

**IDENTIFICATION OF BASOPHILIC METACHROMATIC  
CELLS (BMCS) AND RELATIONSHIPS BETWEEN BMCS,  
BACTERIA IN NASAL CAVITY AND SPECIFIC  
IMMUNOGLOBULIN E AGAINST HOUSE  
DUST MITES WITH THE SEVERITY OF  
ALLERGIC RHINITIS**

**YUWATIDA SANGRAT**

**MASTER OF SCIENCE**

**IN MICROBIOLOGY**

**GRADUATE SCHOOL**

**CHIANG MAI UNIVERSITY**

**APRIL 2005**

**ISBN 974-9885-23-6**

**IDENTIFICATION OF BASOPHILIC METACHROMATIC  
CELLS (BMCS) AND RELATIONSHIPS BETWEEN BMCS,  
BACTERIA IN NASAL CAVITY AND SPECIFIC  
IMMUNOGLOBULIN E AGAINST HOUSE  
DUST MITES WITH THE SEVERITY OF  
ALLERGIC RHINITIS**

**YUWATIDA SANGRAT**

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

**GRADUATE SCHOOL  
CHIANG MAI UNIVERSITY**

**APRIL 2005**

**ISBN 974-9885-23-6**

**IDENTIFICATION OF BASOPHILIC METACHROMATIC  
CELLS (BMCS) AND RELATIONSHIPS BETWEEN BMCS,  
BACTERIA IN NASAL CAVITY AND SPECIFIC  
IMMUNOGLOBULIN E AGAINST HOUSE  
DUST MITES WITH THE SEVERITY OF  
ALLERGIC RHINITIS**

**YUWATIDA SANGRAT**

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

**EXAMINING COMMITTEE**

.....CHAIRPERSON  
Dr. Volaluck Supajatura

.....MEMBER  
Assist. Prof. Dr. Sumalee Pruksakorn

.....MEMBER  
Assoc. Prof. Supranee Fooanant

.....MEMBER  
Dr. Prateep Warnnissorn

**25 APRIL 2005**

© Copyright by Chiang Mai University

## ACKNOWLEDGEMENT

I would like to express my sincere gratitude and deep appreciation to Dr. Volaluck Supajatura, my major advisor for her warm guidance, invaluable advice, supervision and encouragement throughout this thesis project. I am equally grateful to my co-advisors, Assistant Professor Dr. Sumalee Pruksakorn, Department of Microbiology, Faculty of Medicine, Chiang Mai University for permission to use her research equipments and reagents, valuable comments, advice, supervision and encouragement and Associate Professor Supranee Fooanant, Department of Otolaryngology, Faculty of Medicine, Chiang Mai University for her helpfulness in collecting patient samples, comments, and advice throughout this thesis project. They were never lacking in kindness and support.

My sincere gratitude is also given to the examining committee, Dr. Prateep Warnnissorn, Head of Cosmetic and Natural Products Research Center, Health Science Research Institute, Naresuan University for his invaluable points of suggestion and comment to make my thesis manuscript in better shape.

I would like to express my sincere thanks to Associate Professor Dr. Chatchawan Apichatpiyakul, for his permission to use their research equipments throughout this study, comments and advices in solving technical problems.

I would like to thank all the wonderful staffs in the Department of Microbiology, Faculty of Medicine, Chiang Mai University who always provided me with invaluable advice and assistance when needed. I also thank all my friends for their comments, advice, support, and friendships throughout this thesis project.

Finally, but most importantly, I would like to express my gratitude and deepest appreciation to my family for their love, attention, understanding and encouragement, which will never be forgotten throughout my life.

Yuwatida Sangrat