

7 Literatur

1. **Abe, I., K. Okumoto, S. Tamura, and Y. Fujiki.** 1998. Clofibrate-inducible, 28-kDa peroxisomal integral membrane protein is encoded by PEX11. *FEBS Lett* **431**:468-472.
2. **Agne, B., N. M. Meindl, K. Niederhoff, H. Einwachter, P. Rehling, A. Sickmann, H. E. Meyer, W. Girzalsky, and W. H. Kunau.** 2003. Pex8p: an intraperoxisomal organizer of the peroxisomal import machinery. *Mol Cell* **11**:635-46.
3. **Albertini, M., W. Girzalsky, M. Veenhuis, and W. H. Kunau.** 2001. Pex12p of *Saccharomyces cerevisiae* is a component of a multi-protein complex essential for peroxisomal matrix protein import. *Eur J Cell Biol* **80**:257-70.
4. **Albertini, M., P. Rehling, R. Erdmann, W. Girzalsky, J. A. Kiel, M. Veenhuis, and W. H. Kunau.** 1997. Pex14p, a peroxisomal membrane protein binding both receptors of the two PTS-dependent import pathways. *Cell* **89**:83-92.
5. **Ausubel, F. J., R. Brent, R. E. Kingston, D. D. Moore, J. G. Seidman, J. A. Smith, and K. Struhl.** 1992. *Current Protocols in Molecular Biology*. Greene Publishing Associates, New York.
6. **Baerends, R. J., S. W. Rasmussen, R. E. Hilbrands, M. van der Heide, K. N. Faber, P. T. Reuvekamp, J. A. Kiel, J. M. Cregg, I. J. van der Klei, and M. Veenhuis.** 1996. The *Hansenula polymorpha* PER9 gene encodes a peroxisomal membrane protein essential for peroxisome assembly and integrity. *J Biol Chem* **271**:8887-94.
7. **Baes, M., P. Gressens, E. Baumgart, P. Carmeliet, M. Casteels, M. Fransen, P. Evrard, D. Fahimi, P. E. Declercq, D. Collen, P. P. van Veldhoven, and G. P. Mannaerts.** 1997. A mouse model for Zellweger syndrome. *Nat. Genet.* **17**:49-57.
8. **Bartel, P., C. T. Chien, R. Sternglanz, and S. Fields.** 1993. Elimination of false positives that arise in using the two-hybrid system. *BioTechniques* **14**:920-924.
9. **Berteaux-Lecellier, V., M. Picard, C. Thompson-Coffe, D. Zickler, A. Panvier-Adoutte, and J. M. Simonet.** 1995. A nonmammalian homolog of the PAF1 gene (Zellweger syndrome) discovered as a gene involved in caryogamy in the fungus *Podospora anserina*. *Cell* **81**:1043-1051.
10. **Biardi, L., and S. K. Krisans.** 1996. Compartmentalization of cholesterol biosynthesis. Conversion of mevalonate to farnesyl diphosphate occurs in the peroxisomes. *J Biol Chem* **271**:1784-8.
11. **Blattner, J., B. Swinkels, H. Dorsam, T. Prospero, S. Subramani, and C. Clayton.** 1992. Glycosome assembly in trypanosomes: variations in the acceptable degeneracy of a COOH-terminal microbody targeting signal. *J Cell Biol* **119**:1129-36.
12. **Blobel, F., and R. Erdmann.** 1996. Identification of a yeast peroxisomal member of the family of AMP-binding proteins. *Eur J Biochem* **240**:468-76.
13. **Bottger, G., P. Barnett, A. T. Klein, A. Kragt, H. F. Tabak, and B. Distel.** 2000. *Saccharomyces cerevisiae* PTS1 receptor Pex5p interacts with the SH3 domain of the peroxisomal membrane protein Pex13p in an unconventional, non-PXXP-related manner. *Mol Biol Cell* **11**:3963-76.

14. **Braverman, N., G. Dodt, S. J. Gould, and D. Valle.** 1995. Disorders of peroxisome biogenesis. *Hum Mol Genet* **4**:1791-8.
15. **Braverman, N., G. Dodt, S. J. Gould, and D. Valle.** 1998. An isoform of pex5p, the human PTS1 receptor, is required for the import of PTS2 proteins into peroxisomes. *Hum Mol Genet* **7**:1195-205.
16. **Braverman, N., G. Steel, C. Obie, A. Moser, H. Moser, S. J. Gould, and D. Valle.** 1997. Human PEX7 encodes the peroxisomal PTS2 receptor and is responsible for rhizomelic chondrodysplasia punctata. *Nat Genet* **15**:369-76.
17. **Breidenbach, R. W., and H. Beevers.** 1967. Association of the glyoxylate cycle enzymes in a novel subcellular particle from castor bean endosperm. *Biochem. Biophys. Res. Commun.* **27**:462-469.
18. **Brent, R., and M. Ptashne.** 1985. A eukaryotic transcriptional activator bearing the DNA specificity of a prokaryotic repressor. *Cell* **43**:729-736.
19. **Brickner, D. G., and L. J. Olsen.** 1998. Nucleotide triphosphates are required for the transport of glycolate oxidase into peroxisomes. *Plant Physiol* **116**:309-17.
20. **Brocard, C., F. Kragler, M. M. Simon, T. Schuster, and A. Hartig.** 1994. The tetratricopeptide repeat-domain of the PAS10 protein of *Saccharomyces cerevisiae* is essential for binding the peroxisomal targeting signal-SKL. *Biochem Biophys Res Commun* **204**:1016-22.
21. **Brocard, C., G. Lametschwandtner, R. Koudelka, and A. Hartig.** 1997. Pex14p is a member of the protein linkage map of Pex5p. *Embo J* **16**:5491-500.
22. **Brown, T. W., V. I. Titorenko, and R. A. Rachubinski.** 2000. Mutants of the *Yarrowia lipolytica* PEX23 gene encoding an integral peroxisomal membrane peroxin mislocalize matrix proteins and accumulate vesicles containing peroxisomal matrix and membrane proteins. *Mol Biol Cell* **11**:141-52.
23. **Chang, C. C., W. H. Lee, H. Moser, D. Valle, and S. J. Gould.** 1997. Isolation of the human PEX12 gene, mutated in group 3 of the peroxisome biogenesis disorders. *Nat Genet* **15**:385-8.
24. **Chang, C. C., D. S. Warren, K. A. Sacksteder, and S. J. Gould.** 1999. PEX12 interacts with PEX5 and PEX10 and acts downstream of receptor docking in peroxisomal matrix protein import. *J Cell Biol* **147**:761-74.
25. **Chien, C. T., P. L. Bartel, R. Sternglanz, and S. Fields.** 1991. The two-hybrid system: A method to identify and clone genes for proteins that interact with a protein of interest. *Proc. Natl. Acad. Sci. USA* **88**:9578-9582.
26. **Collins, C. S., J. E. Kalish, J. C. Morrell, J. M. McCaffery, and S. J. Gould.** 2000. The peroxisome biogenesis factors pex4p, pex22p, pex1p, and pex6p act in the terminal steps of peroxisomal matrix protein import. *Mol Cell Biol* **20**:7516-26.
27. **Crane, D. I., J. E. Kalish, and S. J. Gould.** 1994. The *Pichia pastoris* PAS4 gene encodes a ubiquitin-conjugating enzyme required for peroxisome assembly. *J Biol Chem* **269**:21835-44.
28. **Cregg, J. M., I. J. van der Klei, G. J. Sulter, M. Veenhuis, and W. Harder.** 1990. Peroxisomedeficient mutants of *Hansenula polymorpha*. *Yeast* **6**:87-97.
29. **Crookes, W. J., and L. J. Olsen.** 1999. Peroxin puzzles and folded freight: peroxisomal protein import in review. *Naturwissenschaften* **86**:51-61.

