

## University of Groningen

### SecYEG

Lijcklama a Nijeholt, Jelger

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2012

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*  
Lijcklama a Nijeholt, J. (2012). *SecYEG: Plug-and-Play!* s.n.

#### **Copyright**

Other than for strictly personal use, 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), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

#### **Take-down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

*Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.*

# SecYEG

## Plug-and-Play!

ISBN: 978-90-367-5523-8

ISBN: 978-90-367-5524-5 (electronic version)

The work described in this thesis was carried out in the Molecular Microbiology Group of the Groningen Biomolecular Sciences and Biotechnology Institute (GBB) of the University of Groningen, The Netherlands. The work was funded by the Chemical Sciences division of The Netherlands Organization for Scientific Research (NWO-CW).

The thesis was printed by Offpage, Amsterdam ([www.offpage.nl](http://www.offpage.nl))

Financial support for printing of the thesis came from the University of Groningen and the Groningen Biomolecular Sciences and Biotechnology Institute (GBB)

Cover design: Adapted from image designed by Fernando Kuster

RIJKSUNIVERSITEIT GRONINGEN

## SecYEG: Plug-and-play!

**Proefschrift**

ter verkrijging van het doctoraat in de  
Wiskunde en Natuurwetenschappen  
aan de Rijksuniversiteit Groningen  
op gezag van de  
Rector Magnificus, dr. E. Sterken,  
in het openbaar te verdedigen op  
vrijdag 22 juni 2012  
om 16:15 uur

door

**Jelger Ayse Lijcklama à Nijeholt**

geboren op 11 januari 1982

te IJsselmuiden

Promotor:

Prof. dr. A.J.M. Driessen

Beoordelingscommissie:

Prof. dr. S.J. Marrink

Prof. dr. J.M van Dijl

Prof. dr. D.J. Slotboom

Paranimfen:

Dr. A. Kedrov

Dr. J. de Keyzer



# Contents

<b>Outline of the thesis</b>	<b>9</b>
<b>Chapter 1</b> The Bacterial Sec-Translocase – Structure and Mechanism	<b>11</b>
<b>Chapter 2</b> Immobilization of the plug domain inside the SecY channel allows unrestricted protein translocation	<b>31</b>
<b>Chapter 3</b> Conformational dynamics of the plug domain of the SecYEG protein-conducting channel	<b>53</b>
<b>Chapter 4</b> SecY supports the translocation function of SecY through a flexible interaction	<b>79</b>
<b>Chapter 5</b> Summary and perspective	<b>97</b>
<b>Chapter 6</b> Nederlandse samenvatting voor de leek	<b>107</b>
<b>References</b>	<b>119</b>
<b>Acknowledgements / Dankwoord</b>	<b>137</b>



