

7 Literatur

- Abola, E., Bernstein, F., Bryant, S. H., Koetzle, T. F. und Weng, J. (1987). In Crystallographic Databases-Information Content, Software systems, Scientific Applications pp-107-132, Bonn/Cambridge/Chester
- Abrahams, J. P., Leslie, A. G., Lutter, R. und Walker, J. E. (1994). Structure at 2.8 Å resolution of F₁-ATPase from bovine heart mitochondria. *Nature* **370**: 621-628
- Altschul, S. F., Madden, T. L., Scaffer, A. A., Zhang, J., Zhang, Z., Miller, W. und Lipman, J. D. (1997). Gapped BLAST and PSI-BLAST: a new generation of protein database search programs. *Nucleic Acid Res.* **25**: 3389-3402
- Anderson, J. M. und Anderson, B. (1988). The dynamic photosynthetic membrane and regulation of solar energy conversion. *Trends Biochem. Sci.* **13**: 351-355
- Anderson, J. M. und Osmond, C. B. (1987). In: D. J. Kyle, C. B. Osmond, C. J. Arntzen (Eds.), Photoinhibition, Elsevier, Amsterdam, pp. 1-38
- Anderson, J. M., Chow, W. S. und Goodchild, D. J. (1988). Thylakoid membrane organization in sun/shade acclimation. *Aust. J. Plant Physiol.* **15**: 11-26
- Arondel, V., Benning, C. und Somerville, C. R. (1993). Isolation and functional expression in *Escherichia coli* of a gene encoding phosphatidylethanolamine methyltransferase (EC 2.1.1.17) from *Rhodobacter sphaeroides*. *J. Biol. Chem.* **268**: 16002-16008
- Asselineau, J. und Trüper, H. G. (1982). Lipid composition of six species of the phototrophic bacterial genus *Ectothiorhodospira*. *Biochim. Biophys. Acta* **712**: 111-16
- Bahl, J., Francke, B. und Moneger, R. (1976). Lipid composition of envelopes, prolamellar bodies and other plastid membranes in etiolated, green and greening wheat leaves. *Planta* **129**: 193-201
- Barber, G. A. (1963). The formation of uridine diphosphate L-rhamnose by enzymes of the tobacco leaf. *Arch. Biochem. Biophys.* **103**: 276-82
- Barber, J. und Gounaris, K. (1986). What role does sulpholipid play within the thylakoid membrane? *Photosynthesis Res.* **9**: 239-49
- Bariola, P. A., Howard, C. J., Taylor, C. B., Verburg, M. T., Jaglan, V. D. und Green, P. J. (1994). The *Arabidopsis* ribonuclease gene *RNS1* is tightly controlled in response to phosphate limitation. *Plant J.* **6**: 673-685

- Bauer, A. J., Rayment, I., Frey, P. A. und Holden, H. M. (1992). The molecular structure of UDP-Galactose 4-Epimerase from *Escherichia coli* determined at 2.5 Å resolution. *Proteins* **12**: 372-381
- Becker, D. (1990). Binary vectors which allow the exchange of plant selectable markers and reporter genes. *Nucl. Acids Res.* **18**: 203
- Benning, C. (1998). Biosynthesis and function of the sulfolipid sulfoquinovosyl diacylglycerol. *Annu. Rev. Plant Physiol. Plant Mol. Biol.* **49**: 53-75
- Benning, C. und Somerville, C. R. (1992a). Isolation and genetic complementation of a sulfolipid-deficient mutant of *Rhodobacter sphaeroides*. *J. Bacteriol.* **174**: 2352-60
- Benning, C. und Somerville, C. R. (1992b). Identification of an operon involved in sulfolipid biosynthesis in *Rhodobacter sphaeroides*. *J. Bacteriol.* **174**: 6479-87
- Benning, C. und Somerville, C. R. (1993). Genetic analysis of the biosynthesis and function of sulfolipid in *Rhodobacter sphaeroides* and higher plants. In: Biochemistry and molecular biology of membrane and storage lipids of plants, N. Murata und C. R. Somerville (Eds.), The American Society of Plant Physiologists, Rockville, Maryland, pp. 165-174
