

VU Research Portal

Imaging membrane-protein diffusion in living bacteria

Varadarajan, A.

2017

document version

Publisher's PDF, also known as Version of record

[Link to publication in VU Research Portal](#)

citation for published version (APA)

Varadarajan, A. (2017). *Imaging membrane-protein diffusion in living bacteria*.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

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.

E-mail address:

vuresearchportal.ub@vu.nl

TABLE OF CONTENTS

CHAPTER 1	1
------------------------	----------

GENERAL INTRODUCTION

1.1 INTRODUCTION TO MOTION	2
1.2 BACTERIAL MEMBRANE.....	4
1.3 SINGLE-MOLECULE FLUORESCENCE MICROSCOPY	5
1.4 SINGLE PARTICLE TRACKING.....	7
1.5 DATA ANALYSIS	10
1.6 MEAN SQUARED DISPLACEMENT	11
1.7 CUMULATIVE PROBABILITY DISTRIBUTION.....	13
1.8 OUTLINE OF THE THESIS	15

CHAPTER 2	19
------------------------	-----------

FLUORESCENT LABELING AND SINGLE-MOLECULE IMAGING OF *E. coli* TRANS-MEMBRANE PROTEINS

2.1 INTRODUCTION.....	20
2.2 MATERIALS	21
2.3 METHODS.....	22
2.4 NOTES	30

CHAPTER 3	37
------------------------	-----------

MreB-DEPENDENT ORGANIZATION OF THE *E. coli*

CYTOPLASMIC MEMBRANE CONTROLS TRANS-MEMBRANE PROTEIN DIFFUSION

3.1 ABSTRACT.....	38
3.2 INTRODUCTION.....	39
3.3 RESULTS.....	42
3.4 DISCUSSION.....	55
3.5 MATERIALS AND METHODS	58
3.6 ACKNOWLEDGEMENTS	69
3.7 AUTHORS CONTRIBUTION	69
3.8 TABLE	70
3.9 SUPPORTING INFORMATION.....	71

CHAPTER 4 89

**MECHANICAL INSIGHTS INTO THE ROLE OF *TatA* IN THE
TWIN-ARGININE PROTEIN TRANSPORT SYSTEM OBTAINED
USING SINGLE-PARTICLE TRACKING**

4.1 ABSTRACT.....	90
4.2 INTRODUCTION.....	91
4.3 MATERIALS AND METHODS.....	95
4.4 RESULTS.....	104
4.5 DISCUSSION.....	117
4.6 ACKNOWLEDGEMENTS	121
4.7 TABLE	122
4.8 SUPPORTING INFORMATION	123

CHAPTER 5 127

**SINGLE-MOLECULE IMAGING OF MEMBRANE ORGANIZING
PROTEINS *YqiK* AND *MreB* IN THE INNER MEMBRANE OF *E.*
coli BACTERIA**

5.1 INTRODUCTION.....	128
5.2 MATERIALS AND METHODS.....	129
5.3 RESULTS.....	133
5.4 DISCUSSION.....	145
BIBLIOGRAPHY	149
SUMMARY	165
NEDERLANDSE SAMENVATTING	169
LIST OF PUBLICATIONS.....	173
ACKNOWLEDGEMENTS.....	175