

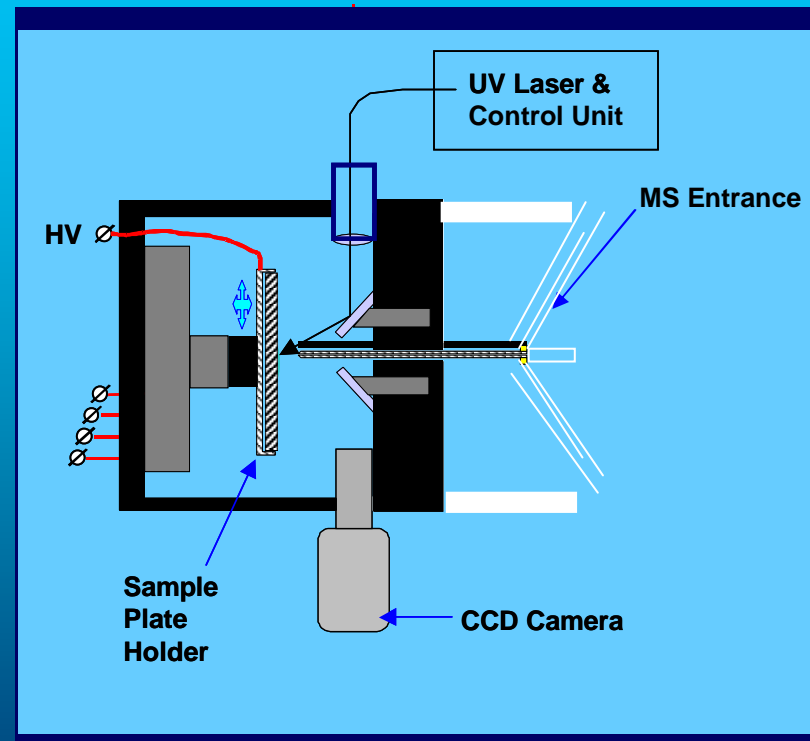
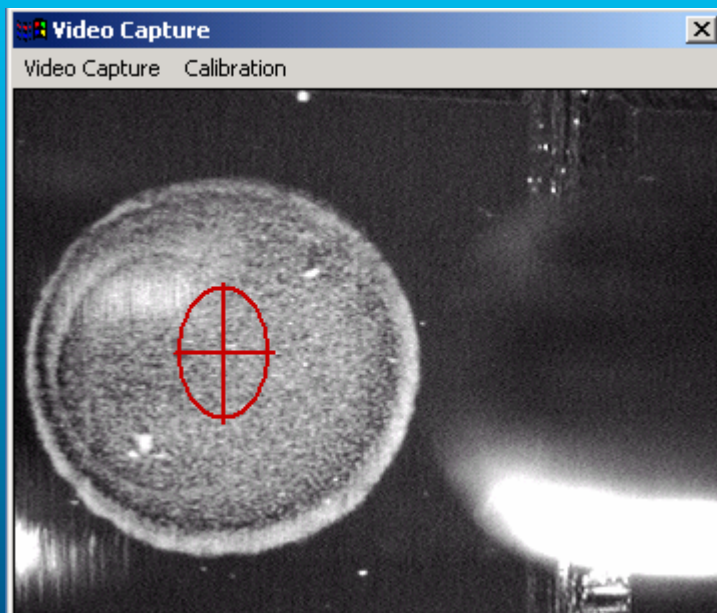
**Atmospheric-Pressure  
MALDI  
On  
Agilent Mass Spectrometers**

## Advantages of MALDI at atmospheric pressure

- Change between MALDI and ESI in 5 minutes
- Load and run new samples in seconds - no waiting for pump-down
- Accurate mass MSMS and MS<sup>n</sup> capability
- As sensitive as vacuum MALDI

