8. Sweden

8.1 General dialogue details Sweden

Dialogue data

Location of the dialogue	Innovatum Science Center, Tröllhattan, Sweden
Topic	Nanomedicine
Date of the dialogue	23 November, 2017
Participants	12 participants (8 men, 4 women): • Representative of umbrella organization of Swedish nanotechnology actors • Research manager of a company developing nanomedical products for cancer diagnostics and treatment • Representative of organization that strives for environmentally responsible behavior in the medical sector • Researcher in the field of nanotechnology, scientific instruments, nanosafety and nanotoxicology • Researcher in the field of molecular surface physics and nanoscience (1) • Researcher in the field of molecular surface physics and nanoscience (2) • Researcher in the field of nanomedicin and biomaterials • Researcher studying nanotechnology from a social perspective • Representative of a digital platform for dialogue and planning of systems • Representative of a national charitable environmental organization, focusing on chemicals and cosmetic products • Representative of an organization coordinating projects on nanosafety

8.2 Recommended directions for change

The discussions in the Swedish multi-stakeholder dialogue were primarily focused on issues of safety and transparency. Although both safety and transparency are relevant topics in relation to the concept of responsible research and innovation, the conversations seemed to elude the question of how societal perspectives can be integrated better in nanotechnology research and innovation processes. The directions for change presented below thus mainly reflect suggestions that relate to other – but not necessarily less relevant - aspects of responsible innovation than societal inclusion. The original responsible innovation table that was created by participants can be found in Appendix 11.

Improving regulation on safety and labeling of nanotechnology products

Many of the participants seemed concerned about the lack of regulation and proper labeling of nanotechnology products, particularly outside the medical field. They referred to the hard regulations and rigorous testing procedures that exist for the production of nanomedicines, and wanted to see similar strictness of regulations for nano innovation processes outside the medical field. Participants argued that irresponsible behaviour in other fields also damage the reputation of nanomedical products. Therefore, participants called for a closer dialogue between researchers, industry and policy-makers to discuss standards and labeling of products.

A prominent request of participants was a clear definition of how the “nano-concept” should be used in labeling and regulation. Several participants elaborated that not all nano particles are dangerous, and that distinction should be made between those particles and materials that need regulation and those that do not.

In addition, participants asked for the standardization of measurement methods to test and evaluate products and materials. One participant warned that we should not simplify this process, pointing at the enormous variety in properties of nanomaterials, and the consequential need for test methods that are relevant for the specific materials. Participants stressed that testing and evaluation should not only focus on the effects on the body, but should also take into account environmental impacts and life cycle effects. They believed that this is currently still missing in and outside the medical field. Participants underscored that strict safety regulation is needed as soon as possible, preferably coming from the EU level. Support from politicians was considered crucial, and some participants called for a coordinating European authority focused on the area of nanotechnologies.

Lastly, the need for transparent labeling of nanotechnology products was emphasized. Business and industry should exchange more information about the functions and properties of nanotechnologies and materials in their products. Participants accentuated that such labeling information should be written in clear language, which consumers can easily understand.

Increasing public knowledge on nanotechnologies

One of the prominent themes in the dialogue discussion was improving the education of the public on nanotechnologies. Participants explained that much is still unknown about the effects and the risks of certain nanoparticles and nanomaterials on the human body and the environment. Instead of banning all products with uncertain effects, participants seemed to agree that citizens should take more responsibility themselves in gathering information on nanotechnology risks and benefits to then decide for themselves whether they would like to use such products and to determine which risks they are willing to take. However, participants did emphasize that citizens should then have sufficient knowledge on how to judge such risks, and participants considered this something that still requires improvement. Two suggestions were made on how to accomplish this, which are elaborated below.

Accessible and understandable information

Participants mainly focused on two directions for change to stimulate citizens to make their own risk judgments. First is the increase of accessibility to information on properties of nanomaterials and nano-enabled products. People should be able to trust that the information on packaging is correct and is not hiding any details about the materials of which the product is made. Information about properties and risks should also be communicated in an

understandable manner. One participant pointed out that this may require the use of pictures or videos, instead of big pieces of text. Researchers were considered to have a significant responsibility in providing clear communication on nanomaterials and nanotechnologies, although financial incentives might be needed for them to really take up this role. In addition, it was mentioned that nanotechnology actors should attend to the needs and concerns of citizens and ask for their opinions. The argument of the participants suggested that the main goal of such undertakings would be to identify knowledge gaps and make sure that citizens focus on the "right" risks instead of those that were deemed irrelevant by the dialogue participants.

Increased number of educational programs on nanotechnologies and risk assessment

A second suggestion that was made was to set up educational programs, particularly in schools and colleges. Participants called for more focus in the school curriculums on nanotechnologies and strategies to process information on properties of materials. The idea of a web platform to educate students was also suggested. Policy-makers were considered an important facilitator of these changes. They should make policy on the school curriculums and provide funding for educational programs and communication channels.