

# Bruker rapifleX Matrix-Assisted Laser Desorption Ionization Tandem Time-of-Flight Mass Spectrometer (MALDI/TOF-TOF MS)

## University of Alabama Mass Spectrometry Facility

### Second TOF

- Mass analyzer
- Linear detector swings inline for linear mode
- ~300 cm length
- Gridless reflector with a double stage design, ~21 kV

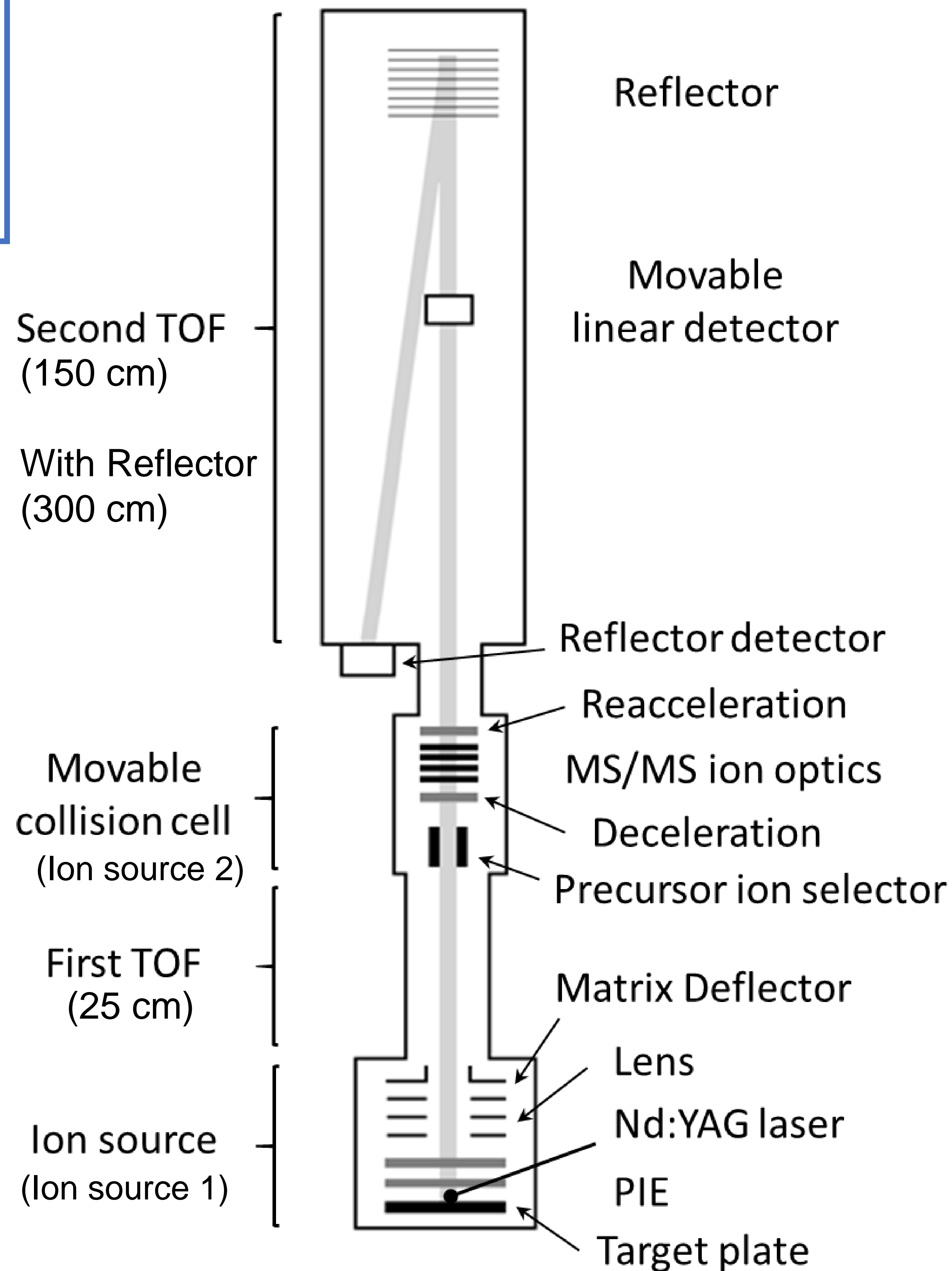
### Collision Cell

- Swings inline for tandem MS (TOF-TOF) mode
- Argon collision gas used for high energy CID
- Voltage settings  
Deacceleration: ~2.6 kV  
Reacceleration: ~18 kV

