



- 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.

Customer Profile

"You purchase the TriVersa NanoMate for one purpose, but it allows you to develop many applications."

Max Planck Institute for Chemical Ecology - Jena, Germany



Dr. Aleš Svatoš
Research Group Leader

Research focus:

- Natural products
- Structural elucidation
- Proteomics
- Mass spectrometry imaging
- Noncovalent interactions

Mass spectrometers:

- Waters HDMS SYNAPT
- Thermo Orbitrap XL

Customer since: 2008

No. of TVNM: 1

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

One of the topics of our lab is the interaction of insect pheromones and their analogues with pheromone-binding proteins (PBPs) which are part of an extremely sensitive multi-component pheromone detection system.

We utilize binding assays to determine the function of the PBPs through affinity measurements of the protein-ligand receptors, calculate binding constants, spatial arrangement of the complex, and do modeling. In addition, point-mutated PBPs are used for a better understanding of the contribution of individual amino acids to the binding event.

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

The TVNM enabled us to develop a high-throughput method to study protein-ligand-interactions for large series of different pheromones and their analogues.

As the binding energies involved are very low and we need to preserve the native structure of the molecules, the soft-ionization conditions of the TVNM are perfect for us. Further, these studies are difficult with classic electrospray, due to the stickiness of the samples. They create problems from short cleaning cycles and produce contaminations.

In contrast, the established method with the TVNM is reliable and stable, and it eliminates the sticky sample issues. In addition, multiple experiments with very low quantities of protein (1 nmol) at different cone-voltage conditions are possible.

We recently added the LESA™ (Liquid Extraction Surface Analysis) capability to the TVNM. This enables us to detect putative signal molecules on leaf surfaces and to track down their production and storage sites by comparing the data with extracts from samples derived from the inner compartments of the leaves.

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

I would recommend the TriVersa NanoMate to everybody, because it is a universal source. With direct infusion, coupling for fraction collection and surface analysis, it may replace all ionization sources.

Relevant Publications

High-throughput ESI-MS analysis of binding between the *Bombyx mori* pheromone-binding protein BmorPBP1, its pheromone components and some analogues.

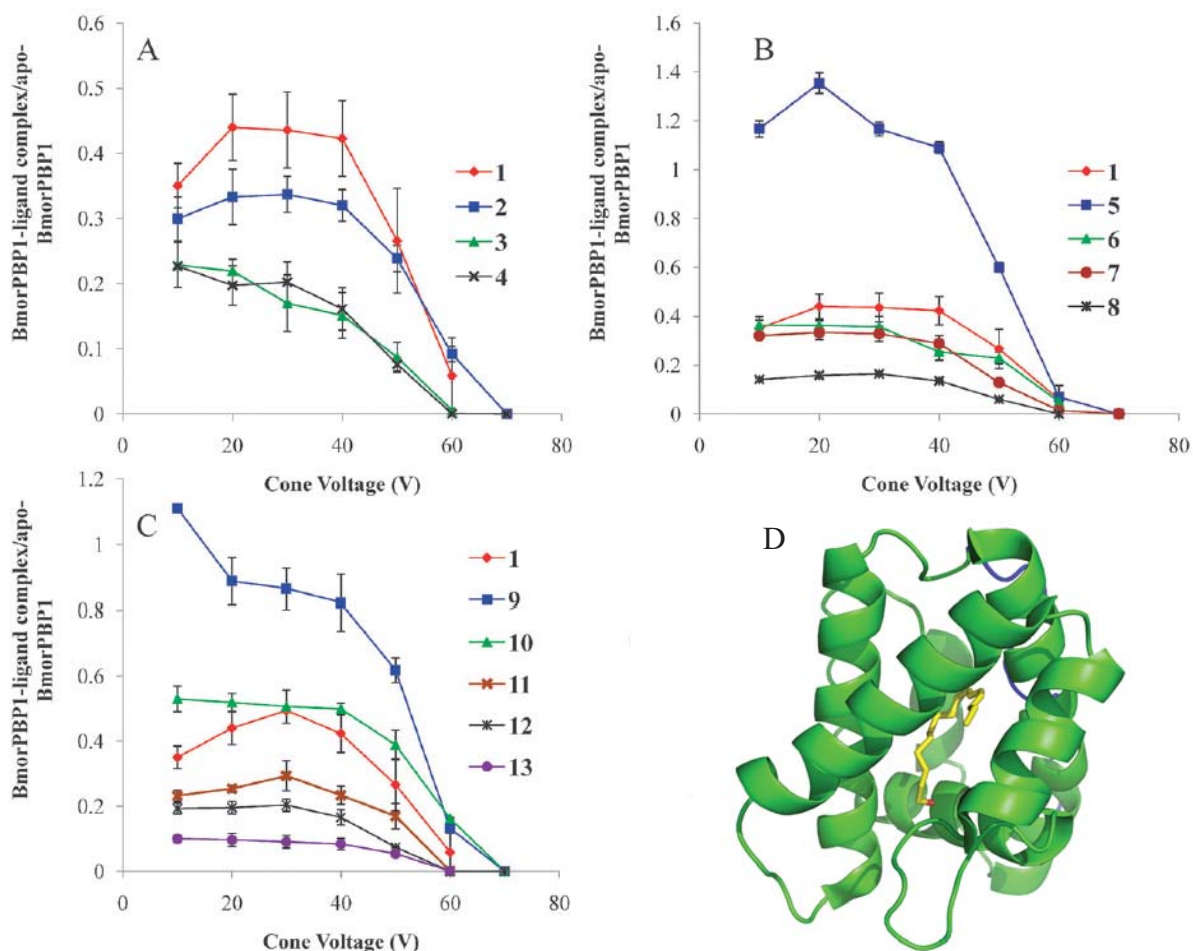
Hooper A.M., Dufour S., He X., Muck A., Zhou JJ, Almeida R., Field L.M., Svatoš A., Pickett J.A., *Chem. Commun.* 2009, 5725-27.

Protein-Ligand Interactions

Reliable and stable high-throughput screening using chip-based nanoelectrospray

- Multiple experiments with low protein quantities at different cone voltages
- Consistent profile response from reproducible chip-based spray with up to 400 analyses per chip
- Fast and automated analysis compared to conventional nanoelectrospray

Ratio of ligand-bound BmorPBP1 to unbound protein at increasing ESI-MS cone-voltages on HDMS SYNAPT



A; bombykol and 3 diastereoisomers. B; bombykol and analogues of different chain length with the (*E,Z*)-diene motif. C; bombykol and analogues of different unsaturation. D; Computer model of BmPBP1 (green) with immersed native ligand (bombykol, yellow) calculated by V. Klusák, unpublished.