

Publications R. Thauer

Publications of R. K. Thauer (42 pages) (04-06-18)

Web of Science: h = 79 (almost 26,000 citations)

Google Scholar: h = 93 (over 36,000 citations)

	Page
Theses (3)	1
Original Publications (349)	1
Reviews (76)	32
Published lectures (38)	38
Miscellaneous (19)	42

Theses (3)

Thauer, R.K. (1966) Protein-Biosynthese in Ehrlichs-Ascites-Tumor-Zellen unter der Einwirkung von Natulan. Diplomarbeit, Universität Tübingen.

Thauer, R.K. (1968) Der Energiestoffwechsel von *Clostridium kluyveri*. Dissertation, Universität Freiburg.

Thauer, R.K. (1971) Biochemie und Physiologie von vier neuen Ferredoxin-abhängigen Reaktionen. Habilitationsschrift, Universität Freiburg

Original Publications (349)

Tübingen

Thauer, R.K., Stöffler, G. und Uehleke, H. (1965) N-Hydroxylierung von Sulfanilamid zu p-Hydroxylamiobenzolsulfonamid durch Lebermikrosomen. Naunyn-Schmiedebergs Arch. exp. Path. u. Pharmak. 252, 32-42.

Thauer, R.K., Meiforth, A. und Uehleke, H. (1965) Methämoglobinbildung durch Sulfonamide im System Leberhomogenat, Erythrocyten, NADPH und Sauerstoff. Naunyn-Schmiedebergs Arch. exp. Path. u. Pharmak. 252, 291-296.

Stöffler, G., Thauer, R.K. und Uehleke, H. (1966) Methämoglobinbildung durch p-Hydroxylamino- und p-Nitrosobenzolsulfonamid in Nabelschnur und Erwachsenen-Erythrocyten. Naunyn-Schmiedebergs Arch. exp. Path. u. Pharmak. 252, 359-367.

Weitzel, G., Schneider, F., Hirschmann, W.D., Durst, J., Thauer, R.K., Ochs, H. und Kummer, D. (1967) Untersuchungen zum cytostatischen Wirkungsmechanismus der Methylhydrazine, III. Hoppe Seyler's Z. Physiol. Chem. 348, 443-454

Original Publications R. Thauer

Freiburg

- Decker, K., Thauer, R.K. und Jungermann, K.** (1966) Die Kohlenhydratsynthese in *Clostridium kluyveri*. I. Isotopenversuche zur Biosynthese der Ribose. *Biochem. Z.* 345, 461-471.
- Decker, K., Jungermann, K., Thauer, R.K. and Hunt, S.V.** (1967) Net CO₂ fixation into the S-methyl group of methionine and into the positions 2 and 8 of the purines in *Clostridium kluyveri*. *Biochem. Biophys. Acta* 141, 202-204.
- Thauer, R.K., Jungermann, K. and Decker, K.** (1967) A quantitative isotope method for regulation studies of aromatic amino acid synthesis under growth conditions. *Eur. J. Biochem.* 1, 482-486.
- Jungermann, K., Thauer, R.K. and Decker, K.** (1968) The synthesis of one-carbon units from CO₂ in *Clostridium kluyveri*. *Eur. J. Biochem.* 3, 351-359.
- Jungermann, K., Thauer, R.K., Wenning, J. and Decker, K.** (1968) Confirmation of unusual stereochemistry of glutamate biosynthesis in *Clostridium kluyveri*. *FEBS Lett.* 1, 74-76.
- Thauer, R.K., Jungermann, K., Wenning, J. and Decker, K.** (1968) Characterization of crotonate grown *Clostridium kluyveri* by its assimilatory metabolism. *Arch. Mikrobiol.* 64, 125-129.
- Thauer, R.K., Jungermann, K., Henninger, H., Wenning, J. and Decker, K.** (1968) The energy metabolism of *Clostridium kluyveri*. *Eur. J. Biochem.* 4, 173-180.
- Jungermann, K., Thauer, R.K., Rupprecht, E., Ohrloff, C. and Decker, K.** (1969) Ferredoxin mediated hydrogen formation from NADPH in a cell-free system of *Clostridium kluyveri*. *FEBS Lett.* 3, 144-146.
- Jungermann, K., Rupprecht, E., Ohrloff, C., Thauer, R.K. and Decker, K.** (1969) Hydrogen formation from NADH in cell-free extracts of *Clostridium kluyveri*. Acetyl coenzyme A requirement and ferredoxin dependence. *FEBS Lett.* 4, 108-112.
- Thauer, R.K., Rupprecht, E. and Jungermann, K.** (1970) Separation of ¹⁴C-formate from CO₂ fixation metabolites by isoionic-exchange chromatography. *Anal. Biochem.* 38, 461-468.
- Thauer, R.K., Rupprecht, E. and Jungermann, K.** (1970) The synthesis of one-carbon units from CO₂ via a new ferredoxin dependent monocarboxylic acid cycle. *FEBS Lett.* 8, 304-307.
- Jungermann, K.A., Schmidt, W., Kirchniawy, F.H., Rupprecht, E.H. and Thauer, R. K.** (1970) Glycine formation via threonine and serine aldolase. Its interrelation with the pyruvate formate lyase pathway of one-carbon unit synthesis in *Clostridium kluyveri*. *Eur. J. Biochem.* 16, 424-429.
- Thauer, R. K., Rupprecht, E. and Jungermann, K.** (1970) Glyoxylate inhibition of clostridial pyruvate synthase. *FEBS Lett.* 9, 271-273.
- Jungermann, K., Kirchniawy, H. and Thauer, R. K.** (1970) Ferredoxin dependent CO₂ reduction to formate in *Clostridium pasteurianum*. *Biochem. Biophys. Res. Commun.* 41, 682-689.

Original Publications R. Thauer

Thauer, R. K., Rupprecht, E., Ohrloff, C., Jungermann, K. and Decker, K. (1971) Regulation of the reduced nicotinamide adenine dinucleotide phosphate-ferredoxin reductase system in *Clostridium kluuyveri*. J. Biol. Chem. 246, 954-959.

Jungermann, K., Rupprecht, E., Ohrloff, C., Thauer, R. K. and Decker, K. (1971) Regulation of the reduced nicotinamide adenine dinucleotide-ferredoxin reductase system in *Clostridium kluuyveri*. J. Biol. Chem. 246, 960-963.

Jungermann, K., Leimenstoll, G., Rupprecht, E. and Thauer, R. K. (1971) Demonstration of NADH-ferredoxin reductase in two saccharolytic clostridia. Arch. Mikrobiol. 80, 370-372.

Thauer, R. K., Kirchniawy, F. H. and Jungermann, K. (1972) Properties and function of the pyruvate-formate-lyase reaction in clostridia. Eur. J. Biochem. 27, 282-290.

Jungermann, K., Thauer, R.K., Leimenstoll, G. and Decker, K. (1973) Function of reduced pyridine nucleotide-ferredoxin oxidoreductase in saccharolytic Clostridia. Biochem. Biophys. Acta 305, 268-280. *

Thauer, R. K., Fuchs, G., Schnitker, U. and Jungermann, K. (1973) CO₂ reductase from *Clostridium pasteurianum*: Molybdenum dependence of synthesis and inactivation by cyanide. FEBS Lett. 38, 45-48.

Cleveland

Thauer, R. K. (1972) CO₂-reduction to formate by NADPH. The initial step in the total synthesis of acetate from CO₂ in *Clostridium thermoaceticum*. FEBS Lett. 27, 111-115.

Thauer, R. K. (1973) CO₂ reduction to formate in *Clostridium acidi-urici*. J. Bacteriol. 114, 443-444.

Bochum

Thauer, R. K., Käufer, B., Zähringer, M. and Jungermann, K. (1974) The reaction of the iron-sulfur protein hydrogenase with carbon monoxide. Eur. J. Biochem. 42, 447-452.

Thauer, R. K., Fuchs, G. and Jungermann, K. (1974) Reduced ferredoxin: CO₂ oxidoreductase from *Clostridium pasteurianum*: its role in formate metabolism. J. Bacteriol. 118, 758-760.

Thauer, R. K., Fuchs, G., Käufer, B. and Schnitker, U. (1974) Carbon-monoxide oxidation in cell-free extracts of *Clostridium pasteurianum*. Eur. J. Biochem. 45, 343-349.

Jungermann, K., Kirchniawy, H., Katz, N. and Thauer, R. K. (1974) NADH, a physiological electron donor in clostridial nitrogen fixation. FEBS Lett. 43, 203-206.

Fuchs, G., Schnitker, U. and Thauer, R. K. (1974) Carbon monoxide oxidation by growing cultures of *Clostridium pasteurianum*. Eur. J. Biochem. 49, 111-115.

Original Publications R. Thauer

Thauer, R. K., Käufer, B. and Fuchs, G. (1975) The active species of "CO₂" utilized by reduced ferredoxin: CO₂ oxidoreductase from *Clostridium pasteurianum*. Eur. J. Biochem. 55, 111-117.

Thauer, R. K., Fuchs, G. and Käufer, B. (1975) Reduced ferredoxin: CO₂ oxidoreductase from *Clostridium pasteurianum* effect of ligands to transition metals on the activity and the stability of the enzyme. Hoppe Seyler's Z. f. Physiol. Chem. 356, 653-662.

Riebeling, V., Thauer, R. K. and Jungermann, K. (1975) The internal-alkaline pH gradient, sensitive to uncoupler and ATPase inhibitor, in growing *Clostridium pasteurianum*. Eur. J. Biochem. 55, 445-453.

Thauer, R. K., Käufer, B. and Scherer, P. (1975) The active species of "CO₂" utilized in ferredoxin-linked carboxylation reactions. Arch. Microbiol. 104, 237-240.

Hoffmann, D., Thauer, R. K. and Trebst, A. (1977) Photosynthetic hydrogen evolution by spinach chloroplasts coupled to a *Clostridium* hydrogenase. Z. Naturforsch. 32c, 257-262.

Marburg (Philipps-Universität)

Daniels, L., Fuchs, G., Thauer, R. K. and Zeikus, J. G. (1977) Carbon monoxide oxidation by methanogenic bacteria. J. Bacteriol. 132, 118-126. *

Zeikus, J. G., Fuchs, G., Kenealy, W. and Thauer, R. K. (1977) Oxidoreductases involved in cell carbon synthesis of *Methanobacterium thermoautotrophicum*. J. Bacteriol. 132, 604-613. *

Badziong, W., Thauer, R. K. and Zeikus, J.G. (1978) Isolation and characterization of *Desulfovibrio* growing on hydrogen plus sulfate as the sole energy source. Arch. Microbiol. 116, 41-49. *

Fuchs, G., Stupperich, E. and Thauer, R. K. (1978) Acetate assimilation and the synthesis of alanine, aspartate and glutamate in *Methanobacterium thermoautotrophicum*. Arch. Microbiol. 117, 61-66. *

Badziong, W. and Thauer, R. K. (1978) Growth yields and growth rates of *Desulfovibrio vulgaris* (Marburg) growing on hydrogen plus sulfate and hydrogen plus thiosulfate as the sole energy sources. Arch. Microbiol. 117, 209-214.*

Scherer, P.A. and Thauer, R. K. (1978) Purification and properties of reduced ferredoxin: CO₂ oxidoreductase from *Clostridium pasteurianum*, a molybdenum iron-sulfur-protein. Eur. J. Biochem. 85, 125-135.

Schönheit, P., Wäscher, C. and Thauer, R. K. (1978) A rapid procedure for the purification of ferredoxin from *Clostridia* using polyethyleneimine. FEBS Lett. 89, 219-222.

Thauer, R. K., Schirmacher, H., Schymanski, W. and Schönheit, P. (1978) A rapid procedure for the purification of ferredoxin from spinach using polyethyleneimine. Z. Naturforsch. 33c, 495-497.

Original Publications R. Thauer

- Fuchs, G., Stupperich, E. and Thauer, R. K.** (1978) Function of fumarate reductase in methanogenic bacteria (*Methanobacterium*). Arch. Microbiol. 119, 215-218.
- Diekert, G. B. and Thauer, R. K.** (1978) Carbon monoxide oxidation by *Clostridium thermoaceticum* and *Clostridium formicoaceticum*. J. Bacteriol. 136, 597-606.*
- Fuchs, G., Thauer, R. K., Ziegler, H. and Stichler, W.** (1979) Carbon isotope fractionation by *Methanobacterium thermoautotrophicum*. Arch. Microbiol. 120, 135-139.
- Schönheit, P., Brandis, A. and Thauer, R. K.** (1979) Ferredoxin degradation in growing *Clostridium pasteurianum* during periods of iron deprivation. Arch. Microbiol. 120, 73-76.
- Diekert, G. B., Graf, E.-G. and Thauer, R. K.** (1979) Nickel requirement for carbon monoxide dehydrogenase formation in *Clostridium pasteurianum*. Arch. Microbiol. 122, 117-120.
- Badziong, W., Ditter, B. and Thauer, R. K.** (1979) Acetate and carbon dioxide assimilation by *Desulfovibrio vulgaris* (Marburg), growing on hydrogen and sulfate as sole energy source. Arch. Microbiol. 123, 301-305.
- Schönheit, P., Moll, J. and Thauer, R. K.** (1979) Nickel, cobalt, and molybdenum requirement for growth of *Methanobacterium thermoautotrophicum*. Arch. Microbiol. 123, 105-107. *
- Tewes, F.J. and Thauer, R. K.** (1979) Purification and properties of ferredoxin from *Ruminococcus albus*. FEMS Microbiol. Lett. 6, 375-377.
- Diekert, G., Klee, B. and Thauer, R. K.** (1980) Nickel, a component of factor F₄₃₀ from *Methanobacterium thermoautotrophicum*. Arch. Microbiol. 124, 103-106.*
- Badziong, W. and Thauer, R. K.** (1980) Vectorial electron transport in *Desulfovibrio vulgaris* (Marburg) growing on hydrogen plus sulfate as sole energy source. Arch. Microbiol. 125, 167-174.
- Diekert, G. and Thauer, R. K.** (1980) The effect of nickel on carbon monoxide dehydrogenase formation in *Clostridium thermoaceticum* and *Clostridium formicoaceticum*. FEMS Microbiol. Lett. 7, 187-189.
- Schönheit, P., Moll, J. and Thauer, R. K.** (1980) Growth parameters (K_2 , μ_{max} , Y_S) of *Methanobacterium thermoautotrophicum*. Arch. Microbiol. 127, 59-65.*
- Diekert, G., Weber, B. and Thauer, R. K.** (1980) Nickel dependence of factor F₄₃₀ content in *Methanobacterium thermoautotrophicum*. Arch. Microbiol. 127, 273-278.
- Oberlies, G., Fuchs, G., and Thauer, R. K.** (1980) Acetate thiokinase and the assimilation of acetate in *Methanobacterium thermoautotrophicum*. Arch. Microbiol. 128, 248-252.
- Diekert, G., Gilles, H.-H., Jaenchen, R. and Thauer, R. K.** (1980) Incorporation of 8 succinate per mol nickel into factors F₄₃₀ by *Methanobacterium thermoautotrophicum*. Arch. Microbiol. 128, 256-262.

