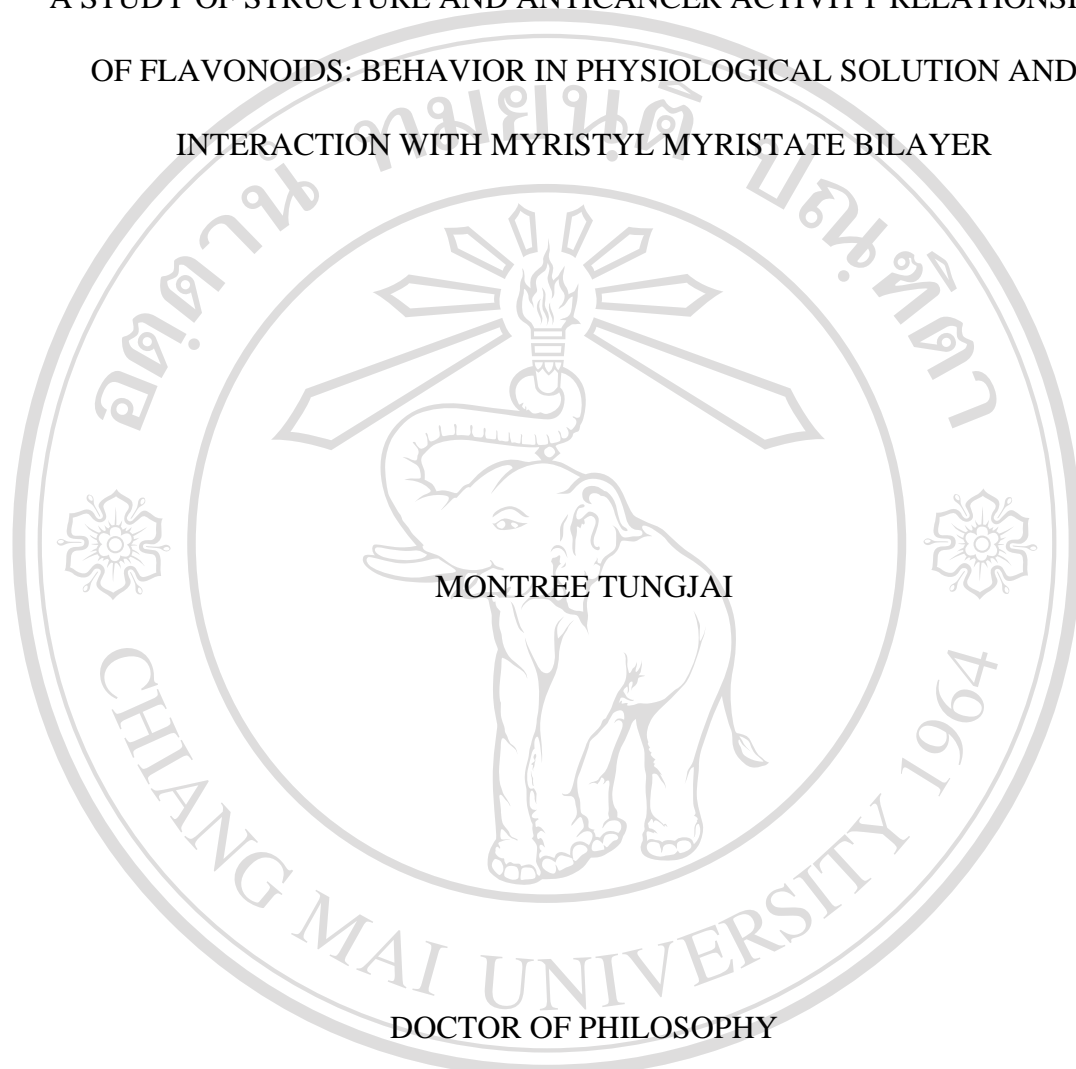


A STUDY OF STRUCTURE AND ANTICANCER ACTIVITY RELATIONSHIP  
OF FLAVONOIDS: BEHAVIOR IN PHYSIOLOGICAL SOLUTION AND  
INTERACTION WITH MYRISTYL MYRISTATE BILAYER



MONTREE TUNGJAI

DOCTOR OF PHILOSOPHY

IN BIOMEDICAL SCIENCE

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

Copyright© by Chiang Mai University

All rights reserved

THE GRADUATE SCHOOL

CHIANG MAI UNIVERSITY

JULY 2008

A STUDY OF STRUCTURE AND ANTICANCER ACTIVITY RELATIONSHIP  
OF FLAVONOIDS: BEHAVIOR IN PHYSIOLOGICAL SOLUTION AND  
INTERACTION WITH MYRISTYL MYRISTATE BILAYER



MONTREE TUNGJAI

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

DOCTOR OF PHILOSOPHY  
IN BIOMEDICAL SCIENCES

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่  
Copyright© by Chiang Mai University  
All rights reserved

THE GRADUATE SCHOOL  
CHIANG MAI UNIVERSITY



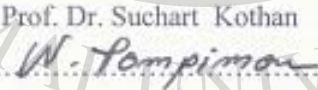


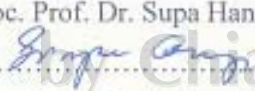
JULY 2008

A STUDY OF STRUCTURE AND ANTICANCER ACTIVITY RELATIONSHIP OF  
FLAVONOIDS: BEHAVIOR IN PHYSIOLOGICAL SOLUTION AND  
INTERACTION WITH MYRISTYL MYRISTATE BILAYER

MONTREE TUNGJAI

THIS THESIS HAS BEEN APPROVED  
TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY  
IN BIOMEDICAL SCIENCES

EXAMINING COMMITTEE

- |  |             |
|--|-------------|
|  | CHAIRPERSON |
| Assoc. Prof. Dr. Samlee Mankhetkorn  |             |
|  | MEMBER      |
| Assist. Prof. Dr. Suchart Kothan   |             |
|   | MEMBER      |
| Assist. Prof. Dr. Wilart Pompimon  |             |
|   | MEMBER      |
| Assoc. Prof. Raweewan Gunphairoh   |             |
|   | MEMBER      |
| Assoc. Prof. Dr. Supa Hannongbua   |             |
|   | MEMBER      |
| Assoc. Prof. Dr. Siriporn Okonogi  |             |

25 July 2008

© Copyright by Chiang Mai University

## ACKNOWLEDGMENTS

There are many persons to whom I am indebted for their help in successful this study.

My sincere gratitude are to my advisor, Assoc. Prof. Dr. Samlee Mankhetkorn for the encouragement, exceptional ideas and support during the course of this study and for providing the excellent facilities for my work.

My grateful are to Asst. Prof. Dr. Suchart Kothan, Asst. Prof. Dr. Wilart Pompimon, Assoc. Prof. Raweevan Gunphairoh, Assoc. Prof. Dr. Supa Hannongbua, and Assoc. Prof. Dr. Siriporn Okonoki who accepted the request to participate in the jury of my thesis and their discussions and advices during my thesis performing.

My special thanks are to members in Laboratory of Physical Chemistry, Molecular and Cellular Biology (PCMCB) and Center of Excellence for Molecular Imaging (CEMI), Department of Radiologic Technology, Faculty of Associated Medical Sciences, Chiang Mai University, Chiang Mai that have been very cooperative and helps.

My thanks are to Graduate School of Chiang Mai University and the Commission on Higher Education, Ministry of Education, the Royal Thai government and the Thailand Research Fund grant number RMU4980034 for my scholarship.

Finally, I would like to express my deepest gratitude to my parents, my whole family and close relatives for their everlasting love, understanding and numerous supports.

Montree Tungjai