

Healthcare industry BW

varionostic: specialist in epigenetic analyses

Ulm-based varionostic helps epigenetics researchers to obtain information on gene activity. The company is specifically focused on the analysis of methyl groups (-CH₃) that are attached to DNA and turn genes on and off. Just as the field of epigenetics, previously only known to insiders, has emerged as a biomedical area of research, the University of Ulm spin-off has matured and grown over the past six years since it was set up.

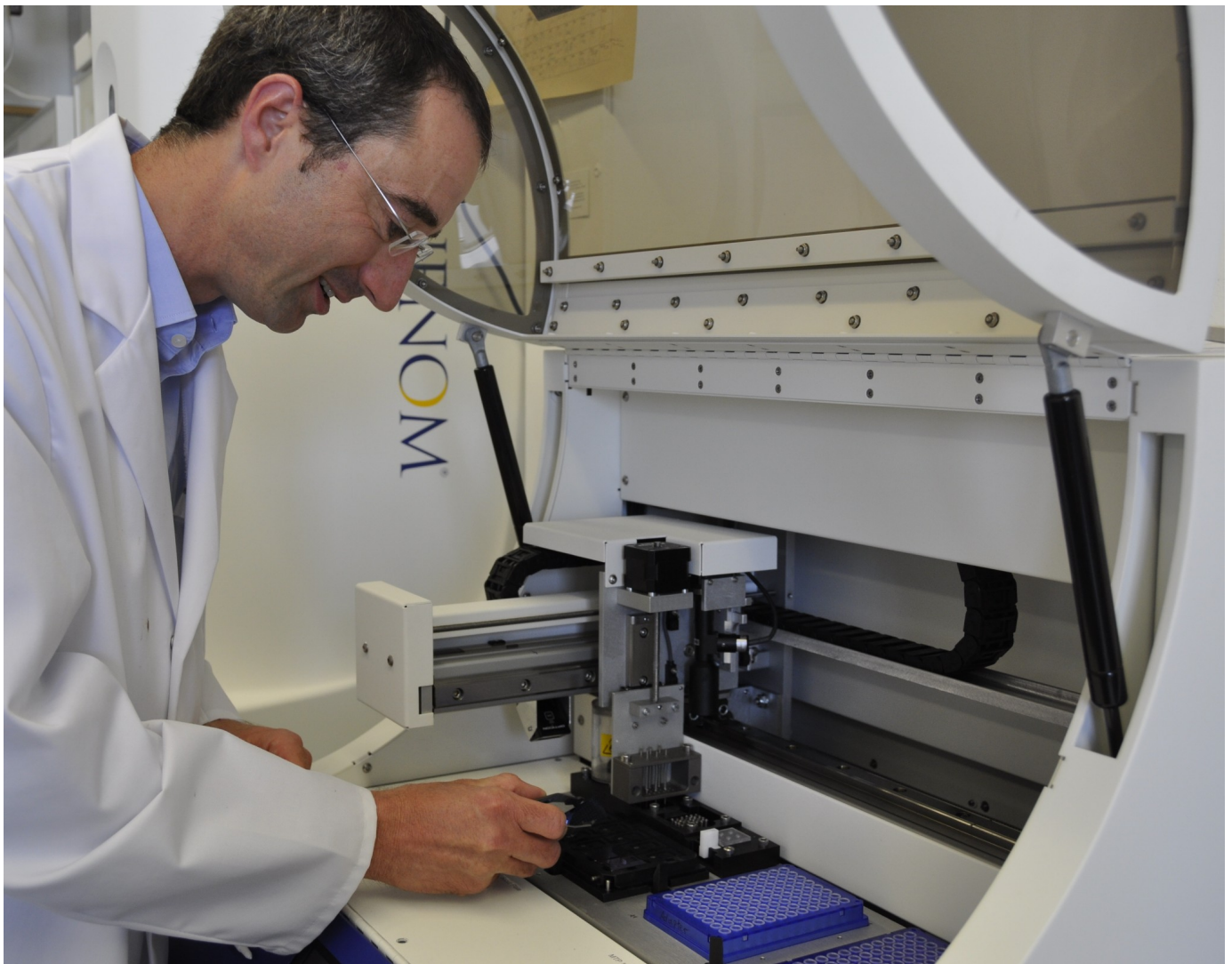
The two company founders, Uwe Gerstenmaier and Hubert Beyrle, plan to use their comprehensive method portfolio and the implementation of a quality management system (ISO/IEC 17025) to tap into the drug development market. In addition to providing bioanalytical services to biomedical researchers and increasingly also to the diagnostics industry focusing on the personalised medicine segment, the Ulm-based biotech company is also planning to work with researchers in larger-scale cooperative projects.

