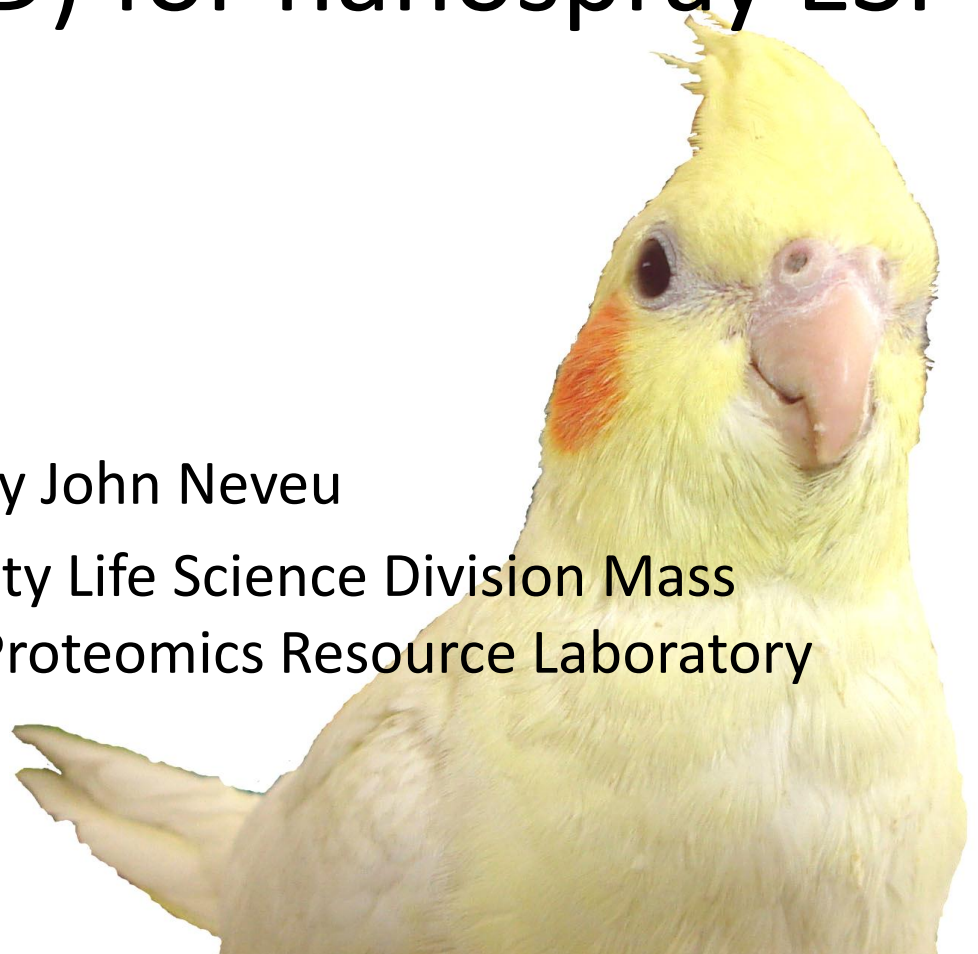


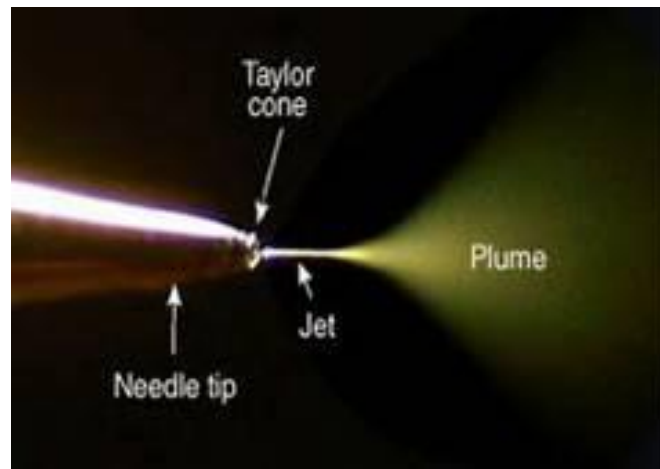
A Background Ion Reduction Device (ABIRD) for nanospray ESI