# AP/MALDI Technology

On-screen sample imaging



# First-Generation AP-MALDI on Agilent MSD (2001)



# AP-MALDI PDF+ (2006) on Agilent Q-Tof

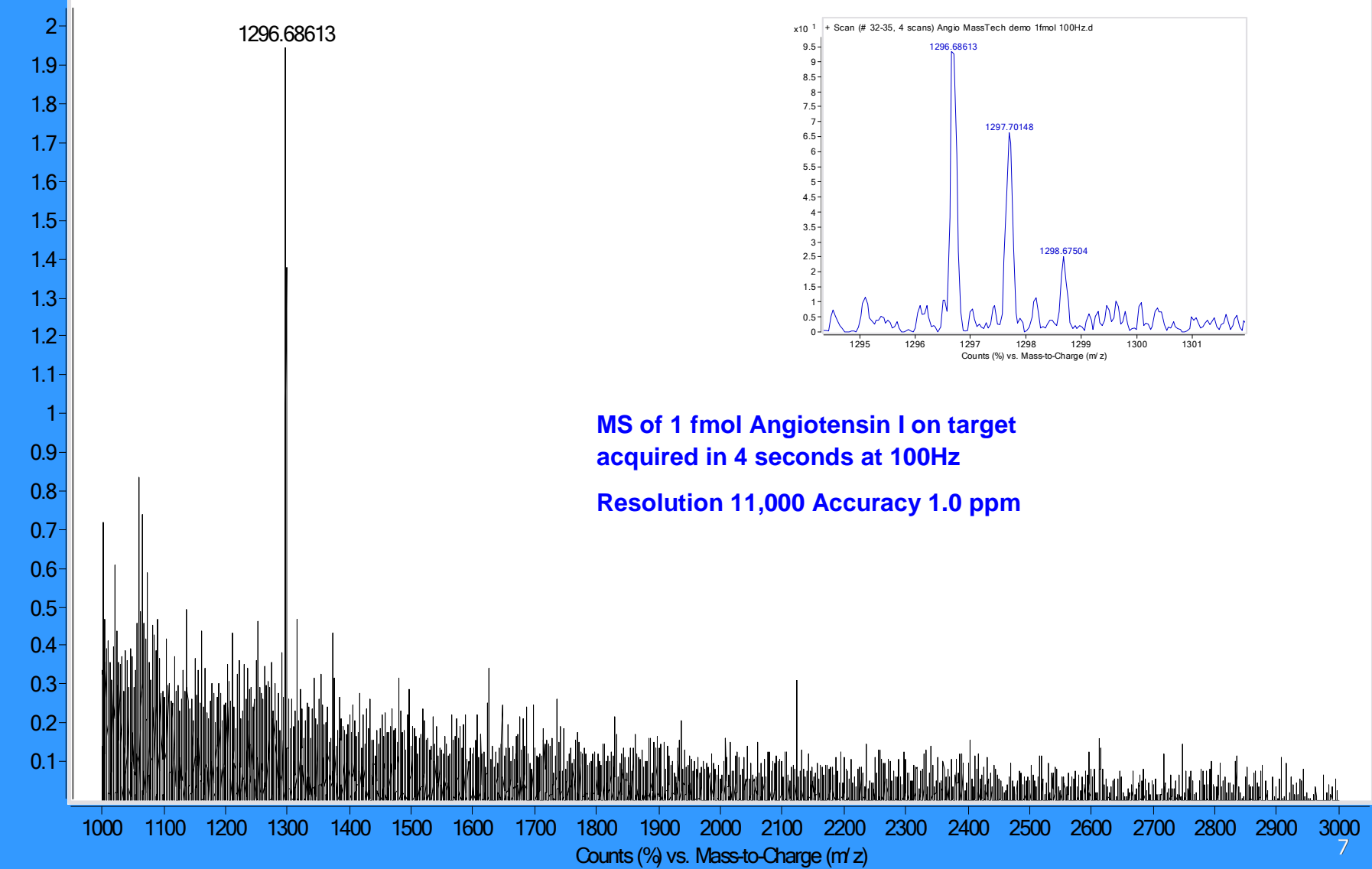


## Features of Third-Generation AP-MALDI PDF +

- All solid-state Nd:YAG laser guaranteed for 1 billion firings
- 200 Hz repetition rate for rapid analysis and faster imaging
- Continuous raster motion for MALDI imaging
- Software-controlled laser attenuation for repeatability
- Supports most common MALDI target plate formats including DIOS and high-density

