

Bibliography

- Abiko, T., Obara, M., Ushioda, A., Hayakawa, T., Hodges, M., Yamaya, T.** (2005) Localization of NAD-isocitrate dehydrogenase and glutamate dehydrogenase in rice roots: Candidates for providing carbon skeletons to NADH-glutamate synthase. *Plant Cell Physiol* **46**, 1724-1734.
- Achnine, L., Huhman, D.V., Farag, M.A., Sumner, L.W., Blount, J.W., Dixon,R.A.** (2005) Genomics-based selection and functional characterization of triterpene glycosyltransferases from the model legume *Medicago truncatula*. *Plant J* **41**, 875-887.
- Adams, M., Kelley, J., Gocayne, J., Dubnick, M., Polymeropoulos, M.H., Xiao, H., Merrill, C.R., Wu, A., Olde, B., Moreno, R.F. et al.** (1991) Complementary DNA sequencing: expressed sequence tags and human genome project. *Science* **252**, 1651-1656.
- Alba R., Fei, Z., Payton, P. Liu, Y., Moore, S.L., Debbie, P., Cohn, J., D'Ascenzo, Gordon, J.S., Rose, J.K.C., Martin, G., Tanksley, S.D., Bouzayen, M., Jahn, M.M., Giovannoni, J.** (2004) ESTs, cDNA microarrays, and gene expression profiling: tools for dissecting plant physiology and development. *Plant J* **39**, 697-714.
- Alba R., Payton, P., Fei, Z., McQuinn, R., Debbie, P., Martin, G.B., Tanksley, S.D., Giovannoni, J.J.** (2005) Transcriptome and selected metabolite analyses reveal multiple points of ethylene control during tomato fruit development. *17*, 2954-2965.
- ap Rees, T.** (1980) Assessment of the contributions of metabolic pathways to plant respiration. In: Davies, D.D. (ed) *The Biochemistry of Plants*. Academic Press, NY, vol. 2.
- ap Rees, T., Beevers, H.** (1960) Pathways of glucose dissimilation in carrot slices. *Plant Physiol* **35**, 830-838.
- ap Rees, T., Hill, S.A.** (1994) Metabolic control analysis of plant metabolism. *Plant Cell Environ* **17**, 587-599.
- ap Ress, T.** (1987) Compartmentation of plant metabolism. In: Davies, D.D. (ed) *The Biochemistry of Plants*. Academic Press, NY, vol. 12.
- Atkin, O.K., Millar, A.H., Gardeström, P., Day, D.A.** (2000) Photosynthesis, carbohydrate metabolism and respiration in leaves of higher plants. In Leegood, R.C., Sharkey, T.D., von Caemmerer, S. (eds), *Photosynthesis: Physiology and Metabolism*, Vol 9. Kluwer Academic Publishers, Dordrecht, The Netherlands, pp 153–185.

- Avelange, M.H., Thiery, J.M., Sarrey, F., Gans, P., Rébeillé, F.** (1991) Mass-spectrometric determination of O₂ and CO₂ gas-exchange in illuminated higher plant cells. Evidence for light-inhibition of substrate decarboxylations. *Planta* **183**, 150–157.
- Balmer, Y., Vensel, W.H., Tanaka, C.K., Hurkman, W.J., Gelhaye, E., Rouhier, N., Jacquot, J.P., Manieri, W., Schuurmann, P., Droux, M., Buchanan, B.B.** (2004) Thioredoxin links redox to the regulation of fundamental processes of plant mitochondria. *Proc Natl Acad Sci USA* **101**, 2642–2647.
- Bartley, G.E., Ishida, B.K.** (2002) Digital fruit ripening: data mining in the TIGR tomato gene index. *Plant Mol Biol Reporter* **20**, 115-130.
- Bartoli, C.G., Gomez, F., Gergoff, G., Guiamét, J.J., Puntarulo, S.** (2005) Up-regulation of the mitochondrial alternative oxidase enhances photosynthetic electron transport under drought conditions. *J Exp Bot* **56**, 1269–1276.
- Bartoli, C.G., Pastori, G.M., Foyer, C.H.** (2000) Ascorbate biosynthesis in mitochondria is linked to the electron transport chain between complexes III and IV. *Plant Physiol* **123**, 335–344.
- Bate, G.C., Siiltemeyer, D.F., Fock, H.P.** (1988) ¹⁶O₂/¹⁸O₂ analysis of oxygen exchange in *Dunaliella tertiolecta*. Evidence for the inhibition of mitochondrial respiration in the light. *Photosynth Res* **16**, 219-231.
- Baxter, C.J., Sabar, M., Quick, W.P., Sweetlove, L.J.** (2005) Comparison of changes in fruit gene expression in tomato introgression lines provides evidence of genome wide transcriptional changes and reveals links to mapped QTLs and described traits. *J Exp Bot* **56**, 1591-1604.
- Beevers, H.** (1961) Respiratory metabolism in plants. Harper and Row, New York, USA, pp 185-197
- Bender-Machado, L., Bäuerlein, M., Carrari, F., Schauer, N., Lytovchenko, A., Gibon, Y., Kelly, A.A., Ehlers-Loureiro, M., Müller-Röber, B., Willmitzer, L., Fernie, A.R.** (2004) Expression of a yeast acetyl CoA hydrolase in the mitochondrion of tobacco plants inhibits growth and restricts photosynthesis. *Plant Mol Biol* **55**, 645–662.
- Bendtsen, J. D., Nielsen, H., von Heijne, G., Brunak, S.** (2004) Improved prediction of signal peptides: SignalP 3.0. *J Mol Biol* **340**, 783-795.
- Bergman, A., Ericson, I.** (1983) Effects of NADH, succinate and malate on the oxidation of glycine in spinach leaf mitochondria. *Physiol Plant* **59**, 421–427.

- Bergmüller, E., Profirova, S., Dörmann, P.** (2003) Characterization of an *Arabidopsis* mutant deficient in γ -tocopherol methyltransferase. *Plant Mol Biol* **52**, 1181-1190.
- Bläsing, O.E., Gibon, Y., Gunther, M., Hohne, M., Morcuende, R., Osuna, D., Thimm, O., Usadel, B., Scheible, W.R., Stitt, M.** (2005) Sugars and circadian regulation make major contributions to the global regulation of diurnal gene expression in *Arabidopsis*. *Plant Cell* **17**, 3257-3281.
- Boldt, R., Edner, C., Kolukisaoglu, U., Hagemann, M., Weckwerth, W., Wienkoop, S., Morgenthal, K., Bauwe, H.** (2005) D-Glycerate 3-kinase, the last unknown enzyme in the photorespiratory cycle in *Arabidopsis*, belongs to a novel kinase family. *Plant Cell* **17**, 2413–2420.
- Bonierbale, M.P., Tanksley, S.** (1988) RFLP maps based on a common set of clones reveal modes of chromosomal evolution in tomato and potato. *Genetics* **120**, 1095-1103.
- Botella-Pavía, P., Rodríguez-Concepción, M.** (2006) Carotenoid biotechnology in plants for nutricionally improved foods. *Physiol Plant* **126**, 369-381.
- Bouché, N., Fait, A., Bouchez, D., Møller, S. G., Fromm, H.** (2003b) Mitochondrial succinic-semialdehyde dehydrogenase of the γ -aminobutyrate shunt is required to restrict levels of reactive oxygen intermediates in plants. *Proc Natl Acad Sci USA* **100**, 6843-6848.
- Bouché, N., Lacombe, B., Fromm, H.** (2003a) GABA signalling: a conserved and ubiquitous mechanism. *Trends in Cell Biol* **13**, 607-610.
- Bradford, M.M.** (1976) Rapid and quantitative method for the quantitation of microgram quantities of protein utilizing the principle of protein-dye binding. *Analytical Biochem* **72**, 248-252.
- Bramley, P.M.** (2000) Is lycopene beneficial to human health? *Phytochem* **54**, 233-236.
- Budde, R.J.A., Randall, D.D.** (1990) Pea leaf mitochondrial pyruvate dehydrogenase complex is inactivated *in vivo* in a light-dependent manner. *Proc Natl Acad Sci USA* **87**, 673-676.
- Bullock, W.O., Fernandez, J.M., Short, J.M.** (1987) XL1-blue: a high efficiency plasmid transforming *recA Escherichia coli* with b-galactosidase selection. *Biotechniques* **5**, 376-378.