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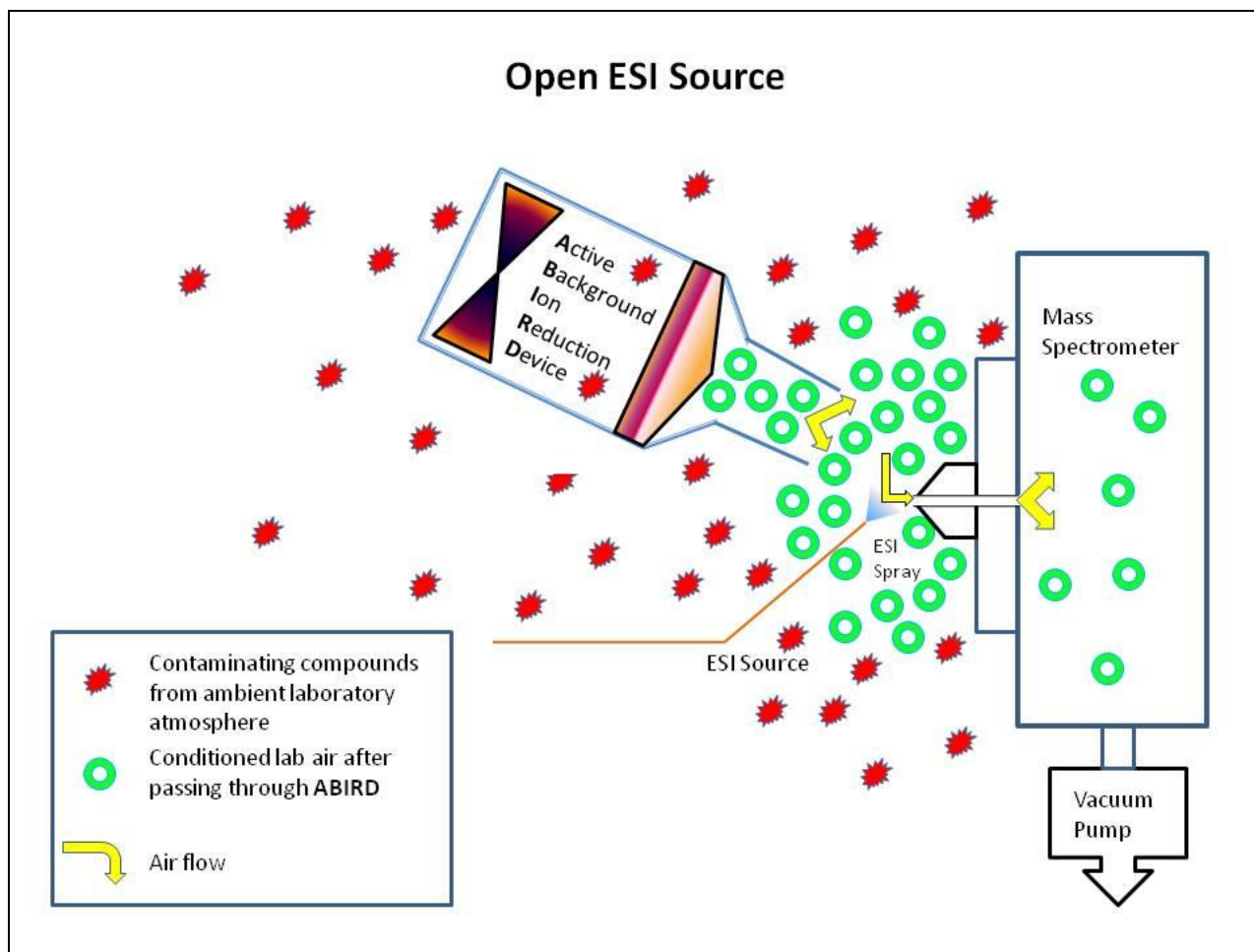


Nanospray ESI (n-ESI) is a common technique for interfacing capillary chromatography systems with a mass spectrometer.

