The beginning of the end of the nanomedicine hype

The U.S. National Cancer Institute (NCI) has announced that it will stop funding its Centers of Cancer Nanotechnology Excellence (CCNEs) [1]. The official reason is that an emerging field of nanotechnology has become mature enough to compete head to head with other types of cancer research. Regardless of the actual reasons, this decision is timely. After 15 years of support, CCNEs have produced numerous research articles, all ending with the same lofty conclusion that nanomedicine has great potential.

When CCNEs began in the United States, the whole world followed, and naturally, scientists all around the world got into the nanomedicine field. It is understandable that scientists follow research funding, and readily available funding has produced thousands of research articles on various aspects of nanomedicine. Competing for research funding resulted in fabrication of more complicated nanoparticles which appeared elegant on paper. The sad part of the nanomedicine history is that nobody knew exactly what nanomedicine meant, and that remains true even today. In the early days of nanomedicine, simply changing the name from conventional drug delivery systems, such as liposomes, polymer micelles, and other colloidal particles, to nanomedicine was enough to receive research funding. The nanomedicine hype, which was fueled further by sensational media coverage, may not be necessarily bad, as hype may motivate risky research that may not be clear at the outset, and thus, some hype can be productive [2]. The issue, however, is how to identify such useful hype and how long it can be treated as a necessary investment. If the hype is decades old, it may just be that the potential of the hype is probably not going to be realized anytime soon.

The nanomedicine hype has caused another conundrum. If nanomedicine is such an enabling technology with great potential for curing diseases, what can explain that nanomedicine research has almost exclusively focused on tumor-targeted drug delivery, when cancer is responsible for only about 25% of all deaths [3]? Even for cancer, there are more than 100 types, and each cancer requires different treatments [4]. Lora Kelly vividly described her painful journey as a cancer survivor at the annual Controlled Release Society meeting in July 2018 in New York [5]. Over the years, she received 12 Neulasta injections causing long bone pain, 12 atropine injections causing disabled speech, 62 chemotherapy infusions, more than 28 CT scans with radioactive dye, 31 trips to the ER, 72 experimental pancreatic vaccines, 225 min of chemotherapy infusions, more than 28 CT scans with radioactive label, 0168-3659/ © 2019 Published by Elsevier B.V.

https://doi.org/10.1016/j.jconrel.2019.05.044
trendy names with a lot of promotion. To avoid this problem, the current funding systems have to change to support conservative scientists who have diverse, meaningful research ideas. The recent NCI’s announcement is encouraging, as it marks the beginning of shifting resources to nurture unpretentious scientists who do research, without any fanfare, on what matters in real life.

References


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