University of Groningen

On the kinetics and conformational dynamics of elevator transporters

Trinco, Gianluca

DOI:
[10.33612/diss.177792564](https://doi.org/10.33612/diss.177792564)

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:
2021

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

Citation for published version (APA):
Trinco, G. (2021). *On the kinetics and conformational dynamics of elevator transporters*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen. <https://doi.org/10.33612/diss.177792564>

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.

On the kinetics and conformational dynamics of elevator transporters

Gianluca Trinco

university of
 groningen

On the kinetics and conformational dynamics of elevator transporters

PhD thesis

to obtain the degree of PhD at the
 University of Groningen
 on the authority of the
 Rector Magnificus Prof. C. Wijmenga
 and in accordance with
 the decision by the College of Deans.

This thesis will be defended in public on

Friday 27 August 2021 at 11.00 hours

by

Gianluca Trinco

born on 8 December 1988
 in Palmanova, Italy

Copyright © 2021 Gianluca Trinco

ISBN: 978-94-93270-01-5

Cover design: Gianluca Trinco

Layout: Guus Gijben | Proefschrift-aio.nl

Printed by: Proefschrift-AIO

Supervisors

Prof. D.J. Slotboom
Prof. B. Poolman

Assessment Committee

Prof. M.W. Fraaije
Prof. W. Versees, W
Prof. A.J.M. Driessen

Contents

Chapter 1 Introduction	7
Chapter 2 Kinetic mechanism of Na ⁺ -coupled aspartate transport catalyzed by Glt _{Tk}	33
Chapter 3 Transport rate analysis reveals binding order of citrate and Na ⁺ in CitS from <i>Klebsiella pneumoniae</i>	65
Chapter 4 The citrate transporter CitS exhibits a three state elevator-mechanism as revealed by High Speed-Atomic Force Microscopy	83
Chapter 5 Binding and transport of D-aspartate by the glutamate transporter homologue Glt _{Tk}	109
Chapter 6 On the role of a conserved methionine in the Na ⁺ -coupling mechanism of a neurotransmitter transporter homolog	127
Chapter 7 <i>Summary</i>	147