- Busch, K.B., Fromm, H.** (1999) Plant succinic semialdehyde dehydrogenase. Cloning, purification, localization in mitochondria, and regulation by adenine nucleotides. *Plant Physiol* **121**, 589-597.
- Bykova, N.V., Keerberg, O., Pärnik, T., Bauwe, H., Gardeström, P.** (2005) Interaction between photorespiration and respiration in transgenic potato plants with antisense reduction in glycine decarboxylase. *Planta* **222**, 130–140.
- Canvin, D.T., Berry, J.A., Badger, M.R., Fock, H., Osmond, C.B.** (1980) O_2 exchange in leaves in the light. *Plant Physiol* **66**, 302-307.
- Carbone, F., Pizzichini, D., Giuliano, G., Rosati, C., Perrotta, G.** (2005) Comparative profiling of tomato fruits and leaves evidences a complex modulation of global transcript profiles. *Plant Sci* **169**, 165-175.
- Carrari, F., Coll-García, D., Schauer, N., Lytovchenko, A., Palacios-Rojas, N., Balbo, I., Rosso, M., Fernie, A.R.** (2005) Deficiency of a plastidial adenylate kinase in *Arabidopsis* results in elevated photosynthetic amino acids biosynthesis and enhanced growth. *Plant Physiol* **137**, 70-82.
- Carrari, F., Nunes-Nesi, A., Gibon, Y., Lytovchenko, A., Ehlers-Loureiro, M., Fernie, A.R.** (2003) Reduced expression of aconitase results in an enhanced rate of photosynthesis and marked shifts in carbon partitioning in illuminated leaves of wild species tomato. *Plant Physiol* **133**, 1322–1335.
- Cashin, Mc.B.G., Cossins, E.A., Canvin, D.T.** (1988) Dark respiration during photosynthesis in wheat leaf slices. *Plant Physiol* **87**, 155–161.
- Catoni, E., Schwab, R., Hilpert, M., Desimone, M., Schwacke, R., Flügge, U.-I., Schumacher, K., Frommer, W.B.** (2003) Identification of an *Arabidopsis* mitochondrial succinate-fumarate translocator. *FEBS Letters* **534**, 87-92.
- Chen, R.D., Gadál, P.** (1990) Do the mitochondria provide the 2-oxoglutarate needed for glutamate synthesis in higher plant chloroplasts? *Plant Physiol Biochem* **28**, 141–145.
- Chen, Y., Baum, G., Fromm, H.** (1994) The 58-kD calmodulin-binding glutamate decarboxylase is a ubiquitous protein in petunia organs and its expression is developmentally regulated. *Plant Physiol* **106**, 1381-1387.
- Chen, Z., Gallie, D.R.** (2004) The ascorbic acid redox state controls guard cell signaling and stomatal movement. *Plant Cell* **16**, 1143–1162.

- Clifton, R., Lister, R., Parker, K.L., Sappl, P.G., Elhafez, D., Millar, A.H., Day, D.A., Whelan, J.** (2005) Stress-induced co-expression of alternative respiratory chain components in *Arabidopsis thaliana*. *Plant Mol Biol* **58**, 193–212.
- Collakova, E., DellaPenna, D.** (2003) Homogentisate phytyltransferase activity is limiting for tocopherol biosynthesis in *Arabidopsis*. *Plant Physiol* **131**, 632-642.
- Danna, C.H., Bartoli, C.G., Sacco, F., Ingala, L.R., Santa-Maria, G.E., Guiamet, J.J., Ugalde, R.A.** (2003) Thylakoid bound ascorbate peroxidase mutant exhibits impaired electron transport and photosynthetic activity. *Plant Physiol* **132**, 2116–2125.
- Davuluri, G.R., van Tuinen, A., Fraser, P.D., Manfredonia, A., Newman, R., Burgess, D., Brummell, D.A., King, S.R., Palys, J., Uhlig, J., Bramley, P.M., Pennings, H.M.J., Bowler, C.** (2005) Fruit-specific RNAi-mediated suppression of DET1 enhances carotenoid and flavonoid content in tomatoes. *Nature Biotech* **23**, 890-895.
- Deblaere, R., Bytebier, B., Degreve, H., Deboeck, F., Schell, J., van Montagu, M., Leemans, J.** (1985) Efficient octopine Ti-plasmid derived vectors for Agrobacterium-mediated gene transfere to plants. *Nucleic Acids Research* **13**, 4777-4788.
- Debnam, P.M., Fernie, A.R., Leisse, A., Golding, A., Bowsher, C.G., Grimshaw, C., Knight, J.S., Emes, M.J.** (2004) Altered activity of the P2 isoform of plastidic glucose 6-phosphate dehydrogenase in tobacco (*Nicotiana tabacum* cv. Samsun) causes changes in carbohydrate metabolism and response to oxidative stress in leaves. *Plant J* **38**, 49-59.
- Degenkolbe, T., Hannah, M., Freund, S., Hincha, D.K., Heyer, A.G., Köhl, K.** (2005) A quality-controlled microarray method for gene expression profiling. *Anal Biochem* **346**, 217-224.
- DellaPenna, D., Last, R.L.** (2006) Progress in dissection and manipulation of plant vitamin E biosynthesis. *Physiol Plant* **126**, 356-368.
- DellaPenna, D., Pogson, B.** (2006) Vitamin synthesis in plants: tocopherols and carotenoids. *Annu Rev Plant Biol* **57**, 711-738.
- Dixon, R.A.** (1999) Plant natural products: the molecular genetic basis of biosynthetic diversity. *Curr Opin Biotech* **10**, 192-197.
- Doganlar, S., Frary, A., Daunay, M.C., Lester, R.N., Tanksley, S.D.** (2002) A comparative genetic linkage map of eggplant (*Solanum melongena*) and its implications for genome evolution in the Solanaceae. *Genetics* **161**, 1697-1711.

- Douce, R., Neuberger, M.** (1989) The uniqueness of plant mitochondria. *Annu Rev Plant Physiol Plant Mol Biol* **40**, 371–414.
- Drager, D. B., Debrosses-Fonrouge, A. G., Krach, C., Chardonnens, A N, Meyer, R C; Saumitou-Laprade P.; Kramer, U.** (2004) Two genes encoding *Arabidopsis halleri* MTP1 metal transport proteins co-segregate with zinc tolerance and account for high MTP1 transcript levels. *Plant J* **39**, 425-439.
- Dry, I.B., Day, D.A., Wiskich, J.T.** (1983) Preferential oxidation of glycine by the respiratory chain in pea leaf mitochondria. *FEBS Lett* **158**, 154–158.
- Dry, I.B., Wiskich, J.T.** (1982) Role of the external ATP/ADP ratio in the control of plant mitochondrial respiration. *Arch Biochem Biophys* **217**, 72–79.
- Dubois, F., Tercé-Laforgue, T., Gonzales-Moro, M.-B., Estavillo, J.-M., Sangwan, R., Gallais, A., Hirel, B.** (2003) Glutamate dehydrogenase in plants: is there a new story for an old enzyme? *Plant Physiol and Biochem* **41**, 565-576.
- Dutilleul, C., Driscoll, S., Cornic, G., De Paepe, R., Foyer, C.H., Noctor, G.** (2003) Functional mitochondrial complex I is required for optimal photosynthetic performance in photorespiratory conditions and during transients. *Plant Physiol* **131**, 264–275.
- Dutilleul, C., Lelarge, C., Prioul, J.L., De Paepe, R., Foyer, C.H., Noctor, G.** (2005) Mitochondria-Driven Changes in Leaf NAD Status Exert a Crucial Influence on the Control of Nitrate Assimilation and the Integration of Carbon and Nitrogen Metabolism. *Plant Physiol* **139**, 64-78.
- Eastmond, P.J., Graham, I.A.** (2001) Re-examining the role of glyoxylate cycle in oilseeds. *Trends Plant Sci* **6**, 72-77.
- Eckhardt, U., Grimm, B., Hörtensteiner, S.** (2004) Recent advances in chlorophyll biosynthesis and breakdown in higher plants. *Plant Mol Biol* **56**, 1-14.
- Emanuelsson, O., Nielsen, H., Brunak, S., von Heijne, G.** (2000) Predicting subcellular localization of proteins based on their N-terminal amino acid sequence. *J Mol Biol* **300**, 1005-1016.
- Emmerlich, V., Linka, N., Reinhold, T., Hurth, M.A., Traub, M., Martinoia, E., Neuhaus, H.E.** (2003) The plant homolog to the human sodium/dicarboxylic cotransporter is the vacuolar malate carrier. *Proc Natl Acad Sci USA* **100**, 11122–11126.

