

Natural wound healing and bioactive natural products

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Abstract

A wound is a disruption of the normal anatomical structure and function of a tissue. Wounds cure in an orderly and timely repair process which is characterized by three dynamic and interactive phases: inflammation, proliferation and the remodeling. The present review was designed to elaborate the cellular and molecular targets for plant secondary metabolites that target the various aspects of wound repair process. The common mechanism of action of natural products established through *in vitro* and animal studies include direct action on skin cells regeneration, increase in connective tissue deposition, antioxidant activity, inflammatory cells activity and modulation of cytokine and growth factor production and/or function. All these demonstrated pharmacological effects could be exploited to overcome an acute or pathological wound healing conditions. The therapeutic potential of various chemical classes of natural products that act through one or multiple targets are discussed.

Keywords: Natural products, secondary metabolites, wound healing, inflammation, proliferation, remodeling.

Introduction

A wound is defined as the disruption of the normal anatomical structure and function of a tissue (Maklebust and Sieggren, 1996). In general, wounds cure in an orderly and timely repair process which is characterized by dynamic, interactive events described in 3 phases: inflammation, proliferation and remodeling (Singer and Clark, 1999). In order to assess the healing effects of natural products, *in vivo* and *in vitro* assay models may be employed. Based on these assessments, many new therapies that target various aspects of wound repair are emerging in recent years. Among them, plant extracts from folklore medicine have been shown to be beneficial for treatment of wounds. The term natural products here is to be unde-