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ADVANCES AND CHALLENGES IN PHARMACEUTICAL NANOTECHNOLOGY

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Pharmaceutical formulations are a key for the effectiveness of therapeutic agents. Nanotechnology provides a new direction to improve the solubility, stability and bioavailability of various active agents. Incorporation of bioactive molecules into nano-constructs improves their ability to safely cross biological membranes such as the GI tract, BBB, and skin. Nanoparticles made of lipid components, natural or synthetic polymers, carbon, metals and inorganic materials, have been used as drug carriers. Recently, exosomes have been used as natural carriers to direct drug loads to certain body sites. Nucleotide and protein based biological drugs require suitable nano-delivery systems that protect them from deterioration and direct them into specific cells and organs. In addition to the delivery of drugs, nanoparticles have been used as diagnostic agents and as carriers of combined diagnostic and therapeutic agents. The various nano-delivery systems should be tailored to fit the route of administration. The various nano-constructs that have been used for the delivery of active agents and diagnostics by different routes of administration will be discussed.

Biography

Abraham J Domb, is a Professor for Medicinal Chemistry and Biopolymers at the Faculty of Medicine of the Hebrew University, Jerusalem. He earned Bachelor's degrees in Chemistry, Pharmaceutics and Law from Bar-Ilan and Hebrew University and PhD degree in Chemistry from Hebrew University. He did his Postdoctoral training at MIT/Harvard and was R&D Manager at Nova Pharm. Co. Baltimore US from 1988-1992. Since 1992, he is a Faculty member at the Hebrew University with interests on Biopolymer synthesis and applications, Biodegradable polymers, Drug delivery systems, Medicinal Chemistry and Forensic sciences. During 2007-2012, he served as Head of the Division of Identification and Forensic Sciences (DIFS), Israel Police. Since April 2014, he is also President of the Jerusalem College of Engineering.

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