

عنوان مقاله:

Safety by Design Interaction of Nanoparticles and Cells

محل انتشار:

بیستمین کنگره بین‌المللی بیولوژی تولید مثل و پانزدهمین کنگره بین‌المللی سلول های بنیادی (سال: 1398)

تعداد صفحات اصل مقاله: 1

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خلاصه مقاله:

Two reasons herald Nanotechnology as a revolution in science: i. the way in which chemicals and elements behave compared to traditional scientific understanding of their properties; ii. the impact of these new discoveries can transform the daily life of consumers. Miraculous developments, (just thinking to Nano-medicine that offers the promise of diagnosis and treatment at the molecular level to detect and treat presymptomatic disease), sound like science fiction and combined with the emerging commercial impact of nanotechnology applications to consumer products will reshape civil society - permanently. The point that everyone is an end-user of nanotechnology, even without realising that nanotechnology has touched daily life, raises big safety concerns. Scientists and governments agree that un-known risks to human health and the environment exist for the application of nanotechnology. Particularly unexplored is the nanotechnology impact on the environment and non-human species, consequently, the impact on human health. In response to these emerging issues, a plethora of drafts about nanotechnology are floating around the web and in legislatures around the world to create a science policy. The recent progresses of biomedical nanotechnology increased the development of drug delivery systems (DDSs) for diverse therapies. To improve clinical responses and tolerability, conventional nanocarriers (NCs) have been developed and evolved into smart DDSs with stimuli-responsive characteristics. Several clinical trials have shown that these DDSs have better clinical effects in the treatment of many pathologies than those of free drugs. Furthermore, the use of molecules increased the specific targeting of therapeutic DDSs against pathological cells and tissues without affecting health tissues and limiting their toxicity against unspecific body compartments. A significant issue to reduce possible dangers for human and environment health or improve the efficacy of NCs, relies on the thorough knowledge of the biological interactions and subsequent effects. In this context, many factors must be considered, including size, shape, surface charge, and several physico-chemical characteristics of NCs, because of, ideally, nanomaterial development should incorporate a safety by-design approach. Here we discuss on opportunities emerging from the development of multifunctional NCs. Challenges related to biocompatibility of nanomaterials in relation to their characteristics (size, aggregation, shape, surface charge, reactivity, dissolution, etc.) are also discussed.

کلمات کلیدی:

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