30. **Dammai, V., and S. Subramani.** 2001. The human peroxisomal targeting signal receptor, Pex5p, is translocated into the peroxisomal matrix and recycled to the cytosol. *Cell* **105**:187-96.
31. **De Duve, C., and P. Baudhuin.** 1966. Peroxisomes (microbodies and related particles). *Physiol Rev* **46**:323-57.
32. **De Hoop, M. J., and G. AB.** 1992. Import of proteins into peroxisomes and other microbodies. *Biochem.J.* **286**:657-669.
33. **de Walque, S., J. A. Kiel, M. Veenhuis, F. R. Opperdoes, and P. A. Michels.** 1999. Cloning and analysis of the PTS-1 receptor in *Trypanosoma brucei*. *Mol Biochem Parasitol* **104**:106-19.
34. **Deckers, M.** 2002. Pex8p aus der Hefe *Saccharomyces cerevisiae* als Komponente der Importmaschinerie für peroxisomale Matrixproteine, Bochum.
35. **Diestelkötter, P., and W. W. Just.** 1993. In vitro insertion of the 22-kD peroxisomal membrane protein into isolated rat liver peroxisomes. *J Cell Biol* **123**:1717-25.
36. **Dodt, G., N. Braverman, C. Wong, A. Moser, H. W. Moser, P. Watkins, D. Valle, and S. J. Gould.** 1995. Mutations in the PTS1 receptor gene, PXR1, define complementation group 2 of the peroxisome biogenesis disorders. *Nat Genet* **9**:115-25.
37. **Dodt, G., and S. J. Gould.** 1996. Multiple PEX genes are required for proper subcellular distribution and stability of Pex5p, the PTS1 receptor: evidence that PTS1 protein import is mediated by a cycling receptor. *J Cell Biol* **135**:1763-74.
38. **Dodt, G., D. Warren, E. Becker, P. Rehling, and S. J. Gould.** 2001. Domain mapping of human PEX5 reveals functional and structural similarities to *Saccharomyces cerevisiae* Pex18p and Pex21p. *J Biol Chem* **276**:41769-81.
39. **Durfee, T., K. Becherer, R. L. Chen, S. H. Yeh, Y. Yang, K. A.E., W. H. Lee, and S. J. Elledge.** 1993. The retinoblastoma protein associates with the protein phosphatase type I catalytic subunit. *Genes Dev.* **7**:555-569.
40. **Dyer, J. M., J. A. McNew, and J. M. Goodman.** 1996. The sorting sequence of the peroxisomal integral membrane protein PMP47 is contained within a short hydrophilic loop. *J Cell Biol* **133**:269-80.
41. **Eckert, J. H., and R. Erdmann.** 2003. Peroxisome biogenesis. *Rev Physiol Biochem Pharmacol* **147**:75-121.
42. **Eckert, K. A., and T. A. Kunkel.** 1990. High fidelity DNA synthesis by the *Thermus aquaticus* DNA polymerase. *Nucleic Acids Res* **18**:3739-44.
43. **Einwächter, H., S. Sowinski, W. H. Kunau, and W. Schliebs.** 2001. *Yarrowia lipolytica* Pex20p, *Saccharomyces cerevisiae* Pex18p/Pex21p and mammalian Pex5pL fulfil a common function in the early steps of the peroxisomal PTS2 import pathway. *EMBO Rep* **2**:1035-9.
44. **Eitzen, G. A., J. D. Aitchison, R. K. Szilard, M. Veenhuis, W. M. Nuttley, and R. A. Rachubinski.** 1995. The *Yarrowia lipolytica* gene PAY2 encodes a 42-kDa peroxisomal integral membrane protein essential for matrix protein import and peroxisome enlargement but not for peroxisome membrane proliferation. *J Biol Chem* **270**:1429-36.
45. **Eitzen, G. A., R. K. Szilard, and R. A. Rachubinski.** 1997. Enlarged peroxisomes are present in oleic acid-grown *Yarrowia lipolytica* overexpressing the PEX16 gene encoding an intraperoxisomal peripheral membrane peroxin. *J Cell Biol* **137**:1265-78.

46. **Eitzen, G. A., V. I. Titorenko, J. J. Smith, M. Veenhuis, R. K. Szilard, and R. A. Rachubinski.** 1996. The *Yarrowia lipolytica* gene PAY5 encodes a peroxisomal integral membrane protein homologous to the mammalian peroxisome assembly factor PAF-1. *J Biol Chem* **271**:20300-6.
47. **Elgersma, Y., M. Elgersma-Hooisma, T. Wenzel, J. M. McCaffery, M. G. Farquhar, and S. Subramani.** 1998. A mobile PTS2 receptor for peroxisomal protein import in *Pichia pastoris*. *J Cell Biol* **140**:807-20.
48. **Elgersma, Y., L. Kwast, A. Klein, T. Voorn-Brouwer, M. van den Berg, B. Metzger, T. America, H. F. Tabak, and B. Distel.** 1996. The SH3 domain of the *Saccharomyces cerevisiae* peroxisomal membrane protein Pex13p functions as a docking site for Pex5p, a mobile receptor for the import of PTS1-containing proteins. *J Cell Biol* **135**:97-109.
49. **Elgersma, Y., L. Kwast, M. van den Berg, W. B. Snyder, B. Distel, S. Subramani, and H. F. Tabak.** 1997. Overexpression of Pex15p, a phosphorylated peroxisomal integral membrane protein required for peroxisome assembly in *S.cerevisiae*, causes proliferation of the endoplasmic reticulum membrane. *Embo J* **16**:7326-41.
50. **Elgersma, Y., M. van den Berg, H. F. Tabak, and B. Distel.** 1993. An efficient positive selection procedure for the isolation of peroxisomal import and peroxisome assembly mutants of *Saccharomyces cerevisiae*. *Genetics* **135**:731-40.
51. **Elgersma, Y., A. Vos, M. van den Berg, C. W. van Roermund, P. van der Sluijs, B. Distel, and H. F. Tabak.** 1996. Analysis of the carboxyl-terminal peroxisomal targeting signal 1 in a homologous context in *Saccharomyces cerevisiae*. *J Biol Chem* **271**:26375-82.
52. **Erdmann, R.** 1994. The peroxisomal targeting signal of 3-oxoacyl-CoA thiolase from *Saccharomyces cerevisiae*. *Yeast* **10**:935-44.
53. **Erdmann, R., and G. Blobel.** 1995. Giant peroxisomes in oleic acid-induced *Saccharomyces cerevisiae* lacking the peroxisomal membrane protein Pmp27p. *J Cell Biol* **128**:509-23.
54. **Erdmann, R., and G. Blobel.** 1996. Identification of Pex13p a peroxisomal membrane receptor for the PTS1 recognition factor. *J Cell Biol* **135**:111-21.
55. **Erdmann, R., and W. H. Kunau.** 1992. A genetic approach to the biogenesis of peroxisomes in the yeast *Saccharomyces cerevisiae*. *Cell Biochem Funct* **10**:167-74.
56. **Erdmann, R., M. Veenhuis, and W.-H. Kunau.** 1997. Peroxisomes: organelles at the crossroads. *Trends Cell Biol.* **7**:400-407.
57. **Erdmann, R., F. F. Wiebel, A. Flessau, J. Rytka, A. Beyer, K. U. Fröhlich, and W. H. Kunau.** 1991. PAS1, a yeast gene required for peroxisome biogenesis, encodes a member of a novel family of putative ATPases. *Cell* **64**:499-510.
58. **Faber, K. N., J. A. Heyman, and S. Subramani.** 1998. Two AAA family peroxins, PpPex1p and PpPex6p, interact with each other in an ATP-dependent manner and are associated with different subcellular membranous structures distinct from peroxisomes. *Mol Cell Biol* **18**:936-43.
59. **Fields, S., and O. Song.** 1989. A novel genetic system to detect protein-protein interactions. *Nature* **340**:245-6.

