

## Innovative solvent switching and focusing interface for LC and LC-MS

- ▶ Enhances compatibility of LC with MS and other detectors and enables to elucidate the structure of proteins and peptides in salty solutions
- ▶ Combines orthogonal LC systems and allows an intermediate switch of solvents
- ▶ Award-winning device (HPLC, 2015) with patented methodology and high performance

### Liquid chromatography market

Liquid chromatography (LC) is a pervasive technique for analytical separations and, increasingly, for purification of high-value-added products.

LC-MS is nowadays a versatile method in a broad area of analytical chemistry to determine the structure of some thermolabile compounds, but lacks with respect to high salt concentrations. Application areas include life science, biopharma, biotechnology, agriculture and food, oil, petrochemicals and polymers and environmental analysis.

Comprehensive two-dimensional liquid chromatography (LCxLC) is increasingly important for the separation of complex samples. There is a need to combine orthogonal LC systems and to efficiently handle solvent incompatibility.

### Our modulation technology

The solvent switching and focusing technology for LC and LC-MS is also referred to as Reflectron Modulation Interface (ReMI). ReMI changes sample solvent, removes salts and buffers, and focuses analyte bands, increasing concentrations and enhancing detector sensitivity. This novel universal modulation technology is suitable for small volumes.

### Enhanced compatibility of LC with MS and other detectors

LC is used with mass spectrometry (MS) and other detectors, e.g. in the separation of proteins and peptides at high salt concentrations. To be able to use MS, additional steps are required to lower the salt

concentration. Our modulation technology enhances compatibility of LC with MS, and enables to elucidate the structure of proteins and peptides in salty solutions.

### Combination of orthogonal LC systems

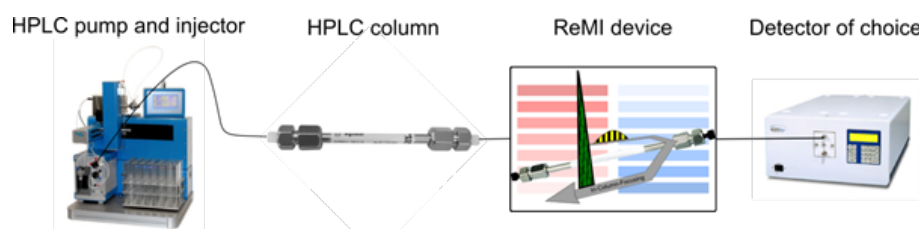
In multidimensional separations, completely different ("orthogonal") LC mechanisms are combined, e.g. for separation of lipid classes by reversed phase and normal phase LC (NPLC×RPLC). However, lipid classes show high variability in terms of polarity and ionizability. Our solvent switching and focusing interface allows orthogonal LC systems to be coupled online, facilitating the analysis of all classes of lipids within a single method.

### Intermediate switch of solvents

Breakthrough is often encountered as a consequence of solvent incompatibility in analyzing natural or synthetic polymers. For example, size exclusion chromatography requires the use of very strong solvents that jeopardize subsequent separations. Our modulation technology allows an intermediate switch of solvents.

### R&D status

The technology has been proven in a prototype interface for solvent switching and focusing. Demonstrated applications of modulation technology include proteins and peptides, detergents, food contaminants and health-promoting constituents) and polymers.



We are interested in offering the finding as a stand-alone solvent switching device or as an integrated part of existing LC or mass spectrometry set-ups.

### **Intellectual property**

PCT-application has been filed on January 27th 2016 with patent number PCT/EP2016/051198.

### **Inventors**

From the Analytical Chemistry department at the Van 't Hoff Institute for Molecular Sciences at the University of Amsterdam:

Henrik Cornelisson van de Ven, MSc,  
Prof. Dr. Ir. Peter Schoenmakers  
Dr. Andrea Gargano

### **Key publications**

H.C. van de Ven, A.F.G. Gargano, S.J. van der Wal, P.J. Schoenmakers, Switching solvent and enhancing analyte concentrations in small effluent fractions using in-column focusing, Journal of Chromatography A 1427 (2016) 90-95.

### **Contact**

Ir. Willem Fokkema – Business Developer – +31 20 5253542 – W.Fokkema@uva.nl – www.ix.nl

Tara Jonker, MSc – Business Developer – +31 20 5257776 – T.Jonker@ixa.nl – www.ix.nl