# AP/MALDI Versatility - High Sensitivity - Agilent 6510

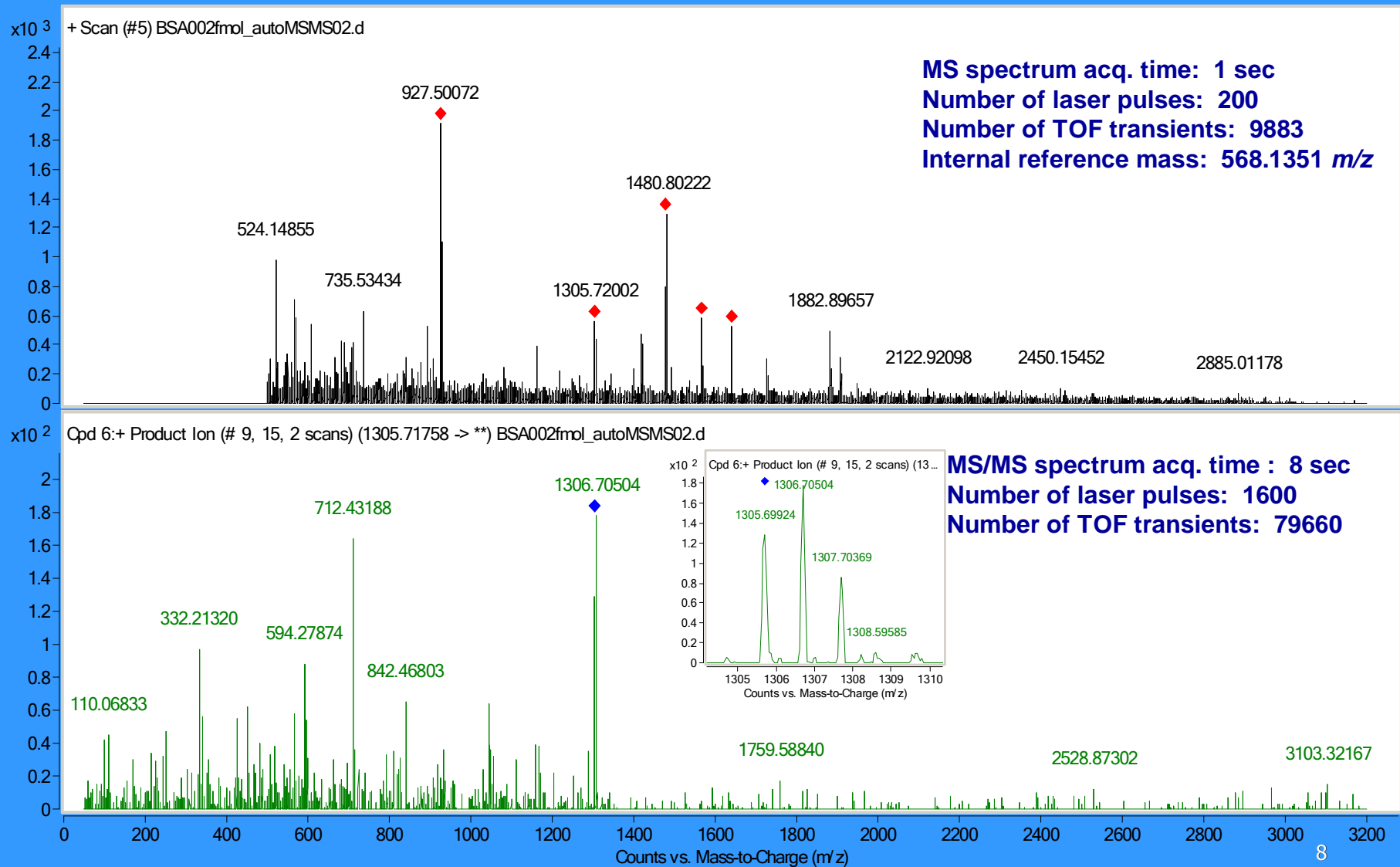
+ Scan (# 32-35, 4 scans) Angio MasTech demo 1fmol 100Hz.d



**MS of 1 fmol Angiotensin I on target  
acquired in 4 seconds at 100Hz**

**Resolution 11,000 Accuracy 1.0 ppm**

# BSA, 2 fmol on Target AP/MALDI PDF+ and 6510 Q-TOF





# BSA Digest, 2 fmol On Target, Auto-validated Spectrum Mill MS/MS Search Results

**Agilent Spectrum Mill - Protein/Peptide Summary**

Spectrum Mill | Summary Settings | Autovalidation | Easy MS/MS | MS/MS Search | Spectrum Summary | Build TIC | Tool Belt | Help

