



## UvA-DARE (Digital Academic Repository)

### Multiple faces of *Fusarium oxysporum* effector protein Avr2

Di, X.

**Publication date**

2017

**Document Version**

Other version

**License**

Other

[Link to publication](#)

**Citation for published version (APA):**

Di, X. (2017). *Multiple faces of Fusarium oxysporum effector protein Avr2*.

**General rights**

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

**Disclaimer/Complaints regulations**

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

## Acknowledgements

It is the end of my thesis. It is also my honor to acknowledge the people who contribute to my work and life. Four pages of acknowledgments might not exactly reflect my feeling, but I hope all of you could feel my gratitude and appreciation.

First of all I would like to thank my co-promoter Dr. Frank Takken and promoter Prof. Ben Cornelissen. Dear **Frank**, I appreciate you so much for providing me the opportunity to join in your group and start my PhD research. I still remembered the first time that I had an interview with you via skype. It was my first time to really have a conversation with foreigner. I was so nervous and made a lot of mistakes during interview. I was so grateful that you gave me the opportunity to be here. Later I realize how lucky I was to have you as my supervisor because of your excellent supervision and guidance in scientific research. You taught me so many things that helped me to improve my research ability. When I had difficulties or problems, your office door was always open (except you were having meeting with someone else) and you were enthusiastic to discuss and explain them to me. Your creative and supportive ideas guided me to discover and resolve the remaining and challenging questions, which made me feel more confident to my work. Dear **Ben**, thank you so much for giving me creative suggestions and support on my project. The first three-month regular meeting with you made me realize that I need to work harder and broad my knowledge. Your experience and insight in science led me to achieve my PhD degree. I also thank you for spending so much time proofreading and revising my thesis. Your precise corrections will definitely benefit me throughout my life. I am especially grateful for your encouragement and support at the end of my PhD.

Second, I would like to thank Dr. Harrold van den Burg and Dr. Martijn Rep. Dear **Harrold**, thank you so much for providing me the idea on graft experiment and contribution on the patent and paper. Your valuable suggestions and comments on my work impressed me a lot. I admired your innovative ideas toward the scientific research. Dear **Martijn**, thank you for spending time proofreading the review paper. You are always so kind and gentle, which gave me deep impression. Each time when I gave the presentation during MPP meeting, you always smiled to me, which made me calm down quickly. Thank you for your helpful suggestions on my project. Dear **Nico**, I am grateful for your input in our review paper. I was so lucky to have my first publication together with you. I learned a lot from your revision and scientific discussion, which later benefit my thesis writing a lot. Dear **Lisong**, thank you very much for picking up me at the airport and sent me to my house when I just arrived in Amsterdam. Thank you so much for guiding me to sign the contract with housing company and go shopping in Chinatown. The day that you invited me to have dinner with your family in your place made me feel home. I am grateful to **Hanna**, thank you for guiding me in the experiment, providing me lots of

help in the daily lab work. I still remembered the moment how you encourage me when my first experiment didn't work. I really appreciated and enjoyed the time working with you. Dear **Petra**, thank for your support on my lab work. No matter how small questions from me, you were always pleased to help me to find out the way. I would also like to thank two students whom I supervised. **Josephine** and **Jo**, thank both of you for your dedicated work on my project, especially for Jo's great contribution in two papers. I wish you both all the best in the future.

Dear **Marijn** and **Jiming**, thank you both for agreeing to be my paranymph and defense preparation. Marijn, you are the pistachio (happy fruit in Chinese) of the group. It is a lot of fun to be working with you in the same lab. I admire your way to enjoy life and experiment. Jiming, thank you so much for taking care of my house when I was on holiday. I wish you all the best in your experiment and enjoy your work. Dear **Heni**, thank you so much for accompany with me all the time, not only in my bioassay but also daily short break. I enjoyed the Indonesian food so much. I really appreciated and acknowledged our friendships. Dear **Mara**, I really appreciated all of your generous help and enjoyed working together with you. Whenever I have questions and come to you, you always replied to me patiently and nicely. I am also grateful to you for helping me with lots of Dutch letters. Of course, also, for correcting my personal statement for MPMI meeting. You taught me how to change my writing from Chinese style to native. I would like to thank **Peter** for offering me lots of help, such as translating Dutch documents and inviting me to your place to try typical Dutch food. I really enjoyed the time with you and Kitty. Dear **Manon** and **Sayantani** thank you very much for organizing bachelor party for me. It was so sweet. Dear **Fran**, thank you for taking over part of work when I was busy with writing my thesis. I enjoyed a lot to work with you in the lab. Dear **Fleur**, thank you for helping me with tomato pull down assay. You were pregnant at that moment; however, you were staying in the cold room with me for the experiment and sharing your experience with me.

Then I would like to thank all colleagues in the MPP group who have helped me to make my PhD enjoyable. I would like to thank **Bas** for the help in the heat shock experiment, **Magda** for providing me good experimental protocols and sharing your experience in quickchange site mutagenesis, **Dirk-Jan** for your help in my last bioassay, **Lotje** for lots of help especially in RNAseq analysis, **Biju** for your instruction in my first bioassay, **Like** for showing me how to run Image J automatically, which works much more efficiently and saved me a lot of time. Dear **Lingxue**, **Georgios**, **Maria**, **Tieme**, **Francesca**, **Marieke**, **Mark**, **Malono**, **Ido**, **Shermineh**, **Sarah** and **Valentin**, I wish you all the best. I really appreciated all of your help and working together with you.