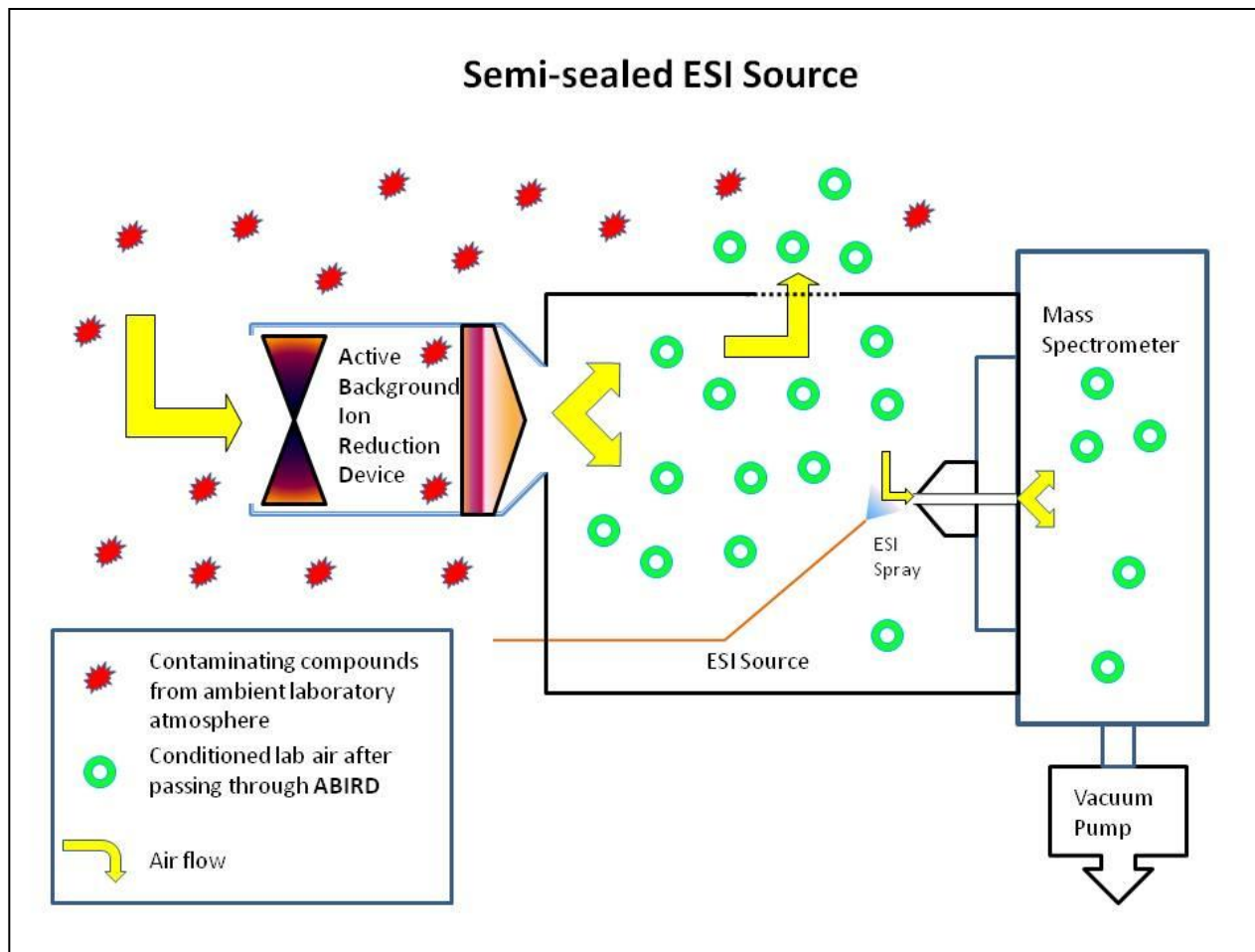


n-ESI is typically done without supplied gas, leaving the background ion signal subject to variable ambient laboratory air conditions.

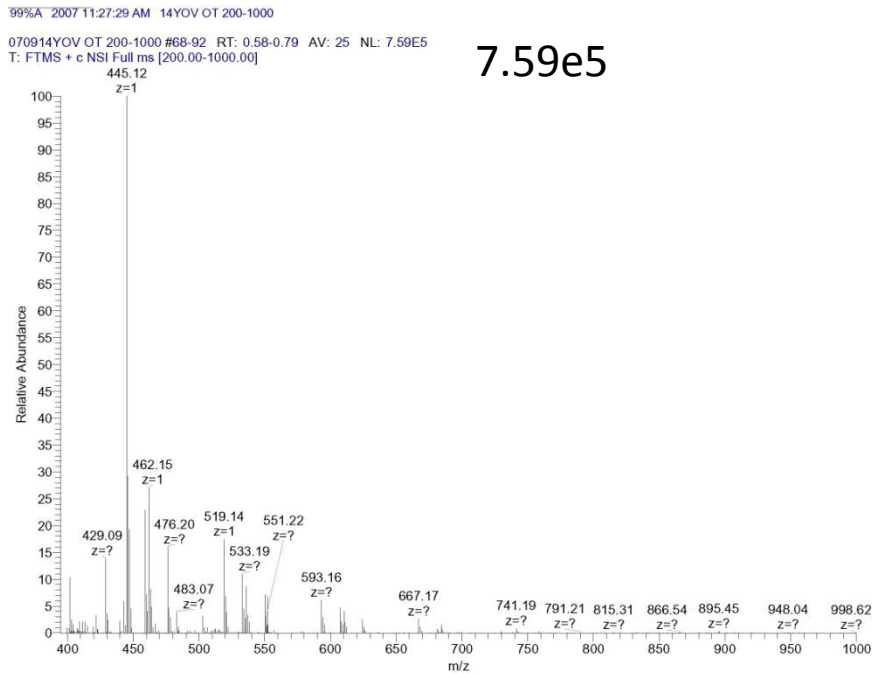
ABIRD works by treating the ambient lab air, which is then directed to the n-ESI spray formation zone in an open source.