Epigenetics is gaining in importance

Epigenetic issues are gaining in importance in the fields of oncology, stem cell research and the neurosciences. At least this is what the company is seeing from the increasing number of orders from clients in these fields. Epigenetics is a young bioscientific discipline focused on the study of the mechanisms and consequences of heritable chromosome modifications that do not involve a change in the underlying DNA sequence. Examples of such changes are: modification of specific DNA bases (DNA methylation), chromatin modification (histone modification) and RNAi-mediated mechanisms. All these changes regulate gene expression without altering the nucleotide sequence.

The genetic regulation of development and disease processes is not yet understood in detail. However, epigenetics research has made a considerable contribution to increasing our current understanding of the role of epigenetic modifications. Uwe Gerstenmaier reports that in addition to methylcytosine, the methylated form of the DNA base cytosine, hydroxymethylcytosine (formed from cytosine by adding a methyl group and then a hydroxy group) has been identified as a potential epigenetic marker. Detailed knowledge of these two markers may provide researchers with more information as to how epigenetic modifications regulate gene transcription, amongst other things. Working in cooperation with researchers from the University of Ulm, varionostic is currently involved in a project to develop a test method involving methylcytosine and hydroxymethylcytosine.

In order to be able to offer its clients answers to any epigenetic question they might have,



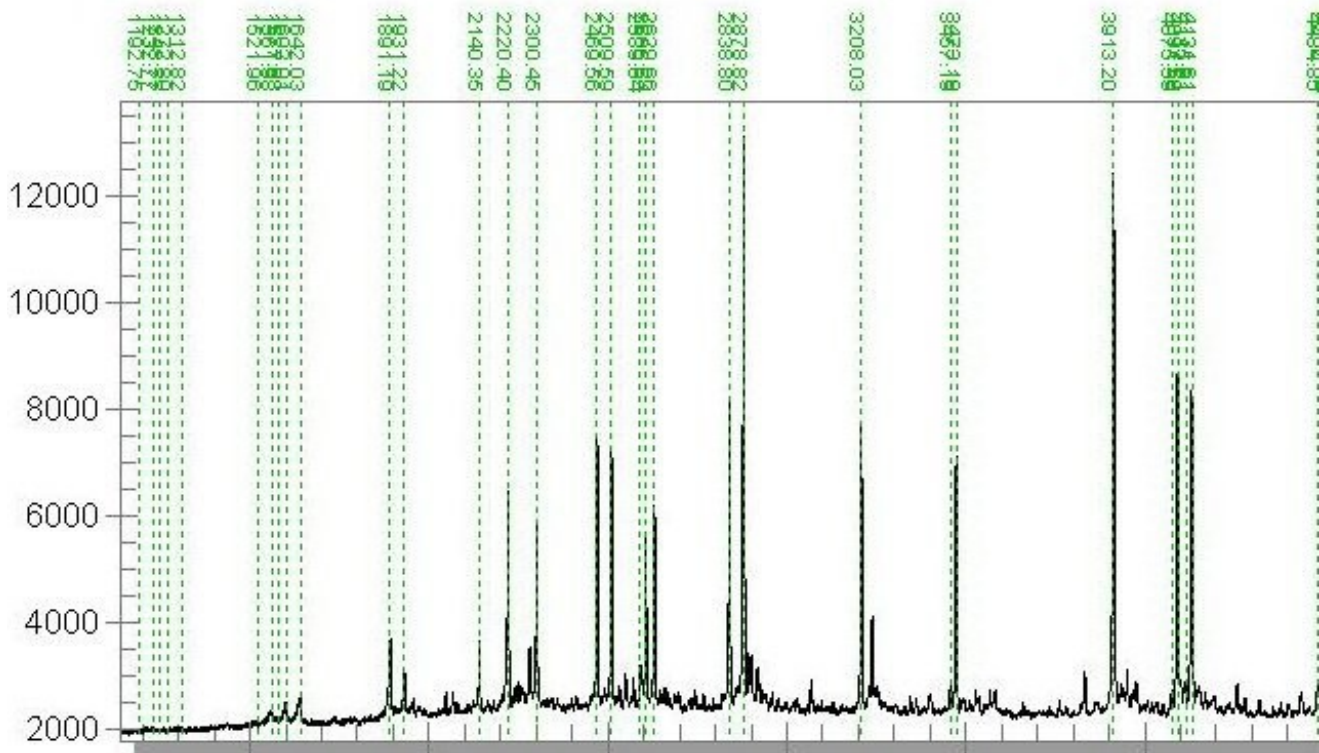
varionostic CEO Uwe Gerstenmaier hopes to position the company more broadly with the MassArray technology
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varionostic recently made the biggest investment it has made since its establishment. The MassArray platform is the latest addition to the company's equipment and enables it to increase sample throughput and the read length of gene regions under investigation. With this new platform, varionostic now has available all standard (epi)genetic analysis methods. Uwe Gerstenmaier is convinced that his company will not only become an attractive service provider, but also an attractive partner for comprehensive research projects.