### First TOF

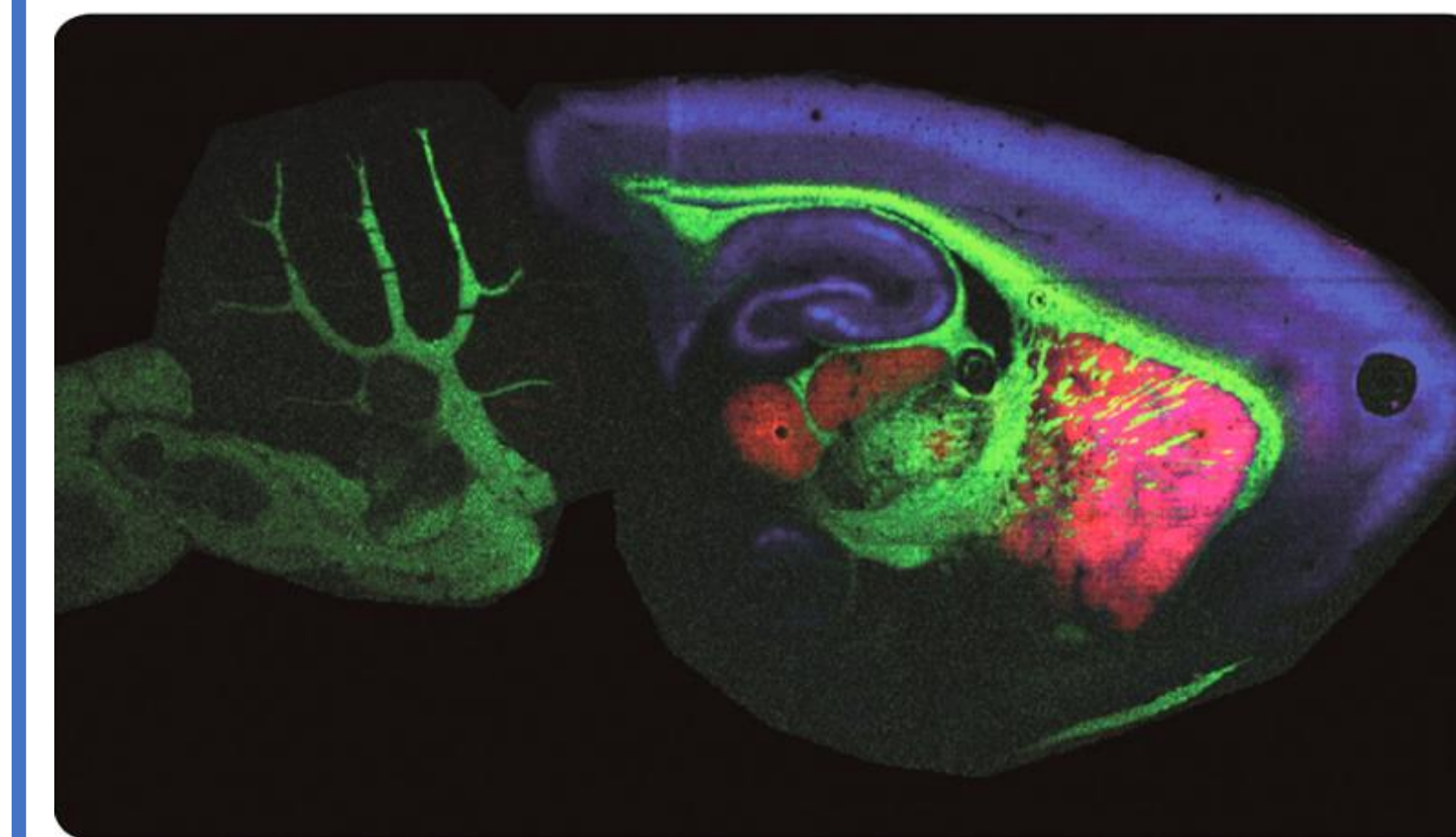
- For precursor ion selection in CID
- 25 cm length