- Benning, C., Beatty, J. T., Prince, R. C. und Somerville, C. R. (1993). The sulfolipid sulfoquinovosyldiacylglycerol is not required for photosynthetic electron transport in *Rhodobacter sphaeroides*, but enhances growth under phosphate-limitation. *Proc. Natl. Acad. Sci. USA* **90**: 1561-1565
- Benson, A. A. (1963). The plant sulfolipid. *Adv. Lipid Res.* **1**: 387-94
- Benson, A. A., Daniel H. und Wiser, R. (1959). A sulfolipid in plants. *Proc. Natl. Acad. Sci. USA* **45**: 1582-87
- Bent, A. F., Kunkel, B. N., Dahlbeck, D., Brown, K. L., Schmidt, R., Giraudat, J. und Staskawicz, B. J. (1994). RPS2 of *Arabidopsis thaliana*: a leucine-rich repeat class of plant disease resistance genes. *Science*, **265**: 1856-1860
- Bick, J.-A., und Leustek, T. (1998). Plant sulfur metabolism. *Curr. Opin. Plant Biol.* **1**: 240-244
- Björkman, O. (1981). In: O. L. Lange, P.S. Nobel, C. B. Osmond, H. Ziegler (Eds.), Encyclopedia of Plant Physiology, NS, Vol 12A: Physiological Plant Ecology I, Springer-Verlag, Berlin, pp. 57-107
- Blanche, F., Cameron, B., Famechon, A., Debussche, L., Thibaut, D., Vuolhorgne, M., Leeper, F. J. und Batterby, A. R. (1995). Vitamin B₁₂: Wie das Problem seiner Biosynthese gelöst wurde. *Angew. Chem.* **107**: 421-452

- Bligny, R., Gardestrom, P., Roby, C. und Douce, R. (1990). ^{31}P NMR studies of spinach leaves and their chloroplasts. *J. Biol. Chem.* **265**: 1319-1326
- Bouchez, D. und Höfte, H. (1998). Functional genomics in plants. *Plant Phys.* **118**: 725-732
- Bradford, M. M. (1976). A rapid and sensitive method for the quantitation of microgram quantities of protein utilizing the principle of protein-dye binding. *Anal. Biochem.* **72**: 248-254
- Browse, J. P. und Somerville, C. R. (1991). Glycerolipid metabolism, biochemistry and regulation. *Annu. Rev. Plant Physiol. Plant Mol. Biol.* **42**: 467-506
- Browse, J. P., McCourt, C. R. und Somerville, C. R. (1985). A mutant of *Arabidopsis* lacking a chloroplast-specific lipid. *Science* **227**: 763-765
- Cedergreen, R. A. und Hollingsworth, R. I. (1994). Occurrence of sulfoquinovosyl diacylglycerol in some members of the family *Rhizobiaceae*. *J. Lipid Res.* **35**: 1452-61
- Clore, G. M. und Gronenborn, A. M. (1998). Determining the structure of large proteins and protein complexes by NMR. *Trends Biotechnol.* **16**: 22-34
- Creighton, T. E. (1996). Proteins: Structures and Molecular Properties, W. H. Freeman and Co., New York, NY
- Davies, W. H., Mercer, E. I und Goodwin, T. W. (1966). Some observations on the biosynthesis of the plant sulfolipid by *Euglena gracilis*. *Biochem J.* **98**: 369-73
- Deblaere, R., Bytebier, D., Deboeck, F., Schell, J., Van Montagu, M. und Leemans, J. (1985). Efficient octopine Ti plasmide derived vectors for *Agrobacterium*-mediated gene transfer to plants. *Nuc. Acid Res.* **13**: 4777-4788
- Dembitsky, V. M., Pechenkina-Schubina, E. E. und Rozentsvet, O. A. (1991). Glycolipids and fatty acids of some sea weeds and marine grasses from the black sea. *Phytochemistry* **30**: 2279-83