Results Shown Filtered by Validation Category: valid  
 Data Directory: msdataSM\patp\070510b\_PDFMALDI  
 hit table read - SpecFeatures read  
 valid hits read from tagSummary file - Files: 2 Hits: 17

proteinGroupingMethod: oneSharedPeptide  
 proteinGroupingMethod: oneSharedPeptide

Run #	Run Name	Group (#)	Spectra (#)	Distinct Peptides (#)	Distinct Summed MS/MS Search Score	% AA Coverage	Mean Peptide Spectral Intensity	Database Accession #	Protein Name
1	BSA002fmol_autoMSMS02	1	2	2	15.61	3	1.99e+003	30794280	albumin

#	Filename	z	Score	Fwd-Rev Score	SPI (%)	Spectrum Intensity	Sequence	MH <sup>+</sup> Matched (Da)	MH <sup>+</sup> Mass Shift (Da)	MH <sup>+</sup> Error (ppm)
1	BSA002fmol_autoMSMS02.0007.0016.1	1	8.05	8.05	75.9	2.76e+003	(K) LGEYGFQNALIVR (Y)	1479.795	0.0042	2.8
2	BSA002fmol_autoMSMS02.0009.0015.1	1	7.56	3.42	73.7	1.22e+003	(K) HLVDEPQNLIK (Q)	1305.716	0.0015	1.1

MS/MS Spectrum for LGEYGFQNALIVR

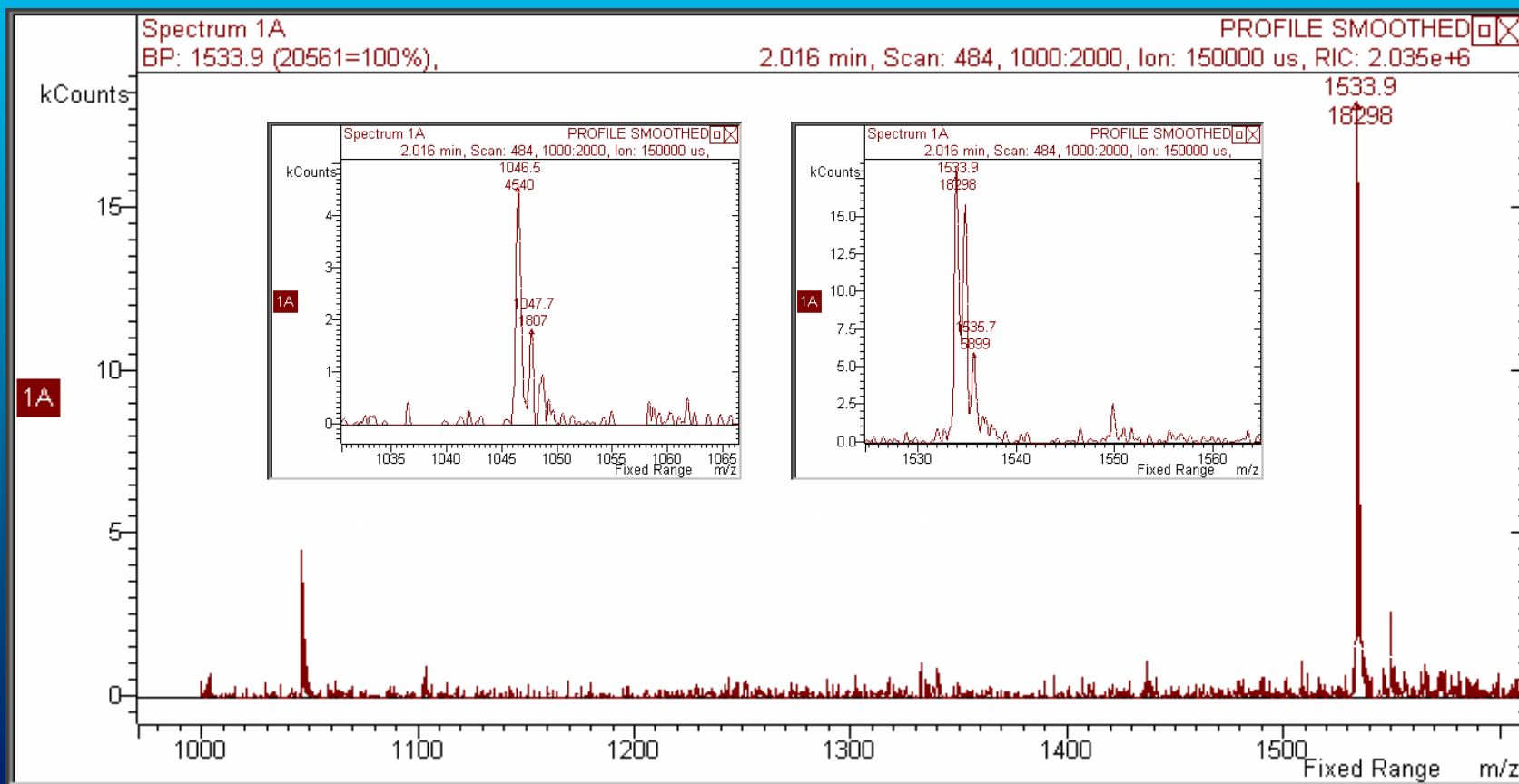
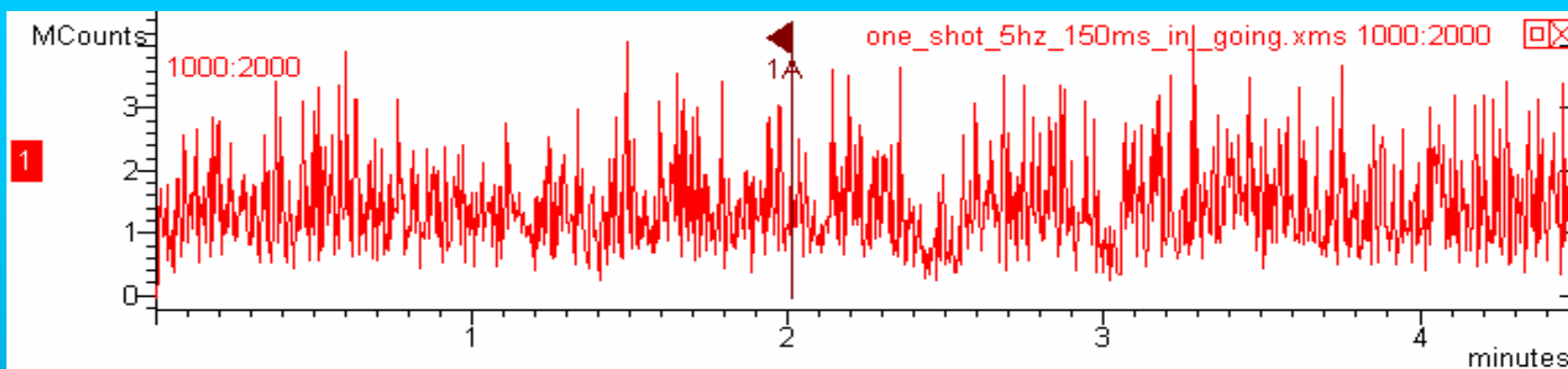
BSA002fmol\_autoMSMS02.0007.0016.1.pkl

