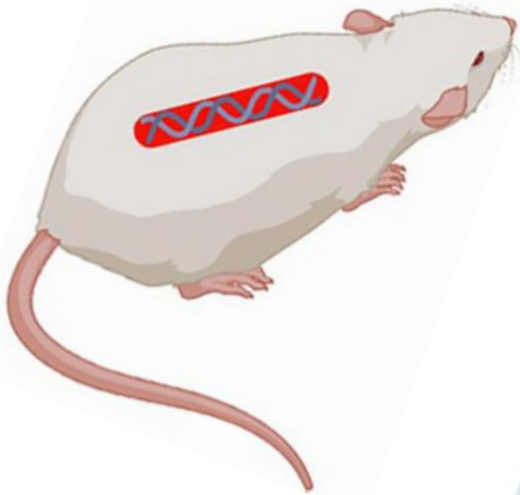


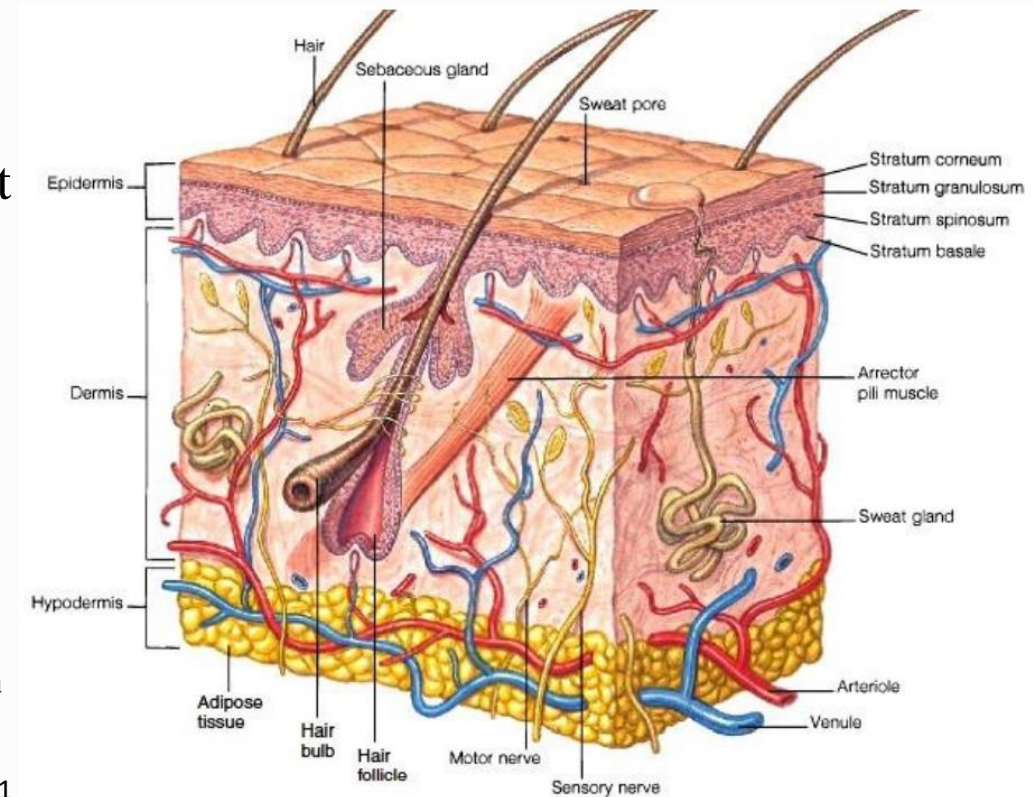
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Introduction



Introduction

- Skin is the largest organ of the human body and plays crucial roles in maintaining body temperature, preventing microorganisms' intrusion, and supplying sensory information about the external environment
- Damage to the integrity of the skin caused by genetic disorders, acute trauma, chronic wounds, or surgical procedures may result in significant disability or even death.
- Skin is composed of three main layers: epidermis, dermis, and hypodermis (subcutaneous tissue).



Multifunctional smart hydrogels: potential in tissue engineering and cancer therapy Xian Li ab and Xiulan Su

Hyaluronic acid (HA)-based hydrogels for full-thickness wound

repairing and skin regeneration Lei Hong¹ Meiting Shen¹ Jiayi Fang¹ Yezhao Wang¹ Zhiyuan Bao¹ Shizhong Bu¹ Yabin Zhu¹