- Dörmann, P. und Benning, C. (1996). Functional expression of uridine 5'-diphospho-glucose 4-epimerase (EC 5.1.3.2) from *Arabidopsis thaliana* in *Saccharomyces cerevisiae* and *E. coli*. *Arch. Biochem. Biophys.* **327**: 27-34
- Dörmann, P., Hoffmann-Benning, S., Balbo, I. und Benning, C. (1995). Isolation and characterization of an *Arabidopsis* mutant deficient in the thylakoid lipid digalactosyl diacylglycerol. *Plant Cell* **7**: 1801-1810
- Douce, R. und Joyard, J. (1990). Biochemistry and function of the plastid envelope. *Annu. Rev. Cell Biol.* **6**: 173-216

- Essigmann, B. (1995). Untersuchung zur Funktion zweier an der Sulfolipidbiosynthese beteiligter Gene aus *R. sphaeroides*. Diplomarbeit, Freie Universität Berlin
- Essigmann, B., Güler, S., Narang, R. A., Linke, D. und Benning, C. (1998). Phosphate availability affects the thylakoid lipid composition and the expression of *SQD1*, a gene required for sulfolipid biosynthesis in *Arabidopsis thaliana*. *Proc. Natl. Acad. Sci. USA* **95**: 1950-1955
- Estelle, M. und Somerville, C. (1987). Auxin-resistant mutants of *Arabidopsis thaliana* with altered morphology. *Mol. Gen. Genet.* **206**: 200-206
- Fromme, P. (1996). Structure and function of photosystem I. *Current Opinion Struct. Biol.*, **6**: 467-472
- Gabriel, O. (1987). Biosynthesis of sugar residues for glycogen, peptidoglycan, lipopolysaccharide, and related systems. In: *Escherichia coli and Salmonella typhimurium: Cellular and Molecular Biology*, Vol. 1, F. C. Neidhardt, J. L. Ingraham, K. B. Low, B. Magasanik, M. Schaechter und H. E. Umbarger (Eds.), Washington: American Society for Microbiology, pp. 504-11
- Gabriel, O. und Lindquist, L. C. (1968). Biological mechanism involved in the formation of deoxy sugars. *J. Biol. Chem.* **243**: 1479-1484
- Gage, D. A., Huang, Z. H. und Benning, C. (1992). Comparison of sulfoquinovosyl diacylglycerol from spinach and the purple bacterium *Rhodobacter sphaeroides* by fast atom bombardment tandem mass spectrometry. *Lipids* **27**: 632-36
- Golbeck, J. H. (1993). Shared thematic elements in photochemical reaction centers. *Proc. Natl. Acad. Sci. USA* **90**: 1642-46
- Gordon, D. M. und Danishevsky, S. J. (1992). Synthesis of a cyanobacterial sulfolipid. Confirming of its structure, stereochemistry, and anti-HIV-1 activity. *J. Amer. Chem. Soc.* **114**: 659-662
- Gounaris, K. und Barber, J. (1985). Isolation and charakterisation of a photosystem II reaction centre lipid protein complex. *FEBS Lett.* **188**: 68-72
- Gounaris, K., Sundby, C., Andersson, B. und Barber, J. (1983). Lateral heterogeneity of polar lipids in the thylakoid membranes of spinach chloroplasts. *FEBS Lett.* **156**: 170-173
- Güler, S. (1996). Genetische Analyse der Funktion des Sulfolipides Sulfoquinovosyl-diacylglycerin in Organismen mit oxygener Photosynthese. Dissertation, Freie Universität Berlin.

- Güler, S., Seeliger, S., Härtel, H., Renger, G. und Benning, C. (1996). A null mutant of *Synechococcus* sp. PCC7942 deficient in the sulfolipid sulfoquinovosyl diacylglycerol. *J. Biol. Chem.* **271**: 7501-07
- Gustafson, K. R., Cardellina II, J. H., Fuller, R. W., Weislow, O. S., Kiser, R. F., Snader, K. M., Patterson, G. M. L. und Boyed, M. R. (1989). AIDS-antiviral sulfolipids from cyanobacteria (blue-green algae). *J. Natl. Cancer Inst.* **81**:1254-58
