

Matching the proteome to the genome

Kiel, Jan A. K. W.; van den Berg, Marco A.; Fusetti, Fabrizia; Poolman, Bert; Bovenberg, Roel A. L.; Veenhuis, Marten; van der Klei, Ida J.

Published in:
FUNCTIONAL & INTEGRATIVE GENOMICS

DOI:

[10.1007/s10142-009-0110-6](https://doi.org/10.1007/s10142-009-0110-6)

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:
2009

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

Citation for published version (APA):

Kiel, J. A. K. W., van den Berg, M. A., Fusetti, F., Poolman, B., Bovenberg, R. A. L., Veenhuis, M., & van der Klei, I. J. (2009). Matching the proteome to the genome: the microbody of penicillin-producing *Penicillium chrysogenum* cells. *FUNCTIONAL & INTEGRATIVE GENOMICS*, 9(2), 167-184.
<https://doi.org/10.1007/s10142-009-0110-6>

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.

Supplementary Table 1. Peroxisomal matrix proteins used as queries in the search for *P. chrysogenum* PTS proteins

organism	Accession #	gene	protein	type of PTS
mammals				
<i>Homo sapiens</i>	EAW64518	<i>ACAA1</i>	acetyl-Coenzyme A acyltransferase 1/3-oxoacyl-CoA thiolase	PTS2
<i>Homo sapiens</i>	EAW89351	<i>ACOX1</i>	acyl-Coenzyme A oxidase isoform a	PTS1
<i>Homo sapiens</i>	EAW65375	<i>ACOX2</i>	acyl-Coenzyme A oxidase 2, branched chain	PTS1
<i>Homo sapiens</i>	CAA72214	<i>ACOX3</i>	acyl-Coenzyme A oxidase 3, pristanoyl	PTS1
<i>Homo sapiens</i>	AAI41821	<i>AGPS</i>	alkyldihydroxyacetone phosphate synthase precursor	PTS2
<i>Homo sapiens</i>	AAI32820	<i>AGXT</i>	alanine-glyoxylate aminotransferase	PTS1
<i>Homo sapiens</i>	EAW50899	<i>ALDH3A2</i>	aldehyde dehydrogenase 3A2	unknown
<i>Homo sapiens</i>	EAX10818	<i>AMACR</i>	alpha-methylacyl-CoA racemase	unknown
<i>Homo sapiens</i>	AAI07425	<i>BAAT</i>	bile acid Coenzyme A: amino acid N-acyltransferase	PTS1
<i>Homo sapiens</i>	AAI12220	<i>CAT</i>	catalase	PTS1
<i>Homo sapiens</i>	EAW87874	<i>CRAT</i>	carnitine acetyltransferase	PTS1
<i>Homo sapiens</i>	EAL24177	<i>CROT</i>	carnitine O-octanoyltransferase	PTS1
<i>Homo sapiens</i>	AAH74770	<i>DAO</i>	D-amino-acid oxidase	PTS1
<i>Homo sapiens</i>	AAH32786	<i>DDO</i>	D-aspartate oxidase	PTS1