60. **Flaspohler, J. A., W. L. Rickoll, S. M. Beverley, and M. Parsons.** 1997. Functional identification of a Leishmania gene related to the peroxin 2 gene reveals common ancestry of glycosomes and peroxisomes. *Mol. Cell. Biol.* **17**:1093-1101.
61. **Fransen, M., C. Brees, E. Baumgart, J. C. T. Vanhooren, M. Baes, G. P. Mannaerts, and P. P. van Veldhoven.** 1995. Identification and characterization of the putative human peroxisomal C-terminal targeting signal import receptor. *J. Biol. Chem.* **270**:7731-7736.
62. **Fransen, M., S. R. Terlecky, and S. Subramani.** 1998. Identification of a human PTS1 receptor docking protein directly required for peroxisomal protein import. *Proc Natl Acad Sci U S A* **95**:8087-92.
63. **Fransen, M., P. P. Van Veldhoven, and S. Subramani.** 1999. Identification of peroxisomal proteins by using M13 phage protein VI phage display: molecular evidence that mammalian peroxisomes contain a 2,4-dienoyl-CoA reductase. *Biochem J* **340**:561-8.
64. **Fransen, M., T. Wylin, C. Brees, G. P. Mannaerts, and P. P. Van Veldhoven.** 2001. Human pex19p binds peroxisomal integral membrane proteins at regions distinct from their sorting sequences. *Mol Cell Biol* **21**:4413-24.
65. **Fromant, M., S. Blanquet, and P. Plateau.** 1995. Direct random mutagenesis of gene-sized DNA fragments using polymerase chain reaction. *Anal Biochem* **224**:347-53.
66. **Fujiki, Y., and K. Okumoto.** 2000. Peroxisome biogenesis and human disorders. *Tanpakushitsu Kakusan Koso* **45**:691-9.
67. **Fujiki, Y., K. Okumoto, H. Otera, and S. Tamura.** 2000. Peroxisome biogenesis and molecular defects in peroxisome assembly disorders. *Cell Biochem Biophys* **32**:155-64.
68. **Gatto, G. J., B. V. Geisbrecht, S. J. Gould, and J. M. Berg.** 2002. Corrigenda: Peroxisomal targeting signal-1 recognition by the TPR domains of human PEX5. *Nat Struct Biol* **9**:788.
69. **Gatto, G. J., B. V. Geisbrecht, S. J. Gould, and J. M. Berg.** 2000. Peroxisomal targeting signal-1 recognition by the TPR domains of human PEX5. *Nat Struct Biol* **7**:1091-5.
70. **Geraghty, M. T., D. Bassett, J. C. Morrell, G. J. Gatto, Jr., J. Bai, B. V. Geisbrecht, P. Hieter, and S. J. Gould.** 1999. Detecting patterns of protein distribution and gene expression in silico. *Proc Natl Acad Sci U S A* **96**:2937-42.
71. **Ghaedi, K., S. Tamura, K. Okumoto, Y. Matsuzono, and Y. Fujiki.** 2000. The peroxin pex3p initiates membrane assembly in peroxisome biogenesis. *Mol Biol Cell* **11**:2085-102.
72. **Gietl, C.** 1990. Glyoxysomal malate dehydrogenase from watermelon is synthesized with an amino-terminal transit peptide. *Proc Natl Acad Sci U S A* **87**:5773-7.
73. **Gietl, C., K. N. Faber, I. J. van der Klei, and M. Veenhuis.** 1994. Mutational analysis of the Nterminal topogenic signal of watermelon glyoxysomal malate dehydrogenase using the heterologous host *Hansenula polymorpha*. *Proc. Natl. Acad. Sci. U S A* **91**:3151-3155.
74. **Girzalsky, W., P. Rehling, K. Stein, J. Kipper, L. Blank, W. H. Kunau, and R. Erdmann.** 1999. Involvement of Pex13p in Pex14p localization and peroxisomal targeting signal 2-dependent protein import into peroxisomes. *J Cell Biol* **144**:1151-62.

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75. **Glover, J. R., D. W. Andrews, and R. A. Rachubinski.** 1994. Saccharomyces cerevisiae peroxisomal thiolase is imported as a dimer. Proc Natl Acad Sci U S A **91**:10541-5.
 76. **Goldfischer, S., C. L. Moore, A. B. Johnson, A. J. Spiro, M. P. Valsamis, H. K. Wisniewski, R. H. Ritch, W. T. Norton, I. Rapin, and L. M. Gärtner.** 1973. Peroxisomal and mitochondrial defects in the cerebro-hepato-renal syndrome. Science **182**:62-4.
 77. **Götte, K., W. Girzalsky, M. Linkert, E. Baumgart, S. Kammerer, W. H. Kunau, and R. Erdmann.** 1998. Pex19p, a farnesylated protein essential for peroxisome biogenesis. Mol Cell Biol **18**:616-28.
 78. **Gould, S. J., and C. Collins.** 2002. Peroxisomal-protein import: ist it really that complex. Nature-reviews **3**:382-389.
 79. **Gould, S. J., J. E. Kalish, J. C. Morrell, J. Bjorkman, A. J. Urquhart, and D. I. Crane.** 1996. Pex13p is an SH3 protein of the peroxisome membrane and a docking factor for the predominantly cytoplasmic PTS1 receptor. J Cell Biol **135**:85-95.
 80. **Gould, S. J., G. A. Keller, N. Hosken, J. Wilkinson, and S. Subramani.** 1989. A conserved tripeptide sorts proteins to peroxisomes. J Cell Biol **108**:1657-64.
 81. **Gould, S. J., G. A. Keller, M. Schneider, S. H. Howell, L. J. Garrard, J. M. Goodman, B. Distel, H. Tabak, and S. Subramani.** 1990. Peroxisomal protein import is conserved between yeast, plants, insects and mammals. Embo J **9**:85-90.
 82. **Gould, S. J., D. McCollum, A. P. Spong, J. A. Heyman, and S. Subramani.** 1992. Development of the yeast Pichia pastoris as a model organism for a genetic and molecular analysis of peroxisome assembly. Yeast **8**:613-28.
 83. **Gould, S. J., and D. Valle.** 2000. Peroxisome biogenesis disorders: genetics and cell biology. Trends Genet **16**:340-5.
 84. **Hajra, A. K., and J. E. Bishop.** 1982. Glycerolipid biosynthesis in peroxisomes via the acyldihydroxyacetone pathway. Ann.N.Y.Acad.Sci. **386**:170-182.
 85. **Hayashi, M., K. Nito, K. Toriyama-Kato, M. Kondo, T. Yamaya, and M. Nishimura.** 2000. AtPex14p maintains peroxisomal functions by determining protein targeting to three kinds of plant peroxisomes. Embo J **19**:5701-10.
 86. **Hazra, P. P., I. Suriapranata, W. B. Snyder, and S. Subramani.** 2002. Peroxisome Remnants in pex3Delta Cells and the Requirement of Pex3p for Interactions Between the Peroxisomal Docking and Translocation Subcomplexes. Traffic **3**:560-74.
 87. **Heinemann, P., and W. W. Just.** 1992. Peroxisomal protein import. In vivo evidence for a novel translocation competent compartment. FEBS Lett **300**:179-82.
 88. **Hettema, E. H., W. Girzalsky, M. van Den Berg, R. Erdmann, and B. Distel.** 2000. Saccharomyces cerevisiae Pex3p and Pex19p are required for proper localization and stability of peroxisomal membrane proteins. Embo J **19**:223-33.
 89. **Hettema, E. H., C. C. Ruigrok, M. G. Koerkamp, M. van den Berg, H. F. Tabak, B. Distel, and I. Braakman.** 1998. The cytosolic DnaJ-like protein djp1p is involved specifically in peroxisomal protein import. J Cell Biol **142**:421-34.

90. **Heyman, J. A., E. Monosov, and S. Subramani.** 1994. Role of the PAS1 gene of *Pichia pastoris* in peroxisome biogenesis. *J Cell Biol* **127**:1259-73.
91. **Hodzic, L.** 2002. Interaction Studies of ScPex8p with ScPex5p and ScPex7p Heterologous Co-expression of ScPex7p with ScPex18p. Free University Berlin, Berlin.
92. **Höhfeld, J., M. Veenhuis, and W. H. Kunau.** 1991. PAS3, a *Saccharomyces cerevisiae* gene encoding a peroxisomal integral membrane protein essential for peroxisome biogenesis. *J Cell Biol* **114**:1167-78.
93. **Holroyd, C., and R. Erdmann.** 2001. Protein translocation Machineries of Peroxisomes. *FEBS Letters*. **25030**:1-5.
94. **Honsho, M., and Y. Fujiki.** 2001. Topogenesis of peroxisomal membrane protein requires a short, positively charged intervening-loop sequence and flanking hydrophobic segments. study using human membrane protein PMP34. *J Biol Chem* **276**:9375-82.
95. **Honsho, M., S. Tamura, N. Shimozawa, Y. Suzuki, N. Kondo, and Y. Fujiki.** 1998. Mutation in PEX16 is causal in the peroxisome-deficient Zellweger syndrome of complementation group D. *Am J Hum Genet* **63**:1622-30.
96. **Huang, K., and P. B. Lazarow.** 1996. Targeting of green fluorescent protein to peroxisomes and peroxisome membranes in *S.cerevisiae*. *Mol Biol Cell* **7**:494a.
97. **Huang, Y., R. Ito, S. Miura, T. Hashimoto, and M. Ito.** 2000. A missense mutation in the RING finger motif of PEX2 protein disturbs the import of peroxisome targeting signal 1 (PTS1)-containing protein but not the PTS2-containing protein. *Biochem Biophys Res Commun* **270**:717-21.
98. **Huhse, B., P. Rehling, M. Albertini, L. Blank, K. Meller, and W. H. Kunau.** 1998. Pex17p of *Saccharomyces cerevisiae* is a novel peroxin and component of the peroxisomal protein translocation machinery. *J Cell Biol* **140**:49-60.
99. **Imanaka, T., Y. Shiina, T. Takano, T. Hashimoto, and T. Osumi.** 1996. Insertion of the 70-kDa peroxisomal membrane protein into peroxisomal membranes *in vivo* and *in vitro*. *J. Biol. Chem.* **271**:3706-3713.
100. **James, G. L., J. L. Goldstein, R. K. Pathak, R. G. W. Anderson, and M. S. Brown.** 1994. PxF, a prenylated protein of peroxisomes. *J. Biol. Chem.* **269**:14182-14190.
101. **Jansen, G. A., R. Ofman, S. Ferdinandusse, L. Ijlst, A. O. Muijsers, O. H. Skjeldal, O. Stokke, C. Jakobs, G. T. Besley, J. E. Wraith, and R. J. Wanders.** 1997. Refsum disease is caused by mutations in the phytanoyl-CoA hydroxylase gene. *Nat Genet* **17**:190-3.
102. **Jardim, A., W. Liu, E. Zheleznova, and B. Ullman.** 2000. Peroxisomal targeting signal-1 receptor protein PEX5 from *Leishmania donovani*. Molecular, biochemical, and immunocytochemical characterization. *J Biol Chem* **275**:13637-44.
103. **Johnson, M. A., W. B. Snyder, J. L. Cereghino, M. Veenhuis, S. Subramani, and J. M. Cregg.** 2001. *Pichia pastoris* Pex14p, a phosphorylated peroxisomal membrane protein, is part of a PTS-receptor docking complex and interacts with many peroxins. *Yeast* **18**:621-41.
104. **Johnsson, N., and A. Varshavsky.** 1994. Split ubiquitin as a sensor of protein interactions *in vivo*. *PNAS* **91**:10340-10344.