- Haas, R., Siebertz, H. P., Wrage, K. und Heinz, E. (1980). Localization of sulfolipid labeling within cells and chloroplasts. *Planta* **148**: 238-44
- Haines, T. H. (1983). Anionic lipid head groups as a proton-conducting pathway along the surface of membranes: A hypothesis. *Proc. Natl. Acad. Sci. USA* **80**: 160-164
- Hanahan, D. (1983). Studies on transformation of *Escherichia coli* with plasmids. *J. Mol. Biol.* **166**: 557-580
- Härtel, H., Essigmann, B., Lockstein, H., Hoffmann-Benning, S., Peters-Kottig, M. und Benning, C. (1998). The phospholipid-deficient *pho 1* mutant of *Arabidopsis thaliana* is affected in the organization, but not in the light acclimation, of the thylakoid membrane. *Biochim. Biophys Acta* **1415**: 205-218
- Harwood, J. L. (1980). In: The biochemistry of plants, vol. 4, Lipids: Structure and function, P. K. Stumpf, (Ed.), Academic Press, New York, pp. 301-320
- He, X., Thorson, J. S. und Liu, H. W. (1996). Probing the coenzyme and Substrate binding events of CDP-D-glucose 4,6-dehydratase: Mechanistic Implications. *Biochemistry* **35**: 4721-4731
- Heinz, E. (1993). Recent investigations on the biosynthesis of the plant sulfolipid. In: Sulfur Nutrition and Assimilation in Higher Plants, L. J. De Kok (Ed.), Den Haag: SPB Academic, pp. 504-11
- Heinz, E., Schmidt, H., Hoch, M., Jung, K-H., Binder, H., und Schmidt R. R. (1989). Synthesis of different nucleoside 5'-diphospho-sulfoquinovoses and their use for studies on sulfolipid biosynthesis in chloroplasts. *Eur. J. Biochem.* **184**: 445-53
- Hell, R. (1997). Molecular physiology of plant sulfur metabolism. *Planta* **202**:138-48
- Hoch, M., Heinz, E., und Schmidt, R. R. (1989). Synthesis of 6-deoxy-6-sulfo-D-glycopyranosyl phosphate. *Cabohydr. Res.* **191**: 21-28
- Höfgen, R. und Willmitzer, L. (1988). Storage of competent cells for *Agrobacterium tumefaciens*. *Nuc. Acid Res.* **16**: 9877

- Imhoff, J. F. (1984). Sulfolipids in phototrophic purple nonsulfur bacteria. In: Structure, Function and Metabolism of Plant Lipids, P. A. Siegenthaler, W. Eichenberger (Eds.), Amsterdam: Elsevier Science, pp. 175-85
- Imhoff, J. F. (1988). Lipids, fatty acids and quinones in taxonomy and phylogeny of anoxygenic phototrophic bacteria. In: Green Photosynthetic Bacteria, J. M. Olson, J. G. Ormerod, J. Amesz, E. Stackebrandt, H. G. Trüper, (Eds.), New York: Plenum, pp. 223-32
- Imhoff, J. F. und Bias-Imhoff, U. (1995). Lipids, quinones and fatty acids of anoxygenic phototrophic bacteria. In: Anoxygenic Photosynthetic Bacteria, R. E. Blankenship, M. T. Madigan, C. E. Bauer, (Eds.), Dordrecht, The Netherlands: Kluwer Academic, pp. 179-205
- Isono, Y., Mohri, H. und Nagai, Y. (1967). Effect of egg sulpholipid on respiration of sea urchin spermatozoa. *Nature* **214**: 1336-38
- Joyard, J., Blee, E. und Douce, R. (1986). Sulfolipid synthesis from $^{35}\text{SO}_4^{2-}$ and [1- ^{14}C]acetate in isolated spinach chloroplast. *Biochim. Biophys. Acta* **879**: 78-87
- Kempin, S. A., Liljegren, S. J., Block, L. M., Rounsley, S. D., Lamm, E. und Yanofsky, M. (1997). Targeted disruption in *Arabidopsis*. *Nature* **389**: 802-803
- Kleinig, H. und Sitte, P. (1986). Zellbiologie, 2. neubearb. Auflage, G. Fischer Verlag, Stuttgart, New York.
