

VU Research Portal

Darwin s invisible hand

Bosdriesz, E.

2015

document version

Publisher's PDF, also known as Version of record

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

citation for published version (APA)

Bosdriesz, E. (2015). *Darwin s invisible hand*. [PhD-Thesis - Research and graduation internal, Vrije Universiteit Amsterdam].

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

Contents

1	General introduction	1
1.1	Evolutionary optimisation as an ordering principle	2
1.2	The role of theory and mathematical modelling in biology	5
1.3	Simplicity and the use of minimal models	7
1.4	Outline of the thesis	8
2	Cost-Benefit analysis	11
2.1	Introduction	12
2.2	Results	14
2.3	Discussion	21
	Appendices	24
3	Evolutionary pressures in the chemostat	41
3.1	Introduction	42
3.2	Results	44
3.3	Discussion	53
	Appendices	55
4	Low affinity transporters	67
4.1	Introduction	68
4.2	Results	70
4.3	Conclusion and discussion	76
	Appendices	79
5	Binding-protein mediated transport	87
5.1	Introduction	88
5.2	Results	90
5.3	Discussion	102

5.4	Materials and Methods	104
	Appendices	105
6	Optimal regulation of ribosome expression	119
6.1	Introduction	120
6.2	Results	125
6.3	Discussion	134
6.4	Materials and methods	137
	Appendices	139
7	General discussion	155
7.1	The search for general principles of cells	156
7.2	Aim and approach taken in this thesis	159
7.3	Concluding remarks	162
	References	165
	Summary	175
	Samenvatting	179
	Acknowledgements/Dankwoord	183