- Escobar, M.A., Geisler, D.A., Rasmusson, A.G.** (2006) Reorganization of the alternative pathways of the *Arabidopsis* respiratory chain by nitrogen supply: opposing effects of ammonium and nitrate. *Plant J* **45**, 775-788.
- Eshed, Y., Zamir, D.** (1994) A genomic library of *Lycopersicon pennellii* in *L. esculentum*: A tool for fine mapping of genes. *Euphytica* **79**, 175-179.
- Ewing, R.M., Kahla, A.B., Poirot, O., Lopez, F., Audic, S., Claverie, J.M.** (1999) Large-scale statistical analysis of rice ESTs reveal correlated patterns of gene expression. *Genome Res* **9**, 950-959.
- Fatland, B.L., Nikolau, B.J., Wurtele, E.S.** (2005) Reverse genetic characterization of cytosolic acetyl-CoA generation by ATP-citrate lyase in *Arabidopsis*. *Plant Cell* **17**, 182-203.
- Fei, Z., Tang, X., Alba, R.M., White, J.A., Ronning, C.M., Martin G.B., Tanksley, S.D., Giovannoni, J.J.** (2004) Comprehensive EST analysis of tomato and comparative genomics of fruit ripening. *Plant J* **40**, 47-59.
- Fernie, A.R., Trethewey, R.N., Krotzky, A., Willmitzer, L.** (2004b) Metabolic profiling: from diagnostics to systems biology. *Nat Rev Mol Cel Biol* **5**, 763-769.
- Fernie, A.R.; Carrari, F.; Sweetlove, L.** (2004a) Respiratory metabolism: glycolysis, the TCA cycle and mitochondrial electron transport chain. *Curr Opin Plant Biol* **7**, 254-261.
- Fieuw, S., Müller-Röber, B., Gálvez, S., Willmitzer, L.** (1995) Cloning and expression analysis of the cytosolic NADP⁺-dependent isocitrate dehydrogenase from potato. *Plant Physiol* **107**, 905–913.
- Fillatti, J.J., Kiser, J., Rose, R., Comai, L.** (1987) Efficient transfere of a glyphosate tolerance gene into tomato using a binary *Agrobacterium tumefaciens* vector. *Biotech* **5**, 726-730.
- Fraser, M.E., James, M.N.G., Bridger, W.A., Wolodko, W.T.** (1999) A detailed structural description of *Escherichia coli* succinyl-CoA synthetase. *J Mol Biol* **285**, 1633-1653.
- Fridman, E., Carrari, F., Liu, Y.S., Fernie, A.R., Zamir, D.** (2004) Zooming-in on a quantitative trait nucleotide (QTN) for tomato yield using wild species introgression lines. *Science* **305**, 1786–1789.
- Fridman, E., Wang, J., Iijima, Y., Froehlich, J.E., Gang, D.R., Ohlrogge, J., Pichersky, E.** (2005) Metabolic, genomic, and biochemical analyses of glandular

- trichomes from the wild tomato species *Lycopersicon hirsutum* identify a key enzyme in the biosynthesis of methylketones. *Plant Cell* **17**, 1252-1267.
- Galtier, N., Foyer, C.H., Huber, J., Voelker, T.A., Huber, S.C.** (1993) Effects of elevated sucrose phosphate synthase activity on photosynthesis, assimilate partitioning, and growth in tomato (*Lycopersicon esculentum* var UC82B). *Plant Physiol* **101**, 535–543.
- Gálvez, S., Hodges, M., Decottignies, P., Bismuth, E., Lancien, M., Sangwan, R.S., Dubois, F., LeMaréchal, P., Crétin, C., Gadal, P.** (1996) Identification of a tobacco cDNA encoding a cytosolic NADP-isocitrate dehydrogenase. *Plant Mol Biol* **30**, 307–320.
- Gálvez, S., Lancien, M., Hodges, M.** (1999) Are isocitrate dehydrogenases and 2-oxoglutarate involved in the regulation of glutamate synthesis? *Trends Plant Sci* **4**, 484–490.
- García, I., Rodgers, M., Lenne, C., Rolland, A., Sailland, A., Matringe, M.** (1997) Subcellular localization and purification of a p-hydroxyphenylpyruvate dioxygenase from cultured carrot cells and characterization of the corresponding cDNA. *Biochem J* **325**, 761-769.
- Gardeström, P.** (1987) Adenylate ratios in the cytosol, chloroplasts and mitochondria of barley leaf protoplasts during photosynthesis at different carbon dioxide concentrations. *FEBS Lett* **212**, 114-118
- Gardeström, P., Igamberdiev, A.U., Raghavendra, A.S.** (2002) Mitochondrial functions in the light and significance to carbon-nitrogen interactions. In: Foyer, C.H., Noctor, G. (eds) *Photosynthetic nitrogen assimilation and associated carbon and respiratory metabolism*, Kluwer Academic Publishers, Dordrecht, pp. 151-172.
- Gardeström, P., Wigge B.** (1988) Influence of photorespiration on ATP/ADP ratios in the chloroplasts, mitochondria, and cytosol, studied by rapid fractionation of barley (*Hordeum vulgare*) protoplasts. *Plant Physiol* **88**, 69–76.
- Geigenberger, P., Regierer, B., Nunes-Nesi, A., Leisse, A., Urbanczyk-Wochniak, E., Springer, F., van Dongen, J.T., Kossmann, J., Fernie, A.R.** (2005) Inhibition of de novo pyrimidine synthesis in growing potato tubers leads to a compensatory stimulation of the pyrimidine salvage pathway and a subsequent increase in biosynthetic performance. *Plant Cell* **17**, 2077-2088.

- Gemel, J., Randall, D.D.** (1992) Light regulation of leaf mitochondrial pyruvate dehydrogenase complex. Role of photorespiratory carbon metabolism. *Plant Physiol* **100**, 908–914.
- Gerbaud, A., Andre, M.** (1980) Effect of CO₂, O₂ and light on photosynthesis and photorespiration in wheat. *Plant Physiol* **66**, 1032-1036.
- Gibon, Y., Blaesing, O.E., Hannemann, J., Carillo, P., Höhne, M., Hendricks, J.H.M., Palacios, N., Cross, J., Selbig, J., Stitt, M.** (2004) A robot-based platform to measure multiple enzyme activities in *Arabidopsis* using a set of cycling assays: comparison of changes of enzyme activities and transcript levels during diurnal cycles and in prolonged darkness. *Plant Cell* **16**, 3304-3325.
- Gibon, Y., Vigeolas, H., Tiessen, A., Geigenberger, P., Stitt, M.** (2002) Sensitive and high throughput metabolite assays for inorganic pyrophosphate, ADPGlc, nucleotide phosphates, and glycolytic intermediates based on a novel cycling system. *Plant J* **30**, 221-235.
- Giege, P., Heazlewood, J.L., Roessner-Tunali, U., Millar, A.H., Fernie, A.R., Leaver, C.J., Sweetlove, L.J.** (2003) Enzymes of glycolysis are functionally associated with the mitochondrion in *Arabidopsis* cells. *Plant Cell* **15**, 2140–2151.
- Gilmore, A.M.** (1997) Mechanistic aspects of xanthophyll cycle-dependent photoprotection in higher plant chloroplast and leaves. *Physiol Plant* **99**, 197–209.
- Giovannoni, J.** (2001) Molecular biology of fruit maturation and ripening. *Annu Rev Plant Physiol Plant Mol Biol* **52**, 725-749.
- Goossens, A., Häkkinen, S.T., Laakso, I., Seppänen-Laakso, T., Biondi, S., DeSutter, V., Lammertyn, F., Nuutila, A.M., Söderlund, H., Zabeau, M., Inzé, D., Oksman-Caldentey, K.-M.** (2003) A functional genomics approach toward the understanding of secondary metabolism in plant cells. *Proc Natl Acad Sci U S A* **100**, 8595-8600.
- Graham, D.** (1980) Effects of light on "dark" respiration. In Davies, D.D. (ed). *Biochemistry of Plants*, Vol. 2. Academic Press, New York, pp 525–579.
- Hampp, R., Goller, M., Ziegler, H.** (1982) Adenylate levels, energy charge, and phosphorylation potential during dark-light and light-dark transition in chloroplasts, mitochondria, and cytosol of mesophyll protoplasts from *Avena sativa* L. *Plant Physiol* **69**, 448-55.
- Hanahan, D.** (1983) Studies on transformation of *Escherichia coli* with plasmids. *J Exp Bot* **166**, 557-580.