- Kleppinger-Sparace, K. F., Mudd, J. B. und Sparace S. A. (1990). Biosynthesis of plant sulfolipids. In: Sulfur Nutrition and Sulfur Assimilation in Higher Plants, H. Rennenberg, C. Brunold, L. J. DeKok, I. Stulen, (Eds.), Den Haag: SPB Academic Publ., pp. 77-88
- Kotyk, A., Janacek, K. und Koryta, J. (1988). Biophysical Chemistry of membrane functions, John Wiley and Sons, New York, pp. 92-96
- Kribben, F. J. (1964). *Arabidopsis thaliana* (L.) Heynh. Eine botanische Drosophila. *Naturwissenschaftliche Rundschau* **4**: 139-145
- Kühlbrandt W. (1994). Structure and function of the plant light-harvesting complex, LHC-II. *Current Opinion Struct. Biol.* **4**: 519-28
- Laemmli, U. K. (1970). Cleavage of structural proteins during the assembly of the head of bacteriophage T4. *Nature* **227**: 680-682
- Langworthy, T. A., Mayberry, W. R. und Smith, P. F. (1976). A sulfonolipid and novel glucosamidyl glycolipids from the extreme thermoacidophile *Bacillus acidocaldarius*. *Biochim. Biophys. Acta* **431**: 550-69

- Laskowski, R. A., Mac Arther, M. W., Moss, D. S. und Thornton, D. S. (1993). PROCHECK: a program to check the stereochemical quality of protein structures. *J. Appl. Cryst.* **26**: 238-291
- Leech, R. M., Rumsby, M. G. und Thomson, W. W. (1973). Plastid differentiation, acyl lipid and fatty acid changes in developing green maize leaves. *Plant Physiol.* **52**: 240-245
- Lehmann, J. und Weckeler, W. (1972). Zuckersulfonsäuren. *Carbohydr. Res.* **22**: 317-324
- Lehmann, J. und Weckeler, W. (1975). Zusammenhänge zwischen dem Epimerenverhältnis bei der Hydrogen-Sulfitaddition an Hex-5-enopyranosen. *Carbohydr. Res.* **42**: 275-295
- Lehrach, H., Diamon, D., Wozeny, J. M. und Boedtke, H (1977). RNA molecular weight determination by gel electrophoresis under denaturing conditions, a critical reexamination. *Biochemistry* **16**: 4734-4751
- Leustek, T. (1996). Molecular genetics of sulfate assimilation in plants. *Physiol. Plant.* **97**: 411-19
- Li, G., Knowles, P. F., Murphy, D. J., Nishida, I. und Marsh, D. (1989). Spin-label ESR studies of lipid-protein interactions in thylakoid membranes. *Biochemistry* **28**: 7446-7452
- Linke, D. (1996). Charakterisierung zweier Genprodukte aus *Arabidopsis* im Hinblick auf ihre Bedeutung für die Sulfolipidbiosynthese. Diplomarbeit, Freie Universität Berlin
- Liu, Y., Thoden, J. B., Kim, J., Berger, E., Gulick, A. M., Ruzicka, F. J., Holden, H. M. und Frey P. A. (1997). Mechanistic roles of Tyrosine 149 and Serine 124 in UDP-galactose 4-epimerase from *Escherichia coli*. *Biochemistry* **36**: 10675-84
- Logemann, J., Schell, J. und Willmitzer, L. (1987). Improved method for the isolation of RNA from plant tissues. *Anal. Biochem.* **163**: 16-20
- Maréchal E , Block M. A., Dorne, A.-J., Douce, R. und Joyard, J. (1997). Lipid synthesis and metabolism in the plastid envelope. *Physiol. Plantarum* **100**: 65-77
- Meinke, D. W., Cherry, J. M., Dean, C., Roznsley, S. D. und Koornneef, M. (1998). *Arabidopsis thaliana*: A Model Plant for Genom Analysis. *Science* **282**: 662-682
- Melo, A. und Glase, L. (1968). The mechanism of 6-deoxyhexose synthesis. *J. Biol. Chem.* **243**: 1475-1478
- Menke, W., Radunz, A., Schmid, G. H., König, F. und Hirtz, R. D. (1976). Intermolecular interactions of polypeptides and lipids in the thylakoid membran. *Z. Naturforsch.* **31c**: 436-444

- Meyerowitz, E. M. (1994). Structure and organization of the *Arabidopsis thaliana* nuclear genome. In: *Arabidopsis*, Meyerowitz und Somerville (Eds.) Cold Spring Harbor Laboratory Press, New York, pp 21-36
- Miao, C-H. und Lamm, E. (1995). Targeted disruption of the TGA3 locus in *Arabidopsis thaliana*. *Plant J.* **7**: 359-365
- Michel, H. und Deisenhofer, J. (1988). Relevance of the photosynthetic reaction center from purpur bacteria to the structure of photosystem II. *Biochemistry*, **27**: 1-7
- Miller, J. F., Dower, W. J. und Tompkins, L. S. (1988). High-voltage electroporation of bacteria: genetic transformation of *Campylobacter jejuni* with plasmid DNA. *Proc. Natl. Acad. Sci.* **85**: 856-860
