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Letter to the Editor

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Comment on "The long life of unicorns"

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In a recent paper, Erden and Lévy (1) discuss how misconceptions may persist in the scientific literature; the authors refer to these misconstrued ideas as "unicorns" (i.e., mythical creatures with no basis in reality). The paper also highlights the importance of critical discourse (1). I would like to echo this sentiment and add that words are also important. The use of war metaphors in cancer research is well documented. In nanomedicine, there is a tendency to take this to the "next level," from the original "magic bullet" concept to more contemporary variations on the same theme such as "smart bombs" and "stealth nanobombers" (2). Indeed, the constant use of the word "smart" in reference to nanoparticles developed for clinical applications seems misguided (as a material is neither dumb nor smart, it is just a material). In fact, scientific papers that overpromise also tend to underdeliver. Similarly, the overinsistent use of "novelty" is hardly helpful (3). Yet, the word is used over and over again (if an author repeats the phrase "for the first time" in the abstract, introduction, and discussion of an article, this is a sure sign that the results are probably not that novel).

The unicorn is, of course, a fabulous, mythical creature. However, there are other instances when the science may be sound, but where the prevailing paradigm overshadows critical thinking. In science, a paradigm can be seen as a set of concepts and practices that define a particular discipline at a particular period of time. But with paradigms comes the problem of paralysis: the inability or refusal to see what is under our very noses. Indeed, paradigms may be useful, but they cannot replace thoughtful and rigorous experimentation. Take the example of the so-called protein corona. Some experts in the nanomedicine field recently highlighted that a decade has passed since the "inception" of the protein corona (4), while others have suggested that research on how nanoparticles acquire a surface coating of different biomolecules (not only proteins) has been conducted for 30 years (5). In fact, protein adsorption (also known as opsonization) was described more than a century ago in an elegant paper in which the phagocytic "power" of serum was demonstrated (6). I do not wish to dispute the role of the adsorbed proteins, lipids, and other biomolecules on the surface of nanoparticles; indeed, a better understanding of the biological "identity" of nanoparticles is important in both nanosafety and nanomedicine research (7). This, therefore, is not a myth as much as a case of "re-inventing the wheel" of what is already known for other biomaterials (8). However, we should not mistake currently prevailing scientific paradigms for the "truth." Instead, our experimental observations should guide us.

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Conflict of Interests

The author declares no conflict of interest. For a statement, please contact the journal office.

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