

Healthcare industry BW

IBAM GbR - Enzymes, neurotransmitters and Greek mountain tea

Pharmaceutical companies have the objective to treat dysfunctional physiological processes. In order to do so, the companies need to know how enzymes, neurotransmitters and hormones function and how their mode of action can be effectively manipulated. The Denzlingen-based company IBAM GbR offers solutions that enable faster and cost-effective drug discovery. IBAM GbR was spun off from the University of Freiburg and supports industrial customers in identifying biochemical targets of potential drugs or the modes of action of enzymes and second messengers in the central nervous system and other tissues. Over the last few years, the company's managing director Dr. Rainer Knörle, and his partner Dr. Peter Schnierle, have in co-operation with their industrial partners specialised on medicinal plants. The partners use modern biochemical methods to analyse the pharmaceutical effect of traditional medicinal plant extracts such as St. John's wort, passion fruit, or Greek mountain tea.

The human body is a complex system of molecules that interact with each other in biochemical networks. Diseases result from defects in these networks, and this is why pharmaceutical companies are trying to discover compounds to correct these abnormalities. They are often 'fishing in troubled waters': they discover a molecule that is, for example, able to restore the function of damaged synapses, but do not know how this particular function is restored. People with exceptional expertise in methods used to analyse enzymes, receptors and second messengers are required to elucidate the mechanisms that are able to restore a molecule's function. Dr. Rainer Knörle and Dr. Peter Schnierle from the "Institute for Biochemical Analyses and Method Development" (IBAM GbR) based in Denzlingen, Germany are such experts. "I come from academic research and have dealt with contract pharmaceutical research way back in the late 1990s," said Knörle who was a postdoctoral student in the Division of Neuropharmacology led by Prof. Dr. Thomas Feuerstein at the Freiburg University Medical Centre in 1996, the very year IBAM GbR was founded. "We decided to spin off our company from the university, in which the company in principle still carries out the same work that we did during our research in Prof. Feuerstein's research group."

New priority in the green area

The company continues to carry out much the same, and even more, as before. The company was founded by Dr. Peter-Andreas Löschmann from the Department of Human Medicine, Prof. Dr. Thomas Feuerstein from the Department of Neuropharmacology, Dr. Norbert Limberger from the Department of Pharmacy and Dr. Rainer Knörle from the Department of Physical Biochemistry. The company is also contracted by big companies, such as Novartis and Bayer. "For example, our clients might have

a compound that exerts its effect on the nervous system where it reduces the sensation of pain,” said Knörle. “The companies usually contract us to identify the underlying molecular mechanism and to find ways to reduce or eliminate the compound’s potential side effects.” The analyses carried out by Knörle and the IBAM team involve methods that are used in the field of enzyme biochemistry in order to measure the activity of neurotransmitters in the synaptic cleft or the dynamic activity of receptors at nerve cell membranes. The CNS has been the researchers’ major research priority ever since the company’s establishment.



The IBAM GbR headquarters are located in the same building as Vivacell Deutschland
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In 1999, Löschmann left the company and Dr. Peter Schnierle from the Institute of Inorganic and Analytical Chemistry at the University of Basel joined the company as a new full-time partner. Schnierle has contributed considerably to the establishment of new methods that enable the quantitative analysis of amino acids and biogenic amines to which many neurotransmitters belong.

Public clients such as the Universities of Munich, Leipzig, Strasbourg and Freiburg have outsourced such sophisticated analyses to IBAM. Scientific cooperation with the Universities of Freiburg and Strasbourg have led to joint scientific publications in renowned scientific journals and have contributed to the broadening of the existing knowledge about the basics of antiepileptic drug and dementia research. In 2001, IBAM added a new priority to its existing service portfolio: In cooperation with the biotech company Vivacell Deutschland, IBAM started to focus on the investigation of the neuropharmacology of phytopharmaceuticals. Since then, IBAM has been developing bioactive extracts from traditionally used medicinal plants, as well as from a growing number of other plants that are not considered medicinal plants.

Interesting future perspectives

The company has carried out initial analyses on Hypericum (St. John's wort) extracts that also contain valerian and passion flower extracts. Such extracts have been shown to retard the degradation of certain neurotransmitters in the brain, thereby enhancing the length of their effect. Therefore, these extracts may be used as effective remedies for the treatment of depressive disorders, anxiety disorders, or ADHD (attention-deficit hyperactivity disorders). Recently, Knörle and Schnierle, who also focus on basic research in this area, have discovered Greek mountain tea as an interesting research topic. Green mountain tea consists of plants of the genus *Sideritis* (ironwort) and is consumed in Greece and Turkey due to its medicinal property in alleviating common cold or gastrointestinal disorders. IBAM was able to show that different green mountain tea compounds increase the retention time of neurotransmitters (e.g., serotonin, dopamine, and noradrenaline) in the synaptic cleft. Since the messenger molecules, which are released upon a certain stimulus, are not taken up immediately again by the cells, they can exert their effect on the receptors for a longer time and thus increase the activity of a broad range of neurons in the brain.

"We have developed *Sideritis* extracts that have been shown to be effective remedies for the treatment of depressive disorders, anxiety disorders, or for the treatment of ADHD (attention-deficit hyperactivity disorders)," said Knörle. In the future, clinical trials need to provide information on whether it is possible to produce effective drugs with as few side effects as possible from these extracts. IBAM, however, is a far too small company in order to carry out clinical trials and is looking for partners that might be interested in supporting the company in this venture. The phytopharmaceuticals market is huge and IBAM has already broken into this market. In 2001, the company relocated from Freiburg to Denzlingen and is now headquartered in the same building as its cooperation partner Vivacell Deutschland. IBAM also has plans to focus on bioactive food from August 2010. In a cooperative project with the NEMO network under the coordination of Steinbeis Innovation gGmbH in Stuttgart, Knörle and Schnierle have plans to analyse food that promotes human health and well-being. "Which molecules and modes of action promote human health," asks Knörle. IBAM has undergone continuous development over the last 14 years and the two IBAM managers hope that it will continue to do so also in the future, which is why Knörle and Schierle are always open to new areas of research.

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Sideritis plants, which are served in numerous Mediterranean countries as “Greek mountain tea” have a remedial effect on the CNS.

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