- Mizushina, Y., Watanabe, I., Otha, K., Takemura, M., Sahara, H., Takahashi, N., Gasa, S., Sugawara, F., Matsukage, A., Yoshida, S. und Sakaguchi K. (1998). Studies on inhibitors of mammalian DNA polymerase α and β . *Biochem. Pharmacol.* **55**: 537-541
- Muchal, U. S., Pardo, J. M. und Raghothama, K. G. (1996). Phosphate transporters from the higher plant *Arabidopsis thaliana*. *Proc. Natl. Acad. Sci. USA* **93**: 10519-10523
- Mudd, B. J. und Kleppinger-Sparace, K. F. (1987). Sulfolipids. In: The Biochemistry of Plants, Vol. 9, P. K. Stumpf, (Ed.), Academic Press, New York, pp. 159-173
- Murata, N., Fujimura, Y. und Higashi, S. (1990). Glycerolipids in various preparations of photosystem II from spinach chloroplasts *Biochim. Biophys. Acta* **1019**: 261-268
- Noji, H., Yasuda, R., Yoshida, M. und Kinosita, K. (1997). Direct observation of the rotation of F₁-ATPase, *Nature*, **386**: 299-302
- Nußberger, S., Dörr, K., Wang, D. N. und Kühlbrandt, W. (1993). Lipid-protein interactions in crystals of plant light-harvesting complex. *J. Mol. Biol.* **234**:347-56
- Ohlrogge, J. B. (1994). Design of new plant products. Engineering of fatty acid metabolism. *Plant Physiol.* **104**: 821-826
- Ohlrogge, J. und Browse, J. (1995). Lipid biosynthesis. *Plant Cell* **7**: 957-970
- Otha, K., Mizushina, Y., Hirata, N., Takemura, M., Sugawara, F., Matsukage, A., Yoshida, S. und Sakaguchi, K. (1998). Sulfoquinovosyldiacylglycerol, KM043, a potent inhibitor of eukaryotic DNA polymerase and HIV-reverse transcriptase typ 1 from marine red alga, *Gigartina tenella*. *Chem. Pharm. Bull.* **46**: 684-686

- Otis, P. J., Mayer, R. M. und Floss, H. G. (1990). Stereochemistry and mechanism of GDP-mannose dehydratase reaction. *Carbohydr. Res.* **198**: 91-100
- Paulsen, H., (1995). Chlorophyll a/b-binding proteins. *Photochem. Photobiol.* **62**: 367-382
- Pick, U., Weiss, M., Gounaris, K. und Barber, J. (1987). The role of different glycolipids in the function of reconstituted chloroplast ATP synthase, *Biochim. Biophys. Acta*. **891**: 28-39
- Poirier, Y., Thoma, S., Somerville C. R. und Schiefelbein, J. (1991). A mutant of *Arabidopsis* deficient in xylem loading of phosphate. *Plant Physiol.* **97**: 1087-93
- Pugh, C. E, Hawkes, T. und Harwood J. L. (1995a). Biosynthesis of sulfoquinovosyl diacylglycerol by chloroplast fractions from pea and lettuce. *Phytochem.* **39**: 1071-75
- Pugh, C. E., Roy, A. B., Hawkes, T. und Harwood J. L. (1995b). A new pathway for the synthesis of the plant sulpholipid, sulfoquinovosyldiacylglycerol. *Biochem. J.* **309**: 513-519
- Radunz, A. (1969). Über das Sulfoquinovosyl-Diacylglycerin aus höheren Pflanzen, Algen und Purpurbakterien. *Hoppe-Seyler's Z. Physiol. Chem.* **350**: 411-17
- Rhee, K-H., Morris, E. P., Barber, J. und Kühlbrandt, W., (1998). Three-dimensional structure of the plant photosystem II reaction center at 8Å resolution, *Nature*, **369**: 283-286
- Richter, G. (1998). Stoffwechselphysiologie der Pflanze, 6. Aufl., Thieme, Stuttgart-New York
- Ring, C. S. und Cohen, F. E. (1993). Modeling protein structures: construction and their application. *FASEB J.* **7**: 783-790
- Rogers, S. O. und Bendrich, A. J. (1985). Extraction of DNA from milligram amounts of fresh, herbarium and mummified plant tissue. *Plant Mol. Biol.* **5**: 69-76
- Rossak, M., Schäfer, A., Xu, N., Gage, D. A. und Benning, C. (1997). Accumulation of sulfoquinovosyl-1-O-dihydroxyacetone in a sulfolipid-deficient mutant of *Rhodobacter sphaeroides* inactivated in *sqdC*. *Arch. Biochem. Biophys.* **340**: 219-30
- Rossak, M., Tietje, C., Heinz, E. und Benning, C. (1995). Accumulation of UDP-sulfoquinovose in a sulfolipid-deficient mutant of *Rhodobacter sphaeroides*. *J. Biol. Chem.* **270**: 25792-97
- Roughan, P. G. und Slack, C. R. (1982). Cellular organization of glycerolipid metabolism, *Annu. Rev. Plant Physiol.* **33**: 97-132
- Sakamoto, T., Los, D. A., Higashi, S., Wada, H., Nishida, I., Ohmori, M. und Murata, N. (1994). Cloning of 3 desaturase from cyanobacteria and its use in altering the degree of membrane-lipid unsaturation. *Plant Mol. Biol.* **26**: 249-263

- Sambrook, J., Fritsch, E. F. und Maniatis, T. (1989). Molecular Cloning - A laboratory manual, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York, 2nd Edition.
