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Editorial

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Nanomedicine

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Editorial

The introduction of nanotechnology and its evolution has benefited a number of scientific fields significantly. This is particularly important when developing new drug substances and products. The concept of nanomaterial, on the other hand has sparked debate among scientists and international regulatory bodies. Since nanomaterials have novel physicochemical properties that vary from those of their traditional bulk chemical counterparts due to their small scale some attempts have been made to come up with a consensus concept. The most important factor to consider is scale which can be applied to a wide variety of materials. The standard wavelength range is 1 nm to 100 nm. This however does not have a clear cut off. Since the psychochemical and biological properties of materials do not alter suddenly, the maximum size that a material may have to be called nanomaterial is an arbitrary value. Nanomaterials are processed in two ways in the pharmaceutical industry those are top down and bottom up. The top down method entails the mechanical or chemical degradation of a bulk material into a smaller one or smaller parts. The bottom-up process on the other hand begins with atomic or molecular species allowing precursor particles to develop in size *via* chemical reaction. This is due to the intrinsic properties of nanomaterials which have provided numerous benefits in pharmaceutical growth. As a consequence the surface energy of the particles increases making nanomaterials even more reactive. When nanomaterials come into contact with biological fluids they have a propensity to adsorb biomolecules such as proteins and lipids. The plasma/serum biomolecule adsorption layer, known as "corona," that forms on the surface of colloidal nanoparticles is one of the most significant interactions with living matter. Its composition is determined by the point of entry into the body and the fluid with which the nanoparticles come into contact like blood, lung fluid, gastro-intestinal fluid, etc. As the nanoparticle travels from one biological compartment to another, additional dynamic changes will affect the "corona" constitution. Furthermore, electron confinement in nanomaterials can alter and tunable optical, electrical, and magnetic properties. Nanomaterials may also be designed to have a variety of sizes, shapes, chemical compositions, and surfaces allowing them to interact with particular biological targets. The first is concerned with the diseases physio pathological nature. Diseases are caused by biological processes that occur at the nanoscale, such as mutated genes, misfolded proteins, and virus or bacterial infection. A better understanding of molecular processes would allow for more rational design of engineered nanomaterials that target the desired site of action. The interaction of nanomaterial surfaces with the atmosphere in biological fluids is another source of concern. Characterization of the biomolecules corona is critical in this context for understanding how the mutual interaction of nanoparticles and cells affects biological responses. This interface consists of dynamic mechanisms that involve the exchange of nanomaterial surfaces with biological component surfaces like proteins, membranes, phospholipids, vesicles, and organelles. Different risk assessment approaches have been reported. Toxigenomics is a modern branch of Nanotoxicology that combines Genomics and Nanotoxicology to look for changes in gene metabolite expression. It is very important to learn its power to cause harm to human or nature before starting to use this technique.

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