



**SURAT PERNYATAAN**

Saya yang bertanda tangan dibawah ini :

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Menyatakan bahwa karya ilmiah dengan judul **“Fibroblast proliferation in topical application with the natural extract of snakehead fish in traumatic ulceratif “** yang dilaksanakan di Yogyakarta pada tanggal 1-3 Maret 2012 dinyatakan asli .

Demikian surat pernyataan ini saya buat , atas perhatiaanya saya ucapkan terima kasih.

Surabaya, 18 November 2020

Yang membuat pernyataan

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To Commemorate The 64<sup>th</sup> Anniversary of The Faculty of Dentistry  
Universitas Gadjah Mada, Yogyakarta, Indonesia

**The 2<sup>nd</sup> International Joint Symposium  
on Oral and Dental Sciences  
In Conjunction with Dental Specialists Seminar**

**March 1-3, 2012  
Hotel Inna Garuda Yogyakarta, Indonesia**



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*Proceeding Book*



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# Proceeding Book

## **The 2<sup>nd</sup> International Joint Symposium on Oral and Dental Sciences**

**Featuring:**

**Next Generation of Regenerative Therapies in Dentistry**

**In Commemoration with**

**The 64<sup>th</sup> Anniversary of The Faculty of Dentistry  
Universitas Gadjah Mada,  
Yogyakarta, Indonesia**

**Inna Garuda Hotel, Yogyakarta, Indonesia, March 1 - 4, 2012**

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## Address from the Chairperson of the Symposium

It is great pleasure to invite you to "The 2<sup>nd</sup> International Joint Symposium on Oral and Dental Sciences". The event is held to commemorate the 64<sup>th</sup> anniversary of The Faculty of Dentistry, Universitas Gadjah Mada, which has been serving as an academic institution concerning oral and dental sciences to community. This symposium is the continuation of the first fruitful meeting in Bali (2010).

Current clinical technologies, in terms of regenerative medical therapies related to organ transplantation and artificial organ, have been excellent life-saving and life-extending therapies to treat patients who need to reconstitute diseased or devastated organs or tissues as a result of an accident, trauma, and cancer, or to correct congenital structural anomalies. In this context, tissue engineering and DDS (drug delivery system) technology are considered fast growing approaches that play important roles in periodontology, implantology, oral and maxillofacial surgery, and other oral and dental treatments.

We are proudly present world leading scientists and clinicians in the area of tissue engineering and DDS technology, as well as on oral and dental sciences. We will bring together the international community of persons engaged or interested in the field of oral and dental sciences and promotes education and research within the field of oral and dental sciences. We provide a platform where international research colleagues, especially young ones, can share the latest results of research, discuss problems, and envisage a new horizon of oral and dental sciences.

It is a significant platform for the fostering of interactions among scientists, clinicians, and those engaged with funding, regulatory and commercial endeavors. This is a unique opportunity for all stake holders in this exciting field to come together in the beautiful city of Yogyakarta to promote the worldwide advancement of oral and dental sciences; in particular the integration of advanced technologies and clinical needs in our region.

We would like to welcome you in Yogyakarta.

Sincerely,

Dr. drg. Ika Dewi Ana  
Chairperson of the Symposium



## Address from the Chairperson of The 64<sup>th</sup> Anniversary of the Faculty of Dentistry, Universitas Gadjah Mada

Dear Symposium Guest Speakers and All Participants,

Welcome to the Symposium which is held as a part of the programs to commemorate The 64<sup>th</sup> Anniversary of The Faculty of Dentistry, Universitas Gadjah Mada.

Scientific communication in the international level among researchers is important to share knowledge, technology, and to keep in touch with updated progresses in oral and dental sciences. The First International Joint Symposium was held by Universitas Gadjah Mada in collaboration with The University of Tokushima (Japan) and Niigata University (Japan). The first symposium was held in conjunction with "Scientific Meeting on Implant and Aesthetic Dentistry for Next Generation of Dental Therapy" on December 15-18, 2010 in Kuta, Bali, Indonesia. The symposium attracted general practitioners and academicians not only from Indonesia and Japan, but also from Malaysia, Netherlands, Hongkong, and South Korea. Besides having fruitful and productive discussions on the state of the art of oral and dental research, progresses in educational systems among the country involved, participants were able to enjoy dental and medical technology exhibition.