- Sander, C. und Schneider, R. (1991). Database of homologe-derived protein structures and the structural meaning of sequence alignment. *Proteins* **5**: 56-68
- Sato, N., Sonoike, K., Tsuzuki, M. und Kawaguchi, A. (1995a). Impaired photosystem II in a mutant of *Chlamydomonas reinhardtii* defective in sulfoquinovosyl diacylglycerol. *Eur. J. Biochem.* **234**: 16-23
- Sato, N., Tsuzuki, M., Matsuda, Y., Ehara, T., Osafune, T. und Kawaguchi, A. (1995b). Isolation and characterization of mutants affected in lipid metabolism of *Chlamydomonas reinhardtii*. *Eur. J. Biochem.* **230**: 987-93
- Schmidt, A. und Jäger, K. (1992). Open questions about sulfur metabolism in plants. *Annu. Rev. Plant Physiol. Mol. Biol.* **43**: 325-49
- Seifert, U. und Heinz, E. (1992). Enzymatic characteristics of UDP-sulfoquinovose:diacylglycerol sulfoquinovosyltransferase from chloroplast envelopes. *Bot. Acta* **105**:197-205
- Selstam, E. und Campbell, D. (1996). Membrane lipid composition of the unusual cyanobacterium *Gloeobacter violaceus* sp. PCC7421, which lacks sulfoquinovosyl diacylglycerol. *Arch. Microbiol.* **166**:132-35
- Shibuya, I., Yagi, T. und Benson, A. A. (1963). Sulfonic acids in algae. In: Microalgae and Photosynthetic Bacteria, Japanese Society of Plant Physiology (Ed.), Tokyo: Univ. of Tokyo Press, pp. 627-36
- Siegenthaler, P.-A., Smutny, J. und Rawyler, A. (1987). Involvement of distinct populations of phosphatidylglycerol and phosphatidylcholin molecules in photosynthetic electron-flow activities. *Biochim. Biophys. Acta* **891**: 85-93
- Sigrist, M., Zwillenberg, C., Giroud, C. H., Eichenberger, W. und Boschetti, A. (1988). Sulfolipid associated with the light-harvesting complex associated with photosystem II apoproteins of *Chlamydomona reinhardtii*. *Plant Sci.* **58**: 15-23
- Sinensky, M. (1977). Specific deficit in the synthesis of 6-sulfoquinovosyldiglyceride in *Chlorella pyrenoidosa*. *J. Bacteriol.* **129**: 516-524
- Singer, S. J. und Nicolson, G. L. (1972). The fluid mosaic model of the structure of cell membranes. *Science* **175**: 720-731
- Skallal, A. K., Nimer, N. A. und Radwan, S. S. (1990). Lipid and fatty acid composition of fresh water cyanobacteria. *J. Gen. Microbiol.* **136**:2043-48

- So, R. B., Ladha J. K. und Young, J. P. (1994). Photosynthetic symbionts of *Aeschymone* spp. from a cluster with bradyrhizobia on the basis of fatty acid and rRNA analyses. *Int. J. Syst. Bacteriol.* **44**:392-403
- Sobolev, V., Wade, R. C., Vriend, G. und Edelman, M. (1996). Molecular docking using surface complementery. *Proteins* **25**: 238-291
- Staehelin, L. A., Van der Staay, G. W. M. (1996). In: D.R. Ort, C.F. Yocom (Eds.), Oxygenic Photosynthesis: The Light Reactions, Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 11-30
- Strasburger, E. (1996). Lehrbuch der Botanik für Hochschulen, 34. Aufl., neubearb. v. P. Sitte, H. Ziegler, F. Ehrendorfer und A. Bresinsky, G. Fischer Verlag, Stuttgart, Jena, New York
- Tardent, P., (1993). Meeresbiologie, 2. Aufl., Thieme, Stuttgart-New York
- Thoden, J. B., Frey, P. A. und Holden, H. (1996). Molecular structure of the NADH/UDP-glucose abortive complex of UDP-galactose 4-epimerase from *E. coli*: Mechanistic implications *Biochemistry* **36**: 10685-95
