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Capsulation and QIAGEN begin Research Project on LBL-Capsules and Nano-Tests

The Development of New Perspectives in Cancer Therapy and Diagnostics in Co-operation with Universities and Institutions of Higher Education

Berlin / Hilden, 30th May, 2007 --- The Berlin-based company Capsulation Nanoscience AG and QIAGEN GmbH from Hilden are focussed on cooperation. Within the framework of a cooperative agreement, the leading company in the field of nanotechnology and the largest supplier of sample and assay technology aim to make use of the synergies arising between programmable biomolecules and the latest developments in nanotechnology. This future technology is concerned with structures on the smallest possible level. Already three faculties are involved: the task force "Liebscher" from the Faculty of Chemistry, at the Humboldt University and "Herrmann" from the Faculty of Biology at the Humboldt University, Berlin as well as the task force "Huster" from the Faculty of Biotechnology at the Martin-Luther University, Halle. The joint project is being sponsored within the framework of the Ministry of Science and Technology (BMWF) Sponsor Programme "Nanobiotechnology" with a total of 1.23 million Euros. The project will deal with, on the one hand the fundamental work on the coupling of small sections of genetic substance (oligonucleotides) onto LBL® functionalised particles. The latter consist of nanoparticles or capsules suitable for differing uses such as the transport of pharmaceutical substances. On the other hand, the next three years will be concerned with the research into future-oriented diagnostic and medical uses for the programme with which cancer and other diseases can be more easily recognised and treated.

In this way, the development of a simple, highly-sensitive and specific rapid-testing is being planned, which will verify the existence of disease-causing genes such as the so-called "cancer gene", also, however, of bacteria, viruses and genetically changed organisms. As well as an easier and improved diagnosis, the joint project also wants to help cancer and gene therapy onto its feet: Transport containers and Trojan horses aim to make possible the targeted transport of the substance into the single cell. A building-block system is planned for

these innovative drug-delivery systems: Using the latter, the surfaces of the substance-filled capsule are modified to such an extent that they can be dispatched to certain cell types as required. "In both of the research areas – diagnosis and therapy – we are relying on LBL capsules with modified surfaces that will carry oligonucleotides on their outer surfaces", explains project coordinator Lars Dähne of Capsulation. The short filaments which are made up of building blocks of genetic substance act as recognition sequences, can, however, also have a therapeutic effect as a substance.

The basis of the diagnosis kits are tiny particles: "The new nanoparticles proving the existence of biomolecules such as DNA and RNA will consist of a magnetic core and a functionalised shell", describes Dähne and goes on to add: "We are building the shell of the core-shell particle layer-wise, with the help of our LBL-Technology®. In the next step, we couple the required nucleotide fragments onto the rough LBL surface". The nucleic acid filaments then stick out of the particles like hooks. When used in the rapid testing, the oligonucleotides attract complimentary nucleic acid filaments (fragments) into the samples to be investigated. The evidence of a successful catch or of a hybridisation event is proven by using FRET detection (Fluorescence Resonance Energy Transfer). "Now the core takes the stage", states Dähne. "Before the detection, magnets can concentrate the particles exactly". In order to increase the sensitivity of the evidence, his project group wants to work one of the two fluorescent dyes involved into the LBL surface.

The QIAGEN rapid-testing system aims to facilitate the discovery of genetic markers for certain viruses or diseases and therefore press ahead for worldwide prevention and treatment of such diseases. With the new system, neither an concentration, purification nor an amplification of the sought-after biomolecule or gene will be necessary. "We want to develop a method which delivers accurate results, which is reasonably priced and can be carried out by less specialised personnel in the most diverse of laboratories worldwide", states Dr. Ioanna Andreou, Senior Scientist for R&D at QIAGEN. Also, the detection system aims to facilitate identity regulations or legal medical investigations.

For the drug-delivery units, the LBL capsules contain substances which need to be transported to the cells without leakage because only when the capsule has reached its destination cell and has docked on, can the delivered substance influence the cell from the outside or the inside. To enable the capsules to function as transport containers or even as Trojan horses overcoming the cell barriers, a prepared and intended bonding onto biological surfaces needs to be implemented. This can be carried out with the help of oligonucleotides.

The employment of transport capsules and Trojan horses would make enormous therapeutical steps, especially with certain cancer forms such as leukaemia: Here, this employment could lead to practically effect-free medication. Capsulation wants to make use of extra and intracellular drug-delivery units: "The coupling of desired release properties of encapsulated substances with precise cell targeting can be ideally marketed", explains the BD-Manager Silvana Di Cesare of Capsulation Nanoscience.

About Capsulation:

Capsulation NanoScience AG is a leading company in the field of tailor-made drug-delivery systems and other innovative life science products on the basis of so-called nanocapsules. These nanocapsules are manufactured on the basis of the worldwide patent protected LBL Technology®. Due to their minute size and high level of functionability as well as their extremely reproducible manufacture, the capsules can be used in a diverse number of applications. The nano and micro capsules can be manufactured in any desired size, according to application and endowed with practically any biochemical, electric, optical and magnetic properties. Capsulation works together with a Japanese licensee (EBARA) which is responsible for the development, manufacture and the distribution of the so-called LBL units to customers as well as for the fully automated encapsulation of the most diverse substances.

About QIAGEN:

QIAGEN N.V. is a Dutch holding company and the worldwide leading supplier of innovative sample and testing technology and products. These products are seen as standards in areas such as the pre-analytical sample preparation and in molecular diagnostics. The extensive product range consists of more than 500 products and automation platforms for sample selection as well as for the separation, cleaning and handling of nucleic acids and proteins as well as for open and targeted testing. QIAGEN products are sold to scientific research facilities, leading companies in the pharmaceutical and biotechnological fields, to customers in the field of applied testing procedures (forensics, veterinary medicine, biodefence and industrial applications) as well as to molecular-diagnostic laboratories. QIAGEN employs over 1,950 people worldwide and their products are sold in over 40 countries via a customer-oriented distribution net and distribution brokers. For further information on QIAGEN, visit the website at www.QIAGEN.com.