

# FOLIA MEDICA INDONESIANA

Vol. 44 No. 1 January - March 2008

**CORRELATION BETWEEN DENGUE VIRUS SEROTYPE AND HUMORAL IMMUNE RESPONSE IN PEDIATRIC DENGUE HEMORRHAGIC FEVER**

(Aryati, Ety Retno Setyowati, Agung Dwi Wahyu W)

**MODULATION OF IMMUNOGLOBULIN G (IgG) AND CORTISOL RESPONSES IN BREATHING EXERCISE**

(Elyana Suhartono Asnar, Harjanto, Siswantoyo)

**PREDICTION OF DISTRIBUTION PATTERN OF *Aedes Aegypti* AS DHF MAIN VECTOR IN JEMBER**

(Yudha Nurdian, Asmoro Lelono)

**DIFFERENCE OF INTERFERON GAMMA LEVEL (RELEASE ASSAY) IN NURSES EXPOSED TO *MYCOBACTERIUM TUBERCULOSIS* AND ACTIVE TUBERCULOUS PATIENTS**

(Endang Retnowati, Soedarsono, Novi T)

**MOLECULAR EXPRESSION OF ESTROGEN RECEPTOR ALPHA ( $ER\alpha$ ) AND INTERLEUKIN 6 (IL-6) ON ACCELERATION OF HEALING PROCESS OF LONG BONE SHAFT FRACTURE BY IMMEDIATE REPETITIVE AXIAL COMPRESSION TENSION STABILIZATION (IREACT)**

(Achmad Sjarwani)

**IL-4 IN PERIPHERAL BLOOD MONONUCLEAR CELLS AND BRONCHOALVEOLAR LAVAGE PATIENTS WITH PULMONARY TUBERCULOSIS BEFORE AND AFTER TREATMENT WITH ORAL ANTI-TUBERCULOSIS DRUGS**

(JF Pallingan)

**EFFECT OF ORAL CURCUMIN AND IMMOBILIZATION ON THE DIAMETER OF SKELETAL MUSCLE FIBER IN *RATTUS NORVEGICUS***

(Ratna Darjanti Haryadi Soebadi, I Putu Alit Pawana)

**CONTRALATERAL RENAL FIBROBLAST AND TUBULAR CELL APOPTOSIS AND PROLIFERATION IN ARTIFICIAL UNILATERAL TOTAL URETHRAL OBSTRUCTION IN RABBITS**

(Prijambodo Tjaturadi, Soetojo)

**POLYMORPHISM C3435T OF THE MDR-1 GENE PREDICTS RESPONSE TO PREOPERATIVE CHEMOTHERAPY IN LOCALLY ADVANCED BREAST CANCER WITH HER2/Neu EXPRESSION**

(Ami Ashariati)

**Review Article:**

**CHALLENGE OF ENVIRONMENTAL TOXICOLOGY IN REFORMATION ERA**

(Titiek Berniyanti)

**BONE MORPHOGENETIC PROTEIN 4 (BMP4) AND PROSTAGLANDIN ALPHA ( $PGE2\alpha$ ) MOLECULAR EXPRESSION IN HEALING PROCESS ACCELERATION OF LONG BONE SHAFT FRACTURE USING IMMEDIATE REPETITIVE AXIAL COMPRESSION TENSION STABILIZATION (IREACT)**

(Achmad Sjarwani)

**TREATMENT RESPONSE OF CHRONIC MYELOGENIC LEUKEMIA IN DR. SOETOMO HOSPITAL**

(Ugroseno)

**Review Article and Clinical Experience:**

**THE OBESITY PANDEMIC: THE "TIME-BOMB DISEASE" IN THE FUTURE?**

**Where Have We Been? And What Should We Do?**

(Askandar Tjokroprawiro)

International Online Distribution by ProQuest™  
[www.proquest.com](http://www.proquest.com)

Folia Medica Indonesiana	Vol. 44	No. 1	Page 1-66	Surabaya Jan-Mar 2008	ISSN 0303-7932
-----------------------------	---------	-------	-----------	--------------------------	-------------------

