



ADVANCEMENTS IN LC-DIRECT EI-MS INTERFACING: NEW STRATEGIES TO BOOST SENSITIVITY AND SPECIFICITY.

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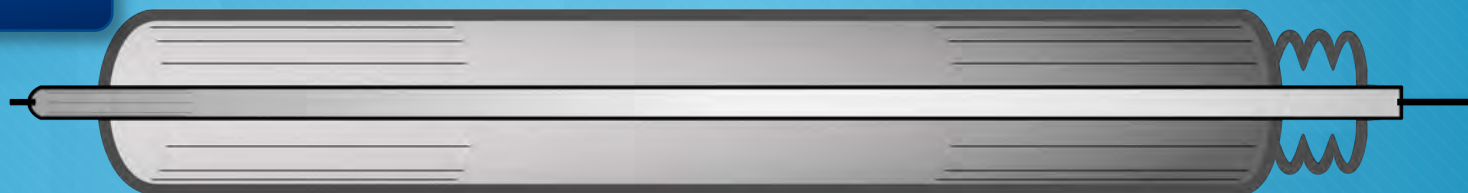
DIRECT EI INTERFACE: HOW DOES IT WORK?

TRIPLE QUAD

VACUUM HEATED REGION

UHPLC
FLOW RATE

EI SOURCE



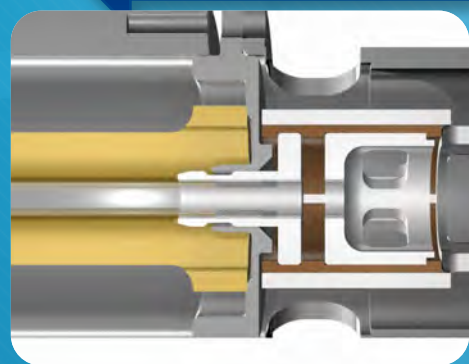
M^+

4 - Analyte
ionization

3 - Solute
vaporization

2 - Solvent
evaporation

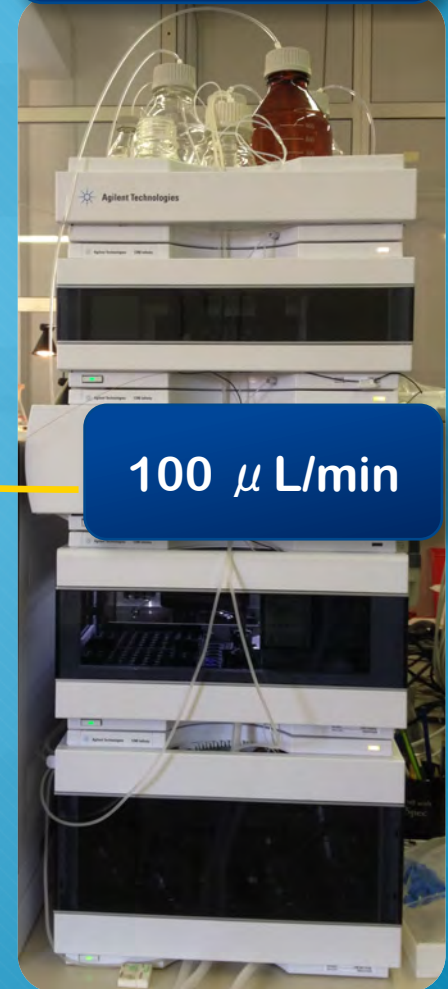
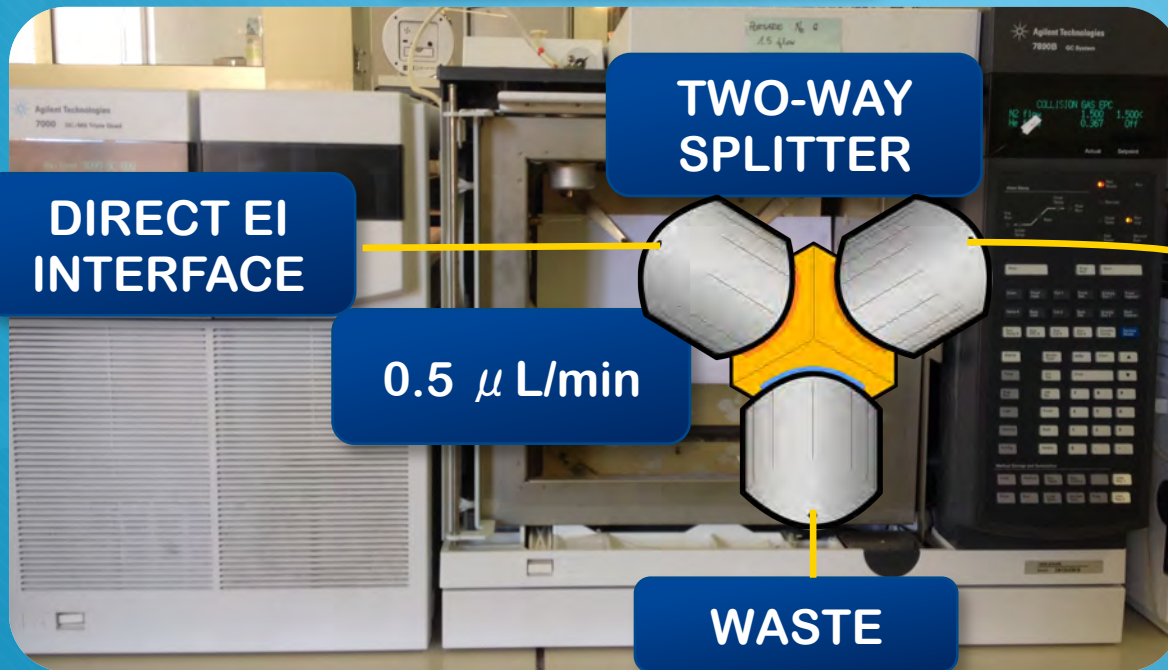
1 - Aerosol
formation



