ITS-NANO - Prioritising nanosafety research to develop a stakeholder driven intelligent testing strategy - DTU Orbit (06/12/2018)

**BACKGROUND:**
To assess the risk of all nanomaterials (NMs) on a case-by-case basis is challenging in terms of financial, ethical and time resources. Instead a more intelligent approach to knowledge gain and risk assessment is required.

**METHODS:**
A framework of future research priorities was developed from the accorded opinion of experts covering all major stakeholder groups (government, industry, academia, funders and NGOs). It recognises and stresses the major topics of physicochemical characterisation, exposure identification, hazard identification and modelling approaches as key components of the current and future risk assessment of NMs.

**RESULTS:**
The framework for future research has been developed from the opinions of over 80 stakeholders, that describes the research priorities for effective development of an intelligent testing strategy (ITS) to allow risk evaluation of NMs. In this context, an ITS is a process that allows the risks of NMs to be assessed accurately, effectively and efficiently, thereby reducing the need to test NMs on a case-by-case basis. For each of the major topics of physicochemical characterisation, exposure identification, hazard identification and modelling, key-priority research areas are described via a series of stepping stones, or hexagon diagrams structured into a time perspective. Importantly, this framework is flexible, allowing individual stakeholders to identify where their own activities and expertise are positioned within the prioritisation pathway and furthermore to identify how they can effectively contribute and structure their work accordingly. In other words, the prioritisation hexagon diagrams provide a tool that individual stakeholders can adapt to meet their own particular needs and to deliver an ITS for NMs risk assessment. Such an approach would, over time, reduce the need for testing by increasing the reliability and sophistication of in silico approaches. The manuscript includes an appraisal of how this framework relates to the current risk assessment approaches and how future risk assessment could adapt to accommodate these new approaches. A full report is available in electronic format (pdf) at http://www.nano.hw.ac.uk/research-projects/itsnano.html.

**CONCLUSION:**
ITS-NANO has delivered a detailed, stakeholder driven and flexible research prioritisation (or strategy) tool, which identifies specific research needs, suggests connections between areas, and frames this in a time-perspective.