- Hanning, I., Heldt, H.W.** (1993) On the function of mitochondrial metabolism during photosynthesis in spinach leaves (*Spinacia oleracea* L.). Partitioning between respiration and export of redox equivalents and precursors for nitrate assimilation products. *Plant Physiol* **103**, 1147-1154.
- Hanson, K.R.** (1992) Evidence for mitochondrial regulation of photosynthesis by a starchless mutant of *Nicotiana sylvestris*. *Plant Physiol* **99**, 276-283.
- Hatch, M.D., Dröscher, L., Flügge, U.I., Heldt, H.W.** (1984) A specific translocator for oxaloacetate transport in chloroplasts. *FEBS Lett* **178**, 15-19.
- Heber, U., Heldt, H.W.** (1981) The chloroplast envelope: structure, function and role in leaf metabolism. *Annu Rev Plant Physiol* **32**, 139-168.
- Heineke, D., Riens, B., Gross, H., Hoferichter, P., Peter, U., Flügge, U.I., Heldt, H.W.** (1991) Redox transfer across the inner chloroplast envelope membrane. *Plant Physiol* **95**, 1131-1137.
- Heldt, H.W.** (1969) Adenine nucleotide translocation in spinach chloroplasts. *FEBS Lett* **5**, 11-14.
- Heldt, H.W., Flügge, U.I.** (1987) Subcellular Transport of Metabolites in Plant Cells. In: Stumpf, P.K., Conn, E.E. (eds), *The biochemistry of Plants*, Academic Press, New York, pp. 49-85.
- Henkes, S., Sonnewald, U., Badur, R., Flachmann, R., Stitt, M.** (2001) A small of plastid transketolase activity in antisense tobacco transformants has dramatic effects on photosynthesis and phenylpropanoid metabolism. *Plant Cell* **13**, 535-551.
- Herald, V.L., Haezelewood, J.L., Day, D.A., Millar, A.H.** (2003) Proteomic identification of divalent metal cation binding proteins in plant mitochondria. *FEBS Letters* **537**, 96-100.
- Herrmann, K.M., Weaver, L.M.** (1999) The shikimate pathway. *Annu Rev Plant Physiol Plant Mol Biol* **50**, 473-503.
- Hill, S.A.** (1997) Carbon metabolism in mitochondria. In: Dennis, D.T., Turpin, D.H., Lefebvre, D.D., Layzell, D.B. (eds), *Plant Metabolism*, vol. 2. Longman, Harlow, UK, pp. 181-199.
- Hirai, M.Y., Yano, M.: Goodenowe, D.B., Kanaya, S., Kimura, T., Awazuhara, M., Arita, M., Fujiwara, T., Saito, K.** (2004) Integration of transcriptomics and metabolomics for understanding of global responses to nutritional stresses in *Arabidopsis thaliana*. *Proc Natl Acad Sci USA* **101**, 10205-10210.

- Hirschberg, J.** (1999) Production of high-value compounds: carotenoids and vitamin E. *Curr Opin Biotech* **10**, 186-191.
- Hedges, M.** (2002) Enzyme redundancy and the importance of 2-oxoglutarate in plant ammonium assimilation. *J Exp Bot* **53**, 905–916.
- Hedges, M., Flesch, V., Gálvez, S., Bismuth, E.** (2003) Higher plant NADP⁺-dependent isocitrate dehydrogenases, ammonium assimilation and NADPH production. *Plant Physiol Biochem* **41**, 577–585.
- Hoefnagel, M.H.N., Atkin, O.K., Wiskich, J.T.** (1998) Interdependence between chloroplasts and mitochondria in the light and in the dark. *Biochim Biophys Acta* **1366**, 235-255.
- Höfgen, R., Willmitzer, L.** (1990) Biochemical and genetic analysis of different patatin isoforms expressed in various organs of potato (*Solanum tuberosum*). *Plant Sci* **66**, 221-230.
- Hrazdina, G., Jensen, R.A.** (1992) Spatial organization of enzymes in plant metabolic pathways. *Annu Rev Plant Physiol Plant Mol Biol* **43**, 241-267.
- Hurry, V.M., Tobiæson, M., Krömer, S., Gardeström, P., Öquist, G.** (1995) Mitochondria contribute to increased photosynthetic capacity of leaves of winter rye (*Secale cereale* L.) following cold-hardening. *Plant Cell Environ* **18**, 69–76.
- Igamberdiev, A.U., Gardeström, P.** (2003) Regulation of NAD- and NADP-isocitrate dehydrogenase by reduction levels of pyridine nucleotides in mitochondria and cytosol of pea leaves. *Biochim Biophys Acta* **1606**, 117-125.
- Igamberdiev, A.U., Hurry, V., Krömer, S., Gardeström, P.** (1998) The role of mitochondrial electron transport during photosynthetic induction. A study with barley (*Hordeum vulgare*) protoplasts incubated with rotenone and oligomycin. *Physiol Plant* **104**, 431–439.
- Ishizaki, K., Larson, T.R., Schauer, N., Fernie, A.R., Graham, I.A., Leaver, C.J.** (2005) The Critical Role of Arabidopsis Electron-Transfer Flavoprotein:Ubiquinone Oxidoreductase during Dark-Induced Starvation. *Plant Cell* **17**, 2587-2600.
- Johnson, J.D., Mehus, J.G., Tews, K., Milavetz, B.I., Lambeth, D.O.** (1998) Genetic evidence for the expression of ATP- and GTP-specific succinyl-CoA synthetase in multicellular eucaryotes. *J Biol Chem* **273**, 27580-27586.

- Journet, E.P., Neuburger, M., Douce, R.** (1981) The role of glutamate oxaloacetate transaminase and malate dehydrogenase in the regeneration of NAD⁺ for glycine oxidation by spinach leaf mitochondria. *Plant Physiol* **67**, 467–469.
- Kampfenkel, K., Van Montagu, M., Inze, D.** (1995) Extraction and determination of ascorbate and dehydroascorbate from plant tissue. *Analytical Biochemistry* **225**, 165–167.
- Karimi, M., Inze, D., Depicker, A.** (2002) GATEWAY vectors for *Agrobacterium*-mediated plant transformation. *Trends Plant Sci* **7**, 193-195.
- Kaufman, S., Alivisatos, S.G.A.** (1955) Purification and properties of the phosphorylating enzyme from spinach. *J Biol Chem* **216**, 141-152.
- Keller, Y., Bouvier, F., D'Harlingue, A., Camara, B.** (1998) Metabolic compartmentation of plastid prenyllipid biosynthesis: Evidence for the involvement of a multifunctional geranylgeranyl reductase. *Eur J Biochem* **251**, 413-417.
- Kennedy, E.P., Lehninger, A.L.** (1949) Oxidation of fatty acids and the tricarboxylic acid cycle intermediates by isolated rat liver mitochondria. *J Biol Chem* **179**, 957-972.
- Kiddle, G., Pastori, G.M., Bernard, S., Pignocchi, C., Antoniw, J., Verrier, P.J., Foyer, C.H.** (2003) Effects of leaf ascorbate content on defence and photosynthesis gene expression in *Arabidopsis thaliana*. *Antioxid Redox Signal* **5**, 23–32.
- Kirschbaum, M.U.F., Farquhar, G.D.** (1987) Investigation of the CO₂ dependence of quantum yield and respiration in *Eucalyptus pauciflora*. *Plant Physiol* **83**, 1032–1036.
- Knapp, S.** (2002) Tobacco and tomatoes: a phylogenetic perspective on fruit diversity in the Solanaceae. *J Exp Bot* **53**, 2001-2022.
- Knight, M.R., Campbell, A.K., Smith, S.M., Trewavas, A.J.** (1991) Transgenic plant aequorin reports the effect of touch and cold shock and elicitors on cytoplasmic calcium. *Nature* **352**, 524-526.
- Kolbe, A., Fernie, A.R., Oliver, S., Stitt, M., van Dongen, J.T., Geigenberger, P.** (2006) Combined transcript + metabolic profiling of arabidopsis leaves reveals fundamentals effects of thiol modification on plant metabolism. *Plant Physiol (Provisionally accepted)*
- Koncz, C., Schell, J.** (1986) The promoter of TL-DNA gene 5 controls the tissue-specific expression of chimaeric genes carried by a novel type of *Agrobacterium* binary vector. *Molecular and General Genetics* **204**, 383-396.

