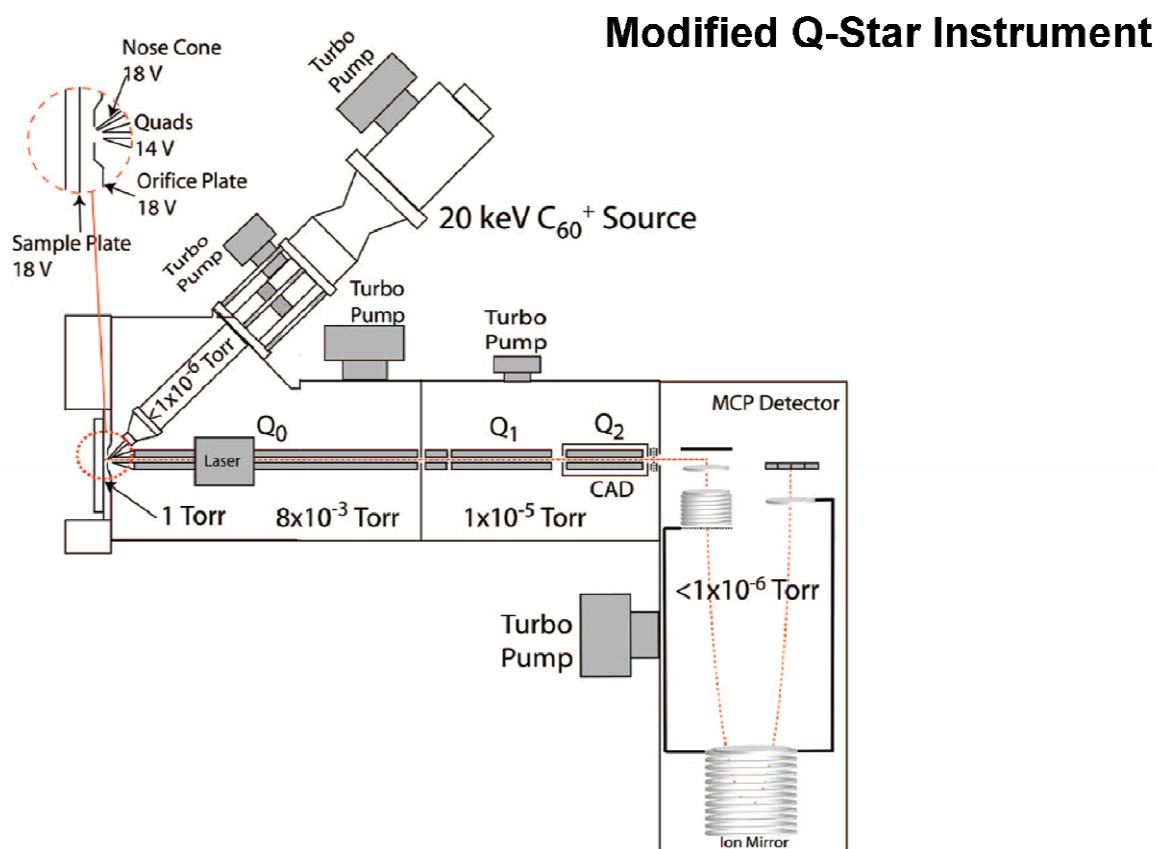


Cellular Imaging with Secondary Ion Mass Spectrometry

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Schematics of the modified Q-Star and the J105 instrument



Schematic diagram of the modified QSTAR XL hybrid QqTOF mass spectrometer. Note the differential pumping column surrounding the C₆₀ source and the conical needle needed to inject ions within 3 mm of the sample surface (see text for details). Primary beam currents reaching the sample plate varied between several picoamperes and 100 pA depending upon the nose cone aperture size. The secondary ions are transported via quadrupole rods Q0, mass selection is possible using Q1, and collision induced dissociation at impact energies up to 200 eV occurs in the differentially pumped collision cell, Q2. For a small preselected mass range, ion storage is possible in Q2 before pulsing a section of the continuous beam into the orthogonal TOF ion mirror.