105. **Kalish, J. E., G. A. Keller, J. C. Morrell, S. J. Mihalik, B. Smith, J. M. Cregg, and S. J. Gould.** 1996. Characterization of a novel component of the peroxisomal protein import apparatus using fluorescent peroxisomal proteins. *Embo J* **15**:3275-85.
106. **Kalish, J. E., C. Theda, J. C. Morrell, J. M. Berg, and S. J. Gould.** 1995. Formation of the peroxisome lumen is abolished by loss of *Pichia pastoris* Pas7p, a zinc-binding integral membrane protein of the peroxisome. *Mol Cell Biol* **15**:6406-19.
107. **Kammerer, S., A. Holzinger, U. Welsch, and A. A. Roscher.** 1998. Cloning and characterization of the gene encoding the human peroxisomal assembly protein Pex3p. *FEBS Lett* **429**:53-60.
108. **Kiel, J. A., R. E. Hilbrands, I. J. van der Klei, S. W. Rasmussen, F. A. Salomons, M. van der Heide, K. N. Faber, J. M. Cregg, and M. Veenhuis.** 1999. *Hansenula polymorpha* Pex1p and Pex6p are peroxisome-associated AAA proteins that functionally and physically interact. *Yeast* **15**:1059-78.
109. **Kinoshita, N., K. Ghaedi, N. Shimosawa, R. J. Wanders, Y. Matsuzono, T. Imanaka, K. Okumoto, Y. Suzuki, N. Kondo, and Y. Fujiki.** 1998. Newly identified Chinese hamster ovary cell mutants are defective in biogenesis of peroxisomal membrane vesicles (Peroxisomal ghosts), representing a novel complementation group in mammals. *J Biol Chem* **273**:24122-30.
110. **Klein, A. T., P. Barnett, G. Bottger, D. Konings, H. F. Tabak, and B. Distel.** 2001. Recognition of the peroxisomal targeting signal type 1 by the protein import receptor Pex5p. *J Biol Chem* **276**:15034-41.
111. **Klein, A. T., M. van Den Berg, G. Bottger, H. F. Tabak, and B. Distel.** 2002. *Saccharomyces cerevisiae* acyl-CoA oxidase follows a novel, non-PTS1, import pathway into peroxisomes that is dependent on Pex5p. *J Biol Chem* **277**:2511-9.
112. **Klein, A. T., M. van Den Berg, G. Bottger, H. F. Tabak, B. Distel, S. Mueller, A. Weber, R. Fritz, S. Mutze, D. Rost, H. Walczak, A. Volkl, and W. Stremmel.** 2002. *Saccharomyces cerevisiae* acyl-CoA oxidase follows a novel, non-PTS1, import pathway into peroxisomes that is dependent on Pex5p Sensitive and real-time determination of H₂O₂ release from intact peroxisomes. *J Biol Chem* **277**:2511-9.
113. **Koller, A., W. B. Snyder, K. N. Faber, T. J. Wenzel, L. Rangell, G. A. Keller, and S. Subramani.** 1999. Pex22p of *Pichia pastoris*, essential for peroxisomal matrix protein import, anchors the ubiquitin-conjugating enzyme, Pex4p, on the peroxisomal membrane. *J Cell Biol* **146**:99-112.
114. **Komori, M., S. W. Rasmussen, J. A. Kiel, R. J. Baerends, J. M. Cregg, I. J. van der Klei, and M. Veenhuis.** 1997. The *Hansenula polymorpha* PEX14 gene encodes a novel peroxisomal membrane protein essential for peroxisome biogenesis. *Embo J* **16**:44-53.
115. **Komori, M., S. W. Rasmussen, J. A. K. W. Kiel, R. J. S. Baerends, J. M. Cregg, I. J. van der Klei, and M. Veenhuis.** 1997. The *Hansenula polymorpha* PEX14 gene encodes a novel peroxisomal membrane protein essential for peroxisome biogenesis. *EMBO J.* **16**:44-53.
116. **Kragler, F., G. Lametschwandtner, J. Christmann, A. Hartig, and J. J. Harada.** 1998. Identification and analysis of the plant peroxisomal targeting signal 1 receptor NtPEX5. *Proc Natl Acad Sci U S A* **95**:13336-41.

117. **Kragler, F., A. Langeder, J. Raupachova, M. Binder, and A. Hartig.** 1993. Two independent peroxisomal targeting signals in catalase A of *Saccharomyces cerevisiae*. *J Cell Biol* **120**:665-73.
118. **Krisans, S. K.** 1996. Cell compartmentalization of cholesterol biosynthesis. *Ann N Y Acad Sci* **804**:142-64.
119. **Kunau, W. H.** 2001. Peroxisomes: the extended shuttle to the peroxisome matrix. *Curr Biol* **11**:R659-62.
120. **Lametschwandtner, G., C. Brocard, M. Fransen, P. Van Veldhoven, J. Berger, and A. Hartig.** 1998. The difference in recognition of terminal tripeptides as peroxisomal targeting signal 1 between yeast and human is due to different affinities of their receptor Pex5p to the cognate signal and to residues adjacent to it. *J Biol Chem* **273**:33635-43.
121. **Lazarow, P. B., and Y. Fujiki.** 1985. Biogenesis of peroxisomes. *Annu Rev Cell Biol* **1**:489-530.
122. **Lazarow, P. B., and H. W. Moser.** 1995. Disorders in peroxisome biogenesis, p. 2287-2324. *In* C. R. Scriver, Beaudet, C.R., Sly, W.S., Valle, D. McGraw Hill Inc., (ed.), *The metabolic and molecular bases of inherited disease*, 7 ed, vol. 2, New York,.
123. **Lee, M. S., R. T. Mullen, and R. N. Trelease.** 1997. Oilseed isocitrate lyases lacking their essential type 1 peroxisomal targeting signal are piggybacked to glyoxysomes. *Plant Cell* **9**:185-97.
124. **Li, B., and S. Fields.** 1993. Identification in mutations in p53 that affects its binding to SV40 large T antigen by using the yeast two-hybrid system. *FASEB J.* **7**:957-963.
125. **Li, X., and S. J. Gould.** 2002. PEX11 promotes peroxisome division independently of peroxisome metabolism. *J Cell Biol* **156**:643-651.
126. **Lin, Y., L. Sun, L. V. Nguyen, R. A. Rachubinski, and H. M. Goodman.** 1999. The Pex16p homolog SSE1 and storage organelle formation in *Arabidopsis* seeds. *Science* **284**:328-30.
127. **Liu, H., X. Tan, K. A. Russell, M. Veenhuis, and J. M. Cregg.** 1995. PER3, a gene required for peroxisome biogenesis in *Pichia pastoris*, encodes a peroxisomal membrane protein involved in protein import. *J Biol Chem* **270**:10940-51.
128. **Liu, H., X. Tan, M. Veenhuis, D. McCollum, and J. M. Cregg.** 1992. An efficient screen for peroxisome-deficient mutants of *Pichia pastoris*. *J Bacteriol* **174**:4943-51.
129. **Lorenz, P., A. G. Maier, E. Baumgart, R. Erdmann, and C. Clayton.** 1998. Elongation and clustering of glycosomes in *Trypanosoma brucei* overexpressing the glycosomal Pex11p. *Embo J* **17**:3542-55.
130. **Lottspeich, F., and H. Zorbas.** 1998. *Bioanalytik*.
131. **Luers, G. H., T. Hashimoto, H. D. Fahimi, and A. Volkl.** 1993. Biogenesis of Peroxisomes: Isolation and Characterization of Two Distinct Peroxisomal Populations from Normal and Regenerating Rat Liver. *J Cell Biol* **121**:1271-1280.
132. **Marshall, P. A., Y. I. Krimkevich, R. H. Lark, J. M. Deyer, M. Veenhuis, and J. M. Goodman.** 1995. *PMP27* promotes peroxisomal proliferation. *J. Cell Biol.* **129**:345-355.
133. **Marzioch, M., R. Erdmann, M. Veenhuis, and W. H. Kunau.** 1994. PAS7 encodes a novel yeast member of the WD-40 protein family essential for import of 3-oxoacyl-CoA thiolase, a PTS2-containing protein, into peroxisomes. *EMBO J* **13**:4908-18.

