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Comments on NNI Strategic Plan 2014

These comments are submitted on behalf of the PETA International Science Consortium which represents the PETA affiliates and its more than three million members and supporters. We thank the NNI for the opportunity to comment on the revision of its 2014 Strategic Plan and appreciate NNI's focus on the need for "consensus standards; education and training; consideration of ethical, legal, and societal implications; public engagements; and environmental, health, and safety research" (pg 24). In order to achieve the goals envisioned by the NNI, we request that certain areas be emphasized among the thrust areas listed under the strategic goals. These areas include expediting the process of nanotoxicity analysis using high-throughput nonanimal methods, quantitative structure-activity relationship (QSAR) methods, and nanotoxicity databases and the standardization of characterization techniques for engineered nanomaterials (ENMs).

One crucial step before the incorporation of nano-based technologies into commercial products is to obtain adequate information related to health and environmental effects of these ENMs in different exposure scenarios. Given the sheer number of ENMs available today that are either ready or show potential for product development, efforts should be channeled towards 1) the use of high throughput methods[1,2], in addition to *in vitro* acellular and more complex *in vitro* cellular models in a tiered testing approach; 2) the development of QSAR models based on these data[3]; and 3) generating databases containing characterization and toxicity information on ENMs[4,5]. The aforementioned approaches will be useful in evaluating ENMs across their lifecycles under different biological and environmental conditions and also in accomplishing the focus areas listed under subgoal 4.4 (pg 39).

Use of ENM characterization techniques, based on current guidance documents, such as OECD guidance ENV/JM/MONO(2012)40, will help streamline nano-based research. Therefore, the development and use of more sophisticated characterization tools should be included in:
- subgoal 4.2 (pg 37)
- 'Nanotechnology for sensors and sensors for nanotechnology' NSI in addition to two other areas mentioned on pg 48, line # 33.
- 'Sustainable Nanomanufacturing', NSI, line # 22, pg 46.

Online nanotechnology certifications, overseen by a designated entity would be a convenient way to train and sustain experts in the field. These certifications would require the completion of an online training module and would inform the user about topics such as current approaches in nanomaterial characterization. The certification process could also provide a means to communicate novel methods across different organizations. We recommend that this suggestion be added to subgoal 2.1 (pg 28) and subgoal 3.1 (pg 32) of the plan as a means to improve access to nano-related information.

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[1] Nel *et al*. Nanomaterial toxicity testing in the 21st century: use of a predictive toxicological approach and high-throughput screening. Acc Chem Res. 2013 Mar 19;46(3):607-21.

[2] Wang *et al*. Ranking and profiling nanomaterial (NM) bioactivity by ToxCast high-throughput screening (HTS). 2013 Society of Toxicology poster. See here. Accessed December 13, 2013.

[3] Winkler *et al*. Applying quantitative structure-activity relationship approaches to nanotoxicology: current status and future potential. Toxicology. 2013;313(1):15-23.

[4] Ostraat *et al*. The Nanomaterial Registry: facilitating the sharing and analysis of data in the diverse nanomaterial community. Int J Nanomedicine. 2013;8 Suppl 1:7-13.

[5] NanoHUB.org. See here. Accessed December 13, 2013.