

## LAYING THE GROUNDWORK AGILENT AIDS CREATION OF NEW METHODS IN METABOLOMICS



**Stephan Hann, Ph.D.**

Analytical Chemist  
University of Natural Resources and Life Sciences,  
Vienna

Stephan Hann isn't trying to cure cancer, but he is one of many scientists around the world who are contributing their expertise in diverse fields in order to understand the complex, interrelated aspects of biology.

Dr. Hann is responsible for metabolomic analysis at the University of Natural Resources and Life Sciences in Vienna. He also leads the core metabolomics facility at the Austrian Center of Industrial Biotechnology, where he and his colleagues collaborate with some of the world's biggest pharmaceutical companies.

Their goal: build better methods to quantify metabolites.

"Our collaboration partners from biotech are using our results to optimize their processes," Hann says, "to increase their yields and improve the quality of their products."

For biotech companies, the products include complex recombinant proteins used in biomedical applications. For Hann and his fellow researchers, the products are validated methods.

**They rely on Agilent instruments— most notably the Agilent 7200 quadrupole time-of-flight system—to develop their methods. The world's first Q-TOF designed specifically for GC/MS, this instrument delivers high sensitivity and selectivity, plus accurate-mass and high-resolution information for structural confirmation.**

"We are publishing new separation methods, new detection concepts, and new data evaluation concepts," he says.

A pure analytical chemist, Hann sees his work as part of a process of continuous improvement and optimization taking place throughout the global scientific community.

"One of the challenges is that we want to analyze more samples in less time, so we always aim to develop methods that are less time consuming," he says.



**Agilent Technologies**

*Hann notes that, fortunately, the university has a longstanding relationship with Agilent, and the company is often able to adapt its software to meet the needs of researchers in emerging fields.*

Although metabolomics is hardly a new science, it is still in its infancy compared to disciplines such as genomics and proteomics, which have enjoyed heightened focus in recent years.

"We have many, many different compounds, and metabolomics tools are not so advanced that we can put everything into the software and the software brings us the final result," he says. "It's a lot of manual work."

**Hann notes that, fortunately, the university has a longstanding relationship with Agilent, and the company is often able to adapt its software to meet the needs of researchers in emerging fields.**

"Metabolomics is emerging as a very important area of research—comparable to where proteomics was several years ago," he says. "I am confident that we will end up with the kind of well-developed data evaluation tools they have now in proteomics."

More specifically, Agilent is contributing to Hann's work in metabolic flux analysis, an experimental technique designed to examine the production and consumption rates of metabolites in a biological system.

"We are developing and implementing GC/MS- and LC/MS-based methods to analyze important metabolites of the central carbon metabolism," Hann says. "We are performing targeted quantitative measurements via LC/MS/MS and GC/MS/MS, and we are using the novel Agilent 7200 GC/Q-TOF MS to measure the distribution of metabolites of interest. This will enable us to determine in vivo reaction rates.

"We are one of the first groups using the GC/Q-TOF in metabolomics, and we are very happy with the results. We can give our methods to another lab and they will get the same results we do," he adds.

"Since this is still an emerging field, we don't have reference materials. Nobody knows: What is the real content of these cells? To see that we are able to produce comparable data between different labs—this was a real milestone for us. It is especially gratifying to see that the methods we have developed and the data we are producing is beneficial to the biotechnology industry."

To learn more about how Agilent is striving to meet the complex needs of scientists and researchers around the world, visit [www.agilent.com/chem/academia](http://www.agilent.com/chem/academia)

For Research Use Only.  
Not for use in diagnostic procedures.  
Information, descriptions and specifications in this publication are subject to change without notice.

© Agilent Technologies, Inc. 2014  
Published in USA, July 9, 2014  
5991-4965EN



**Agilent Technologies**