Considering the above driving forces and the uniqueness of the country in relation to researches in dental sciences, the committee of The 64<sup>th</sup> Anniversary of The Faculty of Dentistry Universitas Gadjah Mada would like to facilitate it by holding **The Second International Joint Symposium on Oral and Dental Sciences in Conjunction with Dental Specialist Seminar**. This forum is hoped to be a starting point to expand scientific activities and scientific collaborations between the Faculty of Dentistry, Universitas Gadjah Mada, international collaborators, industries (business institutions), alumni, and community (government).

Aside from the above activities, we have been coordinating some events such as: Mini Lecture on Bone Graft (October 25, 2012), National Students Scientific Writing Competition and Dentistry Olympiad (November 21-27, 2012), Alumni Meeting (December 10, 2012) and some other cultural events. By holding the events, we would like to facilitate the co-creation among faculty members and supporting staffs of The Faculty of Dentistry as mentioned in our anniversary theme: Co-creation towards Academic Excellence.

We hope you all to enjoy the programs of the anniversary and enjoy fruitful discussion during the symposium.

Sincerely,

Prof. Dr. drg. Haryo Mustiko Dipoyono, SpProst(K).  
Chairperson of The 64<sup>th</sup> Anniversary Committee

# Address from the Dean of The Faculty of Dentistry, Universitas Gadjah Mada

Dear Honorary Guests and Symposium Participants,

It is our great pleasure to welcome you in The 2<sup>nd</sup> International Joint Symposium on Oral and Dental Sciences, which is held in commemoration with The 64<sup>th</sup> Anniversary of The Faculty of Dentistry, Universitas Gadjah Mada.

As mentioned in its Strategic Plans (2008-2012), Universitas Gadjah Mada (UGM) has its vision to be a World Class Research University which is excellent, independent, dignified, inspired by *Pancasila*, the five-basic principles, and dedicated to the needs and welfare of the nation and the world. The vision is done by UGM mission: To promote excellent teaching-learning opportunities and community service through research, with its special mission on research: To promote excellence in educational activities, research, and community service with the interest of the Indonesian society and to participate in Indonesian socio-cultural building.

Faculty of Dentistry should play significant roles towards the vision of the university. For this, research (scientific activity) indeed is one of important factors towards the vision. This symposium is dedicated to encourage faculty members, clinicians and practitioners, as well as alumni to contribute more to scientific knowledge.

We hope the success of the symposium and the overall programs to commemorate The 64<sup>th</sup> Anniversary of The Faculty of Dentistry Universitas Gadjah Mada. We do hope the advancement in education, research and community services will be achieved in near future by our synergy.

Sincerely,

Prof. Dr. drg. Iwa Sutardjo RS., SpKGA(K).  
Dean of The Faculty of Dentistry  
Universitas Gadjah Mada

# The 64<sup>th</sup> Anniversary of the Faculty of Dentistry, Universitas Gadjah Mada

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<b>Food and Beverage Section</b>	Endang Wahyuningtyas Esti Tjahyanti

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O-19	Hardini Dyah	Managing Implant-Supported Protheses in Patients with Periodontal Disease
O-20	Niko Falatehan	Removable Denture as A Permanent Splint on Periodontal Disease
O-21	Puguh Bayu	Fibroblast Proliferation Post Topical Application with The Natural Extract of Snakehead Fish in Traumatic Ulcer
O-22	Krisna Wijayanti, Supriatno, Ana Medawati	Inhibition Tongue Cancer Invasion of Human Oral Cells Cultured SP-C1 Uses Pukul Empat Leves ( <i>Mirabilis jalapa</i> L.) Ethanolic Extract
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## FIBROBLAST PROLIFERATION IN TOPICAL APPLICATION WITH THE NATURAL EXTRACT OF SNAKEHEAD FISH IN TRAUMATIC ULCERATIF

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### Introduction

Snakehead fish (*Ophiocephalus striatus*) known by the common name or Snakehead Murrel. The local name for this fish is Aruan / Haruan (Malaysia and South Kalimantan), Kocolan (Betawi), Kutuk (Java)<sup>1</sup>. Have a distinctive characteristic that is able to survive in extreme water conditions such as low oxygen, low pH and does not require running water. Snakehead fish easily captured to be used as daily food. Snakehead fish consumed as side dishes, either in cooking as the food menu at home or on sale in shops and restaurants.