134. **Marzioch, M., R. Erdmann, M. Veenhuis, and W.-H. Kunau.** 1994. *PAS7* encodes a novel yeast member of the WD-40 protein family essential for import of 3-oxoacyl-CoA thiolase, a PTS2-containing protein, into peroxisomes. *EMBO J.* **13**:4908-4918.
135. **Matsumoto, N., S. Tamura, S. Furuki, N. Miyata, A. Moser, N. Shimosawa, H. W. Moser, Y. Suzuki, N. Kondo, and Y. Fujiki.** 2003. Mutations in novel peroxin gene *PEX26* that cause peroxisome-biogenesis disorders of complementation group 8 provide a genotype-phenotype correlation. *Am J Hum Genet.* **73**:233-46.
136. **Matsuzono, Y., N. Kinoshita, S. Tamura, N. Shimosawa, M. Hamasaki, K. Ghaedi, R. J. Wanders, Y. Suzuki, N. Kondo, and Y. Fujiki.** 1999. Human *PEX19*: cDNA cloning by functional complementation, mutation analysis in a patient with Zellweger syndrome, and potential role in peroxisomal membrane assembly. *Proc Natl Acad Sci U S A* **96**:2116-21.
137. **McCannon, M. T., C. A. Dowds, K. Orth, C. R. Moomaw, C. A. Slaughter, and J. M. Goodman.** 1990. Sorting of peroxisomal membrane protein PMP47 from *Candida boidinii* into peroxisomal membranes of *Saccharomyces cerevisiae*. *J Biol Chem* **265**:20098-105.
138. **McCollum, D., E. Monosov, and S. Subramani.** 1993. The *pas8* mutant of *Pichia pastoris* exhibits the peroxisomal protein import deficiencies of Zellweger syndrome cells - The *Pas8* protein binds to the COOH-terminal tripeptide peroxisomal targeting signal, and is a member of the TPR protein family. *J. Cell. Biol.* **121**:761-774.
139. **McCollum, D., E. Monosov, and S. Subramani.** 1993. The *pas8* mutant of *Pichia pastoris* exhibits the peroxisomal protein import deficiencies of Zellweger syndrome cells--the *PAS8* protein binds to the COOH-terminal tripeptide peroxisomal targeting signal, and is a member of the TPR protein family [published erratum appears in *J Cell Biol* 1993 Sep;122(5):following 1143]. *J Cell Biol* **121**:761-74.
140. **McNew, J. A., and J. M. Goodman.** 1994. An oligomeric protein is imported into peroxisomes in vivo. *J Cell Biol.* **127**:1245-57.
141. **McNew, J. A., and J. M. Goodman.** 1996. The targeting and assembly of peroxisomal proteins: some old rules do not apply. *Trends Biochem. Sci.* **21**:54-58.
142. **Mihalik, S. J., J. C. Morrell, D. Kim, K. A. Sacksteder, P. A. Watkins, and S. J. Gould.** 1997. Identification of *PAHX*, a Refsum disease gene. *Nat Genet* **17**:185-9.
143. **Moser, A. B., M. Rasmussen, S. Naidu, P. A. Watkins, M. McGuinness, A. K. Hajra, G. Chen, G. Raymond, A. Liu, D. Gordon, and et al.** 1995. Phenotype of patients with peroxisomal disorders subdivided into sixteen complementation groups. *J Pediatr* **127**:13-22.
144. **Motley, A., M. J. Lumb, P. B. Oatey, P. R. Jennings, P. A. De Zoysa, R. J. Wanders, H. F. Tabak, and C. J. Danpure.** 1995. Mammalian alanine/glyoxylate aminotransferase 1 is imported into peroxisomes via the PTS1 translocation pathway. Increased degeneracy and context specificity of the mammalian PTS1 motif and implications for the peroxisome-to-mitochondrion mistargeting of AGT in primary hyperoxaluria type 1. *J Cell Biol* **131**:95-109.

145. **Motley, A. M., E. H. Hettema, E. M. Hogenhout, P. Brites, A. L. M. A. ten Asbroek, F. A. Wijburg, F. Baas, H. S. Heijmans, H. F. Tabak, R. J. A. Wanders, and B. Distel.** 1997. Rhizomelic chondrodysplasia punctata is a peroxisomal protein targeting disease caused by a non-functional PTS2 receptor. *Nat. Genet.* **15**:377-380.
146. **Müller, W. H., T. P. van der Krift, A. J. J. Krouwer, H. A. B. Wosten, and L. H. M. van der Voort.** 1991. Localisation of the pathway of the penicillin biosynthesis in *Penicillium chrysogenum*. *EMBO J.* **10**:489-496.
147. **Neer, E. J., C. J. Schmidt, R. Nambudripad, and T. F. Smith.** 1994. The ancient regulatory protein family of WD-repeat proteins. *Nature* **371**:297-300.
148. **Niederhoff, N.** 2002. Untersuchungen zur Funktion von Pex14p im peroxisomalen Matrixproteinimport der Hefe *Saccharomyces cerevisiae*. Dissertation, Bochum.
149. **NPS@**, posting date. [Online.]
150. **Nuttley, W. M., A. M. Brade, G. A. Eitzen, M. Veenhuis, J. D. Aitchinson, R. K. Szilard, J. R. Glover, and R. A. Rachubinski.** 1994. PAY4, a gene required for peroxisome assembly in the yeast *Yarrowia lipolytica*, encodes a novel member of a family of putative ATPases. *J Biol Chem.* **269**:556-566.
151. **Nuttley, W. M., R. K. Szilard, J. J. Smith, M. Veenhuis, and R. A. Rachubinski.** 1995. The *PAH2* gene is required for peroxisome assembly in the methylotrophic yeast *Hansenula polymorpha* and encodes a member of the tetratricopeptide repeat family of proteins. *Gene* **160**:33-39.
152. **Okumoto, K., I. Abe, and Y. Fujiki.** 2000. Molecular anatomy of the peroxin Pex12p: ring finger domain is essential for Pex12p function and interacts with the peroxisome-targeting signal type 1-receptor Pex5p and a ring peroxin, Pex10p. *J Biol Chem* **2000**:25700-10.
153. **Okumoto, K., R. Itoh, N. Shimozawa, Y. Suzuki, S. Tamura, N. Kondo, and Y. Fujiki.** 1998. Mutations in PEX10 is the cause of Zellweger peroxisome deficiency syndrome of complementation group B. *Hum Mol Genet* **7**:1399-405.
154. **Okumoto, K., N. Shimozawa, A. Kawai, S. Tamura, T. Tsukamoto, T. Osumi, H. Moser, R. J. Wanders, Y. Suzuki, N. Kondo, and Y. Fujiki.** 1998. PEX12, the pathogenic gene of group III Zellweger syndrome: cDNA cloning by functional complementation on a CHO cell mutant, patient analysis, and characterization of PEX12p. *Mol Cell Biol* **18**:4324-36.
155. **Opperdoes, F. R.** 1988. Glycosomes may provide clues to the import of peroxisomal proteins. *Trends Biochem Sci* **13**:255-60.
156. **Osumi, T., T. Tsukamoto, S. Hata, S. Yokota, S. Miura, Y. Fujiki, M. Hijikata, S. Miyazawa, and T. Hashimoto.** 1991. Amino-terminal presequence of the precursor of peroxisomal 3-ketoacyl-CoA thiolase is a cleavable signal peptide for peroxisomal targeting. *Biochem. Biophys. Res. Commun.* **181**:947-954.
157. **Otera, H., T. Harano, M. Honsho, K. Ghaedi, S. Mukai, A. Tanaka, A. Kawai, N. Shimizu, and Y. Fujiki.** 2000. The mammalian peroxin Pex5pL, the longer isoform of the mobile peroxisome targeting signal (PTS) type 1 transporter, translocates the Pex7p. PTS2 protein complex into peroxisomes via its initial docking site, Pex14p. *J Biol Chem.* **275**:21703-14.

