Title	**Nanotechnology in Medicine**
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Reference	TA 47/2003: Nanotechnology in medicine, 124 pages, (German); TA 47A/2003: Cutting nature's building blocks down to size, 10 pages (English)

Aim

This study aims to investigate the potential, risks, future applications, and effects of nanotechnology.

Conclusions and results

Nanotechnology is regarded as the key technology of the 21st century. Switzerland is currently providing substantial funding to support this branch of research. In terms of potential applications, nanotechnology is in its infancy. However, the experts consulted expect major advances by the year 2010, especially in the field of disease diagnosis. Diagnosis will be quicker, will be possible at the very early stages of a disease, and will provide more specific and more precise results than current methods. The results of nanoscientific research should bring about a marked improvement in therapies for some diseases by 2020. Experts are hoping to see advances in the early identification and treatment of cancer, cardiovascular diseases, and viral infections. Although the possibilities tend to be overestimated and the difficulties underestimated, opinion among experts is unanimous: nanoscience will mean drastic changes for traditional medicine. Nanorobots, however, are likely to remain in the realms of science fiction for some years to come.

Considerable uncertainty surrounds any evaluation of the opportunities and potential risks of nanotechnology. For example, how much pressure will society put on the individual if nanotechnologically improved genetic diagnosis makes comprehensive, forward-looking health care a possibility. People will possibly be more in tune with their bodies than they are today, and will have to make decisions about what they actually wish to know about themselves. Data protection and the private sphere will become a key issue. It is also possible that the boundary between sickness and health could become less clear. Half of the experts consulted regard the likelihood of toxicity from directly applied nanoparticles in medicine as something that cannot be ignored.

Recommendations

The authors of the TA-SWISS Study recommend establishing an interdisciplinary, independent committee of experts to assess the possible consequences of nanotechnology on an ongoing basis, and to provide early evaluation of those consequences. An appropriate committee of experts should agree to support risk research and permanent concomitant research into acceptance, the potential for misuse, and ethical and moral questions. In addition, there would have to be an appropriate committee to institute a permanent process of communication between researchers, companies, political groups, and the public.

Methods

TA-SWISS has initiated a study to clarify the medium- and long-term applications of nanotechnology and their effects in medicine. The time horizon for the investigation extends to 2020. The findings are based on an international, written survey of experts and involve more than 70 people from a variety of disciplines.

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