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Nanomaterial drug products: Manufacturing and analytical perspectives

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The increasing use of nanotechnology, including nanoparticles, in the preparation of drug products requires both manufacturing and analytical considerations in order to establish the quality metrics suitable for performance and risk assessment. A range of different nanoparticle systems exists including (but not limited to) nano-drugs, nano-additives and nano-carriers. These systems generally require more complex production and characterization strategies than conventional pharmaceutical dosage forms. The advantage of using nanoparticle systems in pharmaceutical science is that the effective and desired function of the material can be designed through modern manufacturing processes. The systematic nomenclature allows for greater understanding of the drug product under evaluation based on available data from other nanoparticle reports. Analytical considerations of nano-drugs, nano-additives and nano-carriers and the way in which they are measured are directly connected to quality control. Ultimately the objective is to consider the entire nano-drugs, nano-additives and nano-carriers product life cycle with respect to its manufacture, use, and eventual fate. The tools and approaches to address the needs of these products exist; it should be the task of the pharmaceutical scientists and those in related disciplines to increase their understanding of nanomedicine and its novel products.

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