### Instrument Diagram (not to scale)



### Applications

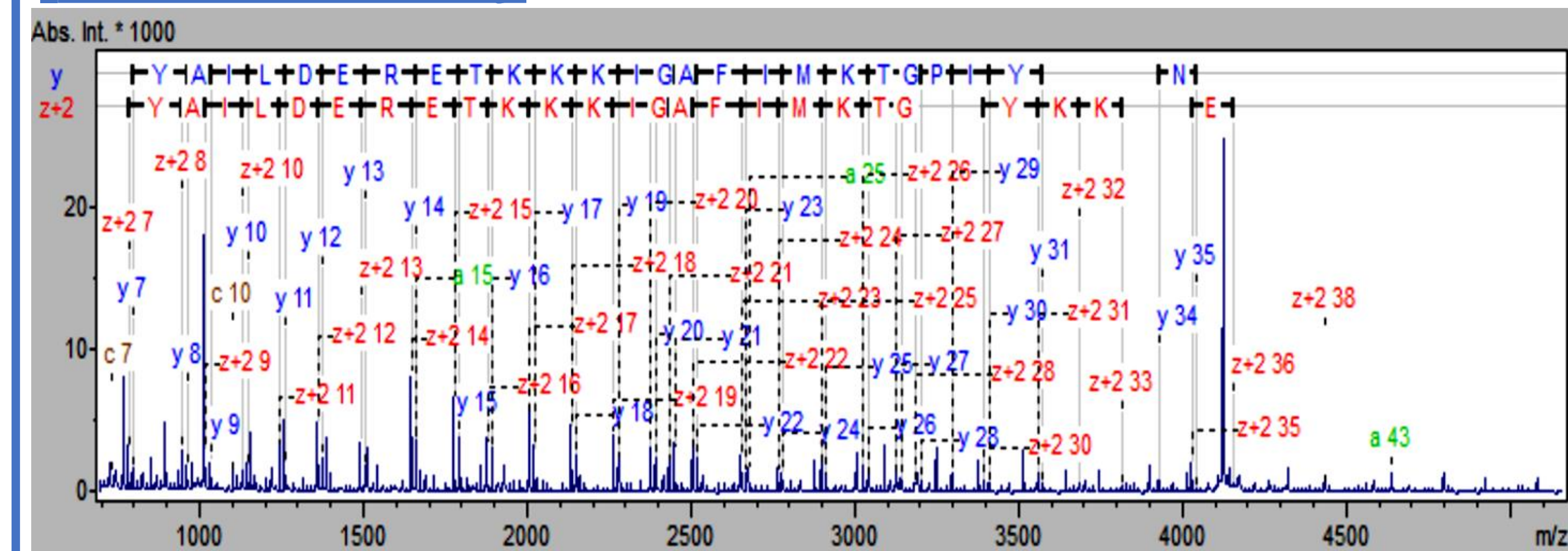
#### MALDI Imaging



- **Imaging Pixel Shape:** Squared pixel with variable pixel size of 10  $\mu\text{m}$  to 100  $\mu\text{m}$
- **Imaging Speed:** Up to 50 pixel/sec