158. **Otera, H., K. Okumoto, K. Tateishi, Y. Ikoma, E. Matsuda, M. Nishimura, T. Tsukamoto, T. Osumi, K. Ohashi, O. Higuchi, and Y. Fujiki.** 1998. Peroxisome targeting signal type 1 (PTS1) receptor is involved in import of both PTS1 and PTS2: studies with *PEX5*-defective CHO cell mutants. *Mol. Cell. Biol.* **18**:388-399.
159. **Passreiter, M., M. Anton, D. Lay, R. Frank, C. Harter, F. T. Wieland, K. Gorgas, and W. W. Just.** 1998. Peroxisome biogenesis: involvement of ARF and coatamer. *J. Cell Biol* **141**:373-383.
160. **Patel, S., and M. Latterich.** 1998. The AAA team: related ATPases with diverse functions. *Trend Cell Biol* **8**:65-71.
161. **Pause, B., P. Diestelkotter, H. Heid, and W. W. Just.** 1997. Cytosolic factors mediate protein insertion into the peroxisomal membrane. *FEBS Lett* **414**:95-8.
162. **Pires, J. R., X. Hong, C. Brockmann, R. Volkmer-Engert, J. Schneider-Mergener, H. Oschkinat, and R. Erdmann.** 2003. The ScPex13p SH3 domain exposes two distinct binding sites for Pex5p and Pex14p. *J Mol Biol* **326**:1427-35.
163. **Portsteffen, H., A. Beyer, E. Becker, C. Epplen, A. Pawlak, W. H. Kunau, and G. Dodt.** 1997. Human PEX1 is mutated in complementation group 1 of the peroxisome biogenesis disorders. *Nat Genet* **17**:449-52.
164. **PSORTII**, posting date. [Online.]
165. **Purdue, P. E., S. M. Castro, V. Protopopov, and P. B. Lazarow.** 1996. Targeting of human catalase to peroxisomes is dependent upon a novel C-terminal peroxisomal targeting sequence. *Ann N Y Acad Sci* **804**:775-6.
166. **Purdue, P. E., and P. B. Lazarow.** 2001. Peroxisome Biogenesis. *Annu. Rev. Cell Dev. Biol.* **17**:701-752.
167. **Purdue, P. E., X. Yang, and P. B. Lazarow.** 1998. Pex18p and Pex21p, a novel pair of related peroxins essential for peroxisomal targeting by the PTS2 pathway. *J Cell Biol.* **143**:1859-69.
168. **Purdue, P. E., J. W. Zhang, M. Skoneczny, and P. B. Lazarow.** 1997. Rhizomelic chondrodysplasia punctata is caused by deficiency of human PEX7, a homologue of the yeast PTS2 receptor. *Nat Genet* **15**:381-4.
169. **Rehling, P.** 1996. Untersuchungen zur Rolle der Pas-Proteine Pas6p, Pas7p und Pas23p für den Proteinimport in Peroxisomen der Hefe *Saccharomyces cerevisiae*. Dissertation, Bochum.
170. **Rehling, P., M. Marzioch, F. Niesen, E. Wittke, M. Veenhuis, and W. H. Kunau.** 1996. The import receptor for the peroxisomal targeting signal 2 (PTS2) in *Saccharomyces cerevisiae* is encoded by the PAS7 gene. *EMBOJ* **15**:2901-13.
171. **Rehling, P., A. Skaletz-Rorowski, W. Girzalsky, T. Voorn-Brouwer, M. M. Franse, B. Distel, M. Veenhuis, W. H. Kunau, and R. Erdmann.** 2000. Pex8p, an intraperoxisomal peroxin of *Saccharomyces cerevisiae* required for protein transport into peroxisomes binds the PTS1 receptor pex5p. *J Biol Chem* **275**:3593-602.
172. **Rottensteiner, H., K. Stein, E. Sonnenhol, and R. Erdmann.** 2003. Conserved function of pex11p and the novel pex25p and pex27p in peroxisome biogenesis. *Mol Biol Cell* **14**:4316-28.
173. **Sacksteder, K. A., J. M. Jones, S. T. South, X. Li, Y. Liu, and S. J. Gould.** 2000. PEX19 binds multiple peroxisomal membrane proteins, is predominantly cytoplasmic, and is required for peroxisome membrane synthesis. *J Cell Biol* **148**:931-44.

174. **Salomons, F. A., J. A. Kiel, K. N. Faber, M. Veenhuis, and I. J. van der Klei.** 2000. Overproduction of Pex5p stimulates import of alcohol oxidase and dihydroxyacetone synthase in a *Hansenula polymorpha* Pex14 null mutant. *J Biol Chem* **275**:12603-11.
175. **Santos, M. J., T. Imanaka, H. Shio, G. M. Small, and P. B. Lazarow.** 1988. Peroxisomal membrane ghosts in Zellweger syndrome-aberrant organelle assembly. *Science* **239**:1536-1538.
176. **Schepers, L., M. Casteels, J. Vamecq, G. Parmentier, P. P. Van eldhoven, and G. P. Mannaerts.** 1988. beta-oxidation of carboxyl side chain of prostaglandin E2 in rat liver peroxisomes and mitochondria. *J Biol Chem.* **274**:5666-5673.
177. **Schrader, M., B. E. Reuber, J. C. Morrell, G. Jimenez-Sanchez, C. Obie, T. A. Stroh, D. Valle, T. A. Schroer, and S. J. Gould.** 1998. Expression of *PEX11B* mediates peroxisome proliferation in the absence of extracellular stimuli. *J. Biol. Chem.* **273**:29607-29614.
178. **Schumann, U., C. Gietl, and M. Schmid.** 1999. Sequence analysis of a cDNA encoding Pex10p, a zinc-binding peroxisomal integral membrane protein from *Arabidopsis thaliana*. *Plant Physiol.* **119**:1147-1147.
179. **SenGupta, D. J., B. Zhang, B. Kraemer, P. Pochart, S. Fields, and M. Wickens.** 1996. A three-hybrid system to detect RNA-protein interactions in vivo. *PNAS* **93**:8496-8501.
180. **Shimizu, N., R. Itoh, Y. Hirono, H. Otera, K. Ghaedi, K. Tateishi, S. Tamura, K. Okumoto, T. Harano, S. Mukai, and Y. Fujiki.** 1999. The peroxin Pex14p. cDNA cloning by functional complementation on a Chinese hamster ovary cell mutant, characterization, and functional analysis. *J Biol Chem* **274**:12593-604.
181. **Shimozawa, N., T. Tsukamoto, Y. Suzuki, T. Orii, Y. Shirayoshi, T. Mori, and Y. Fujiki.** 1992. A human gene responsible for Zellweger syndrome that affects peroxisome assembly. *Science* **255**:1132-1134.
182. **Small, G. M., Y. Luo, T. Wang, and I. V. Karpichev.** 1996. Molecular regulation of peroxisomal acyl-CoA oxidase in yeast. *Ann N Y Acad Sci* **804**:362-72.
183. **Smith, J. J., and R. A. Rachubinski.** 2001. A Role for the Peroxin Pex8p in Pex20p-dependent Thiolase Import into Peroxisomes of the Yeast *Yarrowia lipolytica*. *J Biol Chem* **276**:1618-1625.
184. **Smith, J. J., and R. A. Rachubinski.** 2001. A role for the peroxin Pex8p in Pex20p-dependent thiolase import into peroxisomes of the yeast *Yarrowia lipolytica*. *J Biol Chem.* **276**:1618-25.
185. **Snyder, W. B., K. N. Faber, T. J. Wenzel, A. Koller, G. H. Luers, L. Rangell, G. A. Keller, and S. Subramani.** 1999. Pex19p interacts with Pex3p and Pex10p and is essential for peroxisome biogenesis in *Pichia pastoris*. *Mol Biol Cell* **10**:1745-61.
186. **Snyder, W. B., A. Koller, A. J. Choy, M. A. Johnson, J. M. Cregg, L. Rangell, G. A. Keller, and S. Subramani.** 1999. Pex17p is required for import of both peroxisome membrane and lumenal proteins and interacts with Pex19p and the peroxisome targeting signal-receptor docking complex in *Pichia pastoris*. *Mol Biol Cell* **10**:4005-19.
187. **Snyder, W. B., A. Koller, A. J. Choy, and S. Subramani.** 2000. The peroxin Pex19p interacts with multiple, integral membrane proteins at the peroxisomal membrane. *J Cell Biol* **149**:1171-8.

