

**EFFECTS OF *ENTEROCOCCUS FAECALIS* ON MATRIX
METALLOPROTEINASE- 2 EXPRESSION AND
ACTIVATION IN CULTURED FIBROBLASTS
FROM HUMAN PERIODONTAL LIGAMENT**

NATTAWAN TANTAWIWAT

MASTER OF SCIENCE

IN DENTISTRY

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved

THE GRADUATE SCHOOL

CHIANG MAI UNIVERSITY

MAY 2009

**EFFECTS OF *ENTEROCOCCUS FAECALIS* ON MATRIX
METALLOPROTEINASE- 2 EXPRESSION AND
ACTIVATION IN CULTURED FIBROBLASTS
FROM HUMAN PERIODONTAL LIGAMENT**

NATTAWAN TANTAWIWAT

**A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE**

IN DENTISTRY

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved

**THE GRADUATE SCHOOL
CHIANG MAI UNIVERSITY**

MAY 2009

**EFFECTS OF *ENTEROCOCCUS FAECALIS* ON MATRIX
METALLOPROTEINASE- 2 EXPRESSION AND
ACTIVATION IN CULTURED FIBROBLASTS
FROM HUMAN PERIODONTAL LIGAMENT**

NATTAWAN TANTAWIWAT

THIS THESIS HAS BEEN APPROVED
TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF SCIENCE
IN DENTISTRY

EXAMINING COMMITTEE

Neeracha San

.....
Assoc. Prof. Dr. Neeracha Sanchavanakit

CHAIRPERSON

Kassara Pattamapun

.....
Asst. Prof. Dr. Kassara Pattamapun

MEMBER

Suttichai Krisanaprakornkit

.....
Assoc. Prof. Dr. Suttichai Krisanaprakornkit

MEMBER

Saengusa Khemaleelakul

.....
Dr. Saengusa Khemaleelakul

MEMBER

27 May 2009

© Copyright of Chiang Mai University

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to the following persons and organizations:

My advisor and thesis committee member, Assistant Professor Dr. Kassara Pattamapun, Department of Restorative Dentistry and Periodontology, Faculty of Dentistry, Chiang Mai University, for her guidance, constant support and encouragement throughout the course of my Master Degree program.

My co-advisor and thesis committee chairperson, Associate Professor Suttichai Krisanaprakornkit, Department of Oral Biology and Diagnostic Sciences, Faculty of Dentistry, Chiang Mai University, for providing the laboratory facilities, his valuable technical advice and kind support.

Dr. Saengusa Khemaleelakul, a thesis committee member, Department of Restorative Dentistry and Periodontology, Faculty of Dentistry, Chiang Mai University, for her kindness and encouragement.

Associate Professor Dr. Neeraha Sanchavanakit, Department of Anatomy, Faculty of Dentistry, Chulalongkorn University, the fourth thesis committee member for her suggestions and kindness.

Dr. M. Kevin O Carroll, Professor Emeritus of the University of Mississippi School of Dentistry, USA, and Faculty Consultant at Faculty of Dentistry, Chiang Mai University, Thailand, for his assistance in the preparation of the manuscript.

Miss Prakaimuk Saraithong, Researcher, Faculty of Dentistry, Chiang Mai University, for her helpful suggestions, valuable technical advice, kindness, high

working standards in all steps of laboratory experiments and encouragement throughout the period of laboratory research.

Miss Pareena Chotjumlong, laboratory technician, and Dr. Pattanin Montreekajorn, Department of Restorative Dentistry and Periodontology, Faculty of Dentistry, Chiang Mai University, for their valuable technical advice and kindness.

The Research Fund, Faculty of Dentistry, Chiang Mai University, for its financial support.

Lastly, I am sincerely grateful to my family and friends for their constant support and encouragement during this course.

Nattawan Tantawiwat