Of course, I would also like to thank all members outside our MPP group. Dear **Mark Banfield** and **Richard Hughes** from JIC, UK, thank you for resolving Avr2 construct and contribution to the paper. Dear **Hans Christensen** and **Ali Ahmed** from Denmark University, thank you very much for your instruction in chaperone assay. Dear **Matthieu Joosten**, my external supervisor from Wageningen University, thank you for your idea on high temperature rescue assay. Dear **Michel H.** and **Petra B.**, it is a great honor to have you as my committee members. Dear **Rob** and **Carlos**, thank you for your help in hormone quantification. Dear **Christa** and **Teun**, thank all of you for useful ideas on my project during my talks in PSM. Dear **Ringo** and **Michel V.**, thank you for all kinds of help such as helping me searching for experimental chemicals. I thank **Chris** for providing *Pseudomonas* stain, **Ahmed** for designing primers for VIGS assay, **Marc** for data analysis and **Paula** for ATTA in *N. tabacum*, **Xavi** and **Dorota** for thesis printing. I am also grateful to **Ludek**, **Harold**, **Thijs** and **Fernando** for taking care of my plants in the green house.

Dear **Harro**, thank you for teaching me English when I started my PhD. I made a great progress in English based on your instructions. It was a nice time to have dinner with you. Dear **Jens**, my first flat mate, thank you for riding me to open market and bought my lovely kid bicycle. You were so nice and gentle and I wish you all the best and enjoy your life.

Then I would also like to thank all of my Chinese friends. **Sun Zepeng**, **Gao Jiajia** and **Liu Jie** from IBED, I really had a lot of fun with you travelling around Europe. **Song Yin**, **Li Jinling** and **Wu Xiaolin** from Wageningen University, we had great time together though we missed the flight back to Amsterdam. **Zhang Qianqian**, **Xu Jiesen**, **Zhang Yanxia**, **Wang Yanting** and **Sun Pulv** thank you for having lunch together. **Chen Que**, **Liu Yang**, **Feng Yanfang**, **He Sheng**, **Pan Yu**, **Pan Zhongcheng**, **Diao Muhe** and **Ji Xing**, thank you all for nice party with you. **Dong Lin**, thanks for generous help, unforgettable conversations and dinners. **Liu Xiaolong** and **Du Wei**, wish you make big achievement in the research. **Xiaoqiang**, **Jingjing**, **Anran** and **Xier**, thank you for having party together. **Zhao Juan**, thank you very much for designing the cover for my thesis. It was my pleasure to meet all of you and best wishes to all of you.

Although it is the end of my PhD period, it was an invaluable and remarkable journey and experience. I appreciate to work and live together with all of my helpful, friendly and intelligent colleagues and friends. Without the help and support from you I could have never imagined that the achievement of PhD was successful. Hence, I would like to express my deep gratitude to all of you who helped me in the past four years both in scientific work and my personal life.

最后,感谢养育了我三十载的爸爸妈妈和一直陪伴在父母身边的哥哥嫂子和小侄女悦悦。特别感谢你们这么多年默默的支持与付出,让我能够安心学习,顺利拿到博士学位。另外,我还想感谢我的先生熊晖,谢谢你的出现和相守,让我的留学生活变的更加快乐和多彩。同时我也十分感谢公公婆婆对我们的理解与支持,希望我们新组建的小家庭能够给两个大家庭带来更多的欢乐。我爱你们,祝你们永远平安康健。

Xiaotang Di 邱晓棠

March 2017 in Amsterdam

2017年3月于阿姆斯特丹

---

## List of Publications

- Liu, Y., Yan, Z., Chen, N., **Di, X.**, Huang, J., and Guo, G. (2010). Development and function of central cell in angiosperm female gametophyte. *Genesis* 48, 466-478. doi: 10.1002/dvg.20647.
- Di, X.**, Gomila, J., Ma, L., van den Burg, H. A., and Takken, F. L. W. (2016). Uptake of the *Fusarium* effector Avr2 by tomato is not a cell autonomous event. *Front Plant Sci* 7: 1915. doi: 10.3389/fpls.2016.01915.
- Di, X.**, Takken, F. L. W., and Tintor, N. (2016). How phytohormones shape interactions between plants and the soil-borne fungus *Fusarium oxysporum*. *Front Plant Sci* 7. doi: Artn 170 10.3389/fpls.2016.00170.
- Di, X.**, Gomila, J., Takken, F. L. W. Involvement of salicylic acid, ethylene and jasmonate acid signaling pathways in susceptibility of tomato for *Fusarium oxysporum*. *Molecular Plant Pathology*, *provisionally accepted*.

## Submitted or in preparation

- Di, X.**, Cao, L., Tintor, N., Hughes, R., Banfield, M., and Takken, F. L. W. Structure-function analysis of the *Fusarium oxysporum* Avr2 effector allows uncoupling of its immune-suppressing activity from recognition. *Submitted*.
- de Sain, M., **Di, X.**, Koomen, E., Nooij, S., Sklenar, J., Bozkurt, T., Kamoun, S., Rep, M. The *Fusarium oxysporum* effector Six1 interacts with small heat shock proteins of plants. *In preparation*.

## Patent application

- Takken, F. L. W., **Di, X.**, and van den burg, H. A. (November 2016). Plants comprising pathogen effector constructs. the Netherlands patent application EP16201553.1.

**Cover:** Cell death in tomato plants

**Cover design:** Juan Zhao

**Printed by:** Ipskamp Drukkers, Enschede, the Netherlands