- Koyama, H., Kawamura, A., Kihara, T., Hara, T., Takita, E., Shibata, D.** (2000) Overexpression of mitochondrial citrate synthase in *Arabidopsis thaliana* improved growth on a phosphorus-limited soil. *Plant Cell Physiol* **41**, 1030-1037.
- Krebs, H.A. Johnson, W.A.** (1937) The role of citric acid in intermediate metabolism in animal tissues. *Enzymology* **4**, 148-156.
- Krömer, S.** (1995) Respiration during photosynthesis. *Annu Rev Plant Physiol Plant Mol Biol* **46**, 45–70.
- Krömer, S., Heldt, H.W.** (1991) On the role of mitochondrial oxidative phosphorylation in photosynthesis metabolism as studied by the effect of oligomycin on photosynthesis in protoplasts and leaves of barley. *Plant Physiol* **95**, 1270–1276.
- Krömer, S., Malmberg, G., Gardeström, P.** (1993) Mitochondrial contribution to photosynthetic metabolism. *Plant Physiol* **102**, 947–955.
- Krömer, S., Scheibe, R.** (1996) Function of the chloroplastic malate valve for respiration during photosynthesis. *Biochem Soc Trans* **24**, 761–766.
- Krömer, S., Stitt, M., Heldt, H.W.** (1988) Mitochondrial oxidative phosphorylation participating in photosynthetic metabolism of a leaf cell. *FEBS Lett* **226**, 352–356.
- Kruft, V., Eubel, H., Jänsch, L., Werhahn, W., Braun, H.-P.** (2001) Proteomic approach to identify novel mitochondrial proteins in *Arabidopsis*. *Plant Physiol* **127**, 1694-1710.
- Kruse, A., Fieuw, S., Heineke, D., Müller-Röber, B.** (1998) Antisense inhibition of cytosolic NADP-dependent isocitrate dehydrogenase in transgenic potato plants. *Planta* **205**, 82-91.
- Kumar, S., Tamura, K., Jakobsen I.B., Nei, M.** (2001) MEGA2: molecular evolutionary genetics analysis software. *Bioinformatics* **17**, 1244-1245.
- Lambeth, D.O., Tews, K.N., Adkins, S., Frohlich, D., Milavetz, I.** (2004) Expression of two Succinyl-CoA synthetases with different nucleotide specificities in mammalian tissues. *J Biol Chem* **279**, 36621-36624.
- Lancien, M., Ferrario-Mery, S., Roux, V., Bismuth, E., Masclaux, C., Hirel, B., Gadal, P., Hedges, M.** (1999) Simultaneous expression of NAD-dependent isocitrate dehydrogenase and other Krebs cycle genes after nitrate resupply to short-term nitrogen-starved tobacco. *Plant Physiol* **120**, 717-725.

- Lancien, M., Gadal, P., Hedges, M.** (1998) Molecular characterization of higher plant NAD-dependent isocitrate dehydrogenase: evidence of a heteromeric structure by complementation of yeast mutants. *Plant J* **16**, 325-333.
- Landschütze, V., Willmitzer, L., Müller-Röber, B.** (1995) Inhibition of flower formation by antisense repression of mitochondrial citrate synthase in transgenic potato plants leads to a specific disintegration of the ovary tissue of flowers. *EMBO J* **14**, 660-666.
- Lieman-Hurwitz, J., Rachmilevitch, S., Mittler, R., Marcus, Y., Kaplan, A.** (2003) Enhanced photosynthesis and growth of transgenic plants that express *ictB*, a gene involved in HCO_3^- accumulation in cyanobacteria. *Plant Biotechnol J* **1**, 43–50.
- Linka, M., Weber, A.P.M.** (2005) Shuffling ammonia between mitochondria and plastids during photorespiration. *Trends Plant Sci* **10**, 461–465.
- Livingstone, K.D., Lackney, V.K., Blauth, J.R., van Wijk, R., Jahn, M.** (1999) Genome mapping in *Capsicum* and the evolution of genome structure in the Solanaceae. *Genetics* **152**, 1183-1202.
- Logan, D.C., Scott, I., Tobin, A.K.** (2003) The genetic control of plant mitochondrial morphology and dynamics. *Plant J* **36**, 5000-509.
- Lytovchenko, A., Sweetlove, L.J., Pauly, M., Fernie, A.R.** (2002) The influence of cytosolic phosphoglucomutase on photosynthetic carbohydrate metabolism. *Planta* **215**, 1013–1021.
- Mackenzie, S., McIntosh, L.** (1999) Higher plant mitochondria. *Plant Cell* **11**, 571-585.
- Maher, E.A., Bate, N.J., Ni, W., Elkind, Y., Dixon, R.A., Lamb, C.J.** (1994) Increased disease susceptibility of transgenic tobacco plants with suppressed levels of preformed phenylpropanoid products. *Proc Natl Acad Sci USA* **91**, 7802-7806.
- Masclaux, C., Valadier, M-H., Brugiére, N., Morot-Gaudry, J-F., Hirel, B.** (2000) Characterization of the sink/source transition in tobacco (*Nicotiana tabacum* L.) shoots in relation to nitrogen management and leaf senescence. *Planta* **211**, 510–518.
- Mayne, S.T.** (1996) Beta-carotene, carotenoids, and disease prevention in humans. *FASEB J* **10**, 690-701.
- Michalecka, A.M., Svensson, A.S., Johansson, F.I., Agius, S.C., Johanson, U., Brennicke, A., Binder, S., Rasmusson, A.G.** (2003) Arabidopsis genes encoding mitochondrial type II NAD(P)H dehydrogenases have different evolutionary origin and show distinct responses to light. *Plant Physiol* **133**, 642–65.

- Millar, A.H., Leaver, C.J., Hill, S.A.** (1999b) Characterization of the dihydrolipoamide acetyltransferase of the mitochondrial pyruvate dehydrogenase complex from potato and comparisons with similar enzymes in diverse plant species. *Eur J Biochem* **264**, 973-981.
- Millar, A.H., Heazlewood, J.L., Kristensen, B.K., Braun, H.P., Møller, I.M.** (2005) The plant mitochondrial proteome. *Trends Plant Sci* **10**, 36–43.
- Millar, A.H., Hill, S.A., Leaver, C.J.** (1999a) Plant mitochondrial 2-oxoglutarate dehydrogenase complex: purification and characterization in potato. *Biochem J* **343**, 327-334.
- Millar, A.H., Knorr, C., Leaver, C.J., Hill, S.A.** (1998) Plant mitochondrial pyruvate dehydrogenase complex: purification and identification of catalytic components of potato. *Biochem J* **334**, 571–576.
- Millar, A.H., Leaver, C.J.** (2000) The cytotoxic lipid peroxidation product, 4-hydroxy-2-nonenal, specifically inhibits decarboxylating dehydrogenases in the matrix of plant mitochondria. *FEBS Lett* **481**, 117-121.
- Millar, A.H., Sweetlove, L.J., Giegé, P., Leaver, C.** (2001) Analysis of the *Arabidopsis* mitochondrial proteome. *Plant Physiol* **127**, 1711-1727.
- Miller, J.F., Dower, W.J., Tompkins, L.S.** (1988) High-voltage electroporation of bacteria: genetic transformation of *Campylobacter jejuni* with plasmid DNA. *Proc Natl Acad Sci USA* **85**, 856-860.
- Miyagawa, Y., Tamoi, M., Shigeoka, S.** (2001) Overexpression of a cyanobacterial fructose-1,6-/sedoheptulose-1,7-bisphosphatase in tobacco enhances photosynthesis and growth. *Nat Biotechnol* **19**, 965–969.
- Møller, I.M., Lin, W.** (1986) Membrane-bound NAD(P)H dehydrogenases in higher plant cells. *Annu Rev Plant Physiol* **37**, 309–334.
- Morikawa, T., Mizutani, M., Aoki, N., Watanabe, B., Saga, H., Saito, S., Oikawa, A., Suzuki, H., Sakurai, N., Shibata, D., Wadano, A., Sakata, K., Ohta, D.** (2006) Cytochrome P450 CYP710A Encodes the Sterol C-22 Desaturase in *Arabidopsis* and Tomato. *Plant Cell* **18**, 1008-1022.
- Niyogi, K.K.** (1999) Photoprotection revisited: genetic and molecular approaches. *Annu Rev Plant Physiol Plant Mol Biol* **50**, 333–359.

