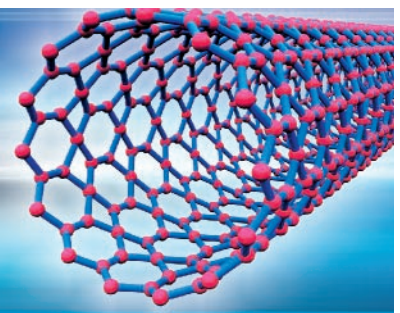


EU Research Funding for Nanotechnologies

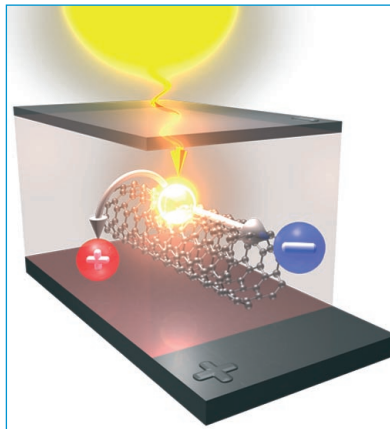


Daily life would no longer be conceivable without them, even though they are invisible to the human eye: Nanoparticles (Greek *nános* = dwarf) have a size of 10^{-9} m. That means one nanometer is one billionth of a meter in length. For comparison: Our fingernails grow approximately one nanometer per second. And still our life is dominated by these „ultrasmall particles“: They are omnipresent, be it in creams in the cosmetics industry, scratch-resistant elements of paints in automobile production or as bactericides in medical products.

Especially in the field of medicine and biotechnology (cancer treatment, simpler diagnosis of diseases), in nanoelectronics (development of efficient semiconductors, multifunctional sensors) or in renewable energies (solar cells, catalytic conversion of biomass), scientists are faced with key challenges that can be counteracted with the aid of nanoscience.

That is not the only reason why nanotechnology is regarded by the EU as one of the important key technologies of the 21st century. Market estimates suggest that the share of nanoproducts on the world market will amount to about EUR 700 billion by 2015. By 2020, the total revenue of products incorporating nanotechnology as the key component should even reach two trillion euros. In other words, these „tiny“ particles will generate about six million jobs.¹ ■

¹Interinstitutional Dossier of the Council of the European Union from May 24, 2012 (10218/12, DE, 2011/0401 [COD], p. 65)



Sunlight is absorbed by the carbon nanotubes and utilized to generate electricity. Photo: Hannes Kraus (Julius Maximilian University of Würzburg) ■

Optimal use of solar energy with new materials comprising carbon nanotubes

Since November 1, 2012, the international consortium of the European research project POCAONTAS (Polymer-Carbon Nanotubes Active Systems for Photovoltaics) has been investigating how nanotechnologies may contribute to the efficient use of solar energy.

Five Bavarian partners representing science, academia and industry are participating in this project.

For the next four years, the European Commission will fund this joint project with EUR 3.5 million aiming at developing an alternative to silicon-based solar cells, the production of which is extremely costly and energy intensive.

By contrast, the production and recycling of solar cells based on plastic are resource efficient. In

addition to that, they are light and flexible, which makes them versatile as well.

The carbon nanotubes composite (CNT) offers the optimum prerequisites for improving the performance of solar cells. Generally carbon nanotubes facilitate a long-term use of cells thanks to their good photochemical stability. Moreover, they absorb light over a broad spectral range and their electrons possess high mobility. All of these characteristics may contribute to an efficient conversion of solar energy.

Polymer-based solar cells to date don't carry out the efficiency of silicon-based solar cells. The participating scientists of POCAONTAS rise to this ambitious challenge. Therefore they intend to optimize the interaction of materials with the aid of modern spectroscopy, and finally make these usable for the efficient energy conversion.

The training of young scientists is in addition to research an important objective of the project, which is promoted via an „Initial Training Network“ (ITN) as part of the EU's Seventh Framework Programme. The project partners will offer scientific and complementary courses and workshops for young scientists throughout the network. ■

Innovation driver for the 21st century

Nanotechnology is an innovation driver for many industrial sectors, which is taken into account by

the European Commission in its Seventh Framework Programme (FP7, 2007-2013) with approx. EUR 3.5 billion for the research theme „Nanosciences, nanotechnologies, materials and new production technologies – NMP“ (Theme 4 in Cooperation). That corresponds with about 5 to 10 percent of the overall funds of FP7. The EU also lays great emphasis on the fostering of cross-cutting technologies; thus the calls for proposals for the themes such as nanotechnologies and new materials are also reflected in themes like health, energy, information and communication technologies.

Hence, long-term objectives are pursued for facilitating a better quality of life with an increased life expectancy, a safe environment and energy savings. ■

Nanotechnology as a key feature in „Horizon 2020“

In the EU’s next Framework Programme for Research and Innovation, Horizon 2020 (2014-2020), topics involving nanotechnologies will be found in all three thematic pillars „Excellent Science“, „Industrial Leadership“ and „Societal Challenges“. Nanotechnology will be mainly funded in the second pillar. To facilitate implementation, the so-called „Key Enabling Technologies - KETs“ are integrated in the following six fields of research:

- Information and Communication Technologies (ICT)
- Nanotechnologies
- Innovative materials
- Biotechnology
- Advanced manufacturing and processing
- Aerospace



The prior proposal of the EU Commission with regard to Horizon 2020 envisaged a budget of EUR 13.7 billion for the KETs, where approx. EUR 4 billion thereof is earmarked for interdisciplinary technologies. ■

Competent support for your EU project

The Bavarian Research Alliance (BayFOR) offers professional advice and support to Bavarian universities and universities of applied sciences as well as small to medium-sized enterprises (SMEs), which are interested in European research funding, prior to, during and after the application process. The current FP7 and the forthcoming programme, Horizon 2020, form a key aspect in this regard. Our scientific officers provide specific technical information, advice and their active support during the project initiation phase, the setup of international research consortia and the application process. In case of a successful evaluation, BayFOR also provides assistance during contract negotiations with the European Commission and, if necessary, assumes project management and the dissemination of scientific results. For instance, BayFOR has supported the POCAONTAS consortium during the preparation of the proposal and will presumably be responsible for the complementary training as an associated partner. Another aim is to increase the par-

ticipation of Bavarian companies, especially SMEs, in European funding programmes. As a partner organization in the support network for SMEs „Enterprise Europe Network“ (EEN), BayFOR acts as an interface between science, academia and the industry.

BayFOR has also been commissioned by Bavaria’s State Ministry of Sciences, Research and the Arts to supervise the Bavarian University Funding Programme for the Initiation of International Projects (BayIntAn). Our efforts are aimed at initiating or strengthening transnational collaboration in research projects involving Bavarian universities and universities of applied sciences.

The Bavarian Research Alliance is a partner organization in the Haus der Forschung (‘‘House of Research’’). ■

Further information:

www.bayfor.org

www.hausderforschung.bayern.de/en

Picture: Nanotube
(Copyright: Tyler Boyes, Shutterstock)

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