LC- DIRECT ELECTRON IONIZATION MASS SPECTROMETRY

Agilent UHPLC
1290 Infinity

Agilent 7000 QqQ



ADVANTAGES... DISADVANTAGES...

+

EXTREMELY SIMPLE INTERFACE

EASY IDENTIFICATION USING ELECTRONIC
MASS SPECTRA LIBRARIES

NO EVIDENT
MATRIX EFFECTS

LC AND GC-AMENABLE
COMPOUNDS IN THE SAME
CHROMATOGRAPHIC RUN

-

LIMITED
SENSITIVITY AND
SELECTIVITY WITH
COMPOUNDS THAT
HAVE A HIGH
BOILING POINT
AND HIGH
MOLECULAR
WEIGHT

HOW TO BOOST SENSITIVITY AND SPECIFICITY?

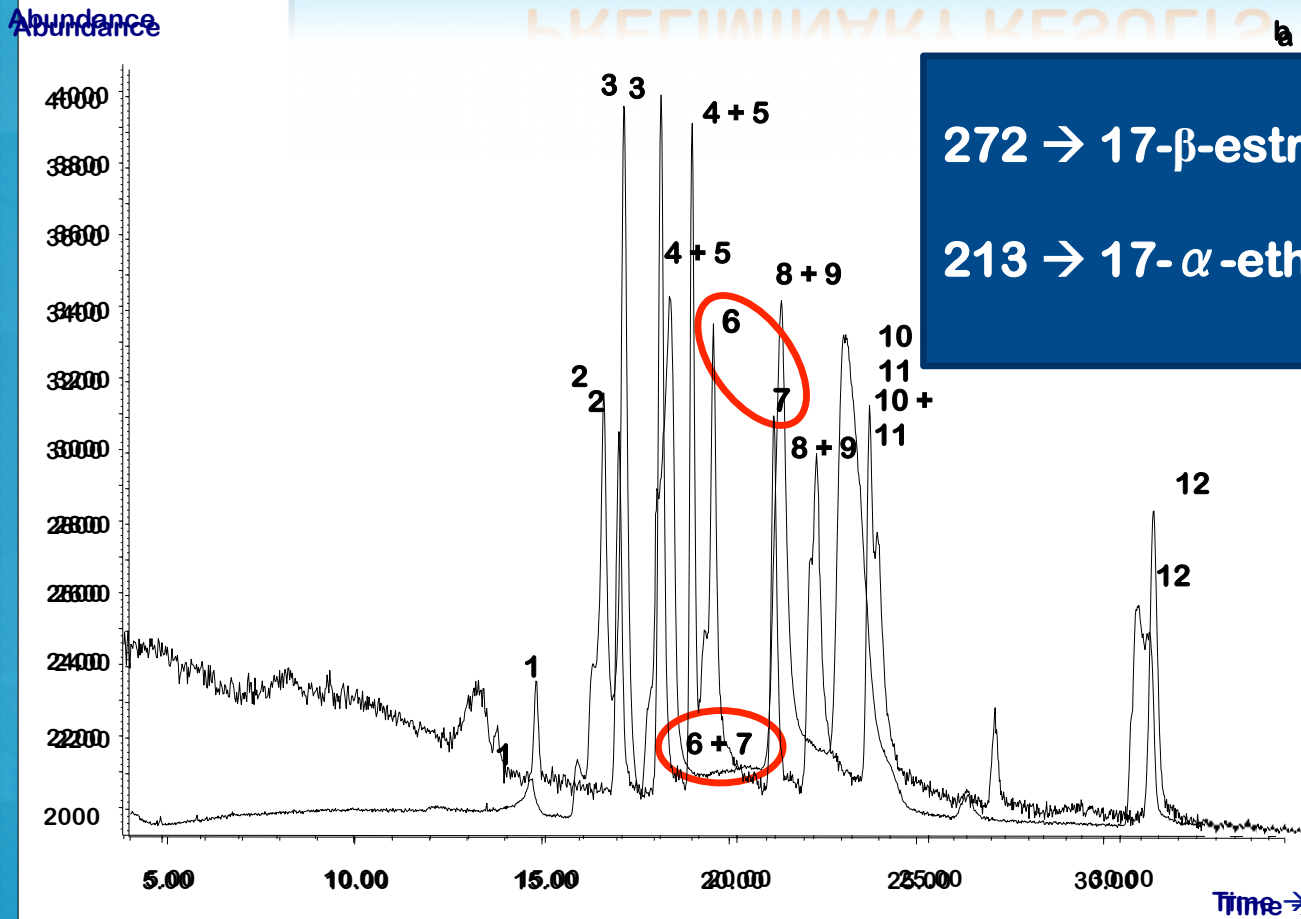
MSIMS

NEW
VAPORIZATION
SURFACE

CERAMIC
COATED
ION
SOURCE



METAL Vs CERAMIC COATING: PRELIMINARY RESULTS



272 → 17-β-estradiol

213 → 17-α-ethynilestradiol

1. 115 → aldicarb

6. 272 → 17-β-estradiol

7. 213 → 17-α-ethynilestradiol

8. 162 → 2,4 DB

9. 142 → MCPB

10. 268 → diethylstilbestrol

11. 196 → silvex

12. 227 → mestranol

Mix 12 50/50 MeOH/EtOH; flow rate: 500 nL/min; mobile phase: water (A), acetonitrile (B), both acidified with 0,1% of TFA. Elution gradient : 0% B → 40 % B in 5 min, 40% B → 80% B in 35 min. Injection volume : 60 nL; SIM one group : dwell time : 40 millis, 0,86 cycle/s; Temperature: 350°C

