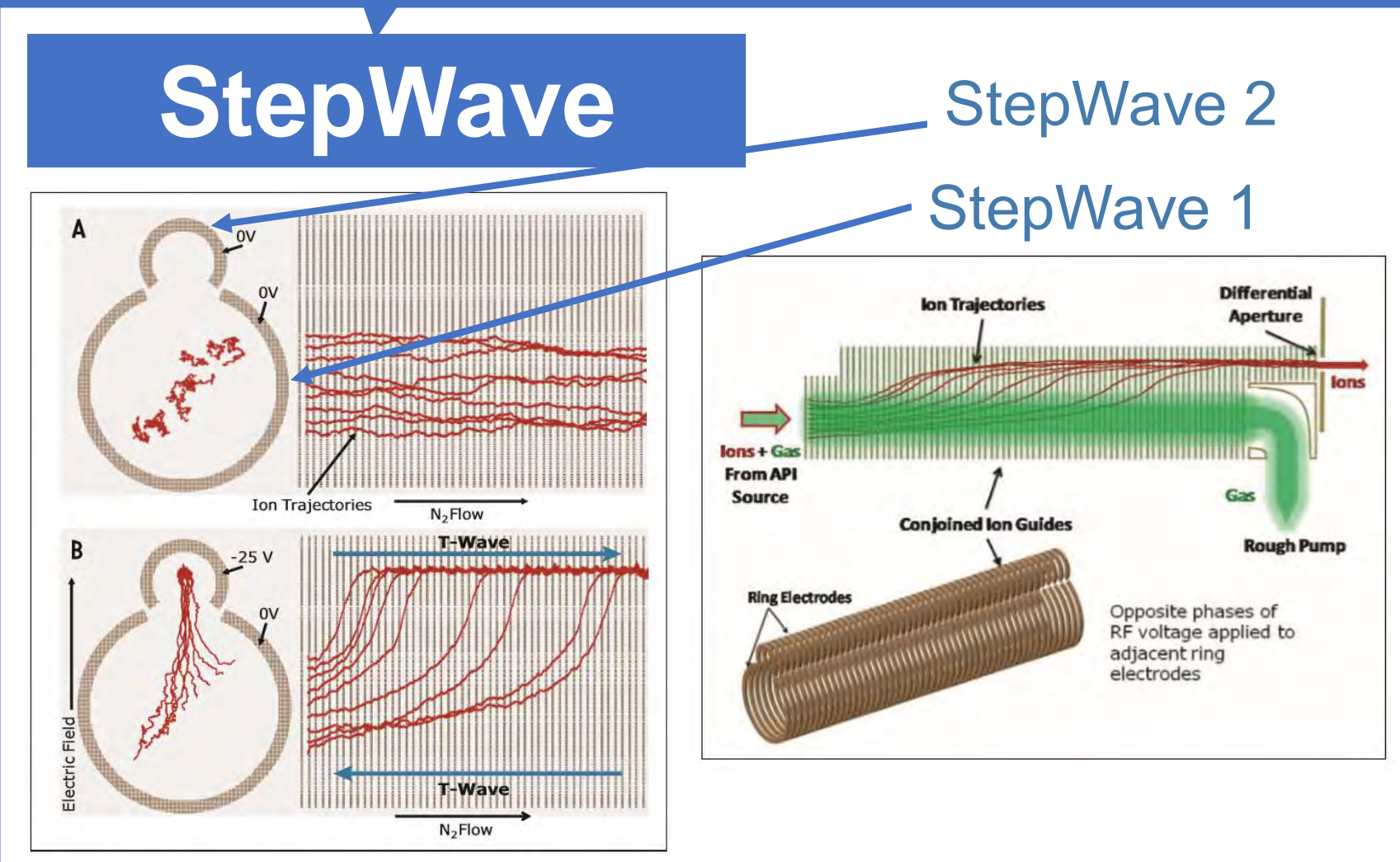
**Source temperature:** for the source block, 60-120°C

