BIOLOGICAL ACTIVITY ASSESSMENT OF SINGLE CHAIN FV M6-1B9

AGAINST CD147 AS SOLUBLE AND INTRABODY FORMS

KHAJORNSAK TRAGOOLPUA

IN BIOMEDICAL SCIENCE

DOCTOR OF PHILOSOPHY "OMEDICAL SCIENC! ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่ Copyright[©] by Chiang Mai University

CHIANG MAI UNIVERSITY

JUNE 2009

BIOLOGICAL ACTIVITY ASSESSMENT OF SINGLE CHAIN FV M6-1B9

AGAINST CD147 AS SOLUBLE AND INTRABODY FORMS

KHAJORNSAK TRAGOOLPUA

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

FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

adan Sun Ponedical science adan Sun Ponedical science Copyright[©] by Chiang Mai University

CHIANG MAI UNIVERSITY

JUNE 2009

BIOLOGICAL ACTIVITY ASSESSMENT OF SINGLE CHAIN FV M6-1B9 AGAINST CD147 AS SOLUBLE AND INTRABODY FORMS

KHAJORNSAK TRAGOOLPUA

THIS THESIS HAS BEEN APPROVED

TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

IN BIOMEDICAL SCIENCE

minimum and a second a second and a second a
EXAMINING COMMITTEE
Hillin Jappaal CHAIRPERSON
Assoc. Prof. Dr. Chatchai Tayapiwatana
MEMBER
Prof. Dr. Watchara Kasinrerk
MEMBER
Prof. Dr. Andre Lieber
P. Lesdranacha: MEMBER
Assist. Prof. Dr. Pranee Leechanachai
Notjeera Întasai MEMBER
Dr. Nutjeera Intasai
ลิปลาธิบหาวิทยาลัยเชียวใหม
Convright hy Chiang Mai University
2201110 2007
© Copyright by Chiang Mai University

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude and appreciation to my thesis advisor, Assoc. Prof. Dr. Chatchai Tayapiwatana, for giving me an opportunity to be a Ph.D student in his laboratory. He gave me the confidence, excellent guidance, continuous suggestions and many encouragements throughout this study and for the revision of this thesis and manuscripts. His deep knowledge and logical way of thinking are a great value for me in proving every significant experiment and generating important ideas.

I am extremely grateful to Prof. Dr. Watchara Kasinrerk for kindly gift the hybridoma, monoclonal antibodies, and cell lines throughout my study, his constructive suggestions and comments, kind supports, revision the manuscripts and supervisory thesis committee.

My grateful thank to Assist. Prof. Dr. Pranee Leechanachai, head of Division of Clinical Microbiology, Department of Medical Technology, Faculty of Associated Medical Sciences, Chiang Mai University for her kindness suggestions, valuable advice and for her help to obtain the scholarship from the Collaborative Research Network (CRN) of Allied Health Sciences, Commission on Higher Education, Ministry of Education.

A part of my thesis work was performed at Division of Medical Genetics, University of Washington, Seattle, USA. I am extremely grateful to Prof. Dr. Andre Lieber for giving me an opportunity to work in his lab. I am eternally grateful for his valuable guidance and suggestions on my work. I gratefully thanks to

Dr. Zong Yi Li, Dr. Daniel Stone, Dr. Robert Strauss, Dr. Sebastian Tuve, Dr. Hong Jia Wang, Dr. Ying Liu and Roma Yamul for their scientific and technical experiment support and also for their warm friendship, kindly help and always support me during living in Seattle.

I additionally need to express my deepest and sincere gratitude to my co-advisor, Dr. Nutjeera Intasai for her valuable suggestions, kind help and approving this thesis and manuscripts.

I thank Dr. Wattana Weerachatyanukul, Department of Anatomy, Faculty of Science, Mahidol University and Dr. Rungpiyada Khunvitaya, a specialist of Microscope Division, E *for* L International Co., Ltd., Thailand for manipulating confocal scanning microscope and imaging analysis.

I would like to extend a special acknowledge to Sawitree Na-ngola, Sompot saoin, Wuttigri Nimlamool, Prakitnavin Pingmuang, Kunthida Kitidee, Dr. Panida Khunkaewla, Dr. Seangdeun Moonsom, Ajarn Ponrat Phunpae, Supansa Pata and all staffs in Assoc. Prof. Dr. Chatchai's Lab and Prof. Dr. Watchara's lab for their kindness, friendship and contributions for technical training throughout my work. I am grateful to all personnel and faculty members for their assistance in using instruments at Department of Medical Technology and Biomedical Technology Research Center, Faculty of Associated Medical Sciences, Chiang Mai University.

This work was supported by a scholarship from the CRN, the Thailand Research Fund and the National Center for Genetic Engineering and Biotechnology (BIOTEC), Thailand. Some part of my thesis work was supported by Prof. Dr. Andre Lieber's grant.

Finally, I would like to express my deepest gratitude to my wife, Assist. Prof. Dr. Yingmanee Tragoolpua and my mom in law, Instructor Montha Boonyakiat, including Dr. Sathanan and Dr. Sukanya Boonyakiat, and also my parent for their love, encouragement and great support to my kids, Ploy and Pooh during my Ph.D study in Seattle, USA.



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่ Copyright[©] by Chiang Mai University All rights reserved