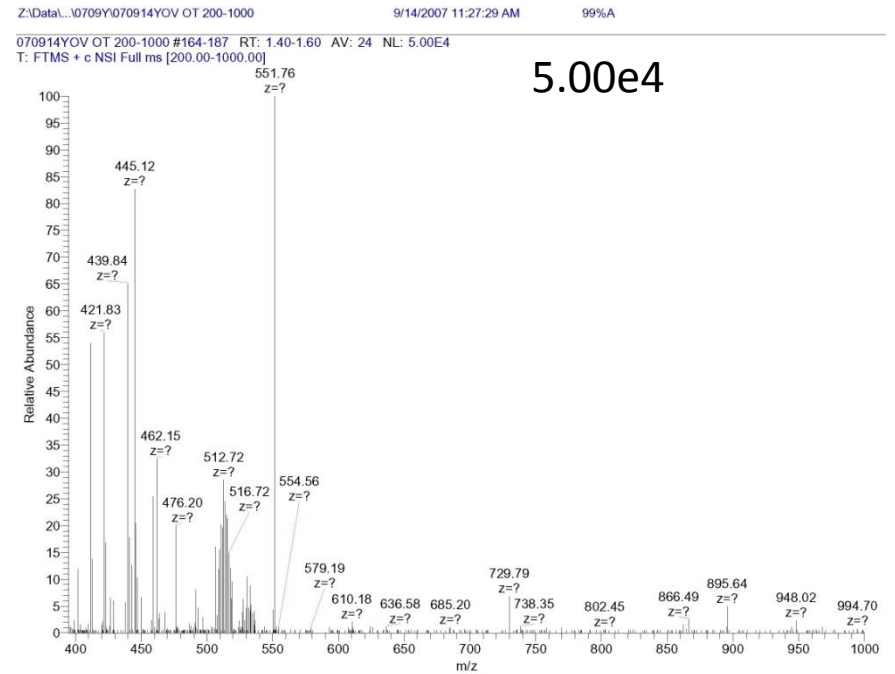
ABIRD also works by treating the ambient lab air which then displaces untreated air in a semi closed source.



ABIRD on an Orbitrap shows greater than a 10x reduction in background ions when operating.

