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Translocation across biological membranes: activity, structure and regulation of transporters

Ruiz, Stephanie

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Translocation across biological
membranes: activity, structure and
regulation of transporters

Stephanie J. Ruiz

Cover: Transmission electron micrograph of intestinal microvilli of a cat. Images such as this were used to develop theories about the composition and organization of the plasma membrane. This image, from Susumu Ito, was published in 'The Cell' (2nd Ed.) by Don W. Fawcett M.D. It is licensed under a Creative Commons Attribution, Non-Commercial, No Derivatives License and is available at <http://www.cellimagelibrary.org/images/12063>.

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Translocation across biological membranes: activity, structure and regulation of transporters

PhD thesis

to obtain the degree of PhD at the
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 and in accordance with
 the decision by the College of Deans.

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Friday 22 September 2017 at 11.00 hours

by

Stephanie Jade Ruiz

born on 26 January 1986
 in Bulli, Australia

Supervisor

Prof. B. Poolman

Assessment Committee

Prof. A.J.M. Driessen

Prof. I.J. van der Klei

Prof. C. Govaerts

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List of abbreviations

AAAP	amino acid/auxin permease
AAP	amino acid permease
AAPTII	amino acid/polyamine transporter II
ABC	ATP-binding cassette
AOX1	alcohol oxidase 1
APC	amino acid-polyamine-organocation
ARS	autonomous replication sequence
ATP	adenosine 5'-triphosphate
AVT	amino acid vacuolar transport
BLAST	basic local alignment search tool
DTT	dithiothreitol
EACA	ϵ -aminocaproic acid
EDTA	ethylenediaminetetraacetic acid
EGTA	ethylene glycol-bis(2-aminoethylether)-N,N,N,N-tetraacetic acid
ER	endoplasmic reticulum
FRAP	fluorescence recovery after photobleaching
GAAC	general amino acid control
GABA	γ -aminobutyric acid
GFP	green fluorescent protein
K_m	Michaelis constant
KPi	potassium phosphate
LCT	lysosomal cystine transporter
MC	mitochondrial carrier
MDR	multidrug resistance
MFS	major facilitator superfamily
NADH	nicotinamide adenine dinucleotide, reduced
NBD	nucleotide-binding domain
NCR	nitrogen catabolite repression
OD ₆₀₀	optical density at 600 nm
PCR	polymerase chain reaction
PCTP	sodium propionate, sodium cacodylate trihydrate, Bis-Tris propane
PEG	poly(ethylene glycol)
PM	plasma membrane
PMSF	phenylmethylsulfonyl fluoride

QAC	quaternary ammonium compound
RMSD	root-mean-square deviation of atomic positions
rpm	revolutions per minute
SBD	substrate-binding domain
SBP	substrate-binding protein
SDS-PAGE	sodium dodecyl sulfate polyacrylamide gel electrophoresis
SEC	size-exclusion chromatography
SPS	Ssy1-Ptr3p-Ssy5p complex
TEV	tobacco etch virus
TFE	2,2,2-trifluoroethanol
TMD	transmembrane domain
TMS	transmembrane segment
TORC1	target-of-rapamycin complex 1
Ub	ubiquitin
VBA	vacuolar basic amino acid
VM	vacuolar membrane
YAT	yeast amino acid transporter

Amino acids and their one- and three-letter codes

Alanine	A	Ala
Arginine	R	Arg
Asparagine	N	Asn
Aspartate	D	Asp
Cysteine	C	Cys
Glutamine	Q	Gln
Glutamate	E	Glu
Glycine	G	Gly
Histidine	H	His
Isoleucine	I	Ile
Leucine	L	Leu
Lysine	K	Lys
Methionine	M	Met
Phenylalanine	F	Phe
Proline	P	Pro
Serine	S	Ser
Threonine	T	Thr
Tryptophan	W	Trp
Tyrosine	Y	Tyr
Valine	V	Val

