Recent Technologies in Drug Delivery System

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The history of controlled drug delivery technologies spans over 5 decades since the introduction of the Spansule®(Dextroamphetamine sulfate, 5, 10, 15 mg) formulation by Smith Kline & French Laboratory in 1952 for the first controlled -release delivery system.

Advances made in controlled drug delivery, especially over the past 2 decades, have been significant. The ability to control the drug release kinetics is such that drug delivery for days and years can be achieved. Since the first book on controlled drug delivery was published in 1978. drug delivery has advanced significantly. At the beginning of 2004, a keyword search on controlled drug delivery using the SciFinder Scholar database would have resulted in 9,612 references.

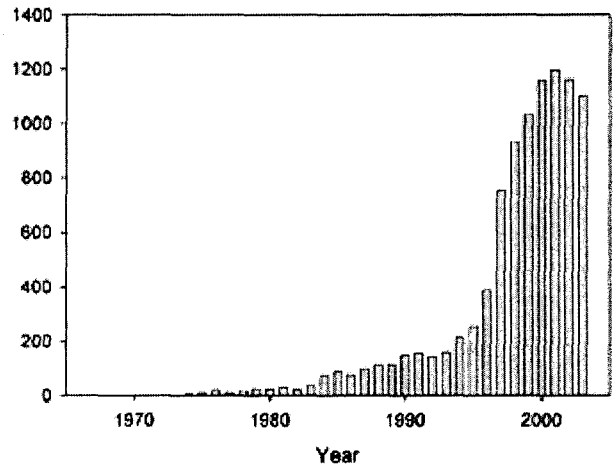

Figure 1. The number of publications on controlled drug delivery published since 1970(SciFinder source)

Figure 1 shows the number of publications since 1970. As can be seen, research on controlled drug delivery has continued a steady rise until the second half of 1990s. Research in the 1980s was focused mainly on mathematical modeling on various types of controlled drug delivery systems, and

clear understandings on how to control the release kinetics may have contributed to the explosive growth of the controlled-release technology area throughout the past 10 years. It is difficult to read all those past publications even only for abstracts. It is desirable to have a single volume that summarizes work done from past to present using comprehensive and coherent information on controlled-release dosage forms.

As controlled drug delivery advances further, the pharmaceutical industry has realized that the introduction of new delivery technologies would extend the patent protection of their drugs. Such an incentive provides significant motives for investment in this lucrative area. Controlled drug delivery systems have acquired a center stage in the arens of pharmaceutical R&D business. Such systems offer temporal and/or spatial control over the release of drug and grant a new lease on life to a drug molecule in terms of patentability. Oral controlled drug delivery systems represent the most popular form of controlled drug delivery systems for the obvious advatages of oral route of drug administration Such systems release the drug with constant or variable release rates. These dosage forms offer many advantages, such as nearly constant drug level at the site of action, prevention of peak-valley fluctuations, reduction in dose of drug, reduced dosage frefuency, avoidance of side effects, and improved patient compliance. This article examines some of the major issues involved in oral controlled drug delivery system.