MH<sup>+</sup>: 1479.7996 m/z: 1479.7996 z: 1

y  b  b-H<sub>2</sub>O  y-H<sub>2</sub>O  a  b-NH<sub>3</sub>  y-NH<sub>3</sub>  y<sup>++</sup>  y<sup>++</sup>-H<sub>2</sub>O  b<sup>++</sup>  y<sup>+</sup>  b<sup>+</sup>  b+H<sub>2</sub>O  y-H<sub>3</sub>PO<sub>4</sub>  y-2H<sub>3</sub>PO<sub>4</sub>  b-H<sub>3</sub>PO<sub>4</sub>

[256.93]LVGVEDVHNIIT[362.24] Go Bars: None  l-b  l-b-H<sub>2</sub>O  l-b-NH<sub>3</sub>  l-a  c  c'  z'  z''  c<sup>++</sup>  c<sup>++</sup>  z<sup>++</sup>  z<sup>++</sup> Rank <- ->

# Single Laser Shots over 5 minute period of 200 fmol loaded on target plate



# Conclusions

- AP-MALDI provides MALDI capability on instruments with ESI/APCI sources
- AP-MALDI can provide MALDI MSMS if instrument has that capability ( $MS^n$  on an ion-trap)
- AP-MALDI is as sensitive as V-MALDI
- Users can change between ESI and AP-MALDI in about 5 minutes
- Samples can be loaded and run in seconds without waiting for vacuum
- AP-MALDI is about half the price of V-MALDI add-on sources
- AP-MALDI is a fraction of the price of a dedicated MALDI MS