Original Publications R. Thauer

Schönheit, P. and Thauer, R. K. (1980) L-Alanine, a product of cell wall synthesis in *Methanobacterium thermoautotrophicum*. FEMS Microbiol. Lett. 9, 77-80.

Diekert, G., Jaenchen, R. and Thauer, R. K. (1980) Biosynthetic evidence for a nickel tetrapyrrole structure of factor F₄₃₀ from *Methanobacterium thermoautotrophicum*. FEBS Lett. 119, 118-120.

Brandis, A. and Thauer, R. K. (1981) Growth of *Desulfovibrio* species on hydrogen and sulphate as sole energy source. J. Gen. Microbiol. 126, 249-252.

Brandis, A., Thauer, R. K. and Stetter, K. O. (1981) Relatedness of strains ΔH and Marburg of *Methanobacterium thermoautotrophicum*. Zbl. Bakt. Hyg., I Abt. Orig. C 2, 311-317.*

Diekert, G., Konheiser, U., Piechulla, K. and Thauer, R. K. (1981) Nickel requirement and factor F₄₃₀ content of methanogenic bacteria. J. Bacteriol. 148, 459-464.*

Jaenchen, R., Diekert, G. and Thauer, R. K. (1981) Incorporation of methionine-derived methyl groups into factor F₄₃₀ by *Methanobacterium thermoautotrophicum*. FEBS Lett. 130, 133-136.

Jaenchen, R., Gilles, H.-H. and Thauer, R. K. (1981) Inhibition of factor F₄₃₀ synthesis by levulinic acid in *Methanobacterium thermoautotrophicum*. FEMS Microbiol. Lett. 12, 167-170.

Schönheit, P., Keweloh, H. and Thauer, R. K. (1981) Factor F₄₂₀ degradation in *Methanobacterium thermoautotrophicum* during exposure to oxygen. FEMS Microbiol. Lett. 12, 347-349.

Perski, H.-J., Moll, J. and Thauer, R. K. (1981) Sodium dependence of growth and methane formation in *Methanobacterium thermoautotrophicum*. Arch. Microbiol. 130, 319-321.

Graf, E. G. and Thauer, R. K. (1981) Hydrogenase from *Methanobacterium thermoautotrophicum*, a nickel-containing enzyme. FEBS Lett. 136, 165-169.*

Kristjansson, J. K., Schönheit, P. and Thauer, R. K. (1982) Different K_s values for hydrogen of methanogenic bacteria and sulfate reducing bacteria: An explanation for the apparent inhibition of methanogenesis by sulfate. Arch. Microbiol. 131, 278-282.*

Albracht, S. P.J., Graf, E.-G. and Thauer, R. K. (1982) The EPR properties of nickel in hydrogenase from *Methanobacterium thermoautotrophicum*. FEBS Lett. 140, 311-313.*

Pfaltz, A., Jaun, B., Fässler, A., Eschenmoser, A., Jaenchen, R., Gilles, H.-H., Diekert, G. and Thauer, R. K. (1982) Zur Kenntnis des Faktors F₄₃₀ aus methanogenen Bakterien; Struktur des porphinoïden Ligandensystems. Helv. Chim. Acta 65, 828-865.*

Schönheit, P., Kristjansson, J. K. and Thauer, R. K. (1982) Kinetic mechanism for the ability of sulfate reducers to out-compete methanogens for acetate. Arch. Microbiol. 132, 285-288.*

Original Publications R. Thauer

- Perski, H. J., Schönheit, P. and Thauer, R. K.** (1982) Sodium dependence of methane formation in methanogenic bacteria. *FEBS Lett.* **143**, 323-326
- Stupperich, E., Hammel, K. E., Fuchs, G. and Thauer, R. K.** (1983) Carbon monoxide fixation into the carboxyl group of acetyl coenzyme A during autotrophic growth of *Methanobacterium*. *FEBS Lett.* **152**, 21-23.
- Gilles, H., Jaenchen, R. and Thauer, R. K.** (1983) Biosynthesis of 5-aminolevulinic acid in *Methanobacterium thermoautotrophicum*. *Arch. Microbiol.* **135**, 237-240.
- Gilles, H. and Thauer, R. K.** (1983) Uroporphyrinogen III, an intermediate in the biosynthesis of the nickel-containing factor F₄₃₀ in *Methanobacterium thermoautotrophicum*. *Eur. J. Biochem.* **135**, 109-112.
- Hüster, R. and Thauer, R. K.** (1983) Pyruvate assimilation by *Methanobacterium thermoautotrophicum*. *FEMS Microbiol. Lett.* **19**, 207-209.
- Varma, A., Schönheit, P. and Thauer, R. K.** (1983) Electrogenic sodium ion/proton antiport in *Desulfovibrio vulgaris*. *Arch. Microbiol.* **136**, 69-73.
- Conrad, R. and Thauer, R. K.** (1983) Carbon monoxide production by *Methanobacterium thermoautotrophicum*. *FEMS Microbiol. Lett.* **20**, 229-232.
- Eikmanns, B., Jaenchen, R. and Thauer, R. K.** (1983) Propionate assimilation by methanogenic bacteria. *Arch. Microbiol.* **136**, 106-110.
- Eikmanns, B., Linder, D. and Thauer, R. K.** (1983) Unusual pathway of isoleucine biosynthesis in *Methanobacterium thermoautotrophicum*. *Arch. Microbiol.* **136**, 111-113.
- Brandis-Heep, A., Gebhardt, N.A., Thauer, R. K., Widdel, F. and Pfennig, N.** (1983) Anaerobic acetate oxidation to CO₂ by *Desulfobacter postgatei*. 1. Demonstration of all enzymes required for the operation of the citric acid cycle. *Arch. Microbiol.* **136**, 222-229.
- Gebhardt, N.A., Linder, D. and Thauer, R. K.** (1983) Anaerobic oxidation of acetate to CO₂ by *Desulfobacter postgatei*. 2. Evidence from ¹⁴C-labelling studies for the operation of the citric acid cycle. *Arch. Microbiol.* **136**, 230-233.
- Livingston, D. A., Pfaltz, A., Schreiber, J., Eschenmoser, A., Ankel-Fuchs, D., Moll, J., Jaenchen, R. and Thauer, R. K.** (1984) Zur Kenntnis des Faktors F₄₃₀ aus methanogenen Bakterien: Struktur des proteinfreien Faktors. *Helv. Chim. Acta* **67**, 334-351.*
- Hammel, K. E., Cornwell, K.L. Diekert, G.B. and Thauer, R. K.** (1984) Evidence for a nickel-containing carbon monoxide dehydrogenase in *Methanobrevibacter arboriphilicus*. *J. Bacteriol.* **157**, 975-978.
- Nethe-Jaenchen, R. and Thauer, R. K.** (1984) Growth yields and saturation constant of *Desulfovibrio vulgaris* in chemostat culture. *Arch. Microbiol.* **137**, 236-240.
- Jaenchen, R., Schönheit, P. and Thauer, R. K.** (1984) Studies on the biosynthesis of coenzyme F₄₂₀ in methanogenic bacteria. *Arch. Microbiol.* **137**, 362-365.

Original Publications R. Thauer

Eikmanns, B. and Thauer, R. K. (1984) Catalysis of an isotopic exchange between CO₂ and the carboxyl group of acetate by *Methanosarcina barkeri* grown on acetate. Arch. Microbiol. 138, 365-370.

Jansen, K., Thauer, R. K., Widdel, F. and Fuchs, G. (1984) Carbon assimilation pathways in sulfate reducing bacteria. Formate, carbon dioxide, carbon monoxide, and acetate assimilation by *Desulfovibrio baarsii*. Arch. Microbiol. 138, 257-262.

Ankel-Fuchs, D., Jaenchen, R., Gebhardt, N. A. and Thauer, R. K. (1984) Functional relationship between protein-bound and free factor F430 in *Methanobacterium*. Arch. Microbiol. 139, 332-337.

Eikmanns, B., Fuchs, G. and Thauer, R. K. (1985) Formation of carbon monoxide from CO₂ and H₂ by *Methanobacterium thermoautotrophicum*. Eur. J. Biochem. 146, 149-154.

Gebhardt, N. A., Thauer, R. K., Linder, D., Kaulfers, P. M. and Pfennig, N. (1985) Mechanism of acetate oxidation to CO₂ with elemental sulfur in *Desulfuromonas acetoxidans*. Arch. Microbiol. 141, 392-398.

Hüster, R., Gilles, H.-H. and Thauer, R. K. (1985) Is coenzyme M bound to factor F430 in methanogenic bacteria? Experiments with *Methanobrevibacter ruminantium*. Eur. J. Biochem. 148, 107-111.

Pfaltz, A., Livingston, D. A., Jaun, B., Diekert, G., Thauer, R. K. and Eschenmoser, A. (1985). Zur Kenntnis des Faktors F430 aus methanogenen Bakterien: Über die Natur der Isolierungsartefakte von F430, ein Beitrag zur Chemie von F430 und zur konformationellen Stereochemie der Ligandperipherie von hydroporphinoiden Nickel(II)-Komplexen. Helv. Chim. Acta 68, 1338-1358*.

Eikmanns, B. and Thauer, R. K. (1985) Evidence for the involvement and role of a corrinoid enzyme in methane formation from acetate in *Methanosarcina barkeri*. Arch. Microbiol. 142, 175-179.

Jansen, K., Fuchs, G. and Thauer, R. K. (1985) Autotrophic CO₂ fixation by *Desulfovibrio baarsii*: demonstration of enzyme activities characteristic for the acetyl-CoA pathway. FEMS Microbiol. Lett. 28, 311-315.

Bott, M.H., Eikmanns, B. and Thauer, R.K. (1985) Defective formation and/or utilization of carbon monoxide in H₂/CO₂ fermenting methanogens dependent on acetate as carbon source. Arch. Microbiol. 143, 266-269.

Diakun, G. P., Piggott, B., Tinton, H.J., Ankel-Fuchs, D. and Thauer, R. K. (1985) An extended-X-ray-absorption-fine-structure (e.x.a.f.s) study of coenzyme F₄₃₀ from *Methanobacterium thermoautotrophicum*. Biochem. J. 232, 281-284.

Fässler, A., Kobelt, A., Pfaltz, A., Eschenmoser, A., Bladon, C., Battersby, A. R. und Thauer, R. K. (1985) Factor F430 from methanogenic Bacteria: absolute configuration. Helv. Chim. Acta 68, 2287-2298.

Paulsen, J., Kröger, A. and Thauer, R. K. (1986) ATP-driven succinate oxidation in the catabolism of *Desulfuromonas acetoxidans*. Arch. Microbiol. 144, 78-83

Original Publications R. Thauer

Albracht, S.P.J., Ankel-Fuchs, D., van der Zwaan, J.W., Fontijn, R. D. and Thauer, R. K. (1986) A new EPR signal of nickel in *Methanobacterium thermoautotrophicum*. *Biochim. Biophys. Acta* 870, 50-57.

Macy, J. M., Schröder, I., Thauer, R. K. and Kröger, A. (1986) Growth of *Wolinella succinogenes* on H₂S plus fumarate and on formate plus sulfur as energy sources. *Arch. Microbiol.* 144, 147-150.

Ankel-Fuchs, D. and Thauer, R. K. (1986) Methane formation from methyl-coenzyme M in a system containing methyl-coenzyme M reductase, component B and reduced cobalamin. *Eur. J. Biochem.* 156, 171-177.

Schauder, R., Eikmanns, B., Thauer, R. K., Widdel, F. and Fuchs, G. (1986) Acetate oxidation to CO₂ in anaerobic bacteria via a novel pathway not involving reactions of the citric acid cycle. *Arch. Microbiol.* 145, 162-172.*

Bott, M., Eikmanns, B. and Thauer, R. K. (1986) Coupling of carbon monoxide oxidation to CO₂ and H₂ with the phosphorylation of ADP in acetate-grown *Methanosarcina barkeri*. *Eur. J. Biochem.* 159, 393-398.

Friedmann, H. C. and Thauer, R. K. (1986) Ribonuclease-sensitive δ -aminolevulinic acid formation from glutamate in cell extracts of *Methanobacterium thermoautotrophicum*. *FEBS Lett.* 207, 84-88.

Kräutler, B., Moll, J. and Thauer, R. K. (1987) The corrinoid from *Methanobacterium thermoautotrophicum* (Marburg strain). - Spectroscopic structure analysis and identification as Co _{β} -cyano-5'-hydroxybenzimidazolyl-cobamide (factor III). *Eur. J. Biochem.* 162, 275-278.

Friedmann, H. C. and Thauer, R. K. (1987) Non-enzymatic ammonia formation from glutamine under growth conditions for *Methanobacterium thermoautotrophicum*. *FEMS Microbiol. Lett.* 40, 179-181.

