

*Letter to the editor***Emerging drug delivery systems:
scientific reality or media hype?***Current availability:*

Drug delivery system technologies have advanced in past decade. Worldwide developments in novel drug delivery systems have generated a lot of attention and acceptance by health care professionals and patients alike. Several new delivery products were developed in the last few years. The novel drug product development has not only helped the patients in easing difficulties in delivering drugs but also made them more compliant. These technologies also helped in enhancing the effectiveness of drugs, with low bioavailability (less amount of drug is available for therapeutic action) partly due to less solubility (drugs must show some aqueous solubility at the site of absorption) or large molecular size. Additionally some new drug delivery products reduce side effects. According to published reports, the billion dollars novel drug delivery industry has showed enormous potential to be successful in fast emerging pharmaceutical industrial growth. There has been success with commercializing the novel drug delivery products. Several novel drug products have hit the market in last few years whereas many others are still in clinical trial phase or awaiting FDA approval. Transdermal patches, transmucosal fast melting tablets, intranasal sprays, and intrapulmonary inhalers are the few examples of novel drug delivery systems. However challenges and limitations in certain areas are still undaunted and unresolved. Considerable attention is given to the unresolved issues; various approaches are explored to deliver large molecular drugs via oral route that may bear some positive result in the ongoing efforts.

Future developments:

With further advancement in scientific and technological research that has also inspired the pharmaceutical scientific community to unfold the formulation mysteries with regards to large molecular drugs in general and peptide and protein drugs in particular.

Several academic and industrial research labs are pursuing collaborative research together to develop a more patient friendly and patient compliant drug delivery product, which could be delivered by enduring less pain (noninvasive) and can be more therapeutically potent in rendering its "payload" in

the patients. Several innovative formulation strategies have been developed over the years as a result of hard work.

Some of these technologies are really very intriguing. Based on the comments emanating from the innovators on different occasions about the potential success, may not sound that promising from an individual's perspective, if the individual is working in the similar area or in close proximity to the drug delivery research area will show cautious enthusiasm. However for other health care professionals and the patients it may all look like a possible thaw with high expectations.

Media coverage:

I have seen many reports in media (both newspaper articles and TV programs) positively commenting on the novel and innovative drug delivery technologies. These reports explicitly and exclusively focused on the delivery technology but don't provide enough information on the possible implications that may reflect on the product outcome. The reporters conclude with scintillating remarks, for example such as drug delivery by encapsulated living cells and implantable microchip in the patients with no further explanation thereafter of possible adverse complications and predictable clinical consequences. The readers should be informed of the clinical scenarios that patients might experience once these products become a reality.

Concluding remarks:

I want to be more realistic in my closing remarks but at the same time, I don't want to undermine the unbelievable efforts put together by the pharmaceutical scientific community. Undoubtedly, any innovation in drug delivery is a positive and encouraging proposition, however the amount of scientific burden that would come along with the particular drug delivery technology may not be as successful with regards to its potential as safe and effective remedy. Over the next few years, any stride in the direction to improve the therapeutic outcome by instilling a novel drug delivery system in the vast arsenal of patient's drug therapy will be seen as a remarkable breakthrough.

Naushad M Khan Ghilzai, Ph.D.

Assistant Professor in Pharmaceutical
Sciences Midwestern University
Chicago College of Pharmacy, USA