

Production of Recombinant Proteins from the Secretions of *Lucilia Sericata* Larvae for Wound Healing

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Abstract

Maggot therapy is a useful, effective and controlled method using sterilized larvae *Lucilia sericata* to treat a variety of acute and chronic wounds. Larval secretions include digestive enzymes, antimicrobial peptides, growth factors, and wound healing agents. However, the use of maggot therapy is an effective method of wound healing. But, this method has limitations such as disgust and fear of people (placing insect larvae on the wound), long duration of treatment, sterile breeding of larvae, etc. Therefore, using biological science and genetic engineering, it is possible to identify and produce recombinant proteins in larval secretions and then use them in wound healing. Very little research has been done on the production of recombinant proteins in *Lucilia sericata* larvae. The production of recombinant proteins in *Lucilia sericata* larvae could revolutionize the pharmaceutical and biotechnology industry and reduce wound healing costs.

Keywords: Maggot therapy. Recombinant Protein. Wound healing

Introduction

Today, due to the increasing number of accidents, burns, diabetes, aging, etc., the chronic wounds caused by them are also increasing. Treatment of diabetic foot ulcers and other chronic ulcers has high economic costs on the patient and health care [1,2].

Wounds have become resistant to a wide range of antibiotics. Maggot therapy is a useful, effective and controlled method using sterilized larvae *Lucilia sericata* to treat a variety of acute and chronic wounds. It can be used as an alternative, classic and controlled method instead of other wound healing methods. In this method, larvae can accelerate wound healing by moving on the wound and cleaning and disinfecting it [3]. But many patients refuse to do this method, because they have aversion and phobia to *Lucilia sericata*. And they do not feel good about the movement of living beings on the wounds of their bodies.

The use of recombinant proteins to treat many diseases has been considered by biotechnology researchers, so that today we see the use of recombinant pharmaceutical products, instead of the previous chemical drugs [4]. These proteins have a specific function and because they originate from the body's biological molecules. Many prokaryotic and eukaryotic cells are used as hosts for the production of these proteins, advantages to using a system that best preserves the properties of natural protein, and should be able to maintain high production, high purification, short time, maximum protein biological activity.

Lucilia sericata larvae degrade dead wound tissue, produce neurogenesis, and subsequently wound healing by producing a variety of wound-degrading enzymes and proteins [5]. Larval secretions include a variety of proteolytic enzymes (leucine, carboxypeptidase, aminopeptidases, collagenases,...), growth factors, antimicrobial peptides, anti-inflammatory and other unknown compounds in wound healing [6]. Due to the development of biological science and the production of recombinant proteins, miraculous peptide materials of larval secretions can be produced as recombinant proteins. And replaced them with chemical drugs and antibiotics to treat wounds [7].

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In recent years, recombinant compounds have been produced from the secretions of *Lucilia sericata* larvae. But the number of recombinant proteins produced from the secretions of *Lucilia sericata* larvae is low [7].

Discussion

Maggot therapy has benefits such as wound cleansing, disinfection, as well as accelerating wound healing and being replaced by traditional wound healing methods [8]. However, for reasons such as direct and prolonged contact of insect larvae with wounds and causing fear and phobia, people do not show much satisfaction and interest in using this method and avoid this treatment. Therefore, the production and synthesis of many compounds. Bioavailability in blowflies, such as enzymes and proteins effective in wound healing, is being produced as recombinant proteins using chemical and genetic engineering methods. In recent years, however, recombinant compounds (chymotrypsin-like enzyme) have been produced from the secretions of *Lucilia sericata* larvae. But only a few of them have been effective in wound healing [9]. There are gaps in studies on the identification and production of effective proteins of *Lucilia sericata* larvae and their use in the treatment of wounds. The process of producing recombinant protein, like other processes, has a number of limitations, such as the length and hardness of the process, having sufficient proficiency in the process, and the high cost of materials, etc., which may receive less attention from scientists [7,10].

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