



Universiteit  
Leiden  
The Netherlands

## **Agrobacterium infection : translocation of virulence proteins and role of VirF in host cells**

Jurado Jácome, E.

### **Citation**

Jurado Jácome, E. (2011, November 15). *Agrobacterium infection : translocation of virulence proteins and role of VirF in host cells*. Retrieved from <https://hdl.handle.net/1887/18068>

Version: Corrected Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/18068>

**Note:** To cite this publication please use the final published version (if applicable).

***Agrobacterium* Infection:  
Translocation of Virulence Proteins  
and Role of VirF in Host Cells**

**Esmeralda Jurado Jácome**

Cover: Front: Block construction Youssef Elkhoully Jurado  
Background: Immunocytolocalization of VirF in transgenic *Arabidopsis* plant-cell culture  
Reverse: Crop fields *Finca San Antonio* (Tangua- Nariño, Colombia)  
Design: Cielo Raquel Jurado Jácome

Printed by: Wöhrmann Print Service B.V., Zutphen, The Netherlands

ISBN: 978-90-8570-594-9

***Agrobacterium* Infection:  
Translocation of Virulence Proteins  
and Role of VirF in Host Cells**

**Proefschrift**

ter verkrijging van  
de graad van Doctor aan de Universiteit Leiden,  
op gezag van Rector Magnificus prof.mr. P.F. van der Heijden,  
volgens besluit van het College voor Promoties  
te verdedigen op dinsdag 15 november 2011  
klokke 15:00 uur

door

**Esmeralda Jurado Jácome**

Geboren te Bogotá DC, Colombia  
in 1968

## **Promotiecommissie**

Promotor: Prof. Dr. P.J.J. Hooykaas

Co-promotor: Dr. A.C. Vergunst (INSERM Nimes, France)

Overige Leden: Prof. Dr. J. Memelink  
Prof. Dr. H. P. Spaink  
Prof. Dr. C.A.M.J.J. van den Hondel  
Dr. G.P.H. van Heusden

“*Agrobacterium* Infection: Translocation of Virulence Proteins and Role of VirF in Host Cells” by Esmeralda Jurado Jácome.

The research described in this thesis was performed at the Institute of Biology of Leiden University (IBL), The Netherlands.

This work was supported by the Research Council for Earth and Life Sciences (ALW) with financial aid from the Netherlands Organization for Scientific Research (NWO).

*“Now faith is the assurance of things hoped for, the assurance of things not seen”*

*A mi familia, mis padres, hermanos y en memoria de mis abuelos  
To Mohamed and Youssef*

*“La Fe es una convicción de las cosas que se esperan,  
argumento de las cosas que no se ven”  
Hebreos 11, 1*



# CONTENTS

	<b>Page</b>
<b>Chapter 1</b>	General Introduction 9
1.	<i>Agrobacterium tumefaciens</i> and plant transformation 10
1.1	General biology and morphology 10
1.2	T-DNA transfer and integration process 12
1.3.	Host factors involved in <i>Agrobacterium</i> infection 16
2.	Ubiquitin mediated proteolysis 19
2.1	Structure of UPS 20
2.2	Function of the UPS in plants 22
2.3	UPS and defense response 24
2.4	Ub and Ub-like related processes not associated to protein degradation but protein regulation 26
3.	Aim of the work 27
4.	Outline of the thesis 27
<b>Chapter 2</b>	Translocation of the <i>Agrobacterium tumefaciens</i> VirD2 and VirE3 proteins into eukaryotic host cells 39
<b>Chapter 3</b>	Isolation of <i>Arabidopsis</i> proteins that interact with the <i>Agrobacterium</i> virulence protein VirF 61
<b>Chapter 4</b>	Analysis of protein interaction domains of the <i>Agrobacterium tumefaciens</i> effector protein VirF 87
<b>Chapter 5</b>	Evaluation of the stability of VirF interactors in yeast in the presence and absence of VirF 101
<b>Chapter 6</b>	Interaction of the <i>Agrobacterium tumefaciens</i> VirF protein with members of the SCF complex 113
<b>Chapter 7</b>	Summary and General Discussion 135
<b>Dutch summary</b>	147
<b>Spanish summary</b>	151
<b>Abbreviations</b>	157
<b>Publications</b>	159
<b>Curriculum vitae</b>	161