- Niyogi, K.K., Grossman, A.R., Björkman, O.** (1998) Arabidopsis mutants define a central role for the xanthophyll cycle in the regulation of photosynthetic energy conversion. *Plant Cell* **10**, 1121–1134.
- Noctor, G., Dutilleul, C., De Paepe, R., Foyer, C.H.** (2004) Use of mitochondrial electron transport mutants to evaluate the effects of redox state on photosynthesis, stress tolerance and the integration of carbon / nitrogen metabolism. *J Exp Bot* **55**, 49-57.
- Noguchi, K., Terashima, I.** (2006) Responses of spinach leaf mitochondria to low N availability. *Plant Cell Environ* (in press).
- Norris, S.R., Shen, X., DellaPenna, D.** (1998) Complementation of the *Arabidopsis pds1* mutation with the gene encoding p-hydroxyphenylpyruvate dioxygenase. *Plant Physiol* **117**, 1317-1323.
- Nunes-Nesi, A., Carrari, F., Lytovchenko, A., Fernie, A.R.** (2005b) Enhancing crop yield in Solanaceous species through the genetic manipulation of energy metabolism. *Biochem Soc Trans* **33**, 1430–1434.
- Nunes-Nesi, A., Carrari, F., Lytovchenko, A., Smith, A.M.O., Ehlers-Loureiro, M., Ratcliffe, R.G., Sweetlove, L.J., Fernie, A.R.** (2005a) Enhanced photosynthetic performance and growth as a consequence of decreasing mitochondrial malate dehydrogenase activity in transgenic tomato plants. *Plant Physiol* **137**, 611-622.
- Obiadalla-Ali, H. Fernie, A.R., Kossmann, J., Lloyd, J.R.** (2004) Developmental analysis of carbohydrate metabolism in tomato (*Lycopersicon esculentum* cv. Micro-Tom) fruits. *Physiol Plant* **120**, 196-204.
- Ogihara, Y., Mochida, K., Nemoto, Y., Murai, K., Yamazaki, Y., Shin-I, T., Kohara, Y.** (2003) Correlated clustering and virtual display of gene expression patterns in the wheat life cycle by large-scale statistical analysis of expressed sequence tags. *Plant J* **33**, 1001-1011.
- Ogren, W.L.** (1984) Photorespiration: pathways, regulation, and modification. *Annu Rev Plant Biol* **35**, 415–442.
- Padmasree, K., Padmavathi, L., Raghavendra, A.S.** (2002) Essentiality of mitochondrial oxidative metabolism for photosynthesis: optimization of carbon assimilation and protection against photoinhibition. *Crit Rev Biochem Mol Biol* **37**, 71–119.

- Padmasree, K., Raghavendra, A.S.** (1999a) Importance of oxidative electron transport over oxidative phosphorylation in optimizing photosynthesis in mesophyll protoplasts of pea (*Pisum sativum* L.). *Physiol Plant* **105**, 546–553.
- Padmasree, K., Raghavendra, A.S.** (1999b) Response of photosynthetic carbon assimilation in mesophyll protoplasts to restriction on mitochondrial oxidative metabolism: metabolites related to the redox status and sucrose biosynthesis. *Photosynth Res* **62**, 231–239.
- Palanivelu, R., Brass, L., Edlund, A.F., Preuss, D.** (2003) Pollen tube growth and guidance is regulated by POP2, an *Arabidopsis* gene that controls GABA levels. *Cell* **114**, 47-59.
- Palmer, J.M., Wedding, R.T.** (1966) Purification and properties of succinyl-CoA synthetase from jerusalem artichoke mitochondria. *Biochim et Biophys Acta* **113**, 167-174.
- Palozza, P., Krinsky, N.I.** (1996) Antioxidant effects of carotenoids *in vivo* and *in vitro* – an overview. *Methods Enzymol* **213**, 403-420.
- Pastori, G.M., Kiddle, G., Antoniw, J., Bernard, S., Veljovic-Janovic, S., Verrier, P.J., Graham, N., Foyer, C.H.** (2003) Leaf vitamin C contents modulate plant defence transcripts and regulate genes that control development through hormone signaling. *Plant Cell* **15**, 939–951.
- Pellny, T.K., Ghannoum, O., Conroy, J.P., Schluemann, H., Smeekens, S., Andralojc, J., Krause, K.P., Goddijn, O., Paul, M.J.** (2004) Genetic modification of photosynthesis with *E. coli* genes for trehalose synthesis. *Plant Biotechnol J* **2**, 71–82.
- Peltier, G., Thibault, P.** (1985) O_2 uptake in the light in Chlamydomonas: evidence for persistent mitochondrial respiration. *Plant Physiol* **79**, 225-230.
- Plaxton, W.C.** (1996) The organization and regulation of plant glycolysis. *Annu Rev Plant Physiol Plant Mol Biol* **47**, 185-214.
- Plaxton, W.C., Podestà, F.E.** (2006) The functional organization and control of plant respiration. *Crit Rev Plant Sci* **25**, 1-40.
- Porfirova, S., Bergmüller, E., Tropf, S., Lemke, R., Dörmann, P.** (2002) Isolation of an *Arabidopsis* mutant lacking vitamin E and identification of a cyclase essential for all tocopherol biosynthesis. *Proc Natl Acad Sci USA* **99**, 12495-12500.

- Przybyla-Zawislak, B., Dennis, R.A., Zakharkin, S.O., McCammon, M.T.** (1998) Genes of succinyl-CoA ligase from *Saccharomyces cerevisiae*. *Eur J Biochem* **258**, 736-743.
- Purnell, M.P., Skopelitis, D.S., Roubelakis-Angelakis, K.A., Botella, J.R.** (2005) Modulation of higher-plant NAD(H)-dependent glutamate dehydrogenase activity in transgenic tobacco via alteration of beta subunit levels. *Planta* **222**, 167-180.
- Purnell, M.P., Stewart, G.R., Botella, J.R.** (1997) Cloning and characterisation of a glutamate dehydrogenase cDNA from tomato (*Lycopersicon esculentum* L.). *Gene* **186**, 249-254.
- R Development Core Team** (2004) R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna. <http://www.R-project.org> (February 1, 2005).
- Raghavendra, A.S., Padmasree, K.** (2003) Beneficial interactions of mitochondrial metabolism with photosynthetic carbon assimilation. *Trends Plant Sci* **8**, 546-553.
- Raghavendra, A.S., Padmasree, K., Saradadevi, K.** (1994) interdependence of photosynthesis and respiration in plant cells: interactions between chloroplasts and mitochondria. *Plant Sci* **97**, 1–14.
- Raghavendra, A.S., Reumann, S., Heldt, H.W.** (1998) Participation of mitochondrial metabolism in photorespiration. Reconstituted system of peroxisomes and mitochondria from spinach leaves. *Plant Physiol* **116**, 1333-1337.
- Rasmussen, A.G., Møller, I.M.** (1991) NAD(P)H dehydrogenases on the inner surface of the inner mitochondrial membrane studied using inside-out submitochondrial particles. *Physiol Plant* **83**, 357–365.
- Rasmussen, A.G., Svensson, A.S., Knoop, V., Grohmann, L., Brennicke, A.** (1999) Homologues of yeast and bacterial rotenone-insensitive NADH dehydrogenases in higher eukaryotes: two enzymes are present in potato mitochondria. *Plant J* **20**: 79–87
- Rébeillé, F., Gans, P., Chagvardieff, P., Pean, M., Tapie, P., Thibault, E.** (1988) Mass spectrometric determination of the inorganic carbon species assimilated by photoautotrophic cells of *Euphorbia characias* L. *J Biol Chem* **263**, 12373-12377.
- Regierer, B., Fernie, A.R., Springer, F., Perez-Melis, A., Leisse, A., Koehl, K., Willmitzer, L., Geigenberger, P., Kossmann, J.** (2002) Starch content and yield increase as a result of altering adenylate pools in transgenic plants. *Nat Biotechnol* **20**, 1256–1260.

- Renné, P., Dreßen, U., Hebbeker, U., Hille, A., Flügge, U-I., Westhoff, P., Weber, A.P.M.** (2003) The *Arabidopsis* mutant *dct* is deficient in the plastidic glutamate/malate translocator DiT2. *Plant J* **35**, 316–331.
- Reumann, S., Heupel, R., Heldt, H.W.** (1994) Compartmentation studies on spinach leaf peroxisomes. II. Evidence for the transfer of reductant from the cytosol to the peroxisomal compartment via a malate shuttle. *Planta* **193**, 167–173.
- Roessner-Tunali, U., Hegeman, B., Lytovchenko, A., Carrari, F., Bruedigam, C., Granot, D., Fernie, A.R.** (2003) Metabolic profiling of transgenic tomato plants overexpressing hexokinase reveals that the influence of hexose phosphorylation diminishes during fruit development. *Plant Physiol* **133**, 84-99.
- Ronning, C., Stegalkina, S., Ascenzi, R. et al.** (2003) Comparative analysis of potato expressed sequence tags libraries. *Plant Physiol* **131**, 419-429.
- Rontein, D., Dieuaide-Noubhani, M., Dufourc, E.J., Raymond, P., Rolin, D.** (2002) The metabolic architecture of plant cell: stability of central metabolism and flexibility of anabolic pathways during the growth cycle of tomato cells. *J Biol Chem* **277**, 43948-43960.
- Ryan, D.G., Lin,T., Brownie,E., Bridger,W.A., Wolodko,W.T.** (1997) Mutually exclusive splicing generates two distinct isoforms of pig heart succinyl-CoA synthetase. *J Biol Chem* **272**, 21151-21159.
- Sabar, M., De Paepe, R., de Kouchkovsky, Y.** (2000) Complex I impairment, respiratory compensations and photosynthetic decrease in nuclear and mitochondrial male sterile mutants of *Nicotiana sylvestris*. *Plant Physiol* **124**, 1239–1249.
- Saitou, N., Nei, M.** (1987) The neighbor-joining method: A new method for reconstructing phylogenetic trees. *Mol Biol Evol* **4**, 406-425.
- Sambrook, J., Fritsch, E.F., Maniatis, T.** (1989) Extraction, purification, and analysis of messenger RNA from eukaryotic cells. In: Ford, N., Nolan, C., Ferguson, M. (eds), *Molecular cloning A Laboratory Manual*, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, pp.7.3-7.83.
- Saradadevi, K., Raghavendra, A.S.** (1992) Dark respiration protects photosynthesis against photoinhibition in mesophyll protoplasts of pea (*Pisum sativum*). *Plant Physiol* **99**, 1232–1237.