<i>Homo sapiens</i>	AAH03019	<i>DHRS4</i>	peroxisomal short-chain alcohol dehydrogenase	PTS1
<i>Homo sapiens</i>	AAH11792	<i>ECH1</i>	peroxisomal enoyl-coenzyme A hydratase-like protein	PTS1
<i>Homo sapiens</i>	EAW78229	<i>EHHADH</i>	enoyl-Coenzyme A, hydratase/3-hydroxyacyl Coenzyme A dehydrogenase	PTS1
<i>Homo sapiens</i>	EAW63548	<i>EPHX2</i>	epoxide hydrolase 2	PTS1
<i>Homo sapiens</i>	AAH50073	<i>FACL1</i>	acyl-CoA synthetase long-chain family member 1	PTS1
<i>Homo sapiens</i>	AAH41692	<i>FACL3</i>	acyl-CoA synthetase long-chain family member 3	unknown
<i>Homo sapiens</i>	AAH34959	<i>FACL4</i>	acyl-CoA synthetase long-chain family member 4	unknown
<i>Homo sapiens</i>	AAH07985	<i>FACL5</i>	acyl-CoA synthetase long-chain family member 5	unknown
<i>Homo sapiens</i>	NP_056071	<i>FACL6</i>	acyl-CoA synthetase long-chain family member 6	unknown
<i>Homo sapiens</i>	EAW69953	<i>GNPAT</i>	glyceronephosphate O-acyltransferase	PTS1
<i>Homo sapiens</i>	AAH50715	<i>GSTK1</i>	glutathione transferase kappa 1	PTS1
<i>Homo sapiens</i>	AAI13666	<i>HAO1</i>	hydroxyacid oxidase (glycolate oxidase) 1	PTS1
<i>Homo sapiens</i>	AAH20863	<i>HAO2</i>	Hydroxyacid oxidase 2 (long chain)	PTS1
<i>Homo sapiens</i>	AAH10570	<i>HMGCL</i>	3-hydroxymethyl-3-methylglutaryl-Coenzyme A lyase	PTS1
<i>Homo sapiens</i>	AAH01627	<i>HPCL2</i>	2-hydroxyphytanoyl-CoA lyase	PTS1
<i>Homo sapiens</i>	AAH03098	<i>HSD17B4</i>	hydroxysteroid (17-beta) dehydrogenase 4 - peroxisomal multifunctional protein 2	PTS1
<i>Homo sapiens</i>	AAH96339	<i>IDE</i>	insulysin/insulin-degrading enzyme	PTS1
<i>Homo sapiens</i>	EAW70441	<i>IDH1</i>	isocitrate dehydrogenase 1 (NADP+), soluble	PTS1
<i>Homo sapiens</i>	CAA51512	<i>INOS</i>	nitric oxide synthase 2A	unknown
<i>Homo sapiens</i>	EAW82724	<i>LONP</i>	peroxisomal LON protease-like	PTS1
<i>Homo sapiens</i>	AAH22267	<i>MLSTD1</i>	male sterility domain containing 1	unknown
<i>Homo sapiens</i>	AAH17377	<i>MLSTD2</i>	male sterility domain containing 2	unknown
<i>Homo sapiens</i>	AAH52592	<i>MLYCD</i>	malonyl-CoA decarboxylase	PTS1
<i>Homo sapiens</i>	EAW54474	<i>NPY1</i>	nudix-type motif 13	unknown
<i>Homo sapiens</i>	AAH41099	<i>NUDT12</i>	peroxisomal NADH pyrophosphatase NUDT12	PTS1

