

such as lysozyme and chymotrypsin can form physical cross-linking with sodium alginate and are thus encapsulated within the gel. Enzymes with low encapsulation efficiency release at a faster rate from alginate gels. Insulin-loaded alginate [30] gel prepared by blending alginate with chitosan-coating protects insulin from denaturation even at gastric pH [31]. Hydrogel containing bovine serum albumin (BSA) [29] dispersed in poly(lactic-co-glycolic acid) (PLGA) microspheres is an example of combined gel and microsphere vehicle systems. A similar system is the hydrogel of heat shock protein fused with a transcriptional activator in a vesicle.

8.4 Conclusions

In this chapter, potential biomedical applications of alginates in the areas of drug encapsulation and drug delivery have been discussed. Biocompatibility, mild gelation conditions, and easy modifications of its chemical structure to prepare alginate derivatives with new properties have been highlighted throughout this chapter. Factors governing encapsulation and delivery of different types of drugs, such as hydrophilic, amphiphilic, and hydrophobic drugs, have been presented. Encapsulation and delivery of macromolecular drugs like enzymatic drugs by alginates and their composites with other biomaterials have been discussed. It has been shown that alginate–chitosan composites are prospective biomaterials for the development of safe drug delivery system.

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