- Saradadevi, K., Raghavendra, A.S.** (1994) Inhibition of photosynthesis by osmotic stress in pea (*Pisum sativum*) mesophyll protoplasts is intensified by chilling or photoinhibitory light: intriguing responses of respiration. *Plant Cell Environ* **17**, 739–746.
- Satyanarayan, V., Nair, P.M.** (1986) Enhanced operation of 4-aminobutyrate shunt in γ -irradiated potato tubers. *Phytochem* **25**, 1801-1805.
- Satyanarayan, V., Nair, P.M.** (1990) Metabolism, enzymology and possible roles of 4-aminobutyrate in higher plants. *Phytochem* **29**, 367-375.
- Schauer, N., Semel, Y., Roessner, U., Gur, A., Balbo, I., Carrari, F., Pleban, T., Perez-Melis, A., Bruedigam, C., Kopka, J., Willmitzer, L., Zamir, D., Fernie, A.R.** (2006) Genetics of metabolite content in fruits of interspecific introgressions of tomato. *Nat Biotechnol (in press)*.
- Schauer, N., Zamir, D., Fernie, A.R.** (2005) Metabolic profiling of leaves and fruit of wild species tomato: a survey of the *Solanum lycopersicum* complex. *J Exp Bot* **56**, 297–307.
- Scheibe, R.** (2004) Malate valves to balance cellular energy supply. *Physiol Plant* **120**, 21–26.
- Scheibe, R., Backhausen, J.E., Emmerlich, V., Holtgrefe, S.** (2005) Strategies to maintain redox homeostasis during photosynthesis under changing conditions. *J Exp Bot* **56**, 1481-1489.
- Scheible, W.R., Gonzalez-Fontes, A., Lauerer, M., Müller-Röber, B., Caboche, M., Stitt, M.** (1997) Nitrate acts as a signal to induce organic acid metabolism and repress starch metabolism in tobacco. *Plant Cell* **9**, 783–798.
- Schiestl, R.H., Gietz, R.D.** (1989) High efficiency transformation of intact yeast cells using single stranded nucleic acids as a carrier. *Curr Genet* **16**, 339-346.
- Schnarrenberger, C., Martin, W.** (2002) Evolution of the enzymes of the citric acid cycle and the glyoxylate cycle of higher plants – a case study of endosymbiotic gene transfer. *Eur J Biochem* **269**, 868-883.
- Schuller, K.A., Randall, D.D.** (1989) Regulation of pea mitochondrial pyruvate dehydrogenase complex. *Plant Physiol* **89**, 1207-1212.
- Schultz, C.J., Hsu, M., Miesak, B., Coruzzi, G.M.** (1998) *Arabidopsis* mutants define an *in vivo* role for isoenzymes of aspartate aminotransferase in plant nitrogen assimilation. *Genetics* **149**, 491–499.

- Sharp, R.E., Matthews, M.A., Boyer, J.S.** (1984) Kok effect and the quantum yield of photosynthesis: light partially inhibits dark respiration. *Plant Physiol* **75**, 95–101.
- Shaw, J.M., Nunnari, J.** (2002) Mitochondrial dynamics and division in budding yeast. *Trends Cell Biol* **12**, 178-184.
- Shelp, B.J., Bown, A.W., McLean, M.D.** (1999) Metabolism and functions of gamma-aminobutyric acid. *Trends Plant Sci* **4**, 446-452.
- Shelp, B.J., Walton, C.S., Snedden, W.A., Tuin, L.G., Oresnik, I.J., Layzell, D.B.** (1995) GABA shunt in developing soybean seeds is associated with hypoxia. *Physiol Plant* **94**, 219-228.
- Shintani, D., DellaPenna, D.** (1998) Elevating the vitamin E content of plants through metabolic engineering. *Science* **282**, 2098-2100.
- Siedow, J., Day, D.A.** (2000) Respiration and photorespiration. In: Buchanan, B.B., Gruissem, W., Jones, R.L. (eds) *Biochemistry and molecular biology of plants*. American Society of Plant Biologists, Rockville, M.D., pp 676-728.
- Small, I., Peeters, N., Legeai, F., Lurin, C.** (2004) Predotar: A tool for rapidly screening proteomes for N-terminal targeting sequences. *Proteomics* **4**, 1581-1590.
- Smirnoff, N.** (2000) Ascorbate biosynthesis and function in photoprotection. *Philos Trans R Soc Lond B Biol Sci* **355**, 1455–1464.
- Smirnoff, N., Wheeler, G.L.** (2000) Ascorbic acid in plants: biosynthesis and function. *Crit Rev Plant Sci* **19**, 267–290.
- Smith, A.M.O., Ratcliffe, R.G., Sweetlove, L.J.** (2004) Activation and function of mitochondrial uncoupling protein in plants. *J Biol Chem* **279**, 51944–51952.
- Snedden, W.A., Arazi, T., Fromm, H., Shelp, B.J.** (1995) Calcium/calmodulin activation of soybean glutamate decarboxylase. *Plant Physiol* **108**, 543-549.
- Snedden, W.A., Fromm, H.** (1999) Regulation of the γ -aminobutyrate-synthesizing enzyme, glutamate decarboxylase, by calcium-calmodulin: a mechanism for rapid activation response to stress. In: Lerner, H.R (ed), *Plant responses to environmental stresses: From phytohormones to genome reorganization*, Marcel Dekker, Inc, pp. 549-547.
- Söling, H.-D., Rescher, C.** (1985) On the regulation of cold-labile cytosolic and of mitochondrial acetyl-CoA hydrolase in rat liver. *Eur J Biochem* **147**, 111-117.

- Stark, D.M., Timerman, K.P., Barry, G.F., Preiss, J., Kishore, G.M.** (1992) Regulation of the amount of starch in plant tissues by ADP glucose pyrophosphorylase. *Science* **258**, 287–292.
- Steinbauer, D., Usadel, B., Luedemann, A., Thimm, O., Kopka, J.** (2004) CSB.DB: a comprehensive systems-biology database. *Bioinformatics* **20**, 3647 - 3651.
- Stitt, M.** (1999) Nitrate regulation of metabolism and growth. *Curr Opin Plant Biol* **2**, 178–186.
- Stitt, M., McC Lilley, R., Heldt, H.W.** (1982) Adenine nucleotide levels in the cytosol, chloroplasts, and mitochondria of wheat leaf protoplasts. *Plant Physiol* **70**, 971–977.
- Suzuki, H., Reddy, M.S., Naoumkina, M., Aziz, N., May, G.D., Huhman, D.V., Sumner, L.W., Blount, J.W., Mendes, P., Dixon, R.A.** (2005) Methyl jasmonate and yeast elicitor induce differential transcriptional and metabolic re-programming in cell suspension cultures of the model legume *Medicago truncatula*. *Planta* **220**, 696-707.
- Svensson, A.S., Rasmusson, A.G.** (2001) Light-dependent gene expression for proteins in the respiratory chain of potato leaves. *Plant J* **28**, 73–82.
- Sweetlove, L.J., Fernie, A.R.** (2005) Regulation of metabolic networks: understanding metabolic complexity in the systems biology era. *New Phytol* **168**, 9-24.
- Sweetlove, L.J., Heazelwood, J.L., Herald, V., Holtzapffel, R., Day, D.A., Leaver, C.J., Millar, A.H.** (2002) The impact of oxidative stress on *Arabidopsis* mitochondria. *Plant J* **32**, 891-904.
- Sweetlove, L.J., Kossmann, J., Riesmeier, J.W., Trethewey, R.N., Hill, S.A.** (1998) The control of source to sink carbon flux during tuber development in potato. *Plant J* **15**, 697–706.
- Taira, M., Valtersson, U., Burkhardt, B., Ludwig, R.A.** (2004) *Arabidopsis thaliana* *GLN2*-encoded glutamine synthetase is dual targeted to leaf mitochondria and chloroplasts. *Plant Cell* **16**, 2048–2058.
- Tanaka, R., Oster, U., Kruse, E., Rüdiger, W., Grimm, B.** (1999) Reduced activity of geranylgeranyl reductase leads to loss of chlorophyll and tocopherol and to partially geranyl-geranylated chlorophyll in transgenic tobacco plants expressing antisense RNA for geranylgeranyl reductase. *Plant Physiol* **120**, 695-704.