<i>Homo sapiens</i>	NP_001099040	<i>NUDT19</i>	nudix motif 19	PTS1
<i>Homo sapiens</i>	CAH70287	<i>PAOX</i>	polyamine oxidase (exo-N4-amino)	PTS1
<i>Homo sapiens</i>	AAH10740	<i>PDCR</i>	2,4-dienoyl CoA reductase 2, peroxisomal	PTS1
<i>Homo sapiens</i>	AAH02668	<i>PECI</i>	peroxisomal D3,D2-enoyl-CoA isomerase	PTS1
<i>Homo sapiens</i>	AAH02529	<i>PECR</i>	peroxisomal trans-2-enoyl-CoA reductase	PTS1
<i>Homo sapiens</i>	AAH29512	<i>PHYH</i>	phytanoyl-CoA 2-hydroxylase isoform a precursor	PTS2
<i>Homo sapiens</i>	AAH08960	<i>PIPOX</i>	L-pipecolic acid oxidase	PTS1
<i>Homo sapiens</i>	AAH21683	<i>PRDX1</i>	peroxiredoxin 1	unknown
<i>Homo sapiens</i>	AAI10984	<i>PRDX5</i>	peroxiredoxin 5 precursor, isoform a	PTS1
<i>Homo sapiens</i>	AAI17158	<i>PTE1</i>	peroxisomal acyl-CoA thioesterase 1	PTS1
<i>Homo sapiens</i>	AAH06335	<i>PTE2</i>	peroxisomal long-chain acyl-coA thioesterase	PTS1
<i>Homo sapiens</i>	AAH90945	<i>PTE2b</i>	peroxisomal acyl-CoA thioesterase 2B	PTS1
<i>Homo sapiens</i>	CAH72590	<i>SCP2</i>	sterol carrier protein 2	PTS1
<i>Homo sapiens</i>	AAI27637	<i>SERHL</i>	serine hydrolase-like 2	PTS1+2 ?
<i>Homo sapiens</i>	CAG29351	<i>SOD1</i>	superoxide dismutase 1, soluble	unknown
<i>Homo sapiens</i>	AAH12423	<i>SOD2</i>	manganese superoxide dismutase isoform A precursor	unknown
<i>Homo sapiens</i>	AAC64973	<i>VLACS</i>	very long-chain acyl-CoA synthetase	unknown
<i>Homo sapiens</i>	AAAY68219	<i>XDH</i>	xanthine dehydrogenase	unknown
<i>Mus musculus</i>	AAH27754	<i>HAO3</i>	hydroxyacid oxidase (glycolate oxidase) 3	PTS1
<i>Mus musculus</i>	AAF13873	<i>PTE2a</i>	peroxisomal acyl-CoA thioesterase 2A	PTS1
<i>Mus musculus</i>	AAH19771	<i>UOX</i>	urate oxidase	PTS1
fungi				
<i>Aspergillus nidulans</i>	AAF67173	<i>HEX1</i>	woronin body protein	PTS1
<i>Aspergillus nidulans</i>	EAA62727	<i>ICL</i>	isocitrate lyase	unknown
<i>Candida boidinii</i>	BAA97653	<i>ASO1</i>	acetylspermidine oxidase	PTS1
<i>Candida boidinii</i>	AAA34358	<i>PMP20</i>	putative peroxiredoxin (Thioredoxin reductase)	PTS1
<i>Hansenula polymorpha</i>	CAA33209	<i>AMO</i>	peroxisomal copper amine oxidase (Methylamine oxidase)	PTS2
<i>Hansenula polymorpha</i>	CAA26278	<i>AOX</i>	alcohol oxidase	PTS1 + PTS3
<i>Hansenula polymorpha</i>	CAA26276	<i>DAS</i>	dihydroxyacetone synthase	PTS1
<i>Penicillium chrysogenum</i>	AAA33692	<i>IAT</i>	acyl-coenzyme A:6-aminopenicillanic-acid-acyltransferase	PTS1
<i>Penicillium chrysogenum</i>	CAA04820	<i>PCL</i>	phenylacetyl-CoA ligase	PTS1
<i>Penicillium janthinellum</i>	CAA70219	<i>dadA</i>	fructosyl amino acid oxidase	PTS1
<i>Penicillium marneffeii</i>	AAN04057	<i>CPE1</i>	catalase/peroxidase	PTS1
<i>Penicillium simplicissimum</i>	CAA75722	<i>vaoA</i>	vanillyl-alcohol oxidase	PTS1
<i>Pichia pastoris</i>	AAC41653	<i>PEX8</i>	peroxin-8	PTS1 + PTS2
<i>Saccharomyces cerevisiae</i>	NP_013127	<i>AAT2</i>	aspartate aminotransferase	PTS1
<i>Saccharomyces cerevisiae</i>	NP_013670	<i>CAT2</i>	carnitine acetyl-CoA transferase	PTS1
<i>Saccharomyces cerevisiae</i>	NP_009931	<i>CIT2</i>	citrate synthase	PTS1
<i>Saccharomyces cerevisiae</i>	NP_010542	<i>CTA1</i>	catalase A	PTS1
<i>Saccharomyces cerevisiae</i>	NP_014823	<i>DCI1</i>	peroxisomal delta(3,5)-delta(2,4)-dienoyl-CoA isomerase	PTS1 + PTS2
<i>Saccharomyces cerevisiae</i>	NP_013386	<i>ECI1</i>	peroxisomal delta3,delta2-enoyl-CoA isomerase	PTS1
<i>Saccharomyces cerevisiae</i>	NP_010931	<i>FAA2</i>	long chain fatty acyl-CoA synthetase	PTS1