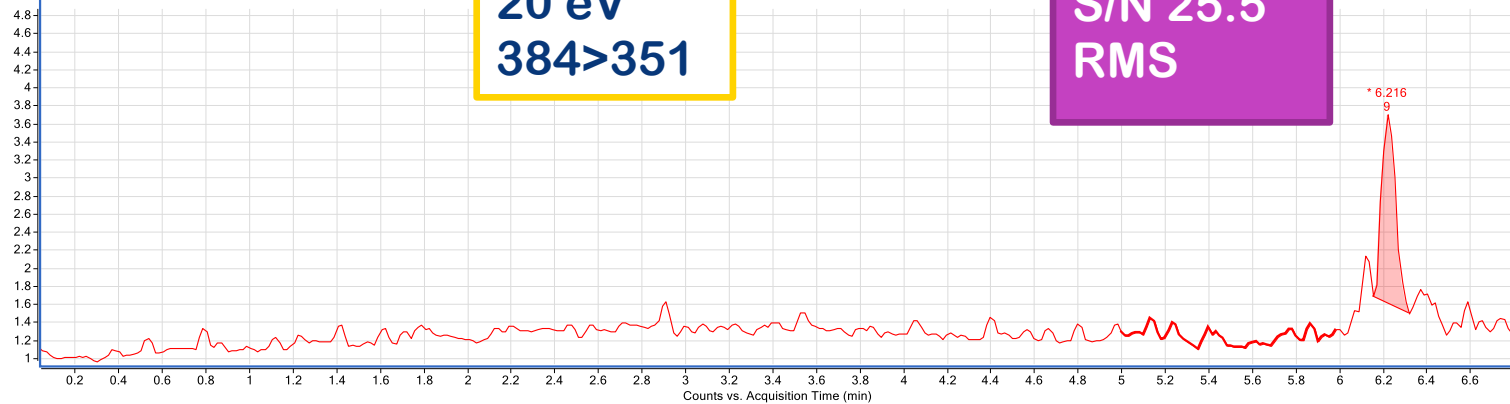
....PLAY WITH DIFFERENT IONIZATION ENERGIES!!!!

40 pg/ μ L of Vitamin D₃ in plasma...

+EI MRM CID@5.0 (384.0 -> 351.0) CHOLECAL_RECPLASMA_002.D
Noise (RMS) = 0.08; SNR (6.216min) = 25.5

20 eV
384>351

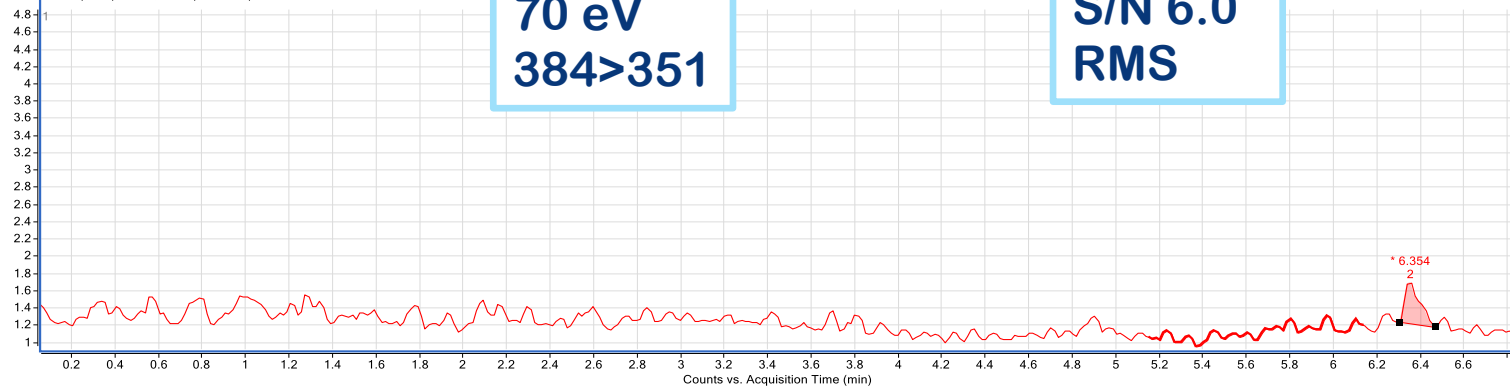
S/N 25.5
RMS



+EI MRM CID@5.0 (384.0 -> 351.0) CHOLECAL_PLASMA_005.D
Noise (RMS) = 0.08; SNR (6.354min) = 6.0

70 eV
384>351

S/N 6.0
RMS





Thanks.....



Agilent Technologies

