From Science Fiction to Reality: Nanomedicine Brings Fresh Hope to the Medical World

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Emerging nanomedicine technologies could **dramatically transform** medical science as we know it today with their potential to address unmet medical needs and provide targeted therapy.

Nanomedicine technologies could find an increasing place in various areas and applications of the healthcare sector including drug delivery, drug discovery and development, diagnostics and medical devices.

“Nanomedicine holds the promise of site-specific therapeutic action and consequently, fewer side effects,” says Technical Insights Industry

Analyst Rajaram Sankaran. “Such site-specificity holds the promise of a better risk-benefit ratio and thus enhances the prospects for nanomedicine applications.”

The advent of nanomedicine and techniques for the early diagnosis of diseases could usher in a new era of superior prophylactic or preventive medicine. By using preventive medicine, treatment for diseases could be initiated even before preliminary symptoms appear.

Prophylactic interventions might help postpone or even avoid diseases altogether. Nanomedicine could therefore have a huge impact on people’s lives, substantially improving their physical health and quality of life.

If nanomedicine’s adoption rates in pharmaceutical, biopharmaceutical, and drug delivery companies are anything to go by, its prospects in the healthcare industry seem bright.

Nanocrystal technology, for instance, is being used in drug formulation and the new chemical entities screening in the discovery phase of drug development. Quantum dot particles are being applied in high-content drug screening and in the detection of breast cancer cells among others.

However, as with other new technologies, nanomedicine also faces its own set of issues. Scalability is one of its biggest technological challenges. While large-scale production makes better economic sense, this is likely to be a complex task, especially when manufacturing three-dimensional nanostructures as compared to stand-alone or two-dimensional layer-shaped nanosurfaces.

This perceived difficulty is attributed to the fact that manufacturing standards for nanomaterials and components are yet to evolve. Therefore, there is an urgent need for standardized manufacturing

techniques; only then can nanotechnology become ubiquitous in everyday applications.

“Furthermore, since the characteristics of nanoscale matter are very different owing to their unique nature, there is a need for appropriate quality control measures that are specific to them,” notes Sankaran. “This will become increasingly relevant as nanomedicine continues to evolve and face various other challenges.”

Nanotechnology also faces a strong challenge in the shape of negative public perceptions with growing reports about the possible toxic effects of exposure to nanoparticles. Concerns about the potential ill effects of engineered nanomaterials such as carbon buckyballs and nanotubes through inhalation, ingestion, or absorption through the skin are increasing.

Although there is sporadic evidence supporting these possible hazards, it is essential for the nanomedicine community to take the lead in defining the risks associated with nanotechnology. Proactively supporting experts in risk communication can help avert a situation in which the public might actually reject the technology due to unexplained fears and worries.

Nanomedicine – Global Developments and Growth Opportunities, part of the Healthcare Vertical Subscription Service, studies the emerging field of nanomedicine and the exciting possibilities it offers. It discusses prospective therapeutic and diagnostic applications of nanomedicine, focusing on path-breaking research developments and trends that have helped bring it to the forefront. Executive summaries and interviews are available to the press.

Source: Technical Insights

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