

Finally, this wound-dressing material has been used on the burn wound of a diabetic rat to evaluate the efficacy of the developed wound dressing.

#### 9.4.1.4 *Chitosan/Alginate- and Collagen/Alginate-Based Wound Dressing*

Gils *et al.*, [32] developed a unique wound dressing based on collagen-alginate, and they have evaluated the functionality of this wound dressing in the postoperative management of chemical matricectomies. They observed that the wound-healing time required in the case of collagen-alginate dressing has been 24.4 days, whereas it took 35.8 days for control samples. Finally, the researchers suggested that collagen-alginate-based dressing is a good option for the postoperative management of chemical matricectomies in terms of less healing time, lower rate of infection, and improving the patient condition. In another study, Donaghue *et al.*, [33] also systematically studied the efficacy of collagen-alginate (Fibracol) and regular gauze-based wound dressing for diabetic foot ulcer treatment. They have applied these two wound dressings on 75 patients for treatment of foot ulcers. They observed that the wound reduction area is higher in the case of collagen-alginate-based dressing, i.e., 80.6%, whereas the same is 61.1% for local gauze dressing. Therefore, collagen-alginate-based dressing can be a good candidate for wound dressing application. Wang *et al.*, [34] fabricated a very narrow, translucent, and bendable polyelectrolyte composite-based sheet based on the chitosan-alginate biopolymers for potential application in wound dressing. These composite sheets have been developed by solution casting method. The researchers have explored the nontoxic characteristics of the fabricated sheets toward the mouse and human fibroblast cells. They also observed that the growth of the cells has not been disturbed by these composite membranes. Finally, it has been shown that a wound can be properly cured within 14 days in terms of a suitable epidermal structure, whereas the control sample has taken more time for the same.

#### 9.4.1.5 *Alginate Fiber-Based Wound Dressing*

Alginate-based fibers can be used in a significant way in various biomedical applications due to their better flexibility, low cost, and higher surface area. Fibers made from different natural biopolymers like alginate, chitosan, etc. (mainly from the polysaccharides) have been used largely in wound care management because of their very advanced biocompatibility, nontoxicity, and effective bioactivity. Alginate has been used in different forms such as polymer matrix, polymer gel, and fiber (woven and nonwoven) for wound