

OPTIMIZATION OF MULTIPLEX AMPLIFICATION REFRACTORY
MUTATION SYSTEM TECHNIQUE IN PRENATAL
DIAGNOSIS OF β -THALASSEMIA MAJOR AND
 β -THALASSEMIA/Hb E DISEASE



KHANUNGNIT THUNGKHAM

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

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

Copyright© by Chiang Mai University

All rights reserved

GRADUATE SCHOOL
CHIANG MAI UNIVERSITY

SEPTEMBER 2004

ISBN 974-9806-10-7

OPTIMIZATION OF MULTIPLEX AMPLIFICATION REFRACTORY
MUTATION SYSTEM TECHNIQUE IN PRENATAL
DIAGNOSIS OF β -THALASSEMIA MAJOR AND
 β -THALASSEMIA/Hb E DISEASE

KHANUNGNIT THUNGKHAM

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

Thanusak Tatu

.....Chairperson

Assistant Professor Dr. Thanusak Tatu

T. Sanguansermsri

.....Member

Emeritus Professor Dr. Torpong Sanguansermsri

P. Kulapongs

.....Member

Emeritus Professor Dr. Panja Kulapongs

Vip Viprakasit

.....Member

Lecturer Dr. Vip Viprakasit

22 September 2004

ACKNOWLEDGEMENT

The author is greatly indebted of the guidance and the most kind encouragement of Emeritus Professor Dr. Torpong Sanguansermisri who provided his proper advice at all stages of this experimental study.

A special appreciation is also expressed to my advisor, Assistant Professor Dr. Thanusak Tatu, for excellent guidance, valuable advice and kindest encouragement throughout this study.

My deep gratitude is heartily expressed to the members of examining committee; Emeritus Professor Dr. Panja Kulapongs and Lecturer Dr. Vip Viprakasit for the encouragement, criticism, valuable suggestion, helpful discussion and for revising the manuscript.

In addition, I would like to thank Assistant Professor Dr. Supatra Sirichotiyagul Department of Obstetrics and Gynecology, Faculty of Medicine, Assistant Professor Dr. Pimlak Charoenkwan, Miss. Rattika Saetung and all staff of The Thalassemia Unit, The Thalassemia Research Unit, Department of Pediatrics, Faculty of Medicine, Chiang Mai University for the support, suggestion in this thesis.

The acknowledgement is also put forward to Department of Clinical Microscopy, Faculty of Associated Medical Sciences, The Thalassemia Unit, Department of Pediatrics, Faculty of Medicine, Chiang Mai University.

Finally, I would like to express thanks to my parents, my colleagues, my friends and everyone in my family for their loves, supports, sympathies and understanding throughout this study. These will remain in my memory forever.

Khanungnit Thungkham