

GRADUATE SCHOOL
CHIANG MAI UNIVERSITY
JULY 2016



GRADUATE SCHOOL
CHIANG MAI UNIVERSITY
JULY 2016

KANOKKARN JUNTAPING

A THESIS SUBMITTED TO CHIANG MAI UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE

Copyright[©] by Chiang Mai University

All rights reserved

IN BIOINFORMATICS

GRADUATE SCHOOL, CHIANG MAI UNIVERSITY
JULY 2016

KANOKKARN JUNTAPING

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

Examination Committee:	Advisory Committee:
	Patrine Traisathit Advisor
(Asst. Prof. Dr. Lily Ingsrisawang)	(Asst. Prof. Dr. Patrinee Traisathit)
	leur Olv Co-advisor
(Assoc. Prof. Dr. Jeerayut Chaijaruwanich)	(Assoc. Prof. Dr. Kaweesak Chittawatanarat)
Patrine Traisathit Member	
(Asst. Prof. Dr. Patrinee Traisathit)	(Asst. Prof. Dr. Sukon Prasitwattanaseree)
(Asst. Prof. Dr. Sukon Prasitwattanaseree)	

25 July 2016 Copyright © by Chiang Mai University

To
All participants in the study



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

ACKNOWLEDGEMENTS

During a period of studying in master degree, many people providential assisted me. I would like to thank all of them for their supporting. I would like to express the deepest and sincere grateful to my thesis advisor, Asst. Prof. Dr. Patrinee Traisathit for their supervision, advice and guidance for me about statistical analysis, thesis writing and other suggestions of my graduate education. My sincere grateful also go to Assoc. Prof. Dr. Kaweesak Chittawatanarat, Asst. Prof. Dr. Sukon Prasitwattanaseree for their comments and suggestions about my thesis.

I gratefully thank Asst. Prof. Dr. Lily Ingsrisawang, Department of Statistics, Faculty of Science, Kasetsart University and Assoc. Prof. Dr. Jeerayut Chaijaruwanich, Faculty of Science, Chiang Mai University for having kindly accepted to be members of the thesis committee.

In addition, I am grateful to all of my friends especially Mr. Prakit Riyaten and Mr. Suttipong Kawilapat their abundant assistance in my projects. The project could not be success if I did not get bioelectrical impedance analyzer from the Maharaj Nakorn Chiang Mai Hospital, Faculty of Medicine, Chiang Mai.

Finally, I most gratefully acknowledge my parents and family for support and encouragement during my graduate study. I sincerely thank all of my teachers for the inspiration. This thesis is dedicated to all my beloved people.

Kanokkarn Juntaping