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Trends in design and evaluation of drug delivery systems

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The success of pharmacotherapy depends on the availability of the drug at the site of action at a rate that ideally matches the real need *in vivo* for the duration of therapy. Therefore, pharmacological information such as dose response, onset and duration of effect, as revealed by pharmacokinetic-pharmacodynamic (drug concentration-effect) relationships, has necessitated attentiveness to and piqued interest in delivering drugs at rates and locations that optimize their effects. Controlled drug delivery, in general, encompasses both rate and location of drug release for achieving beneficial effects and reducing undesired side effects. Design of such delivery systems has evolved and requires expertise in disciplines such as material and polymer sciences, engineering technologies, colloid and surface chemistry, biology, and molecular biopharmaceutics. In this presentation, emphasis is placed on various facets of drug delivery via oral administration, which is the most convenient and preferred means of administration. Novel concepts, experimental and predictive methods, conventional practices, and biosimulation studies for achievements of better delivery systems and more efficacious medication will be discussed.