First and foremost, I would like to express my gratitude to the one and only, the al-Mighty Allah SWT, the Omnipotent, the Benevolent, the Sovereign, for having blessed me and giving me these valuable experiences during my PhD period.

This PhD thesis is the end of long journey, starting at Rijkuniversiteit Groningen (RuG) and then at Institut Teknologi Bandung. Then it has ending at the Rijkuniversiteit Groningen (RuG). There are a lot of memorable experiences that cannot describe with words and many people have been involved to complete this thesis. It would not have been possible without their countless help and support. Therefore, I would like to thank all those who were involved directly or indirectly.

I would like to express my hearty thanks to my supervisor and promotor Prof. Marc J. E. C. van der Maarel for his guidance, constructive suggestions and understanding throughout the past two years. I have benefited tremendously from working with and learning from you. I am extremely grateful for your patience and ability in helping to improve my English skills in writing and conversation. Thank you for translating the Dutch summary for me, I (literally) could not have done it without your helping. Thanks to my co-promotor, Prof. Lubbert Dijkhuizen who invited me to be part of Microbial Physiology group in my first two years of my program. I sincerely thank Dr. Dessy Natalia and Dr. Zeily Nurachman for their support and encouragement, especially to Dr. Ihsanawati for the assistance and encouragement when I was in difficult times at the end of my PhD period. Thank you all for your understanding and patience in guiding me over the years.

I would like to sincerely thank to reading committee – Prof. Gert-Jan W. Euverink, Prof. Marco W. Fraaije, and Prof. Birte Svensson- for their precious time and for valuable comments and insight are very much appreciated.

My special thanks go to members and staffs in ABBE group, both former and present, visiting and permanent, for a pleasant working atmosphere and interesting discussion on various matters. In addition to my colleagues, Marta Martinez-Garcia and Delicia Yunita Rahman, who helped me in the Galdieria work. This is the first time I've been involved in microalgae work, it is a very impressive and exciting experience, thank you for discussion in between the busy times of experiments. To all others colleagues in the ABBE and PPBE groups: Martin Velthuis, Selvaraj Chinnatambi, Xue-Wen Zhang, Spyridon Achinas, and whom their names are not mentioned here; thank you for the wonderful environment. Many thanks to the
technical staff who keeps the lab running, Alle van Wijk and the office staff, Inge Meijerink-Verwer who was so helpful in organizing office life in Groningen.

My fellow graduate student in ABBE provided great advice and inspiring conversation, Otto Schepers. Whether it was setting up the bioreactors; counting the microalgal cells; doing assay; or cataloging equipment used, I appreciate all the help rendered. Thanks also extended to Leonardo Silva, Theresa Passath, and Thomas Riche for their valuable suggestion and comments on manuscripts and thesis preparation, your participation keeps me on track and helps a lot. I am also grateful to Marta Martinez Garcia and Fikri Zul Fahmi for being my paranymphs.

I would also like to thank several member and ex-members of Microbial Physiology group Pieter Grijpstra, Hans Leemhuis, Marta Palomo i Reixach, and Munir Anwar. Thank you for the friendly atmosphere that helped me a lot at beginning of my PhD in Haren.

Dear Pipit, Herfita Agustiandari, you were my first Indonesian friend back when we were in Biological Centre, Haren. Thank you for all the nice moments together, all the fun in general, we shared many laughs. Thank you also for keeping the contact when we are so far away from each other. I would like to thank my friends out of the lab for their support and making life more fun. In particular I’d like to thank Syarif Riyadi and Desti Alkano, Muhammad Insanu, A’ Nandang Mufti, teh Rahmatun Nisa, mbak Puri Handayani, teh Uyung (Yunia Sribudiani), especially to Guntur Fibriansah-Intan Widyasari (also Nadya and Azka) family who helped me a lot at the beginning of my study in Groningen. For Arramel-Puti Syahrani, thanks for offering help for a lot of stuffs inside and outside the university.

I am blessed that I was surrounded by wonderful and special people. Special thanks to Adhyatmika and Nur Rochmah Hidayati, mas Didik Setiawan and family (mbak Roselina Wulandari, Nafi, and Najwa), Kurnia Sari Setio Putri and Raditya Iswandana for being close friends, for traveling around Europe or Netherlands, and for playing caps (for sure... hahahaha), M. Zainal Abidin and family (Ayu Nuzulia and Aira), Erlangga H. Roesdyoko, Ali Syari’ati-Liany Septiany who created such a great atmosphere at home (NS74 family), M. Nazmuddin and Guntur D. Putra for spending so many hours with me in the office during thesis writing, as well as in many social activities. Mbak Tiurma P. Allagan, mbak Sri Awalia Febriana, and Anisha Maharani for Pathe’s craziness (hahahaha). Genggong woy ngumpul woy, (Masyitha Ambarwati, Dina Maniar, Rasyida Noor, Yusran A. Muthahari,
Caecilia A. Satyawan, Natasha Witto, Florence Husada, and Elisabet Keisia) and Muh. Insan Nugraha are thanked for being good friends and arranging off-sciences activities out of office time. They all have made my stay in Groningen very special and unforgettable. I have spent amazing times and had lots of fun here during all these years. I like to thank all member of Chem-ITB in Groningen, and mbak Rosewitha Irawaty, you helped me on my summary as well as for being good housemate while in GS38. I also thank mbak Nur Qomariyah and Pak Asmoro family for many different things.

Dear Ayu Anggraini, thank you for the friendship we have, and also for being there, for helping me to fight, to listen to my complaints, and to make me feel better. Sari Dewi Kurniasih, Sofi Siti Shofiyah and bu Fernita Puspasari, thank you for fruitful discussion. Jehan, I’m very glad to have such a nice friend, and thanks for your wise advices.

My appreciations also go to the Indonesian student community and Indonesia moslem society in Groningen (PPIG and deGromiest, respectively) for their kindness so that I never felt alone in the Netherlands. I hope I will be forgiven if I am forgetting someone.

In addition, my gratefulness to my auntie Sri Susanti and my uncle oom Ilsyafri for your valuable support, encouragement and love throughout my life.

I wish to express my deepest appreciation and sincere gratitude to most my beloved parents, Papa Sarian F. Sulaiman and Mama Sri Widayanti, your care, support, endless love, and never-ending prayers are the reason I am here. My success is only for you. To my little brother, Fedo R. Sarian, you always support me whenever you can. Our personalities are very different but that makes our relationship colorful. Thanks for taking care of Papa and Mama, while I have been away. I love you all, without you I would never be able to finish this work!

Last but not least, special thanks goes to all of everyone who I forgot to mention, thank you for your help and support. Life is nothing without friends, wherever you are I will always remember you, InsyaAllah. At some points during my stay here, I may have been anxious to get work done and thus could have offended people without knowing. I use this medium to sincerely apologizing and beg for full forgiveness.