Another benefit of snakehead fish is to help the healing process of wounds. It is known that this fish is very rich in albumin<sup>2</sup>. Albumin is the major protein found in plasma<sup>3</sup>. Provision of snakehead fish meat or extract protein has attempted to raise levels of albumin in the blood and help cure some diseases.

Snakehead fish phenomenon is ever raised in a special study by Suprayitno (2003), entitled "Use of Albumin Snakehead fish (*Ophiocephalus striatus*) on Wound Closure", a study comparing the tensile strength of wounds that have healed with Snakehead fish extract therapy (*Ophiocephalus striatus*) showing the efficiency of these fish in the process of wound healing<sup>4</sup>.

This research observes and proves how great an increase in fibroblasts in the wound after traumatic ulcer was applied with snakehead fish extract.

### Materials and Methods

This type of research is experimental laboratory using a research design *Completely Randomized Design = CRD*. In this study, using adult wistar rat (*Rattus Novergicus Wistar* strain) 5-month-old male sex weighing 300-350 grams. Rats are physically fit are marked by characteristic clear eyes, shiny fur feet, active movement, and the stool is not soft either. Laboratory for examination of environmental factors are environmental factors that affect the state laboratory for examination of rats fed adequate lighting and air circulation is free. Mice were developed at the Laboratory of Biochemistry Faculty of General Medicine Airlangga University. Before the rats were treated was held adaptation to the environment for 1 week and guarded condition. The sample studies 30 wistar rats. Samples obtained from the population taken at random / random and divided into 3 groups: group C (control), group P1 (25% extract treatment applications), and group P2 (50% extract treatment applications).

Snakehead fish extract obtained according to research of Daud (2010). Method of manufacture is as follows: snakehead fish, washed and cleaned, then cut into small pieces (approximately 2 cm), then drained so that water content is reduced and the blood runs out. Then put the snakehead fish pieces into filters and steamed until the fish oil that are dark red and smelled fishy out, the extract is then discarded. Repeat the process until the results are steaming golden brown. If the result had already shown a clear yellowish brown, the capacity to extract the last drops of the extract



indicating Snakehead fish (*Ophiocephalus striatus*) is up. In order to obtain preparations in gel form, was added 0.1 g of benzyl ethers, polikarbofil, hydroxypropyl methyl cellulose (PHMC) 0.2% and stirred until a paste consistency. So that the concentration of snakehead fish is to 25% and 50%<sup>5</sup>.

On Day 1 each rat (*Rattus Novergicus Wistar* strain) in group C (control), P1 (treatment 1), and P2 (treatment 2) anaesthetized by inhalation with ether. Do manufacture traumatic ulcers by cutting the labial mucosa that were previously characterized by using ink marker with a diameter of +3 mm. Making a bleeding lesion is characterized by a mean injury / trauma has exceeded basement membrane. On day-2 was observed the formation of ulcers on the labial mucosa of rats (*Rattus Novergicus Wistar* strains). If the traumatic ulcers has occurred, then perform the measurement and recording of the initial ulcer diameter using digital calipers and the provision of topical application of 0.2% sterile solution aquadest in group C (control), the application of cork Fish extract (*Ophiocephalus striatus*) 50% in group P1 (treatment 1), and the application of cork extracts Fish (*Ophiocephalus striatus*) 25% in group P2 (treatment 2). On day 5 after ulcer is formed, ulcer tissue taken for HPA examination and computed the number of fibroblast. Furthermore, the data were analyzed with independent t-test.

## Results

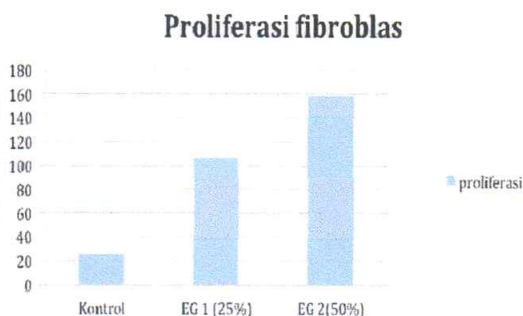


Figure 1. The Average amount of fibroblast proliferation

Figure 1, shows the average amount of proliferation of fibroblast in each group who showed descriptively that there are differences in the mean number of fibroblast proliferation.