<i>Saccharomyces cerevisiae</i>	NP_009597	<i>FAT1</i>	fatty acid transporter and very long-chain fatty acyl-CoA synthetase	unknown
<i>Saccharomyces cerevisiae</i>	NP_012934	<i>FOX2</i>	multifunctional enzyme of the peroxisomal fatty acid beta-oxidation pathway	PTS1
<i>Saccharomyces cerevisiae</i>	NP_010262	<i>GPD1</i>	NAD-dependent glycerol-3-phosphate dehydrogenase	PTS2
<i>Saccharomyces cerevisiae</i>	NP_011670	<i>GTO1</i>	peroxisomal Omega-class glutathione transferase	PTS1
<i>Saccharomyces cerevisiae</i>	NP_014389	<i>IDP3</i>	peroxisomal NADP-dependent isocitrate dehydrogenase	PTS1
<i>Saccharomyces cerevisiae</i>	NP_012300	<i>LYS1</i>	saccharopine dehydrogenase (NAD+, L-lysine-forming)	PTS1
<i>Saccharomyces cerevisiae</i>	NP_010520	<i>LYS4</i>	homoaconitase, catalyzes the conversion of homocitrate to homoisocitrate	PTS1
<i>Saccharomyces cerevisiae</i>	NP_010205	<i>MDH3</i>	malate dehydrogenase	PTS1
<i>Saccharomyces cerevisiae</i>	NP_014282	<i>MLS1</i>	malate synthase	PTS1
<i>Saccharomyces cerevisiae</i>	NP_013252	<i>PCD1</i>	peroxisomal nudix pyrophosphatase with specificity for coenzyme A and CoA derivatives	PTS2
<i>Saccharomyces cerevisiae</i>	NP_009781	<i>PCS60</i>	peroxisomal AMP-binding protein, similar to long chain acyl-CoA synthetase	PTS1
<i>Saccharomyces cerevisiae</i>	NP_011591	<i>PEX8</i>	peroxin-8	PTS1
<i>Saccharomyces cerevisiae</i>	NP_011478	<i>PNC1</i>	nicotinamidase that converts nicotinamide to nicotinic acid as part of the NAD(+) salvage pathway	unknown
<i>Saccharomyces cerevisiae</i>	NP_012106	<i>POT1</i>	3-ketoacyl-CoA thiolase with broad chain length specificity	PTS2
<i>Saccharomyces cerevisiae</i>	NP_011310	<i>POX1</i>	fatty-acyl coenzyme A oxidase	unknown
<i>Saccharomyces cerevisiae</i>	NP_014197	<i>SPS19</i>	peroxisomal 2,4-dienoyl-CoA reductase	PTS1
<i>Saccharomyces cerevisiae</i>	NP_012553	<i>TES1</i>	peroxisomal acyl-CoA thioesterase	PTS1
<i>Saccharomyces cerevisiae</i>	NP_014727	<i>YOR084w</i>	putative lipase of the peroxisomal matrix	PTS1
plant				
<i>Arabidopsis thaliana</i>	ABD67503	<i>ACD31.2</i>	alpha-crystallin-Hsps	PTS1 + PTS2
<i>Arabidopsis thaliana</i>	AAM20462	<i>CSY1</i>	citrate synthase 1	PTS1 + PTS2
<i>Arabidopsis thaliana</i>	AAM28873	<i>LACS6</i>	long chain acyl-CoA synthetase 6	PTS2
<i>Arabidopsis thaliana</i>	AAM28874	<i>LACS7</i>	long chain acyl-CoA synthetase 7	PTS1 + PTS2
<i>Citrullus lanatus</i> var. <i>lanatus</i>	AAA33041	<i>MDHA</i>	glyoxysomal malate dehydrogenase precursor	PTS2
<i>Cucurbita</i> cv. <i>Kurokawa Amakuri</i>	AAC15870	<i>AOX</i>	acyl CoA oxidase homolog	PTS2
<i>Glycine max</i>	AAC50014	<i>AAT1</i>	aspartate aminotransferase glyoxysomal	PTS2
trypanosoma				
<i>Trypanosoma brucei</i>	XP_822806	<i>ald</i>	fructose-bisphosphate aldolase, glycosomal	PTS2