- Thoden, J. B., Gulick, A. M. und Holden, H. (1997). Molecular structure of the S124A, S124T, and S124V site-directed mutans of UDP-galactose 4-epimerase from *E. coli*. *Biochemistry* **36**: 10685-95
- Tiehl, T. (1994). Genetic analysis of Cyanobacteria, In: The Molecular Biology of Cyanobacteria, D. A. Bryant (Ed.) Kluwer Academic Publisher, Dordrecht, pp. 581-611
- Tietje, C. und Heinz, E. (1998). Uridine-diphospho-sulfoquinovose: diacylglycerol sulfoquinovosyltransferase activity is concentrated in the inner membrane of chloroplast envelopes. *Planta* **206**: 72-78
- Töpfer, R., Martini, N. und Schell, J. (1995). Modification of plant lipid synthesis. *Science* **268**: 681-685
- Trémolierès, A., Dainese, P. und Bassi, R., (1994). Heterogenous lipid distribution among chlorophyll-binding proteins of photosystem II in maize mesophyll chloroplasts *Eur. J. Biochem.* **221**, 721-730
- Trémolierès, A., Roche, O., Dubertret, G., Guyon, D. und Garnier, J. (1991). Restoration of thylakoid appressation by trans- hexadecenoic acid-containing phosphatidylglycerol in a mutant of Chlamydomonas reinhardtii. Relationship with the regulation of excitation energy distribution. *Biochim. Biophys. Acta* **1059**: 286-292
- Tulloch, A. P., Heinz, E. und Fischer, W. (1973). Combination and positional distribution of fatty acids in plant sulfolipids. *Hoppe-Seyler's Z. Physiol. Chem.* **354**: 879-889

- von Schaeven, A. (1989). Untersuchung zur ER vermittelten subzellulären Kompartimentierung fremder Proteine in höheren Pflanzen. Doktorarbeit. Freie Universität Berlin
- Wada, H., Gombos, Z. und Murata, N. (1990). Enhancement of chilling tolerance of a cyanobacterium by genetic manipulation of fatty acid desaturation. *Nature* **347**: 200-203
- Walters, R. G. und Horton, P. (1994). Acclimation of *Arabidopsis thaliana* to the light environment changes in the composition of the photosynthetic apparatus. *Planta* **195**: 248-256
- Webb, M.S. und Green, B. R. (1991). Biochemical and biophysical properties of thylakoid acyl lipids. *Biochim. Biophys. Acta* **1060**:133-58
- Williams, W. P. (1994). The role of lipids in the structure and function of photosynthetic membranes. *Prog. Lipid Res.* **33**: 119-127
- Winter, H., Robinson, D. G. und Heldt, W. (1994). Subcellular volumes and metabolite concentrations in spinach leaves. *Planta* **193**: 530-535
- Woese, C. R. (1987). Bacterial evolution. *Microbiol. Rev.* **51**: 221-71
- Wunderlich, F., Speth, V., Beitz, W. und Kleinig, H. (1973). The effect of temperature on membrane core structure and fatty acid composition of *Tetrahymena* cells. *Biochim. Biophys. Acta* **298**: 39-49
- Yasuda, R., Noji, H., Kinoshita, K. und Yoshida, M. (1998). F₁-ATPase is a highly efficient molecular motor that rotates with discrete 120° steps. *Cell* **93**: 117-1124
- Zahner, D. und Malaisse, W. J. (1993). Enzyme-to-enzyme tunnelling between phosphoglucoisomerase and phosphofructokinase. *Int. J. Biochem.* **25**: 1303-1307
- Zhou, C., Yang, Y. und Jong, A. Y. (1990). Mini-prep in 10 minutes. *Bio Techniques* **8**: 172-173