

- TriVersa NanoMate is the latest in chip-based technology from Advion that combines the strengths of liquid chromatography, mass spectrometry, fraction collection, and chip-based infusion in one integrated system. It allows researchers to obtain more information from their complex samples than with LC/MS alone.

*"If I could, I would have a TriVersa NanoMate on all of our mass spectrometers."*

## Institute for Research in Biomedicine - Barcelona, Spain



Marta Vilaseca, PhD  
Mass Spectrometry  
Core Facility Manager

### Research focus:

- Top-down MS
- Intact Proteins
- PTM Analysis
- Non-covalent Interactions
- Proteomics
- Structural Biology

### Mass spectrometers:

- Waters G1 SYNAPT
- Thermo LTQ-FT Ultra
- Waters LCT-Premier XE

Customer since: 2007

No. of TVNM: 2

### Q: What is the focus of your lab's research?

Our goal is to provide the research community at IRBBarcelona and their co-workers with state-of-the-art tools and methodologies for the MS analysis of a broad range of biological species, from large proteins and DNA to small molecules. The final purpose is to get insight into these molecules' identity, structure, interaction with other molecules and biological function in order to help in drug design, protein mechanism elucidation and in the search for biomarkers. We have implemented methods specialized in top-down proteomics and we are pioneers in this MS strategy in Spain.

As a core facility we are responsible for working with different biologic molecules, and we are required to change methods constantly and efficiently.

### Q: How does the TriVersa NanoMate® (TVNM) align with your research goals?

Originally, we purchased the TVNM for its chip-based direct infusion mode for noncovalent interaction analysis, but we learned quickly that it could be applied to other areas of our research. Prior to using the TVNM, the steps involved in collecting fractions were painful and time consuming. With the TVNM, we can run LC/fraction collection or infusion without changing the set up and wasting time with stabilization. We do not experience the problems typical with traditional nanoelectrospray sources.

One aspect of the TVNM that impressed us was the ability to analyze complicated top-down samples with the LC compatibility. It is not possible to analyze these samples on an LC time scale, and the fraction collection capability allowed us to analyze in a way that was not possible previously.

### Q: To whom would you recommend the TriVersa NanoMate for their research?

We use the TriVersa NanoMate for everything; noncovalent interactions, top-down, middle-down, bottom-up, basic infusion, LC coupled to fraction collection. The instrument is useful in all of its different set-ups, especially without having to change sources and waiting for a stable spray.

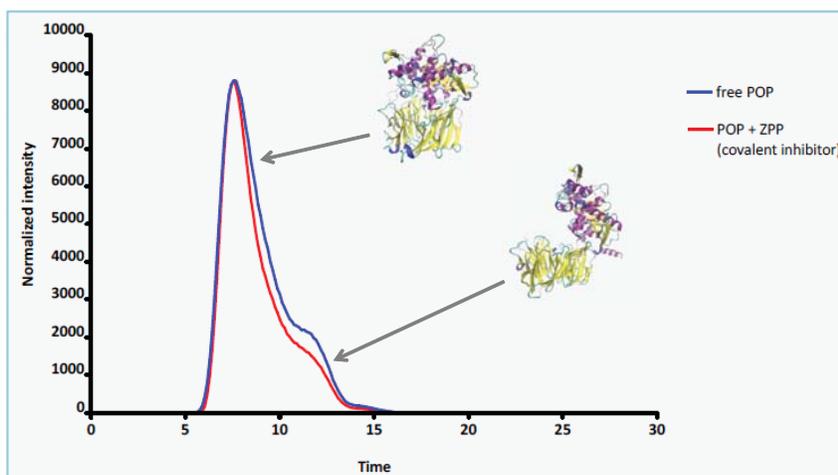
The reliability of the system, is one of the greatest benefits especially for people who have to change frequently between applications. We have found the spray sensing feature to be very valuable, because we know our precious samples will not be lost.

## Protein Conformation by Ion Mobility MS

### Consistent, reliable protein analysis using chip-based nanoelectrospray

- Long-lasting stable spray in aqueous buffers at pH7 of large-protein analysis using chip-based nanoelectrospray infusion
- Easy to use, compared to conventional nanoelectrospray, with minor nozzle blocking compared to nanospray needles
- Reduced downtime from rapid change-over between applications
- Conservation of precious protein sample with spray sensing function
- Consistent profile response from reproducible chip-based spray with up to 400 analyses per chip

### Separation of Prolyl Oligopeptidase (POP) Conformers



Two major POP conformers are resolved by IM-MS. The interaction with a covalent inhibitor displaces the equilibrium between the close-like and the open-like conformers. This work was performed by Abraham López, PhD student at IRB-Barcelona. Image from Poster presented at Sanibel MS Conference 2012. Authors: López A, Tarragó T, Vilaseca M, Madurga S, Giralt E.

#### Recent publications

Spectral counting assessment of protein dynamic range in cerebrospinal fluid following depletion with plasmadesigned immunoaffinity columns

Borg J, Campos A, Diema C, Omeñaca N, de Oliveira E, Guinovart J, Vilaseca M. J  
*Clin Proteom*, **8** (6) (2011)

Enhanced reactivity of Lys182 explains the limited efficacy of biogenic amines in preventing the inactivation of Glucose-6-Phosphate Dehydrogenase by Methylglyoxal

Flores-Morales P, Diema C, Vilaseca M, Estelrich J, Luque FJ, Gutiérrez-Oliva S, Toro-Labbé A, Silva E.  
*Bioorg Med Chem*, **19**, 1613-1622 (2011)