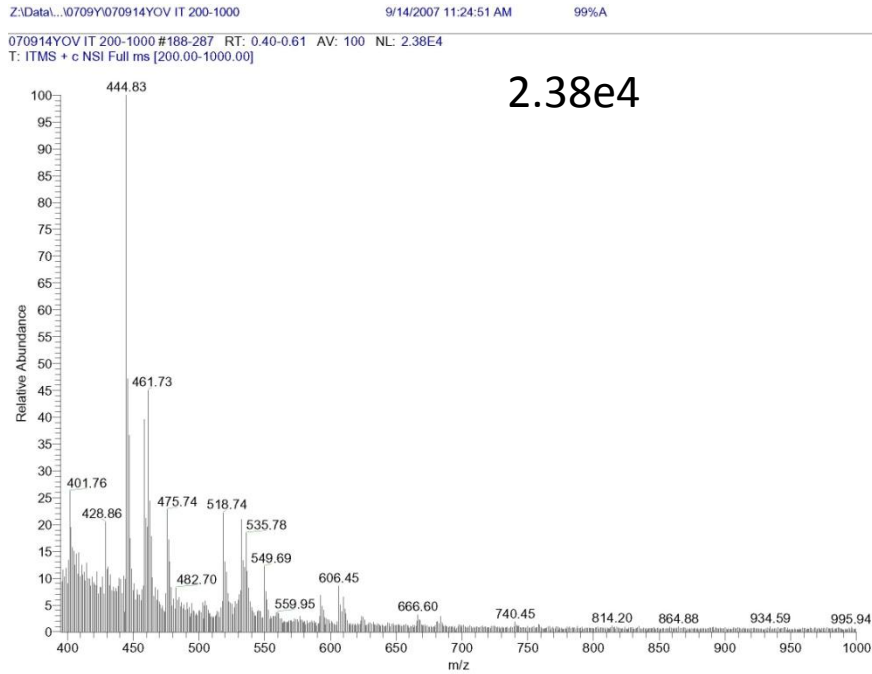


Typical Orbitrap full MS no ABIRD

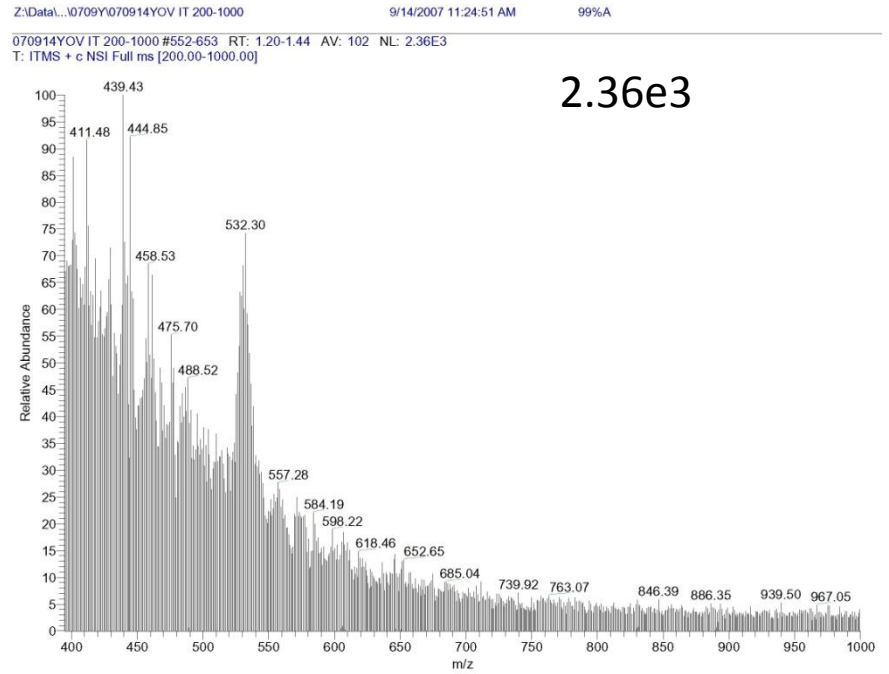


Typical Orbitrap full MS with ABIRD.

ABIRD installed on an LTQ shows 10x reduction in background ion signal.

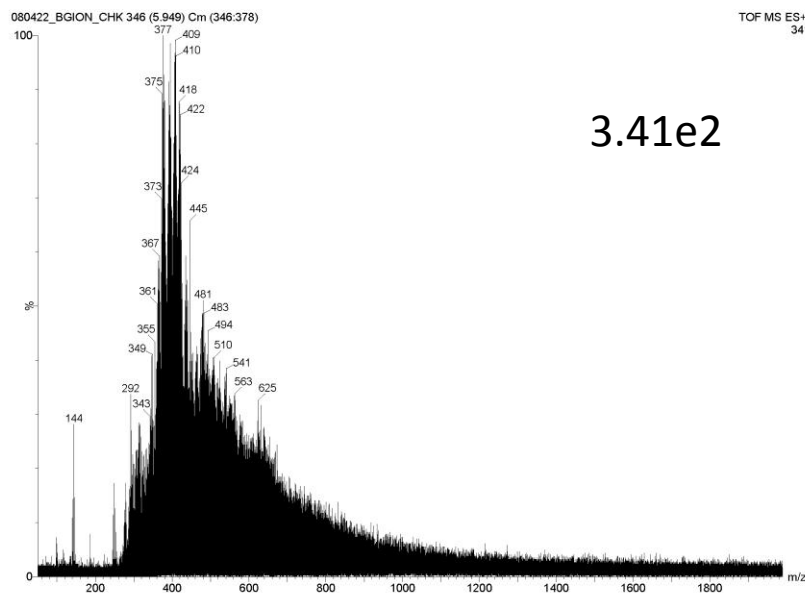
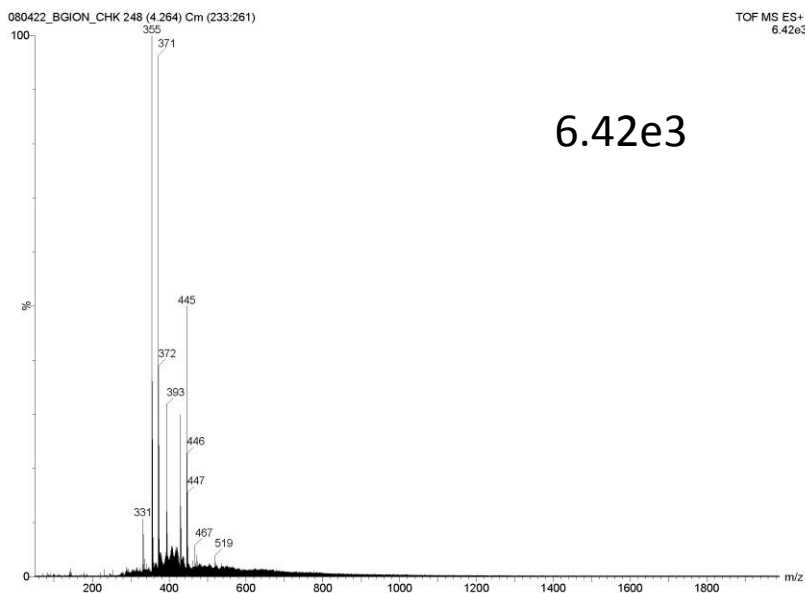