The ideal characteristics of wound dressings

1. easy to use .cost effective

2. Control the moisture around wound

3. Eliminate from excess exudates

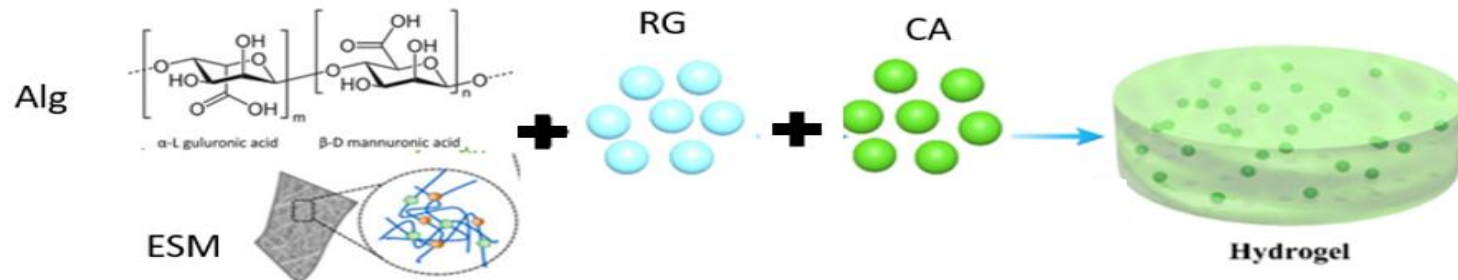
4. Non-adherent/non-toxic, non-allergic

5. Not contaminate the wound with foreign particles

6. Protect the wound from microorganism

7. Allow gaseous exchange and control wound odor

8. Provide thermal insulation and mechanical protection



- Biodegradable
- Biocompatible
- Non-antigenic
- Non-toxic
- Biologically adhesive
- Biological activity
- Antimicrobial
- Hemostatic

- Provide a moist wound environment
- Offer protection from secondary infections
- Remove wound exudate
- Promote re-epithelialization
- Accelerate angiogenesis and collagen maturity

Promote wound healing

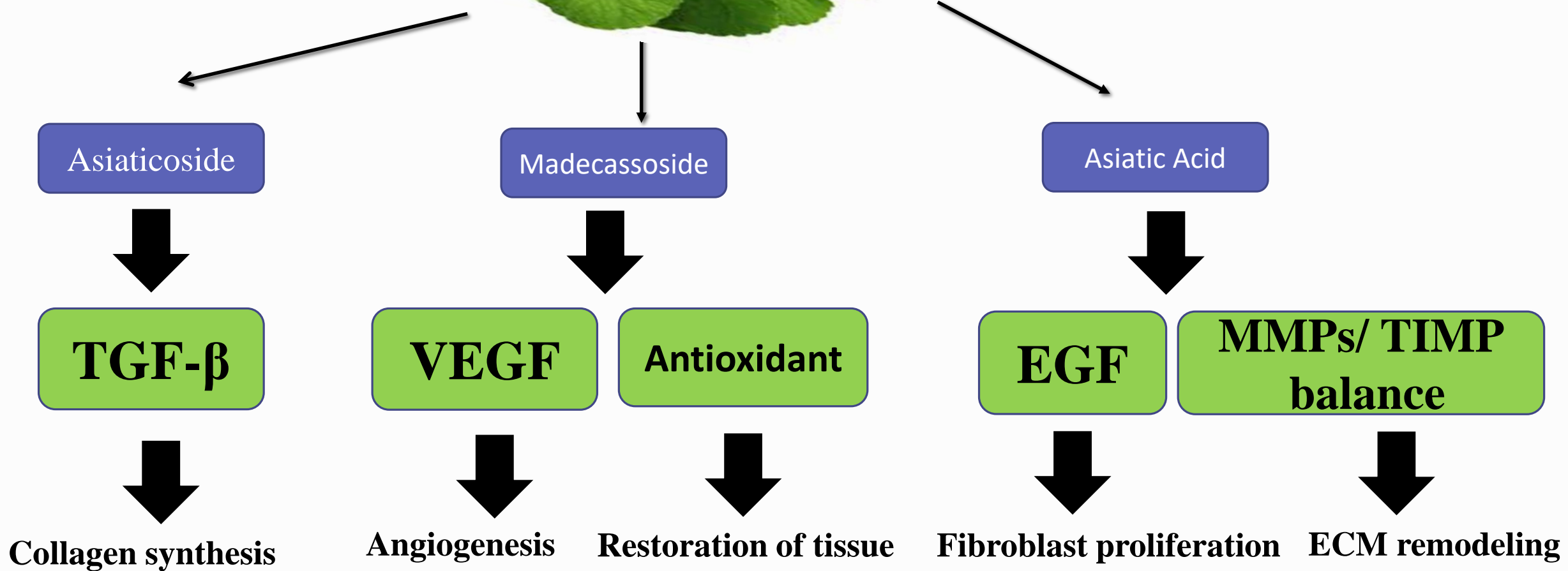
Antibacterial agents

Growth factors

Anti-oxidative

Anti-inflammatory





Red Ginseng roots

- Red Ginseng root (*Panax ginseng* CA Meyer) is used clinically in China, Korea and Japan for various diseases, including atherosclerosis, liver dysfunction, cerebrovascular diseases, hypertension and post-menopausal disorder
- Red Ginseng root extracts have also been used clinically as topical treatments for atopic suppurative dermatitis, wounds and skin inflammation



Saponins → **accelerate numerous biological activities**

- Anti-bacterial , anti-viral, and anti-oxidative functions
- Anti-inflammatory activity which can reduce edema and skin inflammation
- Accelerate neovascularization in burn wounds
- Increase vascular endothelial growth factor and interleukin (IL)- 1 β

Methods