Whether the company uses the MassArray platform, pyrosequencing, real-time PCR or capillary sequencing for dealing with a client's request depends on the issue to be clarified (methylation, genotyping, allele frequency, species identification), the type and size of the DNA sample as well as the client's budget. The methods can be combined and data obtained can be validated using different systems.

varionostic has a unique specialised competence in epigenetic research

Gerstenmaier knows from his colleagues working in academic research how important it is to find answers to scientific questions without having to pay a fortune. Basic and clinical researchers interested in region-specific methylation contract him for bioanalytical services. He also tells us that he is not aware of any other company in Europe with specialised competence in epigenetic research.



Example of an epigenetic analysis carried out with the MassArray platform: the photo shows the mass peaks of enzymatically digested DNA. Methylated and unmethylated DNA (related to the base to which a CH₃ group is attached) led to two peaks in close vicinity to each other and with a defined mass difference. This difference provides quantitative information about the DNA's state of methylation.

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Research institutions are the company's greatest "competitors". However, varionostic has established a lead in terms of its experience in setting up methylation assays using the pyrosequencing method. The actual measurement only takes a few minutes. However, adapting the assays to required specifications and preparing the samples, of which only a few hundred nanogrammes are needed, is a long process. varionostic's services do not end with the transfer of data to its clients; the company also provides a kind of knowledge and technology transfer. "We look closely at all results," said Gerstenmaier who is in charge of interpreting his clients' data, providing technical advice with regard to suitable methods, and also helping to turn the data into a publishable form if his clients wish to submit their study for publication in a scientific journal.

varionostic's clients, who come from eight European countries, appreciate these services. Most of them decline to be named as references for confidentiality reasons. Among the institutions varionostic is allowed to name as references are outstanding institutions such as the German Cancer Research Centre, Max Planck Institutes, the ETH Zurich and the Karolinska Institute.

When varionostic was founded in 2006, only a few people knew what epigenetics actually was, and even fewer knew what pyrosequencing (a method for sequencing short stretches of DNA developed by Swedish researchers and commercialized by Pyrosequencing AB) was. Pyrosequencing AB was acquired by the largest German biotech company in 2008, which can be seen as confirmation that varionostic's decision to make the pyrosequencing method an integral part of its analytical services right from the word go, was the right one. New test methods are constantly being developed. The company now hopes to tap into markets outside academic research.

The signs show that the company is set for growth

varionostic hopes to tap into the veterinary diagnostics market in the not-too-distant future, but still has to tackle some regulatory hurdles. The company is also active in the Baden-Württemberg Bioactive Plant Foods Network, which brings together around 25 partners (including plant breeders and nutrition experts) with the goal of using the South American plants amaranth and quinoa to assess the affect of food on human health. In cooperation with the Esslingen University of Applied Sciences (Faculty of Applied Sciences, Department of Biotechnology), varionostic carries out investigations involving amaranth in which cell biological activities are combined with molecular biology studies. Gerstenmaier believes that varionostic's participation in the Bioactive Plant Foods Network will be quite fruitful, particularly given that one of his major personal interests is the interactions between epigenetics and nutrition.

The company is about to reach a new stage of development. As an established provider of epigenetic analyses using all available state-of-the-art methods and equipment, varionostic now plans to grow and tap into new markets, clearly evident when one realises that the varionostic team of six is planning to expand its current company space to around 250 square metres. More than 50% of the space is reserved for laboratories which will deal specifically with epigenetic investigations.

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Epigenetics – heritable traits without changing the DNA sequence

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