

Center for Applied Nanotechnology

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Successful conclusion of business year 2007

“CAN GmbH was able to effectively develop and consolidate its position as a leading innovator in the field of nanoparticle technology,” is how Frank Schröder-Oeynhausen, Chief Operating Officer, summed up CAN GmbH’s second business year. Typical results were the acquisition of new research contracts and an increase in turnover and income from project funding to nearly 1 million Euros. This represents an increase in turnover of 10% versus the previous year. Income was generated particularly by contract projects with well-known companies, projects funded by the private sector as well as small orders. Responsible for this were independent collaboration, patent, and third-party strategies in the business areas cosmetics/flavours, medicine/medical technology, technical applications as well as analysis/toxicity. “Special thanks for their successful work in the first two years of development goes to our excellent team that we are so proud of. Now numbering 25, with their help we will be able to continue to develop CAN GmbH into a leading technology service provider,” Chief Officers Dr. Frank Schröder-Oeynhausen and Prof. Dr. Horst Weller agreed.

With conclusion of a cooperation agreement between CAN and the University of Hamburg, CAN GmbH will now be able to discover, evaluate and utilize nanotechnology innovations in the university environment. The agreement regulates in particular handling of patent rights, utility-model rights, freedom to publish and utilization of grandfathering rights. CAN GmbH makes optimal use of patent rights either by selling them, granting licenses to third parties or using them itself. Thanks to this agreement four inventions could already be transferred to CAN GmbH in the business year 2007 and are patent pending. It was even possible with one patent to achieve initial sales of 25,000 Euro from commercialization.

The focus of activities in 2008 is on targeted development of business areas. Applying for open tenders of the German government and the EU in selected fields such as Molecular Imaging und Theranostics is an important part of our strategy. In collaboration with selected partners CAN GmbH is determining the usability of functionalized nanoparticles and planning more projects (see below). A further increase in turnover from industry orders and project funding is planned to offset a disproportionate increase in expenses. The declared goal is to establish CAN GmbH

far beyond the borders of the metropolitan Hamburg area as an internationally recognized centre of research and development in the field of nanoparticle preparation and functionalisation while keeping customer requirements and research excellence a priority.

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Honour plaque for a “Landmark in the Land of Ideas“



From left to right: Volker Sehne (Deutsche Bank), Dr. Frank Schröder-Oeynhausen (CAN GmbH), Dr. Kathrin Adlkofer (Norgenta), Prof. Dr. Horst Weller (CAN GmbH), Prof. Dr. Klaus-Peter Wittern (Chairman of the Supervisory Board of CAN GmbH)

visionary thinking, creativity and motivation are the right way to shape the future,” said Adlkofer. “Through its close association with universities and research facilities in Hamburg, CAN GmbH is integrated in a large regional network of internationally outstanding researchers.” As a partner in the German “Land of ideas” initiative, German Bank also confirmed the exceptional expertise of CAN GmbH. “Here application- and industry-oriented nano-research is used to achieve sustained development and strengthening of Hamburg as a centre of business and finance,” emphasized Volker Sehne, Head of Marketing of Deutsche Bank Hamburg.

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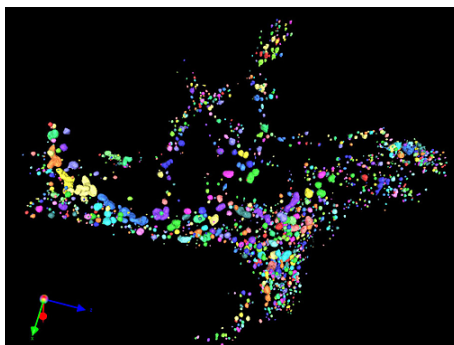
On 29 May, Deutsche Bank presented an honour plaque to CAN GmbH as part of the German “Land of Ideas” initiative. The research facility is a “Landmark in the Land of Ideas 2008” and will host an Open House on 4 December to introduce itself to the public. “Our team sees this award as special recognition for their work,” said the delighted CAN Chief Officers Dr. Frank Schröder-Oeynhausen and Prof. Dr. Horst Weller. Representing Hamburg’s Senator for Science and Research Dr. Herlind Gundelach at the ceremony was Norgenta CEO Dr. Kathrin Adlkofer, who emphasized that CAN as a ‘Landmark’ represents Hamburg as a centre of science and research.

“CAN’s naming as a “Landmark 2008” shows that



United against diabetes with VIBRANT

The start of 2008 saw the launch by CAN GmbH of an ambitious project on “in Vivo Imaging of Beta cell Receptors by Applied Nano Technology” – abbreviated “VIBRANT”. This pan-European project deals with medical imaging of the so-called “beta cells” of the human pancreas that regulate the blood sugar level by releasing insulin. These cells are present only in very small amounts and it has so far been impossible to measure them quantitatively in the living organism. When the beta cells die, humans develop diabetes. Because of today’s lifestyle this disease is on the rise, with serious consequences for the health and social well-being of those affected and ultimately with immense costs for national economies – due to long-term diabetes complications such as blindness, kidney failure and amputations. If the number of intact beta cells could be determined as part of medical exams, action could be taken to control diabetes much earlier than previously possible. In addition, it would be possible for the first time to monitor directly the success of treatment or even develop new therapies to maintain or increase the number of beta cells.