Laufer, K., Eikmanns, B., Frimmer, U. and Thauer, R. K. (1987) Methanogenesis from acetate by *Methanosarcina barkeri*: Catalysis of acetate formation from methyl iodide, CO₂, and H₂ by the enzyme system involved. *Z. Naturforsch.* 42c, 360-372.

Ankel-Fuchs, D., Böcher, R., Thauer, R. K., Noll, K. M. and Wolfe, R. S. (1987) 7-Mercaptoheptanoylthreonine phosphate functions as component B in ATP-independent methane formation from methyl-CoM with reduced cobalamin as electron donor. *FEBS Lett.* 213, 123-127.

Wolfe, R. S., Thauer, R. K. and Pfennig, N. (1987) A "capillary racetrack" method for isolation of magnetotactic bacteria. *FEMS Microbiol. Ecol.* 45, 31-35.

Kobelt, A., Pfaltz, A., Ankel-Fuchs, D. and Thauer, R. K. (1987) The L-form of N-7-mercaptoheptanoyl-O-phosphothreonine is the enantiomer active as component B in methyl-CoM reduction to methane. *FEBS Lett.* 214, 265-268.

Bott, M. and Thauer, R. K. (1987) Proton-motive-force-driven formation of CO from CO₂ and H₂ in methanogenic bacteria. *Eur. J. Biochem.* 168, 407-412.

Original Publications R. Thauer

Pfaltz, A., Kobelt, A., Hüster, R., and Thauer, R. K. (1987) Biosynthesis of coenzyme F₄₃₀ in methanogenic bacteria. Identification of 15,173-seco-F₄₃₀-173-acid as an intermediate. *Eur. J. Biochem.* *170*, 459-467.

Möller, D., Schauder, R., Fuchs, G. and Thauer, R. K. (1987) Acetate oxidation to CO₂ via a citric acid cycle involving an ATP-citrate lyase: a mechanism for the synthesis of ATP via substrate level phosphorylation in *Desulfobacter postgatei* growing on acetate and sulfate. *Arch. Microbiol.* *148*, 202-207.

Hogenkamp, H. P. C., Follmann, H. and Thauer, R. K. (1987) Ribonucleotide reductase in cell extracts of *Methanobacterium thermoautotrophicum*. *FEBS Lett.* *219*, 197-201.

Ellermann, J., Kobelt, A., Pfaltz, A. and Thauer, R. K. (1987) On the role of N-7-mercaptoheptanoyl-O-phospho-L-threonine (component B) in the enzymatic reduction of methyl-coenzyme M to methane. *FEBS Lett.* *220*, 358-362.

Friedmann, H. C., Thauer, R. K., Gough, S. P. and Kannangara, C. G. (1987) δ-aminolevulinic acid formation in the archaebacterium *Methanobacterium thermoautotrophicum* requires tRNA^{Glu}. *Carlsberg Res. Commun.* *52*, 363-371.

Albracht, S. P. J., Ankel-Fuchs, D., Böcher, R., Ellermann, J., Moll, J., van der Zwaan, J. W. and Thauer, R. K. (1988) Five new EPR signals assigned to nickel in methyl-coenzyme M reductase from *Methanobacterium thermoautotrophicum*, strain Marburg. *Biochim. Biophys. Acta* *955*, 86-102.

Ellermann, J., Hedderich, R., Böcher, R. and Thauer, R. K. (1988) The final step in methane formation: Investigations with highly purified methyl-CoM reductase (component C) from *Methanobacterium thermoautotrophicum* (strain Marburg). *Eur. J. Biochem.* *172*, 669-677. *

Grinbergs, A., Müller, V., Gottschalk, G. and Thauer, R. K. (1988) Different effects of 5-fluorouracil on *Methanosarcina barkeri* and on *Methanobacterium thermoautotrophicum*. *FEMS Microbiol. Lett.* *49*, 43-47.

Pankhania, I. P., Spormann, A. M., Hamilton, W. A. and Thauer, R. K. (1988) Lactate conversion to acetate, CO₂ and H₂ in cell suspensions of *Desulfovibrio vulgaris* (Marburg): indications for the involvement of an energy driven reaction. *Arch. Microbiol.* *150*, 26-31.

Fischer, R. and Thauer, R. K. (1988) Methane formation from acetyl phosphate in cell extracts of *Methanosarcina barkeri*: Dependence of the reaction on coenzyme A. *FEBS Lett.* *228*, 249-253.

Möller-Zinkhan, D. and Thauer, R. K. (1988) Membrane-bound NADPH dehydrogenase- and ferredoxin:NADP oxidoreductase activity involved in electron transport during acetate to CO₂ in *Desulfobacter postgatei*. *Arch. Microbiol.* *150*, 145-154.

Spormann, M. A. and Thauer, R. K. (1988) Anaerobic acetate oxidation to CO₂ by *Desulfotomaculum acetoxidans*. Demonstration of enzymes required

Original Publications R. Thauer

for the operation of an oxidative acetyl-CoA/carbon monoxide dehydrogenase pathway. Arch. Microbiol. 150, 374-380.

Hedderich, R. and Thauer, R. K. (1988) *Methanobacterium thermoautotrophicum* contains a soluble enzyme system that specifically catalyzes the reduction of the heterodisulfide of coenzyme M and 7-mercaptoheptanoylthreonine phosphate with H₂. FEBS Lett. 234, 223-227.

Karrasch, M., Bott, M. and Thauer, R. K. (1989) Carbonic anhydrase activity in acetate grown *Methanosarcina barkeri*. Arch. Microbiol. 151, 137-142.

Bott, M. and Thauer, R. K. (1989) Proton translocation coupled to the oxidation of carbon monoxide to CO₂ and H₂ in *Methanosarcina barkeri*. Eur. J. Biochem. 179, 469-472.

Fischer, R. and Thauer, R. K. (1989) Methyltetrahydromethanopterin as an intermediate in methanogenesis from acetate in *Methanosarcina barkeri*. Arch. Microbiol. 151, 459-465.

Ellermann, J., Rospert, S., Thauer, R. K., Bokranz, M., Klein, A., Voges, M. and Berkessel, A. (1989) Methyl-coenzyme-M reductase from *Methanobacterium thermoautotrophicum* (strain Marburg): Purity, activity and novel inhibitors. Eur. J. Biochem. 184, 63-68.

Börner, G., Karrasch, M. and Thauer, R. K. (1989) Formylmethanofuran dehydrogenase activity in cell extracts of *Methanobacterium thermoautotrophicum* and of *Methanosarcina barkeri*. FEBS Lett. 244, 21-2

Bott, M. and Thauer, R. K. (1989) The active species of "CO₂" formed by carbon monoxide dehydrogenase from *Peptostreptococcus productus*. Z. Naturforsch. 44c, 392-396.

Spormann, A.M. and Thauer, R. K. (1989) Anaerobic acetate oxidation to CO₂ by *Desulfotomaculum acetoxidans*. Isotopic exchange between CO₂ and the carbonyl group of acetyl-CoA and topology of enzymes involved. Arch. Microbiol. 152, 189-195.

Cheesman, M. R., Ankel-Fuchs, D., Thauer, R. K. and Thomson, A. J. (1989) The magnetic properties of the nickel cofactor F430 in the enzyme methyl-coenzyme M reductase of *Methanobacterium thermoautotrophicum*. Biochem. J. 260, 613-616.

Möller-Zinkhan, D., Börner, G. and Thauer, R. K. (1989) Function of methanofuran, tetrahydromethanopterin, and coenzyme F₄₂₀ in *Archaeoglobus fulgidus*. Arch. Microbiol. 152, 362-368.

Karrasch, M., Börner, G., Enßle, M. and Thauer, R. K. (1989) Formylmethanofuran dehydrogenase from methanogenic bacteria, a molybdoenzyme. FEBS Lett. 253, 226-230.

Krone, U. E., Thauer, R. K. and Hogenkamp, H. P. C. (1989) Reductive dehalogenation of chlorinated C₁-hydrocarbons mediated by corrinoids. Biochemistry 28, 4908-4914. *

Original Publications R. Thauer

Krone, U. E. Laufer, F., Thauer, R. K. and Hogenkamp, H. P. C. (1989) Coenzyme F₄₃₀ as a possible catalyst for the reductive dehalogenation of chlorinated C₁ hydrocarbons in methanogenic bacteria. *Biochemistry* 28, 10061-10065.*

Hedderich, R., Berkessel, A. and Thauer, R. K. (1989) Catalytic properties of the heterodisulfide reductase involved in the final step of methanogenesis. *FEBS Lett.* 255, 67-71.

Fischer, R. and Thauer, R. K. (1990) Methanogenesis from acetate in cell extracts of *Methanosarcina barkeri*: Isotope exchange between CO₂ and the carbonyl group of acetyl-CoA, and the role of H₂. *Arch. Microbiol.* 153, 156-162.

Möller-Zinkhan, D. and Thauer, R. K. (1990) Anaerobic lactate oxidation to 3 CO₂ by *Archaeoglobus fulgidus* via the carbon monoxide dehydrogenase pathway: demonstration of the acetyl-CoA carbon-carbon cleavage reaction in cell extracts. *Arch. Microbiol.* 153, 215-218.

Zirngibl, C., Hedderich, R. and Thauer, R. K. (1990) N⁵,N¹⁰-Methylenetetrahydromethanopterin dehydrogenase from *Methanobacterium thermoautotrophicum* has hydrogenase activity. *FEBS Lett.* 261, 112-116.

Ma, K. and Thauer, R. K. (1990) Purification and properties of N⁵,N¹⁰-methylenetetrahydromethanopterin reductase from *Methanobacterium thermoautotrophicum* (strain Marburg). *Eur. J. Biochem.* 191, 187-193.

Peinemann, S., Hedderich, R., Blaut, M., Thauer, R. K. and Gottschalk, G. (1990) ATP synthesis coupled to electron transfer from H₂ to the heterodisulfide of 2-mercaptoethanesulfonate and 7-mercaptoheptanoylthreonine phosphate in vesicle preparations of the methanogenic bacterium strain GÖ1. *FEBS Lett.* 263, 57-60.

Schmitz, R. A., Bonch-Osmolovskaya, E. A. and Thauer, R. K. (1990) Different mechanisms of acetate activation in *Desulfurella acetivorans* and *Desulfuromonas acetoxidans*. *Arch. Microbiol.* 154, 274-279.

Ma, K. and Thauer, R. K. (1990) N⁵,N¹⁰-Methylenetetrahydromethanopterin reductase from *Methanosarcina barkeri*. *FEMS Microbiol. Lett.* 70, 119-124

Hedderich, R., Berkessel, A. and Thauer, R. K. (1990) Purification and properties of heterodisulfide reductase from *Methanobacterium thermoautotrophicum* (strain Marburg). *Eur. J. Biochem.* 193, 255-261.

Karrasch, M., Börner, G., Enßle, M. and Thauer, R. K. (1990) The molybdoenzyme formylmethanofuran dehydrogenase from *Methanosarcina barkeri* contains a pterin cofactor. *Eur. J. Biochem.* 194, 367-372.

Breitung, J., Börner, G., Karrasch, M., Berkessel, A. and Thauer, R. K. (1990) N-Furfurylformamide as a pseudo-substrate for formylmethanofuran converting enzymes from methanogenic bacteria. *FEBS Lett.* 268, 257-260.

Ma, K. and Thauer, R. K. (1990) Single step purification of methylenetetrahydromethanopterin reductase from *Methanobacterium thermoautotrophicum* by specific binding to Blue Sepharose Cl-6B. *FEBS Lett.* 268, 59-62.

Original Publications R. Thauer

Fischer, R. and Thauer, R. K. (1990) Ferredoxin-dependent methane formation from acetate in cell extracts of *Methanosarcina barkeri* (strain MS). FEBS Lett. 269, 368-372.

Rospert, S., Linder, D., Ellermann, J. and Thauer, R. K. (1990) Two genetically distinct methyl-coenzyme M reductases in *Methanobacterium thermoautotrophicum* strain Marburg and Δ H. Eur. J. Biochem. 194, 871-877.

Breitung, J. and Thauer, R. K. (1990) Formylmethanofuran:tetrahydromethanopterin formyltransferase from *Methanosarcina barkeri*: Identification of N⁵-formyltetrahydromethanopterin as the product. FEBS Lett. 275, 226-230.

Karrasch, M., Börner, G. and Thauer, R. K. (1990) The molybdenum cofactor of formylmethanofuran dehydrogenase from *Methanosarcina barkeri* is a molybdopterin guanine dinucleotide. FEBS Lett. 274, 48-52.

Marburg (Max-Planck-Institut)

Krone, U.E., Thauer, R. K., Hogenkamp, H. and Steinbach, K. (1991) Reductive formation of carbon monoxide from CCl₄ and from FREON_S 11, 12 and 13 catalyzed by corrinoids. Biochemistry 30, 2713-2719.

Schwörer, B. and Thauer, R. K. (1991) Activities of formylmethanofuran dehydrogenase, methylenetetrahydromethanopterin dehydrogenase, methylenetetrahydromethanopterin reductase, and heterodisulfide reductase in methanogenic bacteria. Arch. Microbiol. 155, 459-465.

Enßle, M., Zirngibl, C., Linder, D. and Thauer, R. K. (1991) Coenzyme F₄₂₀ dependent N⁵,N¹⁰-methylenetetrahydromethanopterin dehydrogenase in methanol grown *Methanosarcina barkeri*. Arch. Microbiol. 155, 483-490.

Rospert, S., Breitung, J., Ma, K., Schwörer, B., Zirngibl, C., Thauer, R. K., Linder, D., Huber, R. and Stetter, K. O. (1991) Methyl-coenzyme M reductase and other enzymes involved in methanogenesis from CO₂ and H₂ in the extreme thermophile *Methanopyrus kandleri*. Arch. Microbiol. 156, 49-55.

