Governance through responsible innovation: Case of nanotechnology in food and agriculture

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The use of nanotechnology and engineered nanomaterials has been proposed as a way to achieve more sustainable food and agricultural production by harnessing the unique physical-chemical properties and associated functionalities that occur at the nanoscale. Although nano-agrifoods offer numerous potential benefits to society, previous experiences with other novel food and agricultural technologies demonstrated the immense importance of considering responsible innovation (RI) practices that incorporate social and ethical concerns, stakeholder involvement, and issues of trust and transparency along with practices of inclusion, responsiveness, anticipation, and reflexivity.

In response and as a way to reap the benefits of nanotechnology and nanomaterials while minimizing potential risks, the pursuit of RI was put forward by various organizations including the National Nanotechnology Initiative and its associated agencies and departments. However, several studies have found that most nano-innovation has proceeded as "business as usual" and it has been unclear whether and how RI has occurred thus far for nano-agrifoods. A better comprehension and capturing of information on how RI has occurred for nano-agrifoods is critical not only to help ensure the sustainability of these products and applications, but also to reflect on best practices relevant for other emerging food and agricultural technologies.

This presentation therefore provides key findings from a USDA/NIFA grant (2019-67023-29855) that aimed to investigate how RI has been pursued by U.S. researchers and innovators involved in nano-agrifood sectors. Key findings include stakeholder and innovators' definitions and views of RI, motivations and barriers to ensuring RI of nano-agrifoods, and approaches to achieve RI of nano-agrifoods. Further, key lessons learned and best practices for nano-agrifoods are presented that are also relevant to other emerging food technologies.