188. **South, S. T., and S. J. Gould.** 1999. Peroxisome synthesis in the absence of preexisting peroxisomes. *J Cell Biol* **144**:255-66.
189. **South, S. T., K. A. Sacksteder, X. Li, Y. Liu, and S. J. Gould.** 2000. Inhibitors of COPI and COPII do not block PEX3-mediated peroxisome synthesis. *J Cell Biol* **149**:1345-60.
190. **Spong, A. P., and S. Subramani.** 1993. Cloning and characterization of PAS5: a gene required for peroxisome biogenesis in the methylotrophic yeast *Pichia pastoris*. *J Cell Biol* **123**:535-48.
191. **Stein, K., A. Schell-Steven, R. Erdmann, and H. Rottensteiner.** 2002. Interactions of Pex7p and Pex18p/Pex21p with the peroxisomal docking machinery: implications for the first steps in PTS2 protein import. *Mol Cell Biol*.
192. **Subramani, S.** 1998. Components involved in peroxisome import, biogenesis, proliferation, turnover, and movement. *Physiol Rev* **78**:171-88.
193. **Subramani, S.** 1993. Protein import into peroxisomes and biogenesis of the organelle. *Annu Rev Cell Biol* **9**:445-78.
194. **Subramani, S.** 1996. Protein translocation into peroxisomes. *J Biol Chem* **271**:32483-6.
195. **Subramani, S., A. Koller, and W. B. Snyder.** 2000. Import of peroxisomal matrix and membrane proteins. *Annu Rev Biochem* **69**:399-418.
196. **Swinkels, B. W., S. J. Gould, A. G. Bodnar, R. A. Rachubinski, and S. Subramani.** 1991. A novel, cleavable peroxisomal targeting signal at the amino-terminus of the rat 3-ketoacyl-CoA thiolase. *Embo J* **10**:3255-62.
197. **Szilard, R. K., and R. A. Rachubinski.** 2000. Tetratricopeptide repeat domain of *Yarrowia lipolytica* Pex5p is essential for recognition of the type 1 peroxisomal targeting signal but does not confer full biological activity on Pex5p. *Biochem J* **346 Pt 1**:177-84.
198. **Szilard, R. K., V. I. Titorenko, M. Veenhuis, and R. A. Rachubinski.** 1995. Pay32p of the yeast *Yarrowia lipolytica* is an intraperoxisomal component of the matrix protein translocation machinery. *J Cell Biol* **131**:1453-69.
199. **Takada, Y., and T. Noguchi.** 1986. Ureidoglycolate lyase, a new metalloenzyme of peroxisomal urate degradation in marine fish liver. *Biochem. J.* **235**:391-397.
200. **Tam, Y. Y., and R. A. Rachubinski.** 2002. *Yarrowia lipolytica* Cells Mutant for the PEX24 Gene Encoding a Peroxisomal Membrane Peroxin Mislocalize Peroxisomal Proteins and Accumulate Membrane Structures Containing Both Peroxisomal Matrix and Membrane Proteins. *Mol Biol Cell* **13**:2681-91.
201. **Tam, Y. Y., J. C. Torres-Guzman, F. J. Vizeacoumar, J. J. Smith, M. Marelli, J. D. Aitchison, and R. A. Rachubinski.** 2003. Pex11-related proteins in peroxisome dynamics: a role for the novel peroxin Pex27p in controlling peroxisome size and number in *Saccharomyces cerevisiae*. *Mol Biol Cell* **14**:4089-102.
202. **Tan, X., H. R. Waterham, M. Veenhuis, and J. M. Cregg.** 1995. The *Hansenula polymorpha* PER8 gene encodes a novel peroxisomal integral membrane protein involved in proliferation. *J Cell Biol.* **128**:307-319.
203. **Terlecky, S. R., W. M. Nuttley, and S. Subramani.** 1996. The cytosolic and membrane components required for peroxisomal protein import. *Experientia* **52**:1050-4.

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204. **Terlecky, S. R., E. A. Wiemer, W. M. Nuttley, P. A. Walton, and S. Subramani.** 1996. Signals, receptors, and cytosolic factors involved in peroxisomal protein import. *Ann N Y Acad Sci* **804**:11-20.
 205. **Thieringer, R., and C. R. Raetz.** 1993. Peroxisome-deficient Chinese hamster ovary cells with point mutations in peroxisome assembly factor-1. *J. Biol. Chem.* **268**:12631-12636.
 206. **Titorenko, V. I., H. Chan, and R. A. Rachubinski.** 2000. Fusion of small peroxisomal vesicles in vitro reconstructs an early step in the in vivo multistep peroxisome assembly pathway of *Yarrowia lipolytica*. *J Cell Biol* **148**:29-44.
 207. **Titorenko, V. I., and R. A. Rachubinski.** 1998. The endoplasmic reticulum plays an essential role in peroxisome biogenesis. *Trends Biochem Sci* **23**:231-3.
 208. **Titorenko, V. I., and R. A. Rachubinski.** 2001. The life cycle of the peroxisome. *Nat Rev Mol Cell Biol* **2**:357-68.
 209. **Titorenko, V. I., and R. A. Rachubinski.** 2000. Peroxisomal membrane fusion requires two AAA family ATPases, Pex1p and Pex6p. *J Cell Biol* **150**:881-6.
 210. **Titorenko, V. I., J. J. Smith, R. K. Szilard, and R. A. Rachubinski.** 2000. Peroxisome biogenesis in the yeast *Yarrowia lipolytica*. *Cell Biochem Biophys* **32**:21-6.
 211. **Titorenko, V. I., J. J. Smith, R. K. Szilard, and R. A. Rachubinski.** 1998. Pex20p of the yeast *Yarrowia lipolytica* is required for the oligomerization of thiolase in the cytosol and for its targeting to the peroxisome. *J Cell Biol* **142**:403-20.
 212. **Toyama, R., S. Mukai, A. Itagaki, S. Tamura, N. Shimozawa, Y. Suzuki, N. Kondo, R. J. Wanders, and Y. Fujiki.** 1999. Isolation, characterization and mutation analysis of PEX13-defective Chinese hamster ovary cell mutants. *Hum Mol Genet* **8**:1673-81.
 213. **Tsukamoto, T., S. Miura, and Y. Fujiki.** 1991. Restoration by a 35K membrane protein of peroxisome assembly in a peroxisome-deficient mammalian cell mutant. *Nature* **350**:77-81.
 214. **Tsukamoto, T., S. Miura, T. Nakai, S. Yokota, N. Shimozawa, Y. Suzuki, T. Orii, Y. Fujiki, F. Sakai, A. Bogaki, and et al.** 1995. Peroxisome assembly factor-2, a putative ATPase cloned by functional complementation on a peroxisome-deficient mammalian cell mutant. *Nat Genet* **11**:395-401.
 215. **Urquhart, A. J., D. Kennedy, S. J. Gould, and D. I. Crane.** 2000. Interaction of Pex5p, the type 1 peroxisome targeting signal receptor, with the peroxisomal membrane proteins Pex14p and Pex13p. *J Biol Chem* **275**:4127-36.
 216. **Van Criekinge, W., and R. Beyaert** 1999, posting date. Yeast Two-Hybrid: State of the Art. [Online.]
 217. **van der Klei, I. J., R. E. Hilbrands, J. A. Kiel, S. W. Rasmussen, J. M. Cregg, and M. Veenhuis.** 1998. The ubiquitin-conjugating enzyme Pex4p of *Hansenula polymorpha* is required for efficient functioning of the PTS1 import machinery. *Embo J* **17**:3608-18.
 218. **van der Klei, I. J., R. E. Hilbrands, J. A. K. W. Kiel, S. W. Rasmussen, J. M. Cregg, and M. Veenhuis.** 1998. The ubiquitin-conjugating enzyme Pex4p of *Hansenula polymorpha* is required for efficient functioning of the PTS1 import machinery. *EMBO* **17**:3608-3618.

