

ACKNOWLEDGEMENTS

The thesis project has been possible through the kind support and guidance of Asst. Prof. Dr. Panwong Kuntanawat provided valuable advice and knowledge on biotechnology, which facilitated the successful completion of the research and experiments during the study and review of this project.

I would like to thank Dr. Kanjana Thumanu for her advice on the use of the equipment and programs used in the research as well as suggestions on how to solve various problems during the research.

I would like to thank Assoc. Prof. Mariena Ketudat-Cairns for kind guidance, helpful suggestions, and support in developing my academic skills.

I would like to thank Assoc. Prof. Dr. Panlada Tittabutr, for kindly providing the most thorough and transparent perspective on analyzing special problems as well as various knowledge skills. Microbiology that is used in research.

I would like to thank Assoc. Prof. Dr. Pakpoom Boonchuen for kindly accepting as a committee and providing knowledge, and teaching the knowledge that is very necessary for conducting research.

Thank you for the OROG Scholarship for providing the opportunity for me to develop and increase my skills and knowledge in biotechnology

Thank you to Phoochit W. for stand by me. And Synchrotron Light Research Institute (Public Organization) for tools for research as well as training on data analysis used in research.

Sinaphon Chairat