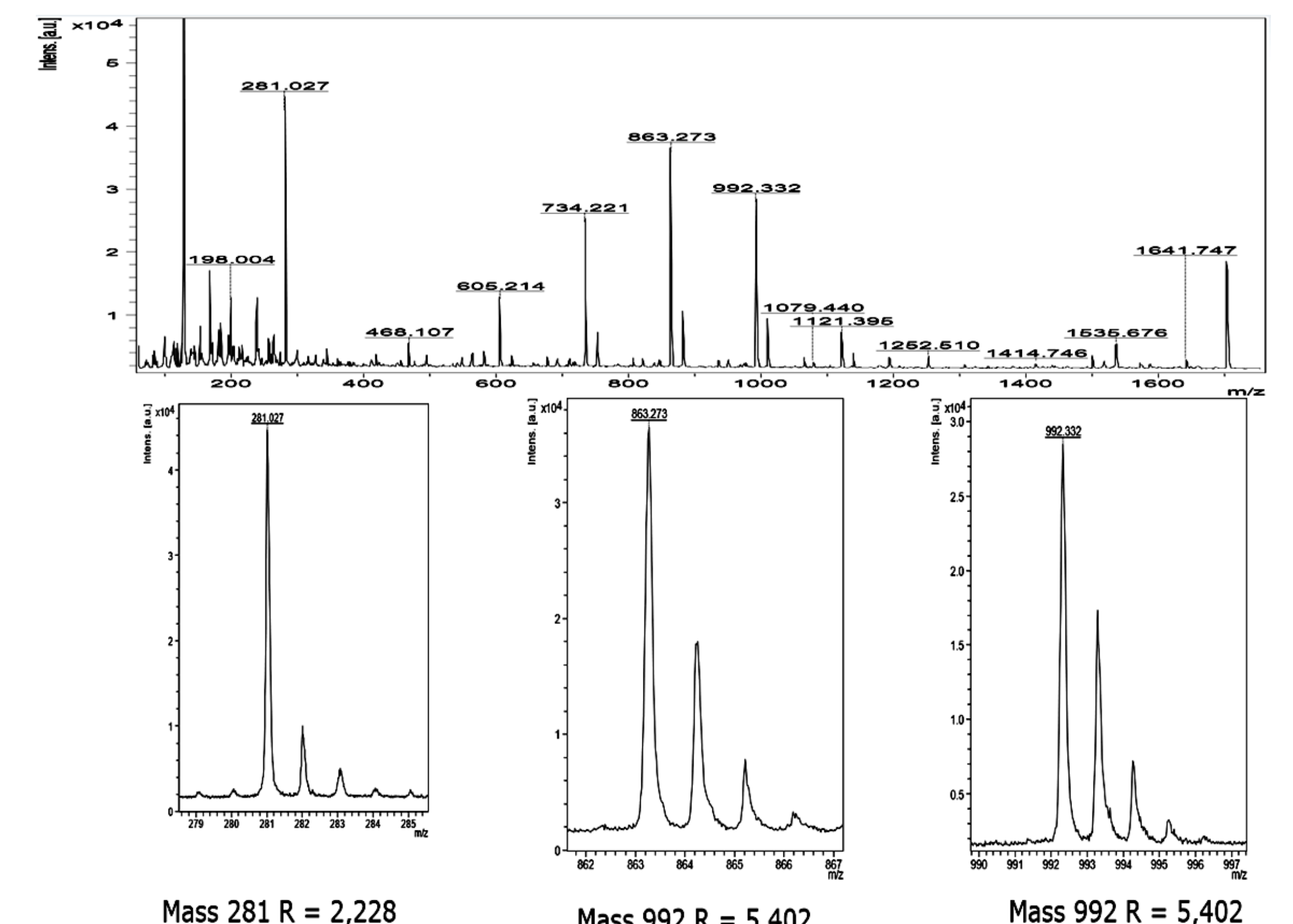
Protein in sagittal rat brain section measured at 30  $\mu\text{m}$  pixel size

#### In-Source Decay



In-source decay on cytochrome c, 12.6 kDa

#### High Energy Collision-Induced Dissociation (CID)



Gastrin I (1-14) human negative mode CID MS/MS using HCCA matrix, product ion resolution up to 5K

