

Nanotechnology: Development, Risk and Regulation

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Abstract

The Nanotech revolution has now officially begun. While products are just being introduced in the marketplace, its proponents are forecasting incredible possibilities especially for the poor, from abundant food to clean energy. Although it is true that there is much more for us to understand about nano-scale research and manipulation, we should recognize that nanotechnology is no longer a part of the distant future. It is a technology that is already an important part of the commercial marketplace, even if not yet widely acknowledged and recognized. The tenor of discourse on nanotechnology is changing, however, as the voices of critics begin to sound about a host of concerns ranging from the societal impacts, environmental devastation to inadequate legal regulation.

As with any new and powerful technology, appropriate controls, in the form of regulations and legislation, must be tailored to fit the risk/benefit ratio. Sometimes these controls come about by trial and error. In the case of nanotechnology, passively waiting for regulations to develop may allow unnecessary harm to society, either in the form of technology unregulated, or technology undeveloped. A lack of understanding of the effects of nanotechnology and nanoscience can lead to the same miscalculation that occurred with asbestos. As a result, the need for standards for regulation and risk assessment becomes significant to the future growth of the industry.

Effective regulation establishes a climate of regulatory certainty. Regulatory certainty exists when the rules to be applied are clear and well understood. Certainty requires clarity as to which authorities will be responsible for enforcement and regulation. Research and technology are essential for economic growth and improvements in the quality of life. Regulatory initiatives must be able to protect research and technology infrastructure and avoid placing restraints on the freedom of scientific enquiry; but after carefully evaluating risks and potential conflicts. One way to positively control nanotechnology is to contemplate the likely directions new technologies will take and to prepare flexible legislation providing for appropriate regulatory schemes even before the products arrive in the marketplace. Nanotechnology research and development, and related discussions about how to best regulate and utilize new technological capabilities will engage with larger societal debates about technology and social values. Some of this debate will focus on the relevance of and various interpretations of 'precautionary principles', how to make decisions before solid scientific confirmation is available, who should bear the burden of showing that new technologies are safe or dangerous, and an appropriate balance between anticipatory planning and resilient learning responses. In the absence of consensus on underlying principles, specific arguments about nanotechnology issues are likely to be entangled with these more fundamental philosophical disputes.

Thus, if nanotechnology is the "Tiger of Change," then it is quickly picking up speed, and there is a battle brewing between those who would like to steer it, and those who would try to stop or cage it. This paper explores this new technology by analyzing its developmental implications, its risks and finally confronting its legal regulation.