

CONSTRUCTION OF RANDOM MUTANT LIBRARY OF *Plasmodium*  
*falciparum* DIHYDROFOLATE REDUCTASE AND ITS USE FOR  
STUDY OF EVOLUTION OF ANTIFOLATE RESISTANCE  
IN *Plasmodium berghei* MODEL

WACHIRAPORN TIPSUWAN

DOCTOR OF PHILOSOPHY  
IN BIOCHEMISTRY

THE GRADUATE SCHOOL  
CHIANG MAI UNIVERSITY  
JANUARY 2012

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

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THIS THESIS HAS BEEN APPROVED  
 TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS  
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 IN BIOCHEMISTRY

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