### Ion Source

#### Smartbeam 3D laser:

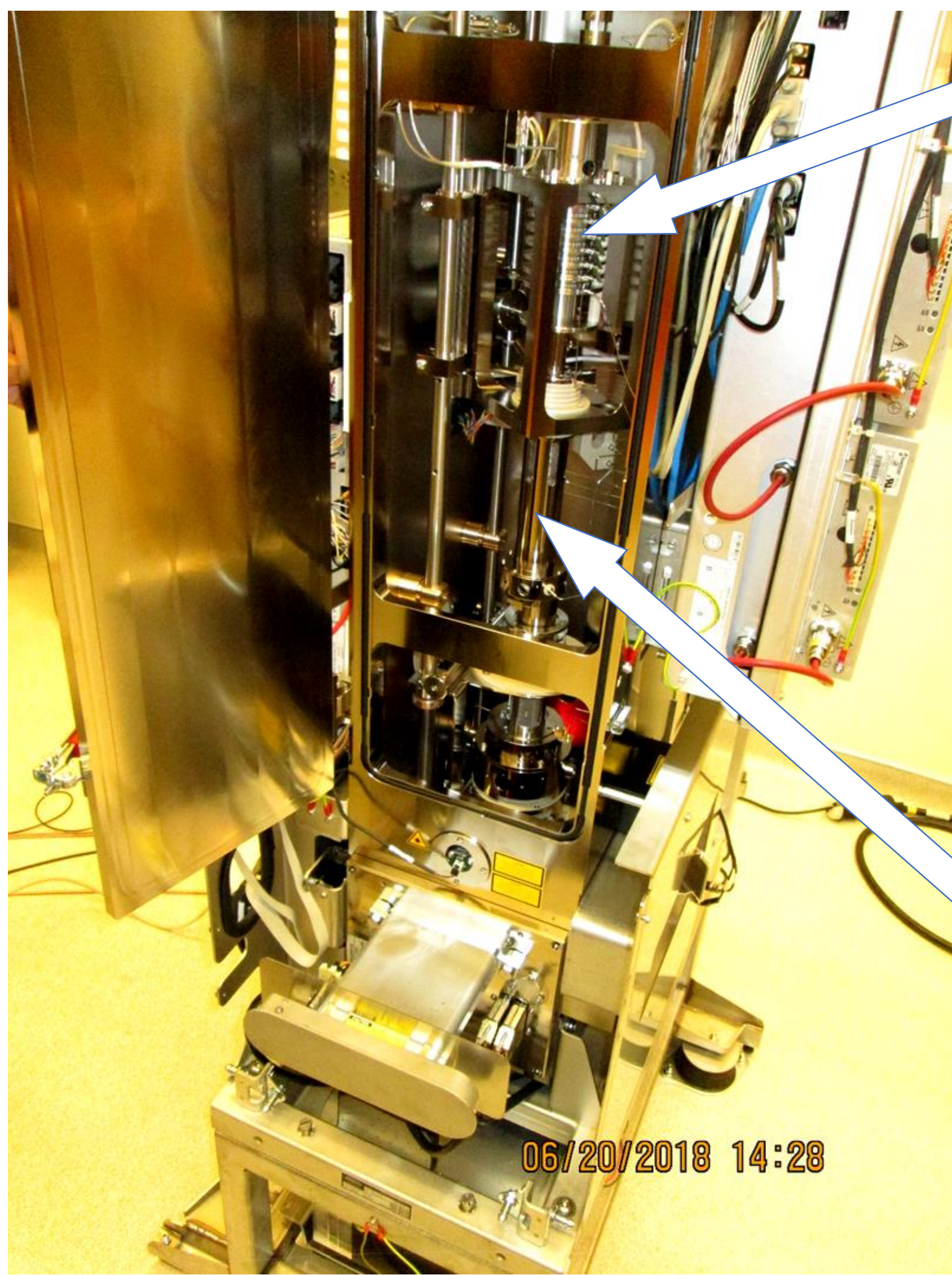
- Repetition rate up to 10 kHz
- 5  $\mu\text{m}$  laser beam diameter
- 355 nm Nd:YAG laser,  $\geq 100 \mu\text{J/pulse}$

**Pulsed Ion Extraction (PIE):** ~2.6 kV

**Target plate:** ~20 kV

**Matrix deflector:** ~11 kV

**Lens:** ~11 kV



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