Ma, K., Linder, D., Stetter, K.O. and Thauer, R. K. (1991) Purification and properties of N⁵,N¹⁰-methylenetetrahydromethanopterin reductase (coenzyme F₄₂₀-dependent) from the extreme thermophile *Methanopyrus kandleri*. Arch. Microbiol. 155, 593-600.

Ma, K., Zirngibl, C., Linder, D., Stetter, K. O. and Thauer, R. K. (1991) N⁵,N¹⁰-Methylenetetrahydromethanopterin dehydrogenase (H₂-forming) from the extreme thermophile *Methanopyrus kandleri*. Arch. Microbiol. 156, 43-48.

Schmitz, R.A., Linder, D., Stetter, K.O. and Thauer, R. K. (1991) N⁵,N¹⁰-Methylenetetrahydromethanopterin reductase (coenzyme F₄₂₀-dependent) and formylmethanofuran dehydrogenase from the hyperthermophile *Archaeoglobus fulgidus*. Arch. Microbiol. 156, 427-434.

Von Büнау, R., Zirngibl, C., Thauer, R. K. and Klein, A. (1991) Hydrogen-forming and coenzyme-F₄₂₀-reducing methylene tetrahydromethanopterin dehydrogenase are genetically distinct enzymes in *Methanobacterium thermoautotrophicum* (Marburg). Eur. J. Biochem. 202, 1205-1208.

Original Publications R. Thauer

Breitung, J., Schmitz, R. A., Stetter, K. O. and Thauer, R. K. (1991) N^5, N^{10} -Methenyltetrahydromethanopterin cyclohydrolase from the extreme thermophile *Methanopyrus kandleri*: Increase of catalytic efficiency (k_{cat}/K_M) and thermostability in the presence of salts. Arch. Microbiol. 156, 517-524.

Börner, G., Karrasch, M. and Thauer, R. K. (1991) Molybdopterin adenine dinucleotide and molybdopterin hypoxanthine dinucleotide in formylmethanofuran dehydrogenase from *Methanobacterium thermoautotrophicum* (Marburg). FEBS Lett. 290, 31-34.

Rospert, S., Böcher, R., Albracht, S.P.J. and Thauer, R. K. (1991) Methyl-coenzyme M reductase preparations with high specific activity from H_2 -preincubated cells of *Methanobacterium thermoautotrophicum*. FEBS Lett. 291, 371-375.

Krone, U.E. and Thauer, R. K. (1992) Dehalogenation of trichlorofluoromethane (CFC-11) by *Methanosarcina barkeri*. FEMS Microbiol. Lett. 90, 201-204.

Hedderich, R., Albracht, S. P. J., Linder, D., Koch, J. and Thauer, R. K. (1992) Isolation and characterization of polyferredoxin from *Methanobacterium thermoautotrophicum*. The *mvhB* gene product of the methylviologen-reducing hydrogenase operon. FEBS Lett. 298, 65-68.

Bonacker, L. G., Baudner, S. and Thauer, R. K. (1992) Differential expression of the two methyl-coenzyme M reductases in *Methanobacterium thermoautotrophicum* as determined immunochemically via isoenzyme-specific antisera. Eur. J. Biochem. 206, 87-92.

Fischer, R., Gärtner, P., Yeliseev, A. and Thauer, R. K. (1992) N^5 -Methyltetrahydromethanopterin:coenzyme M methyltransferase in methanogenic archaeobacteria is a membrane protein. Arch. Microbiol. 158, 208-217.

Schmitz, R., Richter, M., Linder, D. and Thauer, R. K. (1992) A tungsten-containing active formylmethanofuran dehydrogenase in the thermophilic archaeon *Methanobacterium wolfei*. Eur. J. Biochem. 207, 559-565.

Zirngibl, C., van Dongen, W., Schwörer, B., von Büнау, R., Richter, M., Klein, A. and Thauer, R. K. (1992) H_2 -forming methylenetetrahydromethanopterin dehydrogenase, a novel type of hydrogenase without iron-sulfur clusters in methanogenic archaea. Eur. J. Biochem. 208, 511-520.*

Rospert, S., Voges, M., Berkessel, A., Albracht, S. P. J. and Thauer, R. K. (1992) Substrate-analogue-induced changes in the nickel EPR spectrum of active methyl-coenzyme-M reductase from *Methanobacterium thermoautotrophicum*. Eur. J. Biochem. 210, 101-107.

Schmitz, R. A., Albracht, S. P. J. and Thauer, R. K. (1992) A molybdenum and a tungsten isoenzyme of formylmethanofuran dehydrogenase in the thermophilic archaeon *Methanobacterium wolfei*. Eur. J. Biochem. 209, 1013-1018.

Original Publications R. Thauer

Breitung, J., Börner, G., Scholz, S., Linder, D., Stetter, K. O. and Thauer, R. K. (1992) Salt dependence, kinetic properties and catalytic mechanism of *N*-formylmethanofuran:tetrahydromethanopterin formyltransferase from the extreme thermophile *Methanopyrus kandleri*. Eur. J. Biochem. 210, 971-981.

Schmitz, R., Albracht, S. P. J. and Thauer, R. K. (1992) Properties of the tungsten-substituted molybdenum formylmethanofuran dehydrogenase from *Methanobacterium wolfei*. FEBS Lett. 309, 78-81.

Schleucher, J., Schwörer, B., Zirngibl, C., Koch, U., Weber, W., Egert, E., Thauer, R. K. and Griesinger, C. (1992) Determination of the relative configuration of 5,6,7,8,-tetrahydromethanopterin by two-dimensional NMR spectroscopy. FEBS Lett. 314, 440-444.

Klein, A. R., Breitung, J., Linder, D., Stetter, K. O. and Thauer, R. K. (1993) N^5, N^{10} -Methenyltetrahydromethanopterin cyclohydrolase from the extremely thermophilic sulfate reducing *Archaeoglobus fulgidus*: comparison of its properties with those of the cyclohydrolase from the extremely thermophilic *Methanopyrus kandleri*. Arch. Microbiol. 159, 213-219.

Schwörer, B., Fernandez, V. M., Zirngibl, C. and Thauer, R. K. (1993) H_2 -forming N^5, N^{10} -methylene tetrahydromethanopterin dehydrogenase from *Methanobacterium thermoautotrophicum*. Studies of the catalytic mechanism of the H_2 formation with hydrogen isotopes. Eur. J. Biochem. 212, 255-261.

Schwörer, B., Breitung, J., Klein, A. R., Stetter, K. O. and Thauer, R. K. (1993) Formylmethanofuran:tetrahydromethanopterin formyltransferase and N^5, N^{10} -methylene tetrahydromethanopterin dehydrogenase from the sulfate-reducing *Archaeoglobus fulgidus*: similarities with the enzymes from methanogenic Archaea. Arch. Microbiol. 159, 225-232.

Yeliseev, A., Gärtner, P., Harms, U., Linder, D. and Thauer, R. K. (1993) Function of methylcobalamin:coenzyme M methyltransferase isoenzyme II in *Methanosarcina barkeri*. Arch. Microbiol. 159, 530-536.

Gärtner, P., Ecker, A., Fischer, R., Linder, D., Fuchs, G. and Thauer, R. K. (1993) Purification and properties of N^5 -methyltetrahydromethanopterin:coenzyme M methyltransferase from *Methanobacterium thermoautotrophicum*. Eur. J. Biochem. 213, 537-545.

Heiden, S., Hedderich, R., Setzke, E. and Thauer, R. K. (1993) Purification of a cytochrome *b* containing H_2 :heterodisulfide oxidoreductase complex from membranes of *Methanosarcina barkeri*. Eur. J. Biochem. 213, 529-535

Klein, A.R., Koch, J., Stetter, K. O. and Thauer, R. K. (1993) Two N^5, N^{10} -methylene tetrahydromethanopterin dehydrogenases in the extreme thermophile *Methanopyrus kandleri*: Characterization of the coenzyme F_{420} -dependent enzyme. Arch. Microbiol. 160, 186-192.

Kunow, J., Schwörer, B., Setzke, E. and Thauer, R. K. (1993) *Si*-face stereospecificity at C5 of coenzyme F_{420} for F_{420} -dependent N^5, N^{10} -methylene tetrahydromethanopterin dehydrogenase, F_{420} -dependent N^5, N^{10} -methylene tetrahydromethanopterin reductase and $F_{420}H_2$:dimethylnaphthoquinone oxidoreductase. Eur. J. Biochem. 214, 641-646.

Original Publications R. Thauer

Kunow, J., Schwörer, B., Stetter, K. O. and Thauer, R. K. (1993) A F₄₂₀-dependent NADP reductase in the extremely thermophilic sulfate reducing *Archaeoglobus fulgidus*. Arch. Microbiol. 160, 199-205.

Bonacker, L. G., Baudner, S., Mörschel, E., Böcher, R. and Thauer, R. K. (1993) Properties of the two isoenzymes of methyl-coenzyme M reductase in *Methanobacterium thermoautotrophicum*. Eur. J. Biochem. 217, 587-595.

Schleucher, J., Griesinger, C., Schwörer, B. and Thauer, R. K., (1994) H₂-forming N⁵,N¹⁰-methylene tetrahydromethanopterin dehydrogenase from *Methanobacterium thermoautotrophicum* catalyzes a stereoselective hydride transfer as determined by two-dimensional NMR spectroscopy. Biochemistry 33, 3986-3993.

Bertram, P. A., Schmitz, R. A., Linder, D. and Thauer, R. K. (1994) Tungstate can substitute for molybdate in sustaining growth of *Methanobacterium thermoautotrophicum*: Identification and characterization of a tungsten isoenzyme of formylmethanofuran dehydrogenase. Arch. Microbiol. 161, 220-228.

Setzke, E., Hedderich, R., Heiden, S. and Thauer, R. K. (1994) H₂:heterodisulfide oxidoreductase complex from *Methanobacterium thermoautotrophicum*: Composition and properties. Eur. J. Biochem. 220, 139-148.

Bertram, P. A., Karrasch, M., Schmitz, R. A., Böcher, R., Albracht, S. P. J. and Thauer, R. K. (1994) Formylmethanofuran dehydrogenases from methanogenic Archaea. Substrate specificity, EPR properties and reversible inactivation by cyanide of the molybdenum or tungsten iron-sulfur proteins. Eur. J. Biochem. 220, 477-484.

Heiden, S., Hedderich, R., Setzke, E. and Thauer, R. K. (1994) Purification of a two-subunit cytochrome-*b*-containing heterodisulfide reductase from methanol-grown *Methanosarcina barkeri*. Eur. J. Biochem. 221, 855-861.

Schmitz, R. A., Bertram, P. A. and Thauer, R. K. (1994) Tungstate does not support synthesis of active formylmethanofuran dehydrogenase in *Methanosarcina barkeri*. Arch. Microbiol. 161, 528-530.

Gärtner, P., Weiss, D. S., Harms, U. and Thauer, R. K. (1994) N⁵-methyltetrahydromethanopterin:coenzyme M methyltransferase from *Methanobacterium thermoautotrophicum*. Catalytic mechanism and sodium ion dependence. Eur. J. Biochem. 226, 465-472.

Kunow, J., Linder, D., Stetter, K. O. and Thauer, R. K. (1994) F₄₂₀H₂:quinone oxidoreductase from *Archaeoglobus fulgidus*: Characterization of a membrane-bound multisubunit complex containing FAD and iron-sulfur clusters. Eur. J. Biochem. 223, 503-511.

Hedderich, R., Koch, J., Linder, D. and Thauer, R. K. (1994) The heterodisulfide reductase from *Methanobacterium thermoautotrophicum* contains sequence motifs characteristic of pyridine nucleotide-dependent thioredoxin reductases. Eur. J. Biochem. 225, 253-261.

Weiss, D. S., Gärtner, P. and Thauer, R. K. (1994) The energetics and sodium-ion dependence of N⁵-methyltetrahydromethanopterin:coenzyme M

Original Publications R. Thauer

methyltransferase studied with cob(I)alamin as methyl acceptor and methylcob(III)alamin as methyl donor. *Eur. J. Biochem.* 226, 799-809.

Bertram, P. A. and Thauer, R. K. (1994) Thermodynamics of the formylmethanofuran dehydrogenase reaction in *Methanobacterium thermoautotrophicum*. *Eur. J. Biochem.* 226, 811-818.

Schleucher, J., Schwörer, B., Thauer, R. K. and Griesinger, C. (1995) Elucidation of the stereochemical course of chemical reactions by magnetic labeling. *J. Am. Chem. Soc.* 117, 2941-2942.

Vorholt, J., Kunow, J., Stetter, K.O. and Thauer, R. K. (1995) Enzymes and coenzymes of the carbon monoxide dehydrogenase pathway for autotrophic CO₂ fixation in *Archaeoglobus lithotrophicus* and the lack of carbon monoxide dehydrogenase in the heterotrophic *A. profundus*. *Arch Microbiol.* 163, 112-118.

Kunow, J., Linder, D. and Thauer, R. K. (1995) Pyruvate:ferredoxin oxidoreductase from the sulfate-reducing *Archaeoglobus fulgidus*: Molecular composition, catalytic properties and sequence alignments. *Arch. Microbiol.* 163, 21-28.

Klein, A. R. and Thauer, R. K. (1995) Re-face specificity at C14a of methylenetetrahydromethanopterin and Si-face specificity at C5 of coenzyme F₄₂₀ for coenzyme F₄₂₀-dependent methylenetetrahydromethanopterin dehydrogenase from methanogenic Archaea. *Eur. J. Biochem.* 227, 169-174

Harms, U., Weiss, D.S., Gärtner, P., Linder, D. and Thauer, R. K. (1995) The energy conserving N⁵-methyltetrahydromethanopterin:coenzyme M methyltransferase complex from *Methanobacterium thermoautotrophicum* is composed of eight different subunits. *Eur. J. Biochem.* 228, 640-648.

