EUROPÄISCHE AKADEMIE
zur Erforschung von Folgen wissenschaftlich-technischer Entwicklungen
Bad Neuenahr-Ahrweiler GmbH

PRESS RELEASE

Spring Conference of the Europäische Akademie Bad Neuenahr-Ahrweiler:
Nanomedicine. Visions, risks, potential

Bad Neuenahr-Ahrweiler, 24 April 2012. – Nanotechnology is frequently judged to be a key technology of the 21st century. Especially in the field of medicine nanotechnology may help to develop new and effective applications. However, as with many modern technologies, there are considerable moral concerns about the consequences nanotechnology may have for humans and their environment. At this year's Spring Conference of the Europäische Akademie Bad Neuenahr-Ahrweiler, which took place at the Berlin-Brandenburg Academy of Sciences and Humanities from 19 to 20 April with about 50 participants, experts from different involved fields of research presented several aspects of the development in nanomedicine: recent trends in the progress of nanotechnological methods in medical applications, risk and other ethical issues as well as the social impact of nanomedicine in the context of science, industry and the public. Additionally, the conference included a poster session with 14 posters from different research fields such as lab research on nanoparticles, technology assessment and bioethics.

The first session was dedicated to an overview of the current state of art concerning the scientific and technical aspects of nanomedicine, including the attempt to keep the debate on a realistic ground instead of feeding utopian and dystopian views (such as the unlikely nanorobots). First, Professor Hofmann (Ecole Polytechnique Fédérale de Lausanne, Institute of Materials Properties) gave an introduction to nanoparticles, focusing especially on its usage as imaging agents for the diagnosis of rheumatoid arthritis and osteoarthritis. Thereafter, Professor Müller (Freie Universität Berlin, Institute of Pharmacy) presented the possibilities for drug delivery with nanoscaled organic capsules and containers as an example for therapeutic applications. The first two lectures were followed by a lively discussion on the proper definition of "nano-structures" – mere size-related definitions were widely judged as less satisfactorily as those focusing on novel chemical and physical properties due to the small size of the particles. Later on, Dr. Jordan (MagForce AG, a nanomedicine company) reported about cancer therapy by hyperthermia using nanoparticles in brain tumors. From his point of view it was a good example for a method that already underwent the process of scientific development, industrial upscaling and marketing. Dr. Ciofani (Scuola Superiore Sant'Anna, Istituto Italiano di Tecnologia) pointed out the nanomedical application of nanotubes as an alternative material to nanoparticles by exploiting their piezoelectric properties for cell stimulation. In summary, this session did not only outline possi-

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ble methods of diagnosis and therapy but also the importance of market mechanisms, industry and financing to implement a nanomedical innovation in the market.

The question of risk, one of the most debated issues among the possible adverse consequences of nanomedicine, was discussed during the second session. Researchers often regard toxicological aspects to be the main potential risks. Professor Krug (EMPA, Department "Materials meet Life"), an expert of toxicology, stated that with the currently available methods the reliability of toxicological datasets of nanomaterials was sub-optimal and that it was therefore problematic to come to reliable conclusions about toxicity of nanoscaled substances for medical applications. Thus, these should neither be labeled "risky" nor "safe". Mr. D'Silva (Universiteit Twente, Department of Legal and Economic Governance Studies) then explained the legislation and regulation of nanotechnology from the EU perspective in order to control and govern risk and presented several regulations and policies which had already been made on national and international level.

During the third session social and ethical implications were debated. Professor van Lente (Universiteit Utrecht, Department of Innovation and Environmental Studies) investigated the field of nanotechnology and -medicine from the perspective of political sciences. He argued that the further development of the field should be accompanied by a proper social embedding, i.e., the engagement of the public. Dr. Wullweber (Universität Kassel, Department of Political Science) stated that "nanotechnology" was mainly a politically driven expression which obtained acceptance by political and media campaigns and therefore was more accepted than, for example, genetic engineering, although these two fields of research had many similarities in public perception. Finally, Professor Brownsword (King's College, Research Centre TELOS) provided an overview of his concepts of an ethical analysis of nanotechnological matters, including aspects of "precaution" and "informed consent". He came to the conclusion that the current EU legislation provided sufficient laws in order to regulate a new technological development such as nanotechnology.

Speakers:
Professor Dr. Heinrich Hofmann (Ecole Polytechnique Fédérale de Lausanne), Professor Dr. Rainer Müller (Freie Universität Berlin), Dr. Andreas Jordan (MagForce AG, Berlin), Gianni Ciofani, Ph.D. (Scuola Superiore Sant'Anna), Professor Dr. Harald Krug (EMPA, St. Gallen), Joel D'Silva (Universiteit Twente), Professor Harro van Lente, Ph.D. (Universiteit Utrecht), Dr. Joscha Wullweber (Universität Kassel), Professor Roger Brownsword (King's College, London)

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About the Europäische Akademie Bad Neuenahr-Ahrweiler:
The Europäische Akademie deals with the scientific study of the consequences of scientific and technological advances for individuals, society and the natural environment. The main focus is on the examination of foreseeable mid- and long-term processes that are especially influenced by the natural and engineering sciences and the medical disciplines. As an independent scientific institution, the Europäische Akademie pursues a dialogue with the world of politics and society at large. The Europäische Akademie Bad Neuenahr-Ahrweiler gGmbH was founded in 1996 by the Federal State of Rhineland-Palatinate (Land Rheinland-Pfalz) and the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt e.V. – DLR). Further information: www.ea-aw.org