- Taniguchi, M., Taniguchi, Y., Kawasaki, M., Takeda, S., Kato, T., Sato, S., Tabata, S., Miyake, H., Sugiyama, T.** (2002) Identifying and characterizing plastidic 2-oxoglutarate/malate and dicarboxylate transporters in *Arabidopsis thaliana*. Plant, Cell Environ **43**, 706–717.
- Tanksley, S.D., Ganal, M.W., Prince, J.P., de Vicente, M.C., Bonierbale, M.W., Broun, P., Fulton, T.M., Giovannoni, J.J., Grandillo, S., Martin, G.B., et al.** (1992) High density molecular linkage maps of the tomato and potato genomes. Genetics **132**, 1141-1160.
- Tauberger, E., Fernie, A.R., Emmermann, M., Renz, A., Kossman, J., Willmitzer, L., Trethewey, R.N.** (2000) Antisense inhibition of plastidial phosphoglucomutase provides compelling evidence that potato tuber amyloplasts import carbon from the cytosol in the form of glucose 6-phosphate. Plant J **23**, 43-53.
- Tcherkez, G., Cornic, G., Bligny, R., Gout, E., Ghashghaei, J.** (2005) *In vivo* respiratory metabolism of illuminated leaves. Plant Physiol **138**, 1596-1606.
- Thayer, S.S., Björkman, O.** (1990) Leaf xanthophyll content and composition in sun and shade determined by HPLC. Photosynth Res **23**, 331-343.
- Thelen, J.J., Miernyk, J.A., Randall, D.D.** (1998) Partial purification and characterization of the maize mitochondrial pyruvate dehydrogenase complex. Plant Physiol **116**, 1443-1450.
- Thimm, O., Bläsing, O., Gibon, Y., Nagel, A., Meyer, S., Krüger, P., Selbig, J., Müller, L.A., Rhee, S.Y., Stitt, M.** (2004) MAPMAN: a user-driven tool to display genomics data sets onto diagrams of metabolic pathways and other biological processes. Plant J **37**, 914-939.
- Thompson, J.N., Hatina, G.** (1979) Determination of tocopherols and tocotrienols in foods and tissues by high performance liquid chromatography. J Liquid Chromatogr **2**, 327-344.
- Tohge, T., Nishiyama, Y., Hirai, M.Y., Yano, M., Nakajima, J., Awazuhara, M., Inoue, E., Takahashi, H., Goodenowe, D.B., Kitayama, M. et al.** (2005) Functional genomics by integrated analysis of metabolome and transcriptome of *Arabidopsis* plants over-expressing an MYB transcription factor. Plant J **42**, 218-235.
- Tovar-Mendez, A., Miernyk, J.A., Randall, D.D.** (2003) Regulation of pyruvate dehydrogenase complex activity in plant cells. Eur J Biochem **270**, 1043–1049.

- Traber, M.G., Sies, H.** (1996) Vitamin E in humans: demand and delivery. *Annu Rev Nutr* **16**, 321-347.
- Turano, F.J., Fang, T.K.** (1998) Characterization of two decarboxylase cDNA clones from *Arabidopsis*. *Plant Physiol* **117**, 1411-1421.
- Uppalapati, S.R., Ayoubi, P., Weng, H., Palmer, D.A., Mitchell, R.E., Jones, W., Bender, C.L.** (2005) The phytotoxin coronatine and methyl jasmonate impact multiple phytohormone pathways in tomato. *Plant J* **42**, 201-217.
- Urbanczyk-Wochniak, E., Baxter, C., Kolbe, A., Kopka, J., Sweetlove, L.J., Fernie, A.R.** (2005) Profiling of diurnal patterns of metabolite and transcript abundance in potato (*Solanum tuberosum*) leaves. *Planta* **221**, 891-903.
- Urbanczyk-Wochniak, E., Luedemann, A., Kopka, J., Selbig, J., Roessner-Tunali, U., Willmitzer, L., Fernie, A.R.** (2003) Parallel analysis of a transcript and metabolic profiles: a new approach in systems biology. *EMBO Reports* **4**, 989-993.
- Urbanczyk-Wochniak, E., Usadel, B., Thimm, O., Nunes-Nesi, A., Carrari, F., Davy, M., Bläsing, O., Kowalczyk, M., Weicht, D., Polinceusz, A., Meyer, S., Stitt, M., Fernie, A.R.** (2006) Conversion of MapMan to allow the analysis of transcript data from Solanaceous species: effects of genetic and environmental alterations in energy metabolism in the leaf. *Plant Mol Biol (in press)*
- Usadel, B., Nagel, A., Thimm, O., Redestig, H., Blaesing, O., Palacios-Rojas, N., Selbig, J., Hannemann, J., Piques, M.C., Steinhauser, D., Scheible, W-R., Gibon, Y., Morcuende, R., Weicht, D., Meyer, S., Stitt, M.** (2005) Extension of the visualization tool MapMan to allow statistical analysis of array, display of corresponding genes, and comparison with known responses. *Plant Physiol* **138**, 1195-1204.
- Van der Hoeven, R., Ronning, C., Giovannoni, J., Martin, G., Tanksley, S.** (2002) Deductions about the number, organization and evolution of genes in the tomato genome based on analysis of a large expressed sequence tag collection and selective genomic sequencing. *Plant Cell* **14**, 1441-1456.
- Vani, T., Reddy, M.M., Raghavendra, A.S.** (1990) Beneficial interaction between photosynthesis and respiration in mesophyll protoplasts of pea during short-dark cycles. *Physiol Plant* **80**, 467-471.

- Vervliet, G., Holsters, M., Teuchy, H., Vanmontagu, M., Schell, J.** (1975) Characterization of different plaque-forming and defective temperate phages in *Agrobacterium* strains. *J Gen Virol* **26**, 33-48.
- Wallace, W., Secor, J., Schrader, L.E.** (1984) Rapid accumulation of γ -aminobutyric acid and alanine in soybean leaves in response to an abrupt transfer to low temperature, darkness, or mechanical manipulation. *Plant Physiol* **75**, 170-175.
- Weger, H.G., Turpin, D.H.** (1989) Mitochondrial respiration can support NO_3^- and NO_2^- reduction during photosynthesis. *Plant Physiol* **89**, 409-415.
- Wesley, S.V., Helliwell, C.A., Smith, N.A., Wang, M.B., Rouse, D.T., Liu, Q., Gooding, P.S., Singh, S.P., Abbott, D., Stoutjesdijk, P.A., Robinson, S.P., Gleave, A.P., Green, A.G., Waterhouse, P.M.** (2001) Construct design for efficient, effective and high-throughput gene silencing in plants. *Plant J* **27**, 581-590.
- Wider, E.A., Tigier, H.A.** (1971) Porphyrin biosynthesis in soybean callus tissue.VIII. Isolation, purification and general properties of Succinyl CoA synthetase. *Enzymologia* **41**, 217-231.
- Witkowski, A., Witkowska, H.E., Smith, S.** (1994) Reengineering the specificity of a serine active site enzyme. Two active site mutations convert a hydrolase to a transferase. *J Biol Chem* **269**, 379-383.
- Wolodko, W.T., Fraser, M.E., James, M.N.G., Bridger, W.A.** (1994) The crystal structure of succinyl-CoA synthetase from *Escherichia coli* at 2.5-A resolution. *J Biol Chem* **269**, 10883-10894.
- Yiu, R., Iketani, S., Mikami, T., Kubo, T.** (2003) Antisense inhibition of mitochondrial pyruvate dehydrogenase E1 α subunit in anther tapetum causes male sterility. *Plant J* **34**, 57-66.
- Yoshida, K., Terashima, I., Noguchi, K.** (2006) Distinct roles of the cytochrome pathway and alternative oxidase in leaf photosynthesis. *Plant Cell Physiol* **47**, 22-31.
- Zeeman, S.C., ap Rees, T.** (1999) Changes in carbohydrates metabolism and assimilate export in starch-excess mutants of *Arabidopsis*. *Plant Cell Environ* **22**, 1445–1453.
- Zeiher, C.A., Randall, D.D.** (1990) Identification and characterization of mitochondrial acetyl-Coenzyme A hydrolase from *Pisum sativum* L. seedlings. *Plant Physiol* **94**, 20-27.

- Zimmermann, P., Hirsch-Hoffmann, M., Hennig L, Gruissem, W.** (2004) GENEVESTIGATOR. *Arabidopsis Microarray Database and Analysis Toolbox*. *Plant Physiol* **136**, 2621-2632.