

## 9.1 Introduction

Wound has been defined as a break or a defect in the skin due to physical or thermal destruction. There are mainly two types of wounds in terms of wound repair procedure. One type of wound is acute wound, which can be cured permanently with the minimum time periods, mainly within 8–12 weeks [1]. Acute wounds used to occur due to mechanical injury by means of abrasion, tears, knives, gun shots, etc. or chemical injury with an exposure to corrosive chemicals or burn injury by electricity, radiation, thermal stimulus, etc. [2]. Chronic wounds, on the other hand, are cured very slowly and it takes more than 12 weeks to heal permanently [3]. Chronic wounds fail to heal under diabetes and malignancies. So, the wound-healing system has an important role to give the solution for the treatment of various wounds. Wound healing is a biological process in which cell growth and regeneration take place. In the wound-healing process, different stages work independently and also overlap each other. Mainly five stages, i.e., hemostasis, inflammation, migration, proliferation, and maturation phases, occur during the wound-healing process [4].

In recent years, biomaterials have drawn a great interest toward biomedical applications like wound healing, as compared to their synthetic counterpart. Materials extracted from biological sources, for instance, wood, seaweeds, etc., have been greatly used in cell and tissue regeneration process. Different types of biomaterials such as alginate, chitosan, etc. have been used in the recent past in the wound-healing treatment of different acute and chronic wounds. Among different biomaterials, alginate has been found as a promising material in wound healing because of its various beneficial physicochemical properties. It is a polyanionic polysaccharide-based biopolymer and is extracted from brown seaweeds. Its good compatibility with the biological system and eco-friendly nature have given rise to the application of wound healing. Also, it has a good ion exchange and gelation properties, which are very important parts of the wound-healing process. Herein, the different biomedical applications of the naturally extracted alginate biopolymer have been described with special emphasis on its wound-healing application.

## 9.2 Sources and Synthesis of Alginate

Alginate is a natural biopolymer that can be extracted from the sea algae as well as bacteria. It occurs as a structural component in the case of marine