**Desolvation gas :** 300-1000 L/hr

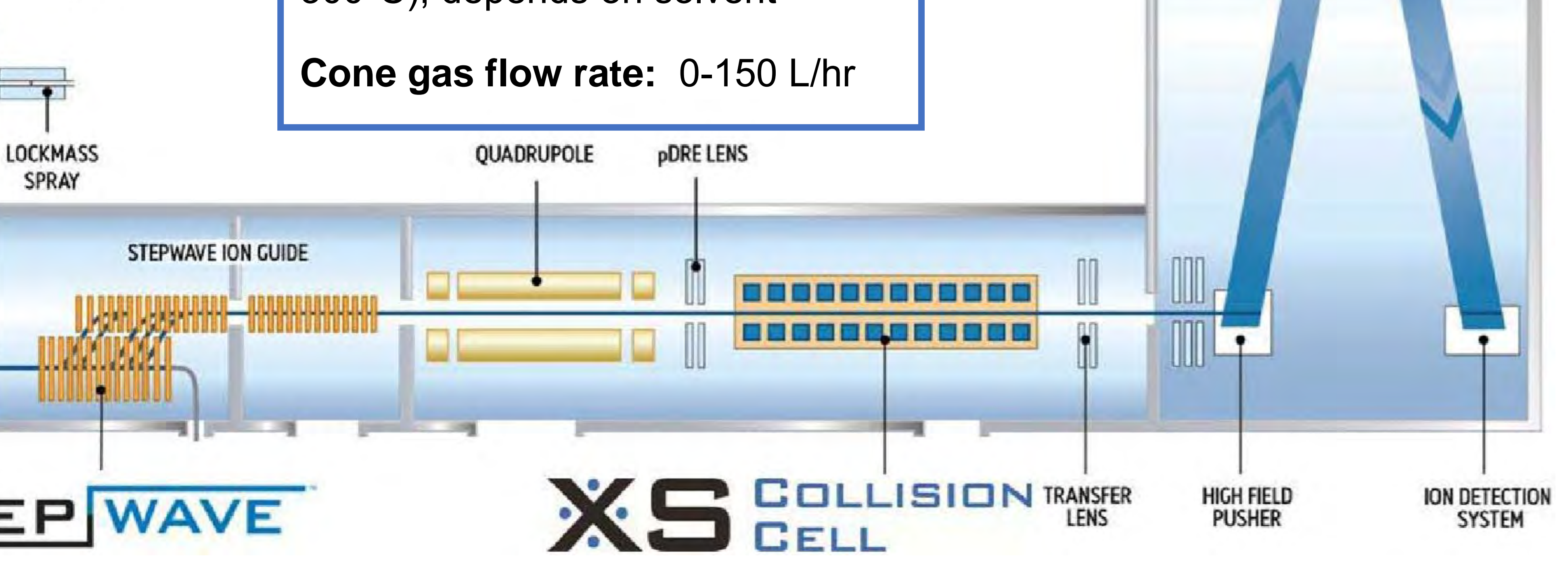
**Desolvation gas temperature:** 150-650°C (typically 150-300°C), depends on solvent

**Cone gas flow rate:** 0-150 L/hr

- **RF setting**  
StepWave: 300 V  
Ion guide: 350 V
- **StepWave 2 offset:** 25 V



- Analytes enter the large diameter ion guide
- Ions enter the upper ion guide (by using differential voltage); neutrals and solvents are directed to the pump inlet



**Quadrupole**

LM Resolution	4.7 (4k quad) 12 (32k quad)	Sets the width of the quad transmission window in Quad and TOF MS/MS modes.
HM Resolution	15	Sets the width of the quad transmission window in Quad and TOF MS/MS modes. Leave set to 15.
Pre-Filter	2	The DC voltage applied to the pre and post filters of the quad. Set to 2V (DO NOT TUNE).
Ion Energy	0.2	The offset voltage applied to the quadrupole.

- Serves as ion guide in the single MS mode
- Served as mass filter in the tandem MS mode (precursor ion selection)

- Collision cell**
- Collision energy: 20-30 eV (collision energy is tuned by adjusting the voltage of focusing lenses, which accelerates ions into the collision cell)
  - Collision gas: argon
  - Pressure up to 10<sup>-4</sup> torr in CID
  - Collision RF values: RF offset is 150 for small molecules, and 400 for proteomics

**Quadrupole theory**

- 4 hyperbolic or cylindrical rods with the combination of dc (U) and rf voltages (V) applied on the rods
- Motion of ion in quadrupole fields:  
 $a_x = 8zeU/mr^2\omega^2$   
 $q_x = 4zeV/mr^2\omega^2$
- A constant a/q ratio will generate a scan line. Scanning this line (U, V varied) allows ions of differing m/z through the Q

Unstable Region, m/z 28, m/z 69, Stable oscillation, m/z 219, Unstable Region, Scan Line Const. DC/RF

**Quad profiles**

% T, 0.8x, Set Mass, x, ~4x, m/z

The Q will transmit over the region of ~4 times the set mass

**oa-TOF**

Detector, Pusher, Reflectron, t<sub>1</sub>, t<sub>2</sub>, t<sub>3</sub>, t<sub>0</sub>, m/z

Ions are accelerated orthogonally (90°) by the pusher voltage

- Pusher: 1900 V
- Reflector grid: 1700 V
- Puller: 1400V
- Reflector: 1400V
- Data is acquired at speeds of up to 30,000 spectra per second
- Individual spectra are summed and a composite spectrum is recorded as raw data

m/z, 30kHz, Σ