## Table of Contents

No.	Title	Page
1	Correlation between Dengue Virus Serotype and Humoral Immune Response in Pediatric Dengue Hemorrhagic Fever	1 - 5
2	MODULATION of IMMUNOGLOBULIN G (Igg) and CORTISOL RESPONSES in BREATHING EXERCISE	6 - 10
3	Prediction of Distribution Pattern of Aedes Aegypti as Dhf Main Vector in Jember	11 - 14
4	Difference of Interferon Gamma $\gamma$ Level (Release Assay) in Nurses Exposed to Mycobacterium Tuberculosis and Active Tuberculous Patients	15 - 20
5	MOLECULAR EXPRESSION OF ESTROGEN RECEPTOR ALPHA (ER $\alpha$ ) AND INTERLEUKIN 6 (IL-6) ON ACCELERATION OF HEALING PROCESS OF LONG BONE SHAFT FRACTURE BY IMMEDIATE REPETITIVE AXIAL COMPRESSION TENSION STABILIZATION (IREACT)	21 - 23
6	Il-4 in Peripheral Blood Mononuclear Cells and Bronchoalveolar Lavage Patients with Pulmonary Tuberculosis Before and After Treatment with Oral Anti-Tuberculosis Drugs	24 - 29
7	<b>Effect of Oral Curcumin and Immobilization on The Diameter of Skeletal Muscle Fiber in Rattus Norvegicus</b>	30 - 34
8	Contralateral Renal Fibroblast and Tubular Cell Apoptosis and Proliferation in Artificial Unilateral Total Urethral Obstruction in Rabbits	35 - 40
9	POLYMORPHISM C3435T OF THE MDR-1 GENE PREDICTS RESPONSE TO PREOPERATIVE CHEMOTHERAPY IN LOCALLY ADVANCED BREAST CANCER WITH HER2/Neu EXPRESSION	41 - 46
10	Review Article:Challenge of Environmental Toxicology in Reformation Era	47 - 51
11	BONE MORPHOGENETIC PROTEIN 4 (BMP4) AND PROSTAGLANDIN ALPHA (PGE $2\alpha$ ) MOLECULAR EXPRESSION IN HEALING PROCESS ACCELERATION OF LONG BONE SHAFT FRACTURE USING IMMEDIATE REPETITIVE AXIAL COMPRESSION TENSION STABILIZATION (IREACT)	52 - 55
12	Treatment Response of Chronic Myelogenic Leukemia in Dr. Soetomo Hospital	56 - 59
13	Review Article and Clinical Experience:THE OBESITY PANDEMIC: THE "TIME-BOMB DISEASE" IN THE FUTURE?Where Have We Been? and What Should We Do?	60 - 66

## ***Effect of Oral Curcumin and Immobilization on The Diameter of Skeletal Muscle Fiber in Rattus Norvegicus***

## ***Effect of Oral Curcumin and Immobilization on The Diameter of Skeletal Muscle Fiber in Rattus Norvegicus***

1. Ratna Darjanti Haryadi Soebadi --> Department of Physical and Rehabilitative Medicine, Airlangga University School of Medicine, Dr Soetomo Teaching Hospital, Jl Prof Dr Moestopo 6-8, Surabaya
2. I Putu Alit Pawana --> Department of Physical and Rehabilitative Medicine, Airlangga University School of Medicine, Dr Soetomo Teaching Hospital, Jl Prof Dr Moestopo 6-8, Surabaya

### **Abstract**

Immobilization may result in skeletal muscle atrophy, in which the diameter of muscle fiber is decreased. The stimulus response at cellular level presents as the activation of Tumor Necrosis Factor (TNF)- $\alpha$  and NF- $\kappa$ B (Nuclear Factor- $\kappa$ B), which results in the degradation of muscular protein. Curcumin is a yellow pigment substance commonly found in plants belonging to the genus *Curcuma longa* (kunyit) and *Curcuma xanthorrhiza* Roxb (temulawak). One of the actions of Curcumin is inhibition of the NF- $\kappa$ B pathway activation. The objective of this study was to analyze the effect of oral curcumin and immobilization on the diameter of skeletal muscle fiber of *Rattus norvegicus*. Subjects of the study were male *Rattus norvegicus* aged 3-4 months, with bodyweight of 150-200 grams. Subjects were divided into three groups, a control group, an immobilization group without curcumin, and an immobilization group with oral curcumin, each of which comprised 11 subjects. Immobilization using a splint was applied to the soleus muscle for 2 weeks. Oral curcumin was given to the immobilization group in a dose of 400 mg/rats (2 g/KgBW) single dose once a week. The diameter of soleus muscle was measured histopathologically with HE staining, under a light microscope using a magnification of 400x. Results showed that the diameter of skeletal muscle fiber in the immobilization group was reduced 42.41% and 26,48% in the immobilization group with curcumin supplementation the reduction was 26.48%, as compared to the control group. There was significant difference ( $p < 0.05$ ) in the diameter of skeletal muscle fiber between control, immobilization, and immobilization with curcumin supplementation groups. In conclusion, the addition of oral curcumin significantly reduces atrophy of soleus muscle in rats immobilized for 2 weeks.

Keyword : curcumin, immobilization, skeletal, muscle, ,

### **Daftar Pustaka :**

1. **Chan, AS & Vallbona, C, (2003).** Immobilization, in Handbook of Physical Medicine and Rehabilitation, 2nd edn . Philadelphia : Lippincott William & Wilkins
2. **Farid, M, Reid, MB, Yi-Ping Li et al., (2005).** Effects of dietary curcumin or N-acetylcysteine on NF- $\kappa$ B activity and contractile performance in ambulatory and unloaded murine soleus . - : Nutrition & Metabolism