-
219. **van der Klei, I. J., R. E. Hilbrands, G. J. Swaving, H. R. Waterham, E. G. Vrieling, V. I. Titorenko, J. M. Cregg, W. Harder, and M. Veenhuis.** 1995. The *Hansenula polymorpha* PER3 gene is essential for the import of PTS1 proteins into the peroxisomal matrix. *J. Biol. Chem* **270**:17229-17236.
 220. **van der Klei, I. J., and M. Veenhuis.** 1996. Peroxisome biogenesis in the yeast *Hansenula polymorpha*: a structural and functional analysis. *Ann N Y Acad Sci* **804**:47-59.
 221. **van der Klei, I. J., and M. Veenhuis.** 1997. Yeast peroxisomes: function and biogenesis of a versatile cell organelle. *Trends Microbiol* **5**:502-9.
 222. **van der Leij, I., M. M. Franse, Y. Elgersma, B. Distel, and H. F. Tabak.** 1993. PAS10 is a tetratricopeptide-repeat protein that is essential for the import of most matrix proteins into peroxisomes of *Saccharomyces cerevisiae*. *Proc. Natl. Acad. Sci. USA* **90**:11782-11786.
 223. **van der Leij, I., M. van den Berg, R. Boot, M. M. Franse, B. Distel, and H. F. Tabak.** 1992. Isolation of peroxisome assembly mutants from *Saccharomyces cerevisiae* with different morphologies using a novel positive selection procedure. *J. Cell Biol.* **119**:153-162.
 224. **van der Voorn, L., and H. L. Ploegh.** 1992. The WD-40 repeat. *FEBS Lett.* **307**:131-134.
 225. **Veenhuis, M., M. Mateblowski, W. H. Kunau, and W. Harder.** 1987. Proliferation of microbodies in *Saccharomyces cerevisiae*. *Yeast* **3**:77-84.
 226. **Voorn-Brouwer, T., I. van der Leij, W. Hemrika, B. Distel, and H. F. Tabak.** 1993. Sequence of the PAS8 gene, the product of which is essential for biogenesis of peroxisomes in *Saccharomyces cerevisiae*. *Biochim Biophys Acta* **1216**:325-8.
 227. **Walton, P. A., P. E. Hill, and S. Subramani.** 1995. Import of stably folded proteins into peroxisomes. *Mol Biol Cell* **6**:675-83.
 228. **Walton, P. A., M. Wendland, S. Subramani, R. A. Rachubinski, and W. J. Welch.** 1994. Involvement of 70-kD heat-shock proteins in peroxisomal import. *J Cell Biol.* **125**:1037-46.
 229. **Wanders, R. J., R. B. Schutgens, and P. G. Barth.** 1995. Peroxisomal disorders: a review. *J Neuropathol Exp Neurol* **54**:726-39.
 230. **Wanders, R. J., and J. M. Tager.** 1998. Lipid metabolism in peroxisomes in relation to human disease. *Mol Aspects Med* **19**:69-154.
 231. **Wang, D., N. V. Visser, M. Veenhuis, and I. van der Klei.** 2003. Physical Interactions of the Peroxisomal Targeting Signal 1 Receptor Pex5p, Studied by Fluorescence Correlation Spectroscopy. *J Biol Chem* **278**:43340-43345.
 232. **Wang, X., M. J. Unruh, and J. M. Goodman.** 2001. Discrete Targeting Signals Direct Pmp47 to Oleate-induced Peroxisomes in *Saccharomyces cerevisiae*. *J Biol Chem* **276**:10897-905.
 233. **Warren, D. S., J. C. Morrell, H. W. Moser, D. Valle, and S. J. Gould.** 1998. Identification of PEX10, the gene defective in complementation group 7 of the peroxisome-biogenesis disorders. *Am J Hum Genet* **63**:347-59.
 234. **Waterham, H. R., and J. M. Cregg.** 1997. Peroxisome biogenesis. *Bioessays* **19**:57-66.

-
235. **Waterham, H. R., Y. de Vries, K. A. Russel, W. Xie, M. Veenhuis, and J. M. Cregg.** 1996. The *Pichia pastoris* PER6 gene product is a peroxisomal integral membrane protein essential for peroxisome biogenesis and has sequence similarity to the Zellweger syndrome protein PAF-1. *Mol. Cell. Biol.* **16**:2527-2536.
236. **Waterham, H. R., V. I. Titorenko, P. Haima, J. M. Cregg, W. Harder, and M. Veenhuis.** 1994. The *Hansenula polymorpha* PER1 gene is essential for peroxisome biogenesis and encodes a peroxisomal matrix protein with both carboxy- and amino-terminal targeting signals. *J Cell Biol* **127**:737-49.
237. **Wendland, M., and S. Subramani.** 1993. Cytosol-dependent peroxisomal protein import in a permeabilized cell system. *J Cell Biol* **120**:675-85.
238. **Wiebel, F. F., and W.-H. Kunau.** 1992. The PAS2 protein essential for peroxisome biogenesis is related to ubiquitin-conjugating enzymes. *Nature* **359**:73-76.
239. **Wiemer, E. A., G. H. Luers, K. N. Faber, T. Wenzel, M. Veenhuis, and S. Subramani.** 1996. Isolation and characterization of Pas2p, a peroxisomal membrane protein essential for peroxisome biogenesis in the methylotrophic yeast *Pichia pastoris*. *J Biol Chem* **271**:18973-80.
240. **Wiemer, E. A., S. R. Terlecky, W. M. Nuttley, and S. Subramani.** 1995. Characterization of the yeast and human receptors for the carboxy-terminal tripeptide peroxisomal targeting signal. *Cold Spring Harb Symp Quant Biol* **60**:637-48.
241. **Wiemer, E. A. C., W. M. Nuttley, B. L. Bertolaet, X. Li, U. Francke, M. J. Wheelock, U. K. Anne, K. R. Johnson, and S. Subramani.** 1995. Human peroxisomal targeting signal-1 receptor restores peroxisomal protein import in cells from patients with fatal peroxisomal disorders. *J. Cell Biol.* **130**:51-65.
242. **Will, G. K., M. Soukupova, X. Hong, K. S. Erdmann, J. A. Kiel, G. Dodt, W. H. Kunau, and R. Erdmann.** 1999. Identification and characterization of the human orthologue of yeast Pex14p. *Mol Cell Biol* **19**:2265-77.
243. **Wilson, G. N., and D. D. Bryant.** 1994. Structure and expression of mammalian peroxisome assembly factor-1 (PMP35) genes. *Biochem. Med. Metab. Biol.* **51**:140-148.
244. **Wilson, T. E., T. J. Fahrner, M. Johnston, and J. Milbrandt.** 1991. Identification of the DNA binding site for NFGI-B by genetic selection in yeast. *Science* **252**:1296-1300.
245. **Wimmer, C., M. Schmid, M. Veenhuis, and C. Gietl.** 1998. The plant PTS1 receptor: similarities and differences to its human and yeast counterparts. *Plant J* **16**:453-64.
246. **Yaffe, M. P., and G. Schatz.** 1984. Two nuclear mutations that block mitochondrial protein import in yeast. *Proc. Natl. Acad. Sci. USA* **81**:4819-4823.
247. **Yahraus, T., N. Braverman, G. Dodt, J. E. Kalish, J. C. Morrell, H. W. Moser, D. Valle, and S. J. Gould.** 1996. The peroxisome biogenesis disorder group 4 gene, PXAAA1, encodes a cytoplasmic ATPase required for stability of the PTS1 receptor. *Embo J* **15**:2914-23.
248. **Yang, X., P. E. Purdue, and P. B. Lazarow.** 2001. Eci1p uses a PTS1 to enter peroxisomes: either its own or that of a partner, Dci1p. *Eur J Cell Biol* **80**:126-38.

-
249. **Zaccolo, M., D. M. Williams, D. M. Brown, and E. Gherardi.** 1996. An Approach to Random Mutagenesis of DNA Using Mixtures of Triphosphate Derivatives of Nucleoside Analogues. *J. Mol. Biol.* **255**:589-603.
 250. **Zhang, J. W., and P. B. Lazarow.** 1995. PEB1 (PAS7) in *Saccharomyces cerevisiae* encodes a hydrophilic, intra-peroxisomal protein that is a member of the WD repeat family and is essential for the import of thiolase into peroxisomes. *J Cell Biol* **129**:65-80.
 251. **Zhang, J. W., and P. B. Lazarow.** 1996. Peb1p (Pas7p) is an intraperoxisomal receptor for the NH₂-terminal, type 2, peroxisomal targeting sequence of thiolase: Peb1p itself is targeted to peroxisomes by an NH₂-terminal peptide. *J Cell Biol* **132**:325-34.
 252. **Zhang, J. W., C. Luckey, and P. B. Lazarow.** 1993. Three peroxisome protein packaging pathways suggested by selective permeabilization of yeast mutants defective in peroxisome biogenesis. *Mol Biol Cell* **4**:1351-9.