Typical LTQ full MS no ABIRD



Typical LTQ full MS with ABIRD.

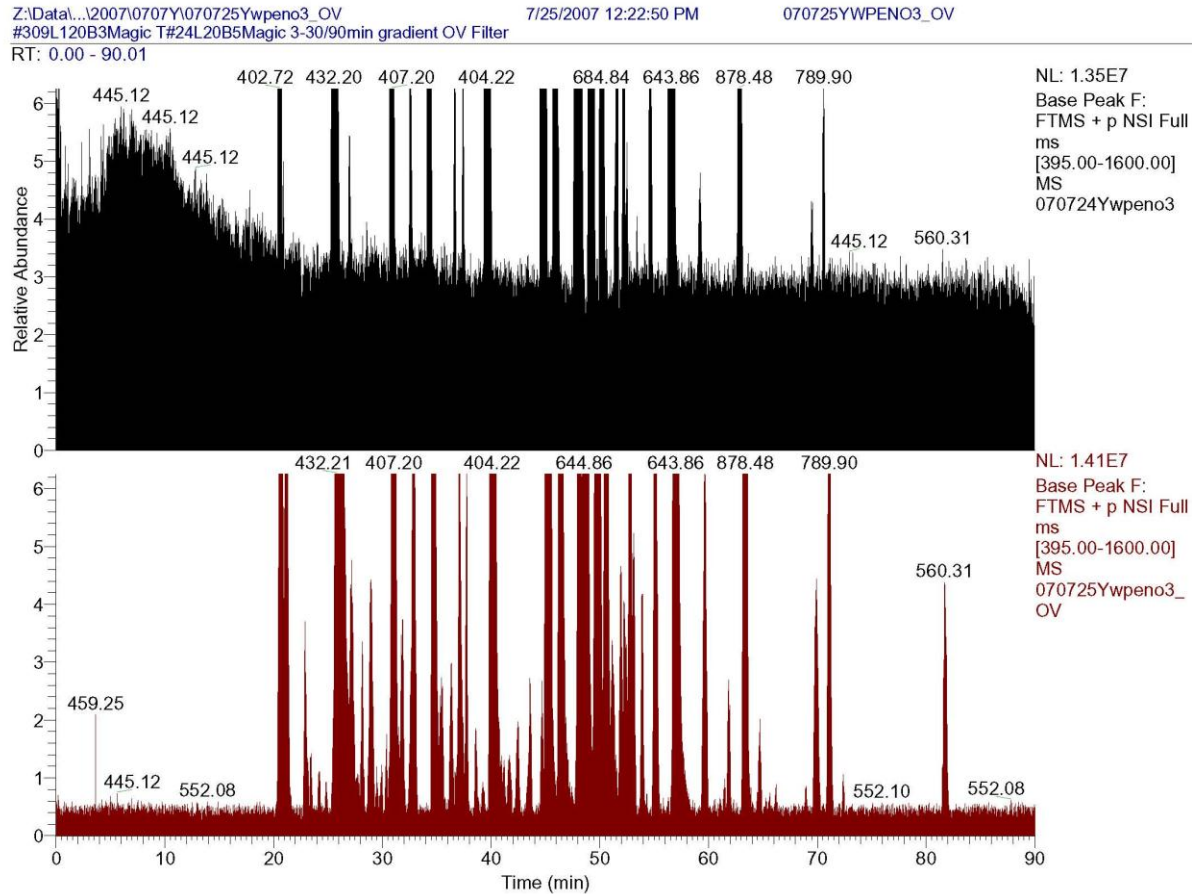
ABRID has been demonstrated on the Q-TOF Premier.
Note expanded mass range 50-2000Da.
~20x reduction in background ion signal



