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Food analysis to check quality, safety and authenticity by full-automated 1H-NMR

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Full-automated high resolution 1H-NMR spectroscopy offers unique screening capabilities for food quality and safety by combining non-targeted and targeted screening in one analysis (15-20 minutes from acquisition to report). Full-automated high resolution 1H-NMR (400 MHz) has found its way into the quality control of food and beverages over the last years. The advantage of full-automated high resolution 1H-NMR is its absolute reproducibility and transferability for laboratory to laboratory, which is not equaled by other methods currently used in food analysis. NMR reproducibility allows statistical investigations e.g. for detection of variety, mixing of varieties, geographical origin and adulterations, where smallest changes of many ingredients at the same time must be recorded. Reproducibility and transferability of the solutions shown are user-, instrument- and laboratory-independent. Sample preparation, measurement and processing are based on strict standard operation procedures which are substantial for this fully automated solution. The non-targeted approach to the data allows detecting even unknown deviations, if they are visible in the 1H-NMR spectra of e.g. fruit juice, wine, edible oils or honey. The same data acquired in high throughput mode are also subjected to quantification of multiple compounds. The fully automated 1H-NMR methodology will shortly be introduced and then results on fruit juices, wine and edible oils will be presented and the advantages of the fully automated 1H-NMR solutions shown. The method has been proven on fruit juices and wine, where so far unknown frauds could be detected. In addition conventional targeted parameters are obtained in the same analysis. This technology has additionally the advantage that NMR is completely quantitative and concentration calibration only has to be done once for all compounds.

Biography

Markus Link joined Bruker BioSpin GmbH in Rheinstetten, Germany in 2009 as Business Development Manager of 'Applied-NMR' solutions in the food and beverage market worldwide. He was born in Mannheim, Germany in 1962. He did his degree in horticulture at the University of Applied Sciences in Wiesbaden (1987-1990), Germany, and his Master`s degree in biology at University Mainz (1990-1994), Germany, followed by his doctorate at Max-Planck-Institute in Ladenburg, Germany, in 1997 (Molecular biology and protein biochemistry). Parallel to employment in 2003 he did a degree in business economics in Kaiserslautern, Germany. He worked at Tecan Germany, Hamilton Life Science Robotics (both as Territory Manager) and Thermo Fisher Scientific (Senior Sales Industrial Solutions) before he joined Bruker.

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