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Pharmaceutical nanocarriers: Past/present/future

About fifteen years ago, the National Institute of Health (USA) launched the National Nanotechnology Initiative to support, coordinate, and advance research and development of nanoscale projects. The impact of this new program on health-science related research and development became quickly visible. Broad governmental financial support advanced the start of new, and the deepening of already existing, interdisciplinary research. The anticipated merger of nanoscience with medicine quickly instigated the conceptualization of nanomedicine. The adoption of nanoscience terminology by pharmaceutical scientists resulted in the advent of nanopharmaceuticals. The term “nano” became tantamount to “cutting-edge” and was quickly embraced by the pharmaceutical science community. Colloidal drug delivery systems reemerged as nanodrug delivery systems; colloidal gold became a suspension of nano gold particles. In this presentation, I shall review nanoscience related definitions applied to pharmaceuticals, discuss currently approved drug formulations which are publicized as nanopharmaceuticals and briefly review the ongoing clinical trials within the broad field of nanomedicine. When confining the definition of nanopharmaceuticals to therapeutic formulations, in which the unique physicochemical properties expressed in the nanosize range, when man-made, play the pivotal therapeutic role, I shall argue that the current number of clinical trials neither reflects the massive investments made in the field of nanomedicine nor the general hype associated with the term “nano”. However, I shall also emphasize the tremendous efforts currently underway worldwide, at the bench and in preclinical research, in order to make the big promise of the nano revolution a reality.

Biography

Volkmar Weissig, ScD, PhD is a Tenured Full Professor of Pharmacology and Chair of the Department of Pharmaceutical Sciences. He received his BS, MS and PhD degrees in Chemistry and his Post-doctoral (ScD) degree in Biochemistry and Pharmaceutical Biotechnology from the Martin-Luther University in Halle (Germany). He holds 16 patents and has published 98 research papers, review articles and book chapters. He also edited and published 8 books. In July 2009, he was inducted into the World Technology Network as a Fellow. In October 2014, he was elected as the President of the World Mitochondria Society.

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