Typical full MS on Q-TOF Premier no ABIRD

Full MS on Q-TOF Premier with ABIRD

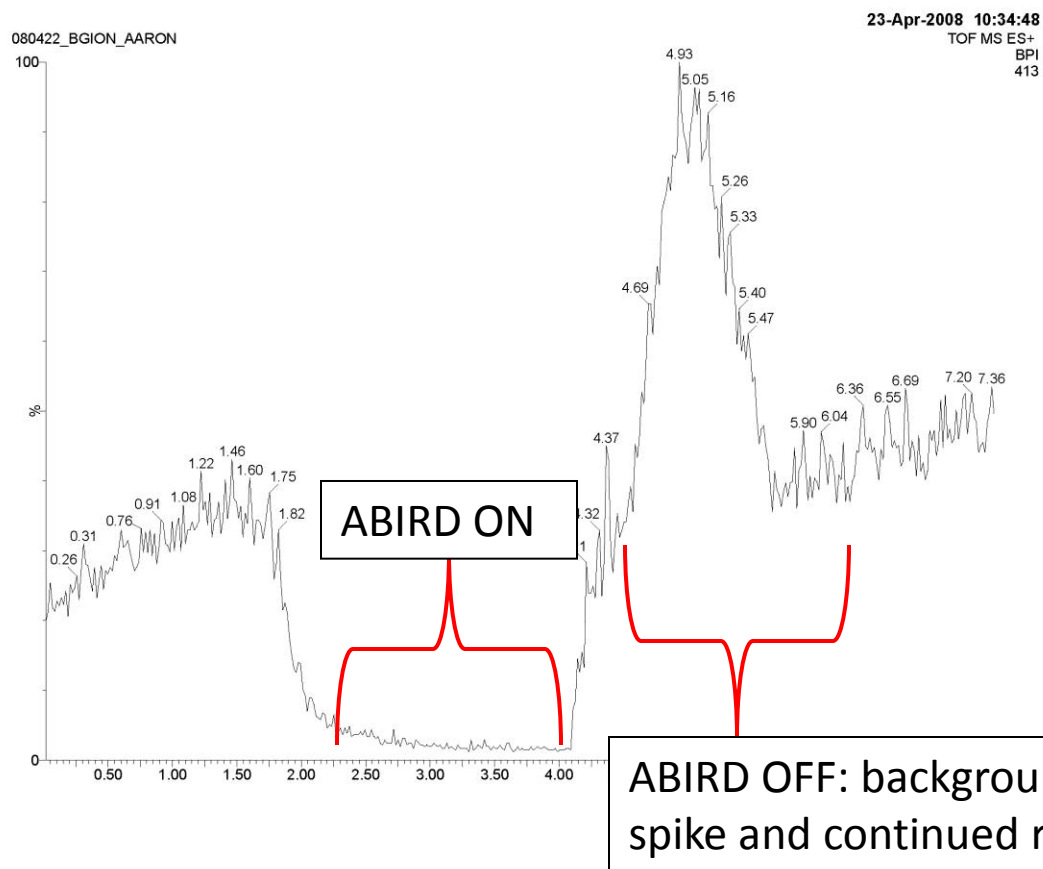
ABIRD significantly improves signal to noise and signal stability across a chromatographic run.



No ABIRD

With ABIRD

ABIRD isolates the mass spectrometer from transient sources of background ions in the lab.



Current prototype images:
Front view of ABIRD device. Approved by mascot, Purdy.

