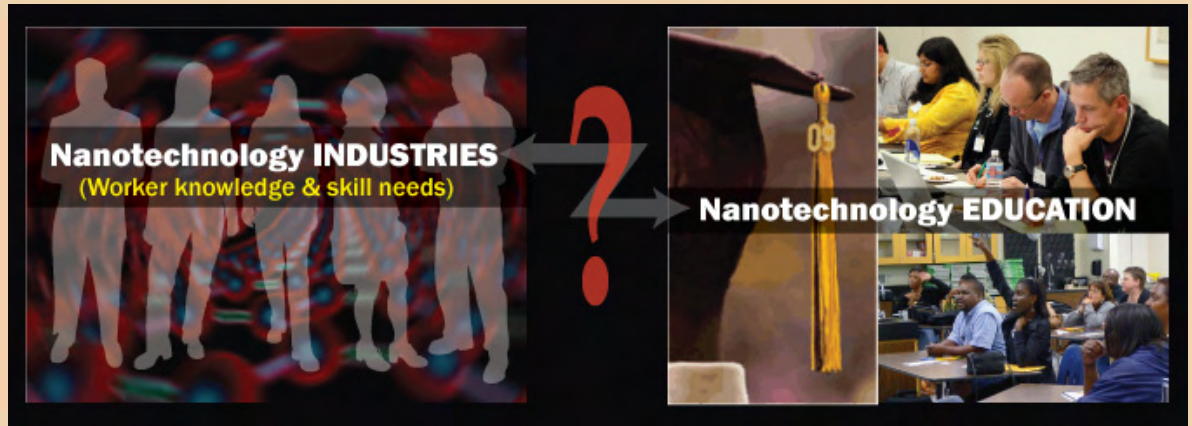


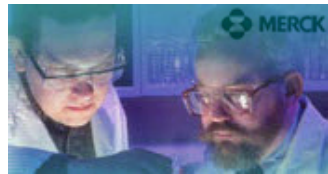
# Nanotechnology Workforce Needs of Pharmaceutical Companies Still Evolving

How do companies hire employees with appropriate skill sets for *emergent technologies* that are so new that little experience exists to identify what new skill sets are appropriate? That has been the riddle encountered by CNS-ASU's collaboration with the Heldrich Center for Workforce Development at Rutgers University to study workforce implications of nanotechnology. The centers' recent case study research with two pharmaceutical firms—Merck and Schering- Plough—reinforces earlier survey findings in other industries: the need for specifically "nanotechnology-trained" workers is still limited, and employers continue to hire workers with degrees in traditional scientific disciplines. However, both companies are planning more comprehensive nanotechnology training for incumbent workers, and both reported the need for workers to have greater interdisciplinary knowledge. Moreover, this study found that nanotechnology presents different skill and knowledge needs for different classes of workers, including those in non-technical positions.



even in their nanotechnology-enabled R&D divisions. They did note a need for workers to have greater interdisciplinary skills that cross chemistry, biology, physics and engineering. The two firms also want employees to understand health and safety issues, flow characteristics, and be skilled in characterization (i.e., observing, measuring, or analyzing the internal structure of materials to understand how they will react with other elements). The primary area where new knowledge and skills are needed is in biology, such as in how nano-chemical formulations interact with living biological systems. One employer noted that non-technical workers in marketing, sales, legal and general management need to become better educated on both the basic science behind nano-technology as well as the social, legal, ethical, health and safety concerns associated with its use.

Much has been speculated about the extent to which the need for skilled nanotechnology workers will grow. At some point, education systems may need to change radically to allow nanotechnology to reach its full social and scientific potential. However, this research suggests that employers have not yet embraced such a paradigm shift. As nanotechnology matures, policy-makers should track how hiring trends and skill and education requirements continue to change, to better align workforce education with evolving employer needs.



Both pharmaceutical companies reported needing very few senior-level nanotechnology workers,