## Discussion

Traumatic ulcer is a common lesion which is defined as the erosion which tend to be superficial damage that causes loss of epithelium of the oral cavity due to various causes, where there is a history of trauma or cause of trauma<sup>6</sup>. In this study, mucosal lip rats (*Rattus Novergicus* Strains Wistar) injured by excised using scissors. Making lesions signed with bleeding which means injury/trauma has exceed basale membrane.

New lesion showed the clinical picture of Traumatic Ulcer in 2 days, because in the first 24 hours after administration of injury, acute inflammation process is the proliferation of inflammatory cells and blood vessels. Then the blood vessels in the area also experienced a decrease in permeability so much protein and erythrocyte, which came out in the area. This also resulted in tissue edema surrounding the lesion appears. The inflammatory response or exudation is useful to eliminate the initial cause, remove the affected tissue injury, and initiate deposition of extracellular matrix<sup>7</sup>. Later in the next 24 hours until it forms a round ulcer with oval, cream-colored base lesions, and surrounded by borders of erythema<sup>8</sup>.

Acute ulcer showed loss of surface epithelium, which appears fibrin fiber network containing neutrophils, degeneration of cells, and debris. At the bottom there is a capillary blood vessel dilatation, and over time formed granulation tissue<sup>7</sup>.

According to Gabriel (2009), the process of wound healing, there are 3 phases. Namely inflammatory phase, proliferative phase, and phase of remodeling / maturation. Inflammatory phase begins when the injury occurred and lasted 2-4 days. This phase begins with hemostasis and platelet plug formation. Platelets release platelet-derived growth factor (PDGF) and transforming growth factor beta (TGF- $\beta$ ) from alpha granules to attract neutrophils and macrophages. Neutrophils kill bacteria and foreign bodies. Macrophages are the most important mediators of wound healing. Macrophages continue to emit growth factors to attract fibroblasts to the next stage of wound healing<sup>9</sup>.

In this study, observations of proliferation of fibroblasts in Traumatic Ulcer on rat (*Rattus Novergicus* Wistar strain) that has been given topical extract of Snakehead fish (*Ophiocephalus striatus*) performed after 5 days. This is based on research results that indicate the existence of an optimal healing in some rats (*Rattus Novergicus* Wistar strain) in group P2 (treatment 2) with topical application of extracts of Snakehead fish (*Ophiocephalus striatus*) 50%. This is evident in the t-test where there is significant differences in-group P1 (snakehead fish extract 25%).



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The systemic factors include nutritional status, such as nutritional protein, and the host immune system<sup>10,7</sup>. Where there are differences in the response of each organism to the quality of repair tissue structure and function<sup>11</sup>.

Amino acids that play a role in the process of tissue repair or wound healing namely, arginine, glycine, lysine, proline, glucosamine, D-glucuronic acid, and carnosin<sup>2</sup>. Among these amino acids, glycine is an amino acid with the highest concentration. Glycine is one of the main components forming collagen in the skin of the human body that works synergistically with other essential amino acids to form a polypeptide that stimulates tissue repair and healing process.

High content of albumin in the extract of Snakehead fish (*Ophiocephalus striatus*) is 62.24 g / kg, also optimize the healing process. Where an important function of albumin is its ability to bind various ligands. In addition, albumin plays an important role in transporting the body of minerals such as copper (Cu 2+) and zinc (Zn2+) in the body<sup>2,4</sup>. Cu and Zn have an important role in immune system function and necessary in the healing process. Mineral plays a role as major antioxidant enzyme cofactors. If there is a lesion that infects the body, then the concentration of Zn in the plasma will be affected and decreased<sup>12</sup>. Thus albumin, which are known to transport about 70% Zn in the cell, acts to bind Zn and transport it in the blood plasma. Transport of Zn by plasma albumin in the blood to the area of the lesion will result in the optimization process of healing lesions, so it can close / shrink the diameter of the lesion<sup>4</sup>.

### Conclusions

Snakehead fish extract with a concentration of 50% showed proliferation of fibroblasts more.

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