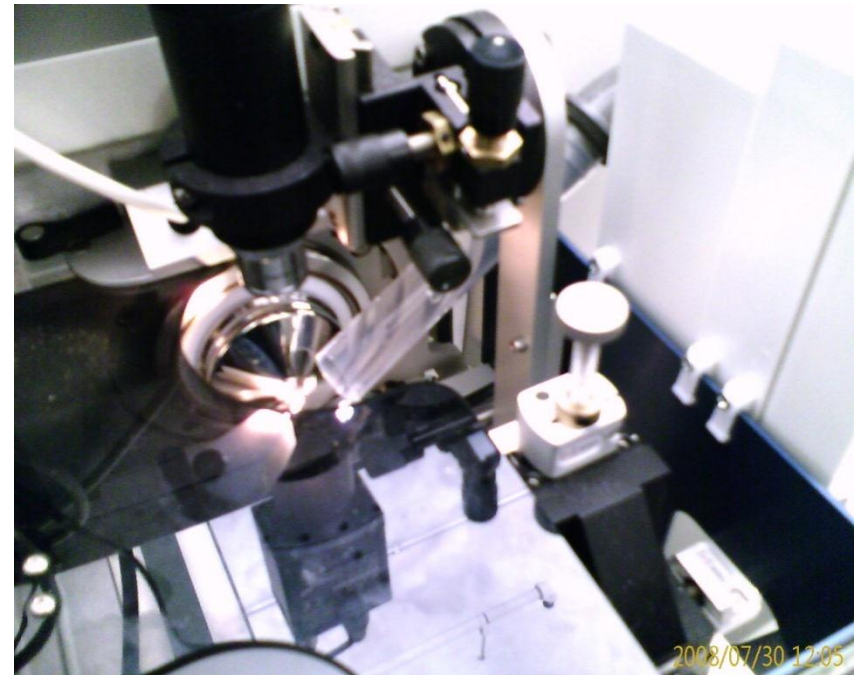


Rear and side views:

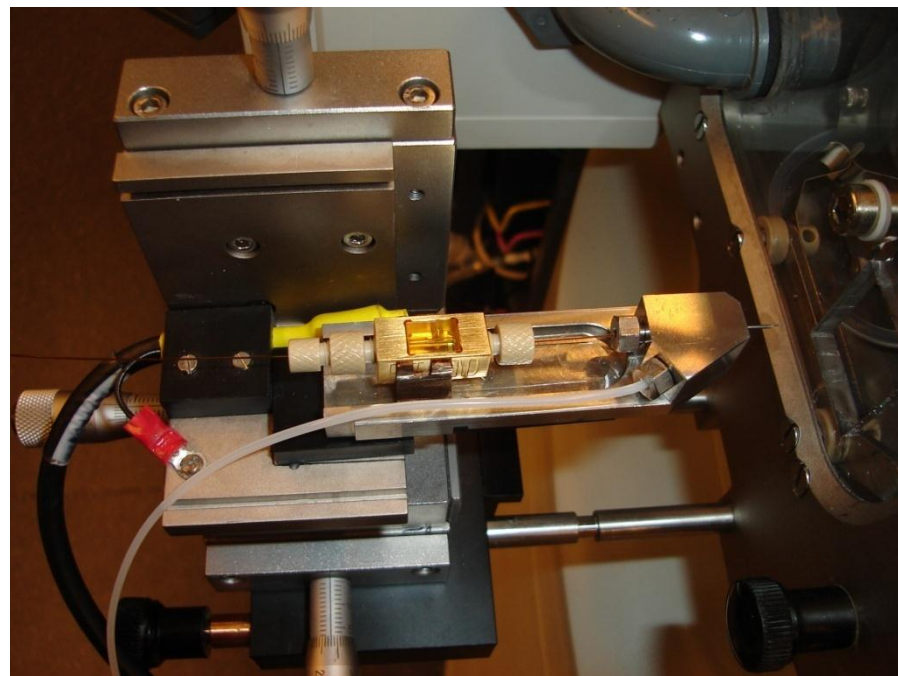


Features include Teflon FEP interface to source, lightweight plastic housing, power switch, fan speed control. Designed to use inexpensive disposable cartridge filters which are available in a variety of chemistries.

ABIRD device in place on LTQ-Orbitrap with a New Objective Picoview source:



ABIRD device in place on Q-TOF Premier with OEM nanospray source.



Note the simple, clean installation which leaves room for column compartment and does not interfere with access to nanospray assembly. (Yes, that is a prototype PicoClear Conductive union at the column and needle interface. Get one if you can and you'll never use anything else...)

Summary:

- ABIRD imparts a controlled low level background ion signal to nanoESI mass spectrometers across a wide mass range.
- ABIRD protects the instrument from ambient spikes in laboratory air quality.
- ABIRD works with either an open or semi-sealed ESI source.
- ABIRD uses inexpensive disposable cartridge filters.
- ABIRD is adaptable to many common ESI sources.