

Research strategy of the Swiss Nanoscience Institute

The Swiss Nanoscience Institute's (SNI) interdisciplinary research teams focus on those topics where they have longstanding expertise and where they are internationally well recognized experts.

Scientists within the SNI are specialized mainly in the analysis of specific nanophenomena and nanoprocesses, in research and development of nanotools and nanosystems. The modules „Nanobiology“, „Quantum Computing and Quantum Coherence“, „Atomic and Molecular Nanosystems“, „Molecular Electronics“, and “Nanotechnology and Applications” stand for the core competencies of the SNI (www.nccr-nano.org/nccr/research/modules).

The development and investigation of new nanomaterials is limited. Scientists within the module “Functional Materials by Hierarchical Self-Assembly” aim to design, prepare and evaluate new intelligent materials and molecular systems with characteristic dimensions in the nanometer range that perform chemical, physical, and biological functions. For instance, they investigate the feasibility of diagnostic and therapeutic targeting by synthetic nanocontainers. Toxicity of these nanocontainers is also examined within this project (link zu http://www.nccr-nano.org/nccr/research/publications/publication_494/publication_item.pdf).

Nanoscale research can be classified into four major fields:

- a) investigation of nanophenomena and nanoprocesses that are specific for the nanometer scale
- b) research and development of nanotools
- c) research and development of new nanomaterials
- d) research of nanosystems consisting of different nanocomponents

For scientists of the SNI it is unquestionable that possible risks of nanomaterials have to be examined in detail and that the approval of new nanomaterials needs to be regulated. Also, a public dialogue on new materials, risks and safety is desirable. Scientists of the SNI are active in this field. Some of them are members of the “Scientific Committee for New and Emerging Health Risks (SCENIHR)” and work closely with their colleagues from the EU. Currently, SCENIHR is in the process of revising the approval guidelines for new substances so that new nanomaterials can be handled appropriately in the future.
http://ec.europa.eu/health/ph_risk/committees/04_scenihhr/scenihhr_cons_01_en.htm

Since toxicity analysis and risk assessment are not or only marginally in the core competencies of the SNI scientists, they closely collaborate with important national institutes like EMPA (Materials Science and Technology). Additionally, it is currently discussed which new toxicological projects could be included in the SNI network in the future.



Sometimes media give the impression that nanoscale science and nanotechnology are to be equated with and limited to research and development of new nanomaterials only. However, nanoscale sciences cover a much wider spectrum of topics. The development of more powerful microscopes to discover and analyze the nanoworld, the investigation of biological systems, the exploration of the basics that might lead to the development of quantum computers, the application of cantilever systems in genomics, proteomics and diagnostics, or the use of single molecules as electronic switches are examples of research fields that are not linked to new nanomaterials and offer a wide range of future applications.

More about the research topics of the SNI at:
www.nccr-nano.org/nccr/research/modules

Contacts within the SNI: (als email link)

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Nanotechnology and Applications: Prof. Jens Gobrecht, Prof. Uwe Piesles
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