Shima, S., Weiss, D. and Thauer, R. K. (1995) Formylmethanofuran:tetrahydromethanopterin formyltransferase (Ftr) from the hyperthermophilic *Methanopyrus kandleri*: Cloning, sequencing and functional expression of the *ftr* gene and one step purification of the enzyme overproduced in *Escherichia coli*. *Eur. J. Biochem.* 230, 906-913.

Nölling, J., Ishii, M., Koch, J., Pihl, T. D., Reeve, J. N., Thauer, R. K. and Hedderich, R. (1995) Characterization of a 45-kDa flavoprotein and evidence for a rubredoxin, two proteins that could participate in electron transport from H₂ to CO₂ in methanogenesis in *Methanobacterium thermoautotrophicum*. *Eur. J. Biochem.* 231, 628-638.

Vaupel, M. and Thauer, R. K. (1995) Coenzyme F₄₂₀-dependent N⁵,N¹⁰-methylene tetrahydromethanopterin reductase (Mer) from *Methanobacterium thermoautotrophicum* strain Marburg. Cloning, sequencing, transcriptional analysis and functional expression in *Escherichia coli* of the *mer* gene. *Eur. J. Biochem.* 231, 773-778.

Klein, A. R., Hartmann, G. C. and Thauer, R. K. (1995) Hydrogen isotope effects in the reactions catalyzed by H₂-forming N⁵,N¹⁰-methylene tetrahydromethanopterin dehydrogenase from methanogenic Archaea. *Eur. J. Biochem.* 233, 372-376.

Original Publications R. Thauer

- Klein, A. R., Fernandez, V. M. and Thauer, R. K.** (1995) H₂-forming N⁵,N¹⁰-methylenetetrahydromethanopterin dehydrogenase: mechanism of H₂ formation analyzed using hydrogen isotopes. *FEBS Lett.* 368, 203-206.
- Hochheimer, A., Schmitz, R.A., Thauer, R. K. and Hedderich, R.** (1995) The tungsten formylmethanofuran dehydrogenase from *Methanobacterium thermoautotrophicum* contains sequence motifs characteristic for enzymes containing molybdopterin dinucleotide. *Eur. J. Biochem.* 234, 910-920.
- Berkessel, A. and Thauer, R. K.** (1995) Zum Katalysemechanismus einer metallfreien Hydrogenase aus methanogenen Archaea: Enzymatische Umsetzung von H₂ ohne Metall und ihre Analogie zur Chemie der Alkane in supersaurer Lösung. *Angewandte Chemie* 107, 2418-2421.
On the mechanism of catalysis by a metal-free hydrogenase from methanogenic Archaea: enzymatic transformation of H₂ without a metal and its analogy to the chemistry of alkanes in superacidic solution. *Angew. Chem. Int. Ed. Engl.* 34, 2247-2250.
- Kunow, J., Shima, S., Vorholt, J. A. and Thauer, R. K.** (1996) Primary structure and properties of the formyltransferase from the mesophilic *Methanosarcina barkeri*: Comparison with the enzymes from thermophilic and hyperthermophilic methanogens. *Arch. Microbiol.* 165, 97-105.
- Harms, U. and Thauer, R. K.** (1996) Methylcobalamin:coenzyme M methyltransferase isoenzymes MtaA and MtbA from *Methanosarcina barkeri*. Cloning, sequencing and differential transcription of the encoding genes, and functional overexpression of the *mtaA* gene in *Escherichia coli*. *Eur. J. Biochem.* 235, 653-659.
- Vaupel, M., Dietz, H., Linder, D. and Thauer, R. K.** (1996) Primary structure of cyclohydrolase (Mch) from *Methanobacterium thermoautotrophicum* (strain Marburg) and functional expression of the *mch* gene in *Escherichia coli*. *Eur. J. Biochem.* 236, 294-300.
- Vorholt, J. A., Vaupel, M. and Thauer, R. K.** (1996) A polyferredoxin with eight [4Fe-4S] clusters as a subunit of molybdenum formylmethanofuran dehydrogenase from *Methanosarcina barkeri*. *Eur. J. Biochem.* 236, 309-317.
- Hartmann, G. C., Klein, A. R., Linder, M. and Thauer, R. K.** (1996) Purification, properties and primary structure of H₂-forming N⁵,N¹⁰-methylenetetrahydromethanopterin dehydrogenase from *Methanococcus thermolithotrophicus*. *Arch. Microbiol.* 165, 187-193.
- Shima, S., Thauer, R. K., Michel, H. and Ermler, U.** (1996) Crystallization and preliminary X-ray diffraction studies of formylmethanofuran:tetrahydromethanopterin formyltransferase from *Methanopyrus kandleri*. *Proteins: Structure, Function, and Genetics* 26, 118-120.
- Hungerer, C., Weiss, D. S., Thauer, R. K. and Jahn, D.** (1996) The *hemA* gene encoding glutamyl-tRNA reductase from the Archaeon *Methanobacterium thermoautotrophicum* strain Marburg. *Bioorgan. Med. Chem.* 4, 1089-1095.
- Klein, A. R., Berk, H., Purwantini, E., Daniels, L. and Thauer, R. K.** (1996) Si-face stereospecificity at C5 of coenzyme F₄₂₀ for F₄₂₀-dependent glucose-6-

Original Publications R. Thauer

phosphate dehydrogenase from *Mycobacterium smegmatis* and F₄₂₀-dependent alcohol dehydrogenase from *Methanoculleus thermophilicus*. Eur. J. Biochem. 239, 93-97.

Hartmann, G. C., Santamaria, E., Fernández, V. M. and Thauer, R. K. (1996) Studies on the catalytic mechanism of H₂-forming methylenetetrahydromethanopterin dehydrogenase: *para-ortho* H₂ conversion rates in H₂O and D₂O. J. Biol. Inorg. Chem. 1, 446-450.

Harms, U. and Thauer, R. K. (1996) The corrinoid-containing 23-kDa subunit MtrA of the energy-conserving N⁵-methyltetrahydromethanopterin:coenzyme M methyltransferase complex from *Methanobacterium thermoautotrophicum*. EPR spectroscopic evidence for a histidine residue as a cobalt ligand of the cobamide. Eur. J. Biochem. 241, 149-154.

Hochheimer, A., Linder, D., Thauer, R. K. and Hedderich, R. (1996) The molybdenum formylmethanofuran dehydrogenase operon and the tungsten formylmethanofuran dehydrogenase operon from *Methanobacterium thermoautotrophicum*: Structures and transcriptional regulation. Eur. J. Biochem. 242, 156-162.

Berk, H., Buckel, W., Thauer, R. K. and Frey, P.A. (1996) Re-face stereospecificity at C4 of NAD(P) for alcohol dehydrogenase from *Methanogenium organophilum* and for (*R*)-2-hydroxyglutarate dehydrogenase from *Acidaminococcus fermentans* as determined by ¹H-NMR spectroscopy. FEBS Lett. 399, 92-94.

Vorholt, J. A., Hafenbradl, D., Stetter, K. O. and Thauer, R. K. (1997) Pathways of autotrophic CO₂ fixation and of dissimilatory nitrate reduction to N₂O in *Ferroglobus placidus*. Arch. Microbiol. 167, 19-23.

Sauer, K., Harms, U. and Thauer, R. K. (1997) Methanol:coenzyme M methyltransferase from *Methanosarcina barkeri*: Purification, properties and encoding genes of the corrinoid protein MT1. Eur. J. Biochem. 243, 670-677.

Goubeaud, M., Schreiner, G. and Thauer, R. K. (1997) Purified methyl-coenzyme M reductase is activated when the enzyme-bound coenzyme F₄₃₀ is reduced to the nickel(I) oxidation state by titanium(III) citrate. Eur. J. Biochem. 243, 110-114.

Künkel, A., Vaupel, M., Heim, S., Thauer, R. K. and Hedderich, R. (1997) Heterodisulfide reductase from methanol-grown cells of *Methanosarcina barkeri* is not a flavoenzyme. Eur. J. Biochem. 244, 226-234.

Tersteegen, A., Linder, D., Thauer, R. K. and Hedderich, R. (1997) Structures and functions of four anabolic 2-oxoacid oxidoreductases in *Methanobacterium thermoautotrophicum*. Eur. J. Biochem. 244, 862-868.

Shima, S., Goubeaud, M., Vinzenz, D., Thauer, R. K. and Ermler, U. (1997) Crystallization and preliminary X-ray diffraction studies of methyl-coenzyme M reductase from *Methanobacterium thermoautotrophicum*. J. Biochem. 121, 829-830

Vorholt, J. A., Vaupel, M. and Thauer, R. K. (1997) A selenium-dependent and selenium-independent formylmethanofuran dehydrogenase and their

Original Publications R. Thauer

transcriptional regulation in the hyperthermophilic *Methanopyrus kandleri*. Mol. Microbiol. 23, 1033-1042

Ermler, U., Merckel, M. C., Thauer, R. K. and Shima, S. (1997)
Formylmethanofuran:tetrahydromethanopterin formyltransferase from *Methanopyrus kandleri* – new insights into salt-dependence and thermostability. Structure 5, 635-646.

Klein, A. R. and Thauer, R. K. (1997) Overexpression of the coenzyme F₄₂₀-dependent N⁵,N¹⁰-methylenetetrahydromethanopterin dehydrogenase gene from the hyperthermophilic *Methanopyrus kandleri*. Eur. J. Biochem. 245, 386-391.

Vorholt, J. A. and Thauer, R. K. (1997) The active species of "CO₂" utilized by formylmethanofuran dehydrogenase from methanogenic Archaea. Eur. J. Biochem. 248, 919-924.

Ermler, U., Grabarse, W., Shima, S., Goubeaud, M. and Thauer, R. K. (1997) Crystal structure of methyl-coenzyme M reductase: The key enzyme of biological methane formation. Science 278, 1457-1462. *

Berk, H. and Thauer, R. K. (1997) Function of coenzyme F₄₂₀-dependent NADP reductase in methanogenic archaea containing an NADP-dependent alcohol dehydrogenase. Arch. Microbiol. 168, 396-402.

Sauer, K. and Thauer, R. K. (1997) Methanol:coenzyme M methyltransferase from *Methanosarcina barkeri*. Zinc dependence and thermodynamics of the methanol:cob(I)alamin methyltransferase reaction. Eur. J. Biochem. 249, 280-285.

Harms, U. and Thauer, R. K. (1997) Identification of the active site histidine in the corrinoid protein MtrA of the energy-conserving methyltransferase complex from *Methanobacterium thermoautotrophicum*. Eur. J. Biochem. 250, 783-788.

Vaupel, M., Vorholt, J. A. and Thauer, R. K. (1998) Overproduction and one-step purification of the N⁵,N¹⁰-methylenetetrahydromethanopterin cyclohydrolase (Mch) from the hyperthermophilic *Methanopyrus kandleri*. Extremophiles 2, 15-22.

Vaupel, M. and Thauer, R. K. (1998) Two F₄₂₀-reducing hydrogenases in *Methanosarcina barkeri*. Arch. Microbiol. 169, 201-205.

Afting, C., Hochheimer, A. and Thauer, R. K. (1998) Function of H₂-forming methylenetetrahydromethanopterin dehydrogenase from *Methanobacterium thermoautotrophicum* in coenzyme F₄₂₀ reduction with H₂. Arch. Microbiol. 169, 206-210.

Heim, S., Künkel, A., Thauer, R. K. and Hedderich, R. (1998)
Thiol:fumarate reductase (Tfr) from *Methanobacterium thermoautotrophicum*. Identification of the catalytic sites for fumarate reduction and thiol oxidation. Eur. J. Biochem. 253, 292-299.

Original Publications R. Thauer

Künkel, A., Vorholt, J. A., Thauer, R. K. and Hedderich, R. (1998) An *Escherichia coli* hydrogenase-3-type hydrogenase in methanogenic archaea. *Eur. J. Biochem.* **252**, 467-476.

Thompson, H., Tersteegen, A., Thauer, R. K. and Hedderich, R. (1998) Two malate dehydrogenases in *Methanobacterium thermoautotrophicum*. *Arch. Microbiol.* **170**, 38-42.

Sauer, K. and Thauer, R. K. (1998) Methanol:coenzyme M methyltransferase from *Methanosarcina barkeri*. Identification of the active-site histidine in the corrinoid-harboring subunit MtaC by site-directed mutagenesis. *Eur. J. Biochem.* **253**, 698-705.

Chistoserdova, L., Vorholt, J. A., Thauer, R. K. and Lidstrom, M. E. (1998) C₁ transfer enzymes and coenzymes linking methylotrophic bacteria and methanogenic archaea. *Science* **281**, 99-102. *

Asakawa, S., Sauer, K., Liesack, W. and Thauer, R. K. (1998) Tetramethylammonium:coenzyme M methyltransferase system from *Methanococcoides* sp. *Arch. Microbiol.* **170**, 220-226.

Vorholt, J. A., Chistoserdova, L., Lidstrom, M. E. and Thauer, R. K. (1998) The NADP-dependent methylene tetrahydromethanopterin dehydrogenase in *Methylobacterium extorquens* AM1. *J. Bacteriol.* **180**, 5351-5356.

Shima, S., Tziatzios, C., Schubert, D., Fukada, H., Takahashi, K., Ermler, U. and Thauer, R. K. (1998) Lyotropic-salt-induced changes in monomer/dimer/tetramer association equilibrium of formyltransferase from the hyperthermophilic *Methanopyrus kandleri* in relation to the activity and thermostability of the enzyme. *Eur. J. Biochem.* **258**, 85-92.

Hochheimer, A., Hedderich, R. and Thauer, R. K. (1998) The formylmethanofuran dehydrogenase isoenzymes in *Methanobacterium wolfei* and *M. thermoautotrophicum*: Induction of the molybdenum isoenzyme by molybdate and constitutive synthesis of the tungsten isoenzyme. *Arch. Microbiol.* **170**, 389-393.

Sauer, K. and Thauer, R. K. (1998) His⁸⁴ rather than His³⁵ is the active site histidine in the corrinoid protein MtrA of the energy conserving methyltransferase complex from *Methanobacterium thermoautotrophicum*. *FEBS Lett.* **436**, 401-402.