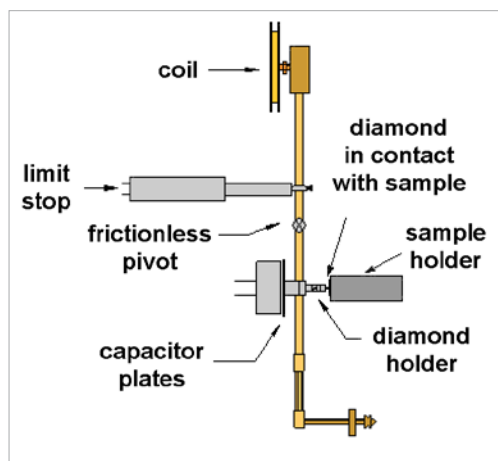
High resolution 3D imaging of the distribution of islet cells in intact pancreas (by permission of Prof. Ulf Ahlgren, Univ. Umea, Sweden)

Eight renowned research institutes and two companies in Germany, Belgium, Spain, Denmark, Sweden and Switzerland – including CAN GmbH – are engaged in this exciting project. “As the originator and applicant, CAN is responsible for coordination of the research work – as well as – of course - the development of the required, highly complex nanoparticles,” explained Dr. Theo Schotten, Business Development/Research & Development of CAN GmbH. In the first of two review procedures of the EU Commission the scientific quality and benefit for society of VIBRANT received very positive ratings from the reviewers. These are ideal prerequisites for

successful conclusion of the second review phase in the fall of this year. VIBRANT is scheduled to run from the beginning of 2009 until the end of 2012. Leading pharmaceutical companies have already indicated a “vibrant” interest in the results of this research.

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CAN GmbH characterizes surfaces



Schematic diagram of operating principle of the NanoTest instrument

CAN GmbH has extended its measuring techniques in the business area “Nanostructured Surfaces and Coatings” with a NanoTest® instrument from the British company Micro Materials Ltd. For analysis of surfaces with a nanoparticle structure, scanning electron microscopy and atomic force microscopy have proved to be useful tools: Playing a prominent role in thin films are not only topographic information and the chemical composition of particles but also their mechanical properties. NanoTest® is a modular platform for quantitative measurement of the mechanical properties of nanostructured surfaces and coatings. Its key component is a diamond-tipped pendulum

by which forces and moments can be applied to the sample. From the response signal the nanomechanical properties of thin films are determined quantitatively. That makes it possible to

- determine with the scratch test feature the adhesion of a coating to the substrate and film failure.
- obtain with the indentation test feature information on the Young’s modulus and hardness of a coating.
- obtain with multiple impact tests findings on film failure and its mechanism under conditions of periodic loading.
- characterize quantitatively with the “High Temperature Nano Testing Stage” option surfaces and coatings even at temperatures above 500°C, thus greatly expanding the range of applications of this analytical method.

“This option is particularly relevant to coating materials that undergo a phase transition within the temperature span and coatings with high application temperatures,” explained Dr. Christoph Gimmler, CAN GmbH. The instrument is used to measure oxide, metallic and polymer coatings. “This makes it interesting for industrial applications in the semi-conductor, optics, pharmaceutical and medical technology industries.”

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CAN GmbH analyses used oils for impurities



In a project supported by the European Regional Development Fund (ERDF), CAN GmbH is analysing several used oils for colloidal impurities. Using modern laboratory methods, the impurities are separated from samples taken from the individual cleaning steps of the treatment process and then analysed by CAN. A combination of test methods like electron microscopy, spectroscopy and light scattering is used to analyse the composition and structure of

impurities and gain new insights into the processes taking place in the individual cleaning steps of used oil treatment. These findings can subsequently be used to make existing processes more efficient and develop new processes.

In this collaboration with the University of Hamburg and Horst Fuhse Mineralö Raffinerie GmbH, CAN GmbH is using its extensive range of characterization methods for the first time to work on a problem from the area of colloid and nanostructured materials analysis. Besides doing the tests and associated evaluations, it will also be necessary to adapt and optimise the test methods for the respective systems.

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CAN runs to help



On 14 June 2008, it was that time again: CAN GmbH took part this year as last in the HSH-Nordbank Run in Hamburg Hafencity with a total of twelve runners. Some of the runners had already participated in 2007, while for others it was their “running premier”. Besides having fun and the satisfaction of crossing the finish line, everyone helped the “Kinder helfen Kindern”

(Children Help Children) campaign through donation of their entry fee. Next year we will definitely be there again – hopefully with an even bigger team.

CAN GmbH Partners

In good company

Beiersdorf AG www.beiersdorf.com

Eppendorf AG www.eppendorf.com

Olympus Winter & Ibe GmbH www.olympus-owi.de

Evotec Technologies GmbH www.evotec-technologies.com

Nanogate AG www.nanogate.com

Merck KGaA www.merck.de

Firmenich International SA www.firmenich.com

Free and Hanseatic City of Hamburg fhh.hamburg.de/stadt/Aktuell/behoerden/wissenschaft-forschung

Hamburger Sparkasse www.haspa.de

Hamburg Chamber of Commerce www.hk24.de

Innovationsstiftung Hamburg www.innovationsstiftung.de

Norgenta North German Life Science Agency www.norgenta.de

Competence Center Hansenanotec www.nanoscience.de/hansenanotec

University of Hamburg www.uni-hamburg.de



CAN GmbH offers companies and research institutions contract research and development services in the area of nanotechnology and participates in national and international research programs. The focus of activities is on the utilization of new findings made in chemical nanotechnology and nanoanalysis, particularly in the areas of consumables, special polymers and health care. The main areas of expertise include, in addition to the characterization of nanostructures, the production of numerous nanoparticulate and nanocomposite materials, the encapsulation of active substances as well as the development of nanoparticle-based biological and medical markers.

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