Food quality improved with software

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Max Planck Innovation GmbH, the technology transfer organization of the Max Planck Society, has awarded an exclusive license for the analysis software TagFinder to Metabolomic Discoveries GmbH, a service provider in biochemical research. The new technology is part of an innovative procedure which makes it possible to measure and interpret virtually all chemical substances within a biological sample. In this way, processes in industrial biotechnology and food quality can be improved.

The quality of biological products, such as fruits and vegetables, strongly depend - in addition to genes - on internal metabolic processes. Those compounds, which can be sugars, amino acids, hormones and many others, are responsible for flavour and nutritional value. Investigating the metabolic inventory of products is of great interest for the food and agriculture industry. Only the knowledge of the exact material composition can improve quality programs.

Metabolites play an important role also in industrial biotechnology. They are important precursors of fine chemicals, enzymes, vaccines or recombinant proteins, which are produced by microorganisms or in cell cultures. The optimization of production processes through the analysis of metabolic processes and the identification of bottlenecks allows more efficient and faster production of these substances.

Metabolomic Discoveries GmbH licensed the TagFinder software, developed by the Max Planck Institute for Molecular Plant Physiology in Golm. This software is part of a new method for metabolite analysis, by

which a comprehensive insight into the physical composition of samples, such as fruits and vegetables, can be obtained. In contrast to conventional methods not only a few, but hundreds of metabolites can be identified in a sample. This is made possible by a multistage process in which the metabolites are first accumulated and then are separated. The separated metabolites are then bombarded with electrons in a high resolution [mass spectrometer](). This creates a typical decay pattern for each metabolite. These patterns, like a fingerprint for each substance, is then matched with the extensive mass spectra database of Metabolomic Discoveries GmbH and precisely identified. The TagFinder software is used for bioinformatics analysis. It converts complex data sets into concrete results and thus makes them accessible for a detailed analysis by experienced specialists. The above findings can now serve as a basis for targeted improvement of food. Thus, for example, the seed industry is capable of identifying metabolites that are responsible for plant resistance more rapidly and then improving this resistance by appropriate measures.

Metabolomics technologies allow also the identification of metabolic biomarkers. Biomarkers can be metabolites or combinations of metabolites that serve as indicators for specific traits or diseases. In the field of plant breeding, biomarkers can predict at an early stage yield or resistances. In addition, biomarker discovery finds application in medicine and can help in early diagnosis of prostate cancer or the identification of risk groups for diabetes and cardiac arrests. Metabolomic Discoveries, which is based in Potsdam, is currently in the development of a comprehensive patent portfolio in the field of diagnostic biomarkers. "For a long time, identifying vast numbers of metabolites in a sample was a major problem in metabolomics. With this software we are now able to offer our customers a highly accurate and robust analysis of hundreds of known and unknown [metabolites]()", said Dr. Nicolas Schauer, CEO of Metabolomic Discoveries GmbH.