Geierstanger, B. H., Prasch, T., Griesinger, C., Hartmann, G., Buurman, G. and Thauer, R. K. (1998) Zum Katalysemechanismus der metallfreien Hydrogenase aus methanogenen Archaea: gegensätzliche Stereospezifität der katalysierten und nichtkatalysierten Reaktion. *Angew. Chemie* **110**, 3491-3494. Catalytic mechanism of the metal-free hydrogenase from methanogenic archaea: Reversed stereospecificity of the catalytic and noncatalytic reaction. *Angew. Chem. Int. Ed.* **37**, 3300-3303.

Shima, S., Héroult, D. A., Berkessel, A. and Thauer, R. K. (1998) Activation and thermostabilization effects of cyclic 2,3-diphosphoglycerate on enzymes from the hyperthermophilic *Methanopyrus kandleri*. *Arch. Microbiol.* **170**, 469-472.

Original Publications R. Thauer

- Berk, H. and Thauer, R. K.** (1998) F₄₂₀H₂:NADP oxidoreductase from *Methanobacterium thermoautotrophicum*: Identification of the encoding gene via functional overexpression in *Escherichia coli*. FEBS Letters 438, 124-126.
- Hochheimer, A., Hedderich, R. and Thauer, R. K.** (1999) The DNA binding protein Tfx from *Methanobacterium thermoautotrophicum*: Structure, DNA binding properties and transcriptional regulation. Mol. Microbiol. 31, 641-650.
- Pomper, B. K., Vorholt, J. A., Chistoserdova, L., Lidstrom, M. E. and Thauer, R. K.** (1999) A methenyl tetrahydromethanopterin cyclohydrolase and a methenyl tetrahydrofolate cyclohydrolase in *Methylobacterium extorquens* AM1. Eur. J. Biochem. 261, 475-480.
- Sauer, K. and Thauer, R. K.** (1999) Methanol:coenzyme M methyltransferase from *Methanosarcina barkeri* - substitution of the corrinoid harbouring subunit MtaC by free cob(I)alamin. Eur. J. Biochem. 261, 674-681.
- Grabarse, W., Vaupel, M., Vorholt, J. A., Shima, S., Thauer, R. K., Wittershagen, A., Bourenkov, G., Bartunik, H. D. and Ermler, U.** (1999) The crystal structure of methenyltetrahydromethanopterin cyclohydrolase from the hyperthermophilic archaeon *Methanopyrus kandleri*. Structure 7, 1257-1268.
- Mikoulinskaia, O., Akimenko, V., Galouchko, A., Thauer, R. K. and Hedderich, R.** (1999) Cytochrome c-dependent methacrylate reductase from *Geobacter sulfurreducens* AM-1. Eur. J. Biochem. 263, 346-352.
- Shima, S., Netrusov, A., Sordel, M., Wicke, M., Hartmann, G. and Thauer, R. K.** (1999) Purification, characterization, and primary structure of a monofunctional catalase from *Methanosarcina barkeri*. Arch. Microbiol. 171, 317-323.
- Schröder, I. and Thauer, R. K.** (1999) Methylcobalamin:homocysteine methyltransferase from *Methanobacterium thermoautotrophicum*. Identification as the *metE* gene product. Eur. J. Biochem. 263, 789-796.
- Hippler, B. and Thauer, R. K.** (1999) The energy conserving methyltetrahydromethanopterin:coenzyme M methyltransferase complex from methanogenic archaea: function of the subunit MtrH. FEBS Lett. 449, 165-168.
- Vorholt, J. A., Chistoserdova, L., Stolyar, S. M., Thauer, R. K. and Lidstrom, M. E.** (1999) Distribution of tetrahydromethanopterin-dependent enzymes in methylotrophic bacteria and phylogeny of methenyl tetrahydromethanopterin cyclohydrolases. J. Bacteriol. 181, 5750-5757.
- Selmer, T., Kahnt, J., Goubeaud, M., Shima, S., Grabarse, W., Ermler, U. and Thauer, R. K.,** (2000) The biosynthesis of methylated amino acids in the active site region of methyl-coenzyme M reductase. J. Biol. Chem. 275, 3755-3780.
- Bartoschek, S., Vorholt, J., Griesinger, C., Geierstanger, B. and Thauer, R. K.** (2000) N-Carboxymethanofuran (carbamate) formation from methanofuran and CO₂ in methanogenic archaea: thermodynamics and kinetics of the spontaneous reaction. Eur. J. Biochem. 267, 3130-3138.

Original Publications R. Thauer

Shima, S., Warkentin, E., Grabarse, W., Sordel, M., Wicke, M., Thauer, R. K. and Ermler, U. (2000) Structure of coenzyme F₄₂₀ dependent methylenetetrahydromethanopterin reductase (MER) from methanogenic archaea. *J. Mol. Biol.* 300, 935-950.

Grabarse, W., Mahlert, F., Shima, S., Thauer, R. K. and Ermler, U. (2000) Comparison of three methyl-coenzyme M reductases from phylogenetically distant organisms: Unusual amino acid modification, conservation and adaptation. *J. Mol. Biol.* 303, 329-344.

Hagemeier, C. H., Chistoserdova, L., Lidstrom, M. E., Thauer, R. K. and Vorholt, J. A. (2000) Characterization of a second methylene tetrahydromethanopterin dehydrogenase from *Methylobacterium extorquens* AM1. *Eur. J. Biochem.* 267, 3762-3769.

Sauer, K. and Thauer, R. K. (2000) Methyl-coenzyme M formation in methanogenic archaea: involvement of zinc in coenzyme M activation. *Eur. J. Biochem.* 267, 2498-2504.

Brioukhanov, A., Netrusov, A., Sordel, M., Thauer, R. K. and Shima, S. (2000) Protection of *Methanosarcina barkeri* against oxidative stress: identification and characterization of an iron superoxide dismutase. *Arch. Microbiol.* 174, 213-216.

Vorholt, J. A., Marx, C. J., Lidstrom, M. E. and Thauer, R. K. (2000) Novel formaldehyde-activating enzyme in *Methylobacterium extorquens* AM1 required for growth on methanol. *J. Bacteriol.* 182, 6645-6650.

Afting, C., Kremmer, E., Brucker, C., Hochheimer, A. and Thauer, R. K. (2000) Regulation of the synthesis of H₂-forming methylenetetrahydromethanopterin dehydrogenase (Hmd) and of Hmd2 and Hmd3 in *Methanothermobacter marburgensis*. *Arch. Microbiol.* 174, 225-232.

Shima, S., Thauer, R. K., Ermler, U., Durchschlag, H., Tziatzios, C., and Schubert, D. (2000) A mutation affecting the association equilibrium of formyltransferase from the hyperthermophilic *Methanopyrus kandleri* and its influence on the enzyme's activity and thermostability. *Eur. J. Biochem.* 267, 6619-6623.

Buurman, G. Shima, S. and Thauer, R. K. (2000) The metal-free hydrogenase from methanogenic archaea: Evidence for a bound cofactor. *FEBS Lett.* 485, 200-204.

Bartoschek, S., Buurman, G., Thauer, R. K., Geierstanger, B.H., Weyrauch, J.P., Griesinger, C., Nilges, M., Hutter, M.C. and Helms, V. (2001) Re-face stereospecificity of methylenetetrahydromethanopterin dehydrogenases and methylenetetrahydrofolate dehydrogenases is predetermined by intrinsic properties of the substrate. *ChemBioChem* 2, 530-541.

Grabarse, W., Mahlert, F., Duin, E.C., Goubeaud, M., Shima, S., Thauer, R. K., Lamzin, V., and Ermler, U. (2001) On the mechanism of biological methane formation: Structural evidence for conformational changes in methyl-coenzyme M reductase upon substrate binding. *J. Mol. Biol.* 309, 315-330.

Original Publications R. Thauer

Hagemeier, C. H., Bartoschek, S., Griesinger, C., Thauer, R. K. and Vorholt, J. A. (2001) Re-face stereospecificity of NADP-dependent methylenetetrahydromethanopterin dehydrogenase from *Methylobacterium extorquens* as determined by NMR spectroscopy. *FEBS Lett.* **494**, 95-98.

Shima, S., Sordel-Klippert, M., Brioukhanov, A., Netrusov, A., Linder, D. and Thauer, R. K. (2001) Characterization of a heme-dependent catalase from *Methanobrevibacter arboriphilus*. *Appl. Environm. Microb.* **67**, 3041-3045.

Warkentin, E., Mamat, B., Sordel-Klippert, M., Wicke, M., Thauer, R. K., Iwata, M., Iwata, S., Ermler, U. and Shima, S. (2001) Structures of F₄₂₀H₂:NADP⁺ oxidoreductase with and without its substrates bound. *EMBO J.* **20**, 6561-6569.

Mahlert, F., Grabarse, W., Kahnt, J., Thauer, R. K. and Duin, E. C. (2002) The nickel enzyme methyl-coenzyme M reductase from methanogenic archaea: in vitro interconversions among the EPR detectable MCR-red1 and MCR-red2 states. *J. Biol. Inorg. Chem.* **7**, 101-112.
Erratum: (2002) *J. Biol. Inorg. Chem.* **7**, 351.

Mahlert, F., Bauer, C., Jaun, B., Thauer, R. K. and Duin, E. C. (2002) The nickel enzyme methyl-coenzyme M reductase from methanogenic archaea: In vitro induction of the nickel-based MCR-ox EPR signals from MCR-red2. *J. Biol. Inorg. Chem.* **7**, 500-513.

Mamat, B., Roth, A., Grimm, C., Ermler, U., Tziatzios, C., Schubert, D., Thauer, R. K. and Shima, S. (2002) Crystal structures and enzymatic properties of three formyltransferases from archaea: Environmental adaptation and evolutionary relationship. *Protein Science* **11**, 2168-2178.

Krüer, M., Haumann, M., Meyer-Klaucke, W., Thauer, R. K., & Dau, H. (2002) The role of zinc in the methylation of the coenzyme M thiol group in methanol:coenzyme M methyltransferase from *Methanosarcina barkeri*. New insights from X-ray absorption spectroscopy. *Eur. J. Biochem.* **269**, 2117-2123.

Duin, E. C., Cosper, N. J., Mahlert, F., Thauer, R. K. and Scott, R. A. (2002) Coordination and geometry of the nickel atom in the active methyl-coenzyme M reductase from *Methanothermobacter marburgensis* as detected by X-ray absorption spectroscopy. *J. Biol. Inorg. Chem.* **8**, 141-148.

Finazzo, C., Harmer, J., Jaun, B., Duin, E. C., Mahlert, F., Thauer, R. K., van Doorslaer, S. and Schweiger, A. (2003) Characterization of the MCR_{red2} form of methyl-coenzyme M reductase: a pulse EPR and ENDOR study. *J. Biol. Inorg. Chem.* **8**, 586-593.

Finazzo, C., Harmer, J., Bauer, C., Jaun, B., Duin, E. C., Mahlert, F., Goenrich, M., Thauer, R. K., van Doorslaer, S. and Schweiger, A. (2003) Coenzyme B induced coordination of coenzyme M via its thiol group to Ni(I) of F₄₃₀ in active methyl-coenzyme M reductase. *J. Am. Chem. Soc.* **125**, 4988-4989 (DOI: 10.1021/ja0344314).

Hagemeier, C.H., Shima, S., Thauer, R. K. and Ermler, U. (2003) Coenzyme F₄₂₀-dependent methylene-tetrahydromethanopterin dehydrogenase from *Methanopyrus kandleri*: The selenomethionine labelled

Original Publications R. Thauer

and non-labelled enzyme crystallized in two different forms. Acta Crystallographica D Biol. Crystallograph. 59, 1653-1655.

Hagemeier, C.H., Shima, S., Thauer, R. K., Bourenkov, G., Bartunik, H. D. and Ermler, U. (2003) Coenzyme F₄₂₀-dependent methylene-tetrahydromethanopterin dehydrogenase (Mtd) from *Methanopyrus kandleri*: A methanogenic enzyme with an unusual quarternary structure. J. Mol. Biol. 332, 1047-1057.

Krüger, M., Meyerdierks, A., Glöckner, F.O., Amann, R., Widdel, F., Kube, M., Reinhardt, R., Kahnt, J., Böcher, R., Thauer, R. K. and Shima, S. (2003) A conspicuous nickel protein in microbial mats that oxidise methane anaerobically. Nature 426, 878-881*.

Lyon, E., Shima, S., Buurman, G., Chowdhuri, S., Batschauer, A., Steinbach, K. and Thauer, R. K. (2004) UV-A/blue-light inactivation of the "metal-free" hydrogenase (Hmd) from methanogenic archaea. The enzyme contains functional iron after all. Eur. J. Biochem. 271, 195-204

Shima, S., Lyon, E., Sordel-Klippert, M., Kauß, M., Kahnt, J., Thauer, R. K., Steinbach, K., Xie, X., Verdier, L. and Griesinger, C. (2004) The cofactor of the iron-sulfur cluster free hydrogenase Hmd: Structure of the light-inactivation product. Angew. Chemie 116, 2601-2605.

Aufhammer, S., Warkentin, E., Berk, H., Shima, S., Thauer, R. K. and Ermler, U. (2004) Coenzyme binding in F₄₂₀-dependent secondary alcohol dehydrogenase, a member of the bacterial luciferase family. Structure 12, 361-370.

Duin, E.C., Signor, L., Piskorski, R., Mahlert, F., Clay, M.D., Goenrich, M., Thauer, R. K., Jaun, B. and Johnson, M. K. (2004) Spectroscopic investigation of the nickel-containing porphinoic cofactor F₄₃₀. Comparison of the free cofactor in the +1, +2 and +3 oxidation states with the cofactor bound to methyl-coenzyme M reductase in the silent, red and ox forms. J. Biol. Inorg. Chem. 9, 563-576.

