

**ROLE OF CD147 MOLECULE ON REGULATION OF CELL
PROLIFERATION AND APOPTOSIS**



PAKORN PENGIN

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

GRADUATE SCHOOL

CHIANG MAI UNIVERSITY

JULY 2003

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved

**ROLE OF CD147 MOLECULE ON REGULATION OF CELL
PROLIFERATION AND APOPTOSIS**

PAKORN PENGIN

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

EXAMINING COMMITTEE

W.K.E.
..... **CHAIRPERSON**

Assoc. Prof. Dr. Watchara Kasinrerk

Chatchai Tayapiwatana
..... **MEMBER**

Asst. Prof. Dr. Chatchai Tayapiwatana

Sawitree Chiampanichayakul
..... **MEMBER**

Lecturer Dr. Sawitree Chiampanichayakul

Sansanee Chaiyaroj
..... **MEMBER**

Assoc. Prof. Dr. Sansanee Chaiyaroj

24 July 2003

© Copyright by Graduate School, Chiang Mai University

ACKNOWLEDGEMENTS

The author wishes to express my gratitude and deepest appreciation to Assoc. Prof. Dr. Watchara Kasinrerak, thesis advisor, for his excellent guidance, very patience, continuous discussion and many encouragements throughout this study. This thesis would not have been accomplished without his help.

I am also extended my grateful to Asst. Prof. Dr. Chatchai Tayapiwatana, Lecturer Dr. Sawitree Chiampanichayakul and Assoc. Prof. Dr. Sansanee Chaiyaroj, my examination committee, for their valuable suggestions and valuable advice.

I would like to express my sincere thanks to Miss Seangduen Moonsom, Miss Panida Khunkeawla and all staff members of Assoc. Prof. Dr. Watchara Kasinrerak's laboratory for their helps, kindly and suggestion.

Finally, I would like to express my special gratitude to my family for their love, understanding, encouragement and support throughout this study.

This work was supported by The National Center for Genetic Engineering and Biotechnology (BIOTEC) of the National Science and Technology Development Agency (NSTDA), Thailand.

Pakorn Pengin

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved