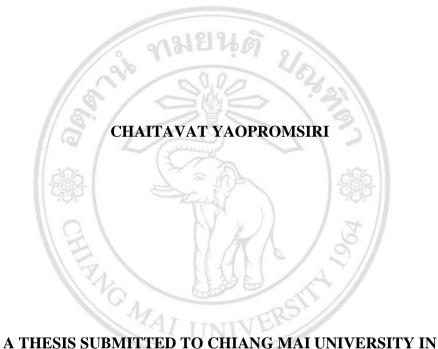
EFFECT OF COLD ATMOSPHERIC PRESSURE PLASMA ON DNA CHANGE AND BACTERIAL MUTATION



Copyright[©] by Chiang Mai University All rights reserved

> GRANDUATE SCHOOL CHIANG MAI UNIVERSITY MAY 2016

EFFECT OF COLD ATMOSHERIC PRESSURE PLASMA ON DNA CHANGE AND BACTERIAL MUTATION



A THESIS SUBMITTED TO CHIANG MAI UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE DREGREE OF MASTER OF SCIENCE IN APPLIED PHYSICS

GRANDUATE SCHOOL, CHIANG MAI UNIVERSITY MAY 2016

EFFECT OF COLD ATMOSHERIC PRESSURE PLASMA ON DNA CHANGE AND BACTERIAL MUTATION

CHAITAVAT YAOPROMSIRI

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

Examination Committee:

Advisory Committee:

Andre Chairman

(Dr.Sureeporn Sarapirom)

medera Member Assoc. Prof Dr. Yu Liang Deng)

O. A. Member

(Assoc. Prof. Dr. Dheerawan Boonyawan)

Member

(Asst. Prof. Dr. Athipong Ngamjarurojana)

VL DEL

Advisor

(Assoc. Prof. Dr. Dheerawan Boonyawan)

19. Co-advisor Assoc. Prof. Yu **L**iangdeng)

26 May 2016 Copyright © by Chiang Mai University

ACKNOWLEDGEMENTS

This thesis would not successed without cooperation and support from many kinds of people and organizations. Firstly, I would like to thank Assoc. Prof. Dr. Dheerawan Boonyawan, who is my thesis advisor and director of the Plasma-Bio & Green Energy project and director of Plasma and Beam Physics Research Facility (PBP), for invitation to the laboratory and beneficial instruction on this thesis.

Secondly, I would like to thank my co – advisor, Assoc. Prof. Dr. Yu Liangdeng. I would like to thank him for his lovely advice and kind assistance.

This thesis would not have been possible without the guidance and help of other people and staffs in the Plasma and Beam Physics Research Facility. I would like to thank Dr.Sureeporn Sarapirom, who taught me about biological theory and taught me to use Origin 8.0 program for calculating percentage of changed naked DNA form. I would like to thank Mr. Prutchatawoot Thopan, who helped and taught me about technique and supported my research. Next person is Mr. Chanchai Umongno, and I would like to thank him for supporting plasma technique and providing electrical equipment in the laboratory.

Finally, I would like to thank my family and my friends for their love, encouragement, inspiration and supporting me everything. I would like to thank Ms. Phimonrat Ketchai for love, supporting and encouragement.

Chaitavat Yaopromsiri