From; A. Carado, M. K. Passarelli, J. Kozole, J. E. Wingate, N. Winograd, A. V. Loboda, *Anal. Chem.*, 2008, **80** (21), 7921

J105

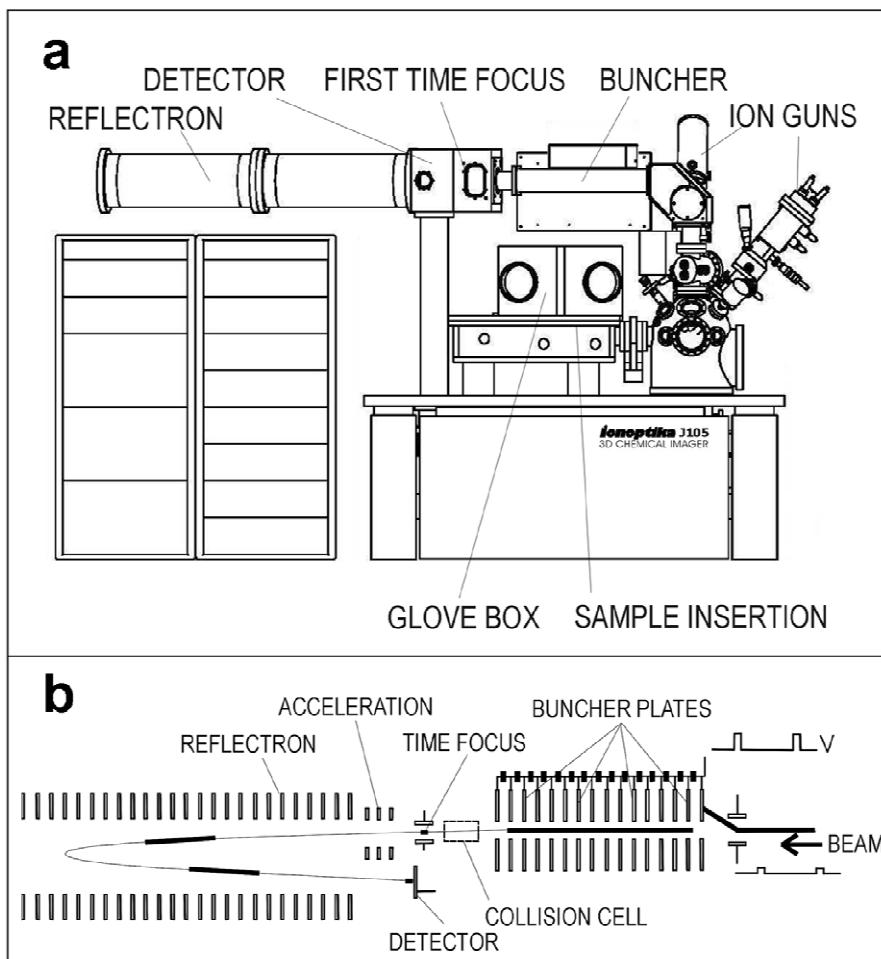


Illustration of the Ionoptika J105 3D Chemical Imager (a). Sample insertion can be performed under an inert atmosphere using the glove box to prevent frosting of frozen hydrated samples. Schematic of the mass spectrometry showing the coupling of the buncher to the harmonic reflectron (b). A section (~0.3 m) of the continuous secondary ion stream is bunched to a time focus and accelerated into the reflectron. The collision cell for dissociation during MS/MS experiments is also labelled.

From: J. S. Fletcher, S. Rabbani, A. Henderson, P. Blenkinsopp, S. P. Thompson, N. P. Lockyer, J. C. Vickerman, *Anal. Chem.*, 2008, **80**, 9058