Sakasegawa, S., Hagemeier, C. H., Thauer, R. K., Essen, L. and Shima, S. (2004) Structure and properties of NAD(P) dependent glycerol-3 phosphate dehydrogenase from *Archaeoglobus fulgidus*. Protein Science 13, 3161-3171.

Seedorf, H., Dreisbach, A., Hedderich, R., Thauer, R. K. and Shima, S. (2004) F₄₂₀H₂-dependent oxidase (FprA) from *Methanobrevibacter arboriphilus*, a coenzyme F₄₂₀-dependent enzyme involved in O₂ detoxification. Arch. Microbiol. 182, 126-137.

Goenrich, M., Mahlert, F., Duin, E. C., Bauer, C., Jaun, B. and Thauer, R. K. (2004) Probing the reactivity of Ni in the active site of methyl-coenzyme M reductase with substrate analogues. J. Biol. Inorg. Chem. 9, 691-705.

Shima, S., Lyon, E., Sordel-Klippert, M., Kauß, M., Kahnt, J., Thauer, R. K., Steinbach, K., Xie, X., Verdier, L. and Griesinger, C. (2004) The cofactor of the iron-sulfur cluster free hydrogenase Hmd: Structure of the light-inactivation product. Angew. Chem. Int. Ed. Engl. 43, 2547-2551.

Original Publications R. Thauer

Lyon, E. J., Shima, S., Böcher, R., Thauer, R. K., Grevels, F.-W., Bill, E., Woseboom, W. and Albracht, S. P. J. (2004) Carbon monoxide as an intrinsic ligand to iron in the active site of the iron-sulfur cluster free hydrogenase (Hmd) as revealed by infrared spectroscopy. *J. Am. Chem. Soc.* 126, 14239-14248.

Buchenau, B. and Thauer R. K. (2004) Tetrahydrofolate-specific enzymes in *Methanosarcina barkeri* and growth dependence of this methanogenic archaeon on folic acid or *p*-aminobenzoic acid. *Arch. Microbiol.* 182, 313-325

Acharya, P., Goenrich, M., Hagemeyer, C. H., Demmer, U., Vorholt, J. A., Thauer, R. K. and Ermler, U. (2005) How an enzyme binds the C1 carrier tetrahydromethanopterin: Structure of the tetrahydromethanopterin-dependent formaldehyde-activating enzyme (Fae) from *Methylobacterium extorquens* AM1. *J. Biol. Chem.* 280, 13712-13719.

Goenrich, M., Duin, E. C., Mahlert, F. and Thauer, R. K. (2005) Temperature dependence of methyl-coenzyme M reductase activity and of the formation of the methyl-coenzyme M red2 state induced by coenzyme B. *J. Biol. Inorg. Chem.* 10, 333-342.

Aufhammer, S. W., Warkentin, E., Ermler, U., Hagemeyer, C. H., Thauer, R. K. and Shima, S. (2005) Crystal structure of methylenetetrahydromethanopterin reductase (Mer) in complex with coenzyme F₄₂₀: Architecture of F₄₂₀/FMN binding site of enzymes within the nonprolyl *cis*-peptide containing bacterial luciferase family. *Protein Science* 14, 1840-1849.

Warkentin, E., Hagemeyer, C. H., Shima, S., Thauer, R. K. and Ermler, U. (2005) The structure of F₄₂₀-dependent methylenetetrahydromethanopterin dehydrogenase: a crystallographic 'superstructure' of the selenomethionine-labelled protein crystal structure. *Act. Cryst. D* 61, 198-202.

Shima, S., Lyon, E.J., Thauer, R. K., Mienert, B. and Bill, E. (2005) Mössbauer studies of the iron-sulfur cluster-free hydrogenase (Hmd): The electronic state of the mononuclear Fe active site. *J. Am. Chem. Soc.* 127, 10430-10435.

Goenrich, M., Thauer, R. K., Yurimoto, H., and Kato, N. (2005) Formaldehyde activating enzyme (Fae) and hexulose-6-phosphate synthase (Hps) in *Methanosarcina barkeri* : a possible function in ribose-5-phosphate biosynthesis. *Arch. Microbiol.* 184, 41-48.

Harmer, J., Finazzo, C., Piskorski, R., Bauer, C., Jaun, B., Duin, E. C., Goenrich, M., Thauer, R. K., von Doorslaer, S. and Schweiger, A. (2005) Spin density and coenzyme M coordination geometry of the ox1 form of methyl-coenzyme M reductase: A pulse EPR study. *J. Am. Chem Soc.* 127, 17744-17755.

Seedorf, H., Kahnt, J., Pierik, A. J. and Thauer, R. K. (2005) *Si*-face stereospecificity at C5 of coenzyme F₄₂₀ for F₄₂₀H₂ oxidase from methanogenic archaea as determined by mass spectrometry. *FEBS J.* 272, 5337-5342.

Fricke, W. F., Seedorf, H., Henne, A., Krüer, M., Liesegang, H., Hedderich, R., Gottschalk, G. and Thauer, R. K. (2006) The genome sequence of

Original Publications R. Thauer

Methanosphaera stadtmanae reveals why this human intestinal archaeon is restricted to methanol and H₂ for methane formation and ATP synthesis. *J. Bacteriol.* 188(2):642-658.

Pilak, O., Mamat, B., Vogt, S., Hagemeyer, C. H., Thauer, R. K., Shima, S., Vonrhein, C., Warkentin, E. and Ermler, U. (2006) The crystal structure of the apoenzyme of the iron-sulfur cluster free hydrogenase. *J. Mol. Biol.* 358, 798-809.

Acharya, P., Warkentin, E., Ermler, U., Thauer, R. K. and Shima, S. (2006) The structure of formylmethanofuran:tetrahydromethanopterin formyltransferase in complex with its coenzymes. *J. Mol. Biol.* 357, 870-879.

Hinderberger, D., Piskorski, R. P., Goenrich, M., Thauer, R. K., Schweiger, A. Harmer, J., and Jaun, B. (2006) A nickel-alkyl bond in an inactivated state of the enzyme catalyzing methane formation. *Angew. Chem. Int. Ed. Engl.* 45, 3602-3607.

Hagemeyer, C. H., Krüer, M., Thauer, R. K., Warkentin, E. and Ermler, U. (2006) Insight into the mechanism of biological methanol activation based on the crystal structure of methanol:cobalamin methyltransferase complex MtaBC from *Methanosarcina barkeri*. *Proc. Natl. Am. Soc.* 103 (50),18917-22.

Korbas, M., Vogt, S., Meyer-Klaucke, W., Bill, E., Lyon, E. J., Thauer, R. K. and Shima, S. (2006) The iron-sulfur cluster free hydrogenase (Hmd) is a metalloenzyme with a novel iron binding motif. *J. Biol. Chem.* 281,30804-30813.

Krause, A., Ramakumar, A., Bartels, D., Battistoni, F., Bekel, T., Boch, J., Böhm, M., Friedrich, F., Hurek, T., Krause, L., Linke, B., McHardy, A.C., Sarkar, A., Schneiker, S., Syed, A. A., Thauer, R. K., Vorhölter, F.-J., Weidner, S., Pühler, A., Reinhold-Hurek, B., Kaiser, O., and Goesmann, A. (2006) Complete genome of the mutualistic, N₂-fixing grass endophyte *Azoarcus* sp. strain BH72. *Nature Biotechnology* 24, 1385-1391.

Seedorf, H., Hagemeyer, C. H., Shima, S., Thauer, R. K., Warkentin, E. and Ermler, U. (2007) Structure of coenzyme F₄₂₀H₂ oxidase (FprA), a di-iron flavoprotein from methanogenic Archaea catalyzing the reduction of O₂ to H₂O. *FEBS J.* 274, 1588-1599.

Buchenau, B., Kahnt, J., Heinemann, I. U., Jahn, D. and Thauer, R. K. (2006) Heme biosynthesis in *Methanosarcina barkeri* via a pathway involving two methylation reactions. *J. Bacteriol.* 188, 8666-8668.

Li, F., Hagemeyer, C. H., Seedorf, H., Gottschalk G. and Thauer, R. K. (2007) Re-citrate synthase from *Clostridium kluyveri* is phylogenetically related to homocitrate synthase and isopropylmalate synthase rather than to Si-citrate synthase. *J. Bacteriol.* 189 (11), 4299-4304.

Forzi, L., Hellwig, P., Thauer, R. K. and Sawers, R. G. (2007) The CO and CN⁻ ligands to the active site Fe in [NiFe]-hydrogenase of *Escherichia coli* have different metabolic origins. *FEBS Lett.* 581, 3317-3321.

Kern, D.I., Goenrich, M., Jaun, B., Thauer, R. K., Harmer, J. and Hinderberger, D. (2007) Two sub-states of the red2 state of methyl-

Original Publications R. Thauer

coenzyme M reductase revealed by high-field EPR spectroscopy. *J. Biol. Inorg. Chem.* 12 (8), 1097-105

Gensheimer, M., Becker, M., Brandis-Heep, A., Wendorff, J. H., Thauer, R. K. and Greiner, A. (2007) Novel biohybrid materials by electrospinning: nanofibers of poly (ethylene oxide) and living bacteria. *Adv. Mater.* 19, 2480-2

Kahnt, J., Buchenau, B., Mahlert, F., Krüger, M., Shima, S. and Thauer, R. K. (2007) Post-translational modifications in the active site region of methyl-coenzyme M reductase from -methanogenic and methanotrophic archaea. *FEBS J.* 274, 4913-4921.

Vogt, S., Lyon, E. J., Shima, S. and Thauer, R. K. (2008) The exchange activities of [Fe] hydrogenase (iron-sulfur-cluster-free hydrogenase) from methanogenic archaea in comparison with the exchange activities of [FeFe] and [NiFe] hydrogenases. *J Biol Inorg Chem.* 13 (1), 97-106

Seedorf, H., Fricke, W. F., Veith, B., Brüggemann, H., Liesegang, H., Strittmatter, A., Miethke, M., Buckel, W., Hinderberger, J., Li, F., Hagemeyer C. H., Thauer, R. K. & Gottschalk, G. (2008) The genome of *Clostridium kluyveri*, a strict anaerobe with unique metabolic features. *PNAS* 105, 2128-2133

Li, F., Hinderberger, J., Seedorf, H., Zhang, J., Buckel, W. & Thauer, R. K. (2008) Coupled ferredoxin and crotonyl coenzyme A (CoA) reduction with NADH catalyzed by the butyryl-CoA dehydrogenase/Etf complex from *Clostridium kluyveri*. *J. Bacteriol* 190, 843-50

Guo, Y., Wang, H., Xiao, Y., Vogt, S., Thauer, R.K., Shima, S., Volkens, P.I., Rauchfuss, T.B., Pelmeshikov, V., Case, D. A., Alp, E., Sturhahn, W., Yoda, Y. & Cramer, S.P. (2008) Characterization of the Fe site in iron-sulfur cluster free hydrogenase (Hmd) and of a model compound via nuclear resonant vibrational spectroscopy (NRVS). *Inorganic Chemistry* 47, 3969-3977.

Shima, S., Pilak O., Vogt, S., Schick, M., Stagni, M.S., Meyer-Klaucke, W., Warkentin, E., Thauer, R.K. and Ermler, U. (2008) The crystal structure of [Fe]-hydrogenase reveals the geometry of the active site. *Science* 321, 572-575

Harmer, J, Finazzo, C., Piskorski, R., Ebner, S., Duin, E.C., Goenrich, M., Thauer, R.K., Reiher, M., Schweiger, A., Hinderberger, D. & Jaun, B: (2008) A nickel hydride complex in the active site of methyl-coenzyme M reductase: Implications for the catalytic cycle. *J. Am. Chem. Soc.*, 130, 10907-10920

Mayr, S., Latkoczy Ch., Krüger, M., Günther, D., Shima, S., Thauer, R. K., Widdel, F. & Jaun, B. (2008) Structure of an F₄₃₀ variant from Archaea associated with anaerobic oxidation of methane. *J. Am. Chem. Soc.*, 130, 10758-10767

Hinderberger, D., Ebner, S., Mayr, S., Jaun, B., Reiher, M., Goenrich, M., Thauer, R. K. & Harmer, J. (2008). Coordination and binding geometry of methyl-coenzyme M in the red1m state of methyl-coenzyme M reductase. *J. Biol. Inorg. Chem.*, 13, 1275-1289.

Original Publications R. Thauer

Hiroto, T., Ataka, K., Pilak O., Vogt, S., Stagni, M. S., Meyer-Klaucke, W., Warkentin, E., Thauer, R. K., Shima, S. & Ermler, U. (2009) The crystal structure of C176A mutated [Fe]-hydrogenase suggests an acyl-iron ligation in the active site iron complex. *FEBS Letters* 583, 585-590

Ebner, S., Jaun, B., Goenrich, M., Thauer, R. K. & Harmer, J. (2009) Binding of coenzyme B induces a major conformational change in the active site of methyl-coenzyme M reductase. *J. Am. Chem. Soc.*, 132, 567-575.

Ceh, K., Demmer, U., Warkentin, E., Thauer, R.K., Shima, S. & Ermler, U. (2009) Structural basis of the hydride transfer mechanism in F₄₂₀-dependent methylene-tetrahydromethanopterin dehydrogenase. *Biochemistry*, 48, 10098-10108.

Scheller, S., Goenrich, M., Boecher, R., Thauer, R. K. & Jaun, J. (2010) The key nickel enzyme of methanogenesis catalyses anaerobic oxidation of methane. *Nature* 465, 606-609.

Scheller, S., Goenrich, M., Mayr, S. Thauer, R. K. & Jaun, B. (2010) Intermediates in the catalytic cycle of methyl-coenzyme M reductase: Isotope exchange is consistent with formation of a δ -alkane Ni complex. *Angewandte Chemie*, 49, 8112-8115.

Wang, S., Haiyan, H., Moll, J. & Thauer, R. K. (2010) NADP⁺ reduction with reduced ferredoxin and NADP⁺ reduction with NADH are coupled via an electron bifurcating enzyme complex in *Clostridium kluyveri*. *Journal of Bacteriology* 192,5115-5123.

Liesegang, H., Kaster, A.-K., Wiezer, A., Goenrich, M., Wollher, A., Seedorf, S., Gottschalk, G. & Thauer, R. K. (2010) Complete Genome Sequence of *Methano-thermobacter marburgensis*, a Methanoarchaeon Model Organism. *Journal of Bacteriology* 192, 5850-5851.

Kaster, A.-K., Goenrich, M., Seedorf, H., Liesegang, H., Wollherr, A., Gottschalk, G. & Thauer, R. K. (2011) More than 200 genes required for methane formation from H₂ and CO₂ and energy conservation in *Methanothermobacter marburgensis* and *M. thermotrophicus*. *Archaea* 2011 doi:10.1155/2011/973848, 23 pages.

Kaster, A.-K., Moll, J., Parey, K. & Thauer, R. K. (2011) Coupling of ferredoxin- and heterodisulfide reduction via electron bifurcation in hydrogenotrophic methanogenic archaea.

Proc. Natl. Acad. Sci. USA, 108, 2981-2986.

Shima, S., Krueger, M., Weinert, T., Demmer, U., Kahnt, J., Thauer, R. K. & Ermler, U. (2011) Crystal structure of a methyl-coenzyme M reductase from Black Sea mats that oxidize anaerobically methane. *Nature* 481, 98-101.

Gensheimer, M., Brandis-Heep, A., Agarwal, S., Thauer, R. K. & Greiner, A. (2011) Polymer/bacteria composite nanofiber nonwoven by electrospinning of living bacteria protected by hydrogel microparticles. *Macromolecular Bioscience* 11, 333-337.

Original Publications R. Thauer

Poehlein, A., Schmidt, S., Kaster, A-K., Goenrich, M., Vollmers, J., Thürmer, A., Bertsch, J., Schuchmann, K., Voigt, B., Hecker, M., Daniel, R., Thauer, R. K., Gottschalk, G. & Müller, V. (2012) * An ancient pathway combining carbon dioxide fixation with the generation and utilization of a sodium ion gradient for ATP synthesis. *PLOS 1*, Volume 7, Issue 3, e33439 (8 pages).

Huang, H., Wang, S., Moll, J. & Thauer, R. K. (2012). Electron bifurcation involved in the energy metabolism of the acetogen bacterium *Moorella thermoacetica*. *Journal of Bacteriology* 194, 3689-3699.

Wang, S., Huang, H., Kahnt, J. & Thauer, R. K. (2013) A reversible electron-bifurcating ferredoxin- and NAD-dependent [FeFe]-hydrogenase (HydABC) in *Moorella thermoacetica*. *Journal of Bacteriology* 195, 1267-75.

Wang, S., Huang, H., Kahnt, J., Mueller, A. P., Köpke, M. & Thauer, R. K. (2013) NADP-specific Electron-bifurcating [FeFe]-hydrogenase in a Functional Complex with Formate Dehydrogenase in *Clostridium autoethanogenum* grown on CO. *Journal of Bacteriology* 95, 4373-4386.

Wang, S., Huang, H., Kahnt, J. & Thauer, R. K. (2013) *Clostridium acidurici* Electron- bifurcating formate dehydrogenase. *Appl. Environ. Microbiol.* 79, 6176-6179.

Scheller, S., Goenrich, M., Thauer, R. K. & Jaun, B. M. (2013) Methyl-Coenzyme M Reductase from Methanogenic Archaea: Isotope Effects on the Formation and Anaerobic Oxidation of Methane. *J. Am. Chem. Soc.* 135, 14975-14984.

Scheller, S., Goenrich, M., Thauer, R. K. & Jaun, B. M. (2013) Methyl-Coenzyme M Reductase from Methanogenic Archaea: Isotope Effects on Label Exchange and Ethane Formation with the Homologous Substrate Ethyl-Coenzyme M. *J. Am. Chem. Soc.* 135, 14985-14995.

Mock, J. Wang, S., Huang, H., Kahnt, J. & Thauer, R. K. (2014). Evidence for a hexameric methylenetetrahydrofolate reductase in *Moorella thermoacetica*. *Journal of Bacteriology* 196,3303-3314.

Zheng, Y., Kahnt, J., Kwon, I., Mackie, R. & Thauer, R. K. (2014) Hydrogen formation and its regulation in *Ruminococcus albus*: Involvement of a non-electron-bifurcating [FeFe]-hydrogenase, on an electron-bifurcating [FeFe]-hydrogenase and of a putative H₂ sensing [FeFe]-hydrogenase. *Journal of Bacteriology* 196, 3840-3852.

Mock, J., Zheng, Y., Mueller, A. P., Ly, S., Tran, L., Segovia, S., Nagaraju, S., Köpke M., Dürre, P. & Thauer, R. K. (2015) Energy conservation associated with ethanol formation from H₂ and CO₂ in *Clostridium autoethanogenum* involving electron bifurcation. *Journal of Bacteriology* 197, 2965-2980.

Demmer, J. K., Huang, H., Wang, S., Demmer, U., Thauer, R. K. & Ermler, U. (2015) Insights into flavin-based electron bifurcation via the NADH-dependent reduced ferredoxin-NADP oxidoreductase structure. *Journal of Biological Chemistry* 290, 21985-21995.

Original Publications R. Thauer

Duin, E. C., Wagner, T., Shima, S., Prakash, D., Cronin, B., Yáñez-Ruiz, D. R., Duval, S., Rumbeli, R., Stemmler, R. T., Thauer, R. K. & Kindermann, M. (2016) Mode of action uncovered for the specific reduction of methane emissions from ruminants by the small molecule 3-nitrooxypropanol. *Proc. Natl. Acad. Sci. USA*, *113*, 6172-6177.

Antranikian, G., Suleiman, M., Schäfers, C., Adams, M. W. W., Bartolucci, S., Blamey, J. M., Birkeland, N. K., Bonch-Osmolovskaya, E., da Costa, M. S., Cowan, D. Danson, M., Forterre, P., Kelly, R., Ishino, Y., Littlechild, J., Moracci, M., Noll, K., Oshima, T. Robb, F., Rossi, M., Santos, H., Schönheit, P., Sterner, R., Thauer, R. K., Thomm, M., Wiegel, J. & Stetter, K. O. (2017) Diversity of bacteria and archaea from two shallow marine hydrothermal vents from Vulcano Island. *Extremophiles* *21*, 733-742

Reviews R. Thauer

Reviews (76)

Decker, K., Jungermann, K. and Thauer, R.K. (1970) Energy production in anaerobic organisms. *Angew. Chem.* 82, 153-173. *Angew. Chem. Int. Ed.* 9, 138-158.

Thauer, R.K., Fuchs, G. and Jungermann, K. (1977) Role of iron-sulfur proteins in formate metabolism. In: *Iron-sulfur proteins in formate metabolism*. In *Iron-sulfur proteins, vol. III* (Lovenberg, W., ed.). Academic Press, New York, San Francisco, London, pp. 121-156.

Thauer, R.K., Jungermann, K. and Decker, K. (1977) Energy conservation in chemotrophic anaerobic bacteria. *Bact. Rev.* 41, 100-180.*

Thauer, R.K. und Fuchs, G. (1979) Methanogene Bakterien. Ungewöhnliche Zellkomponenten und Stoffwechselwege in einer Bakteriengruppe mit phylogenetischer Sonderstellung. *Naturwissenschaften* 66, 89-94.

Thauer, R.K. and Badziong, W. (1980) Respiration with sulfate as electron acceptor. In: *Diversity of Bacterial Respiratory Systems* (C.J. Knowles, ed.). CRC Press Inc., Boca Raton, Florida, Vol. II, pp. 65-85.

Thauer, R.K., Diekert, G. and Schönheit, P. (1980) Biological role of nickel. *Trends in Biochemical Sciences* 5, 304-306.

Thauer, R.K. and Badziong, W. (1981) Dissimilatory sulfate reduction, energetic aspects. In *Biology of Inorganic Nitrogen and Sulfur* (H. Bothe and A. Trebst, eds.). Springer Verlag, Berlin, pp. 188-198.

Thauer, R.K. and Schönheit, P. (1982) Iron-sulfur complexes of ferredoxin as a storage form of iron in *Clostridium pasteurianum*. In *Iron-Sulfur Proteins* (T.G. Spiro, ed.). John Wiley and Sons Inc., New York, pp. 329-341.

Thauer, R.K. (1982) Dissimilatory sulphate reduction with acetate as electron donor. *Phil. Trans. R. Soc., Lond. B* 298, 467-471.

Thauer, R.K., Brandis-Heep, A., Diekert, G., Gilles, H.-H., Graf, E.-G., Jaenchen, R. and Schönheit, P. (1983) Drei neue Nickelenzyme aus anaeroben Bakterien. *Naturwissenschaften* 70, 60-64.

Thauer, R.K. (1983) Leben ohne Licht und Sauerstoff: Sonderwege biologischer Energieumsetzung in niederen Organismen. *Die Umschau* 2, 53-57.

Thauer, R.K. (1985) Nickelenzyme im Stoffwechsel von methanogenen Bakterien. *Biol. Chem. Hoppe-Seyler* 366, 103-112

Ankel-Fuchs, D., Hüster, R., Mörschel, E., Albracht, S.P.J. and Thauer, R.K. (1986) Structure and function of methyl-coenzyme M reductase and of Factor F₄₃₀ in methanogenic bacteria. *System. Appl. Microbiol.* 7, 383-387.

Ankel-Fuchs, D. and Thauer, R.K. (1988) II. Nickel in Biology: Nickel as an essential trace element. In *Bioinorganic chemistry of nickel* (J.R. Lancaster Jr., ed.). VHC Publishers, Deerfield Beach, USA, pp. 93-110

Reviews R. Thauer

Thauer, R.K. (1988) Carbonylierungs-Chemie in anaeroben Bakterien. In *Jahrbuch Biotechnologie, Band 2, 1988/89* (P. Prëve et al., eds.). Carl Hanser Verlag, München, Wien, pp. 49-64.

Thauer, R.K. (1988) Citric acid cycle, 50 years on: Modifications and an alternative pathway in anaerobic bacteria. *Eur. J. Biochem.* 176, 497-508.

Thauer, R.K., Möller-Zinkhan, D. and Spormann, A. (1989) Biochemistry of acetate catabolism in anaerobic chemotrophic bacteria. *Annu. Rev. Microbiol.* 43, 43-67.*

Thauer, R.K. (1989) Energy metabolism of sulfate reducing bacteria. In *Autotrophic Bacteria*, chapter 22. (H.G. Schlegel and B. Bowien, eds.). Science Tech Publishers, Madison, USA, pp. 397-413.

Friedmann, H.C., Klein, A. and Thauer, R.K. (1990) Structure and function of the nickel porphinoïd, coenzyme F₄₃₀, and of its enzyme, methyl coenzyme M reductase. *FEMS Microbiol. Rev.* 87, 339-348.

Thauer, R.K. (1990) Energy metabolism of methanogenic bacteria. *Biochim. Biophys. Acta* 1018, 256-259.

Friedmann, H.C., Klein, A. and Thauer, R.K. (1991) Biochemistry of coenzyme F₄₃₀, a nickel porphinoïd involved in methanogenesis. In *Biosynthesis of Tetrapyrroles, New Comprehensive Biochemistry* (Jordan, P.M., ed.) Elsevier Science Publishers, Amsterdam, pp. 139-154.

Friedmann, H.C. and Thauer, R.K. (1992) Macrocyclic tetrapyrrole biosynthesis in bacteria. In *Encyclopedia of Microbiology*, vol. 3, Academic Press, pp. 1-19.

Thauer, R.K., Hedderich, R. and Fischer, R. (1993) Biochemistry. Reactions and enzymes involved in methanogenesis from CO₂ and H₂. In *Methanogenesis* (Ferry, J.G. ed) Chapman and Hall, New York, pp. 209-252.

Weiss, D.S. and Thauer, R.K. (1993) Methanogenesis and the unity of biochemistry. *Cell* 72, 819-822.

Thauer, R.K. and Kunow, J. (1995) Sulfate reducing Archaea. In *Biotechnology Handbook* (Clark, N. ed.) Plenum Publishing Company Ltd., London, pp. 33-48.

Thauer, R.K., Klein, A.R. and Hartmann, G.C. (1996) Reactions with molecular hydrogen in microorganisms. Evidence for a purely organic hydrogenation catalyst. *Chem. Rev.* 96, 3031-3042. *

Thauer, R.K. (1997) Biodiversity and unity in biochemistry. *Antonie van Leeuwenhoek* 71, 21-32.

Thauer, R.K. (1998) Biochemistry of methanogenesis: a tribute to Marjory Stephenson. *Microbiology* 144, 2377-2406.*

Ermler, U., Grabarse, W., Shima, S., Goubeaud, M. and Thauer, R.K. (1998) Mechanismus der mikrobiellen Methanbildung. *Biospectrum* 4, 20-24.

Ermler, U., Grabarse, W., Shima, S., Goubeaud, M. and Thauer, R.K. (1998) Active sites of transition-metal enzymes with focus on nickel. *Curr. Opin. Struct. Biol.* 8, 749-758.

Reviews R. Thauer

Sauer, K. & Thauer, R.K. (1999) The role of corrinoids in methanogenesis. In *Chemistry and Biochemistry of B₁₂* (Banerjee, R. ed.). John Wiley and Sons, Inc., pp. 655-679.

Grabarse, W., Shima, S., Mahlert, F., Duin, E.C., Thauer, R.K. and Ermler, U. (2000) Methyl-coenzyme M reductase. In *Handbook of Metalloproteins* (Wiegardt, K., Huber, R., Poulos, T.L., Messerschmidt, A.) John Wiley and Sons, pp 897-914

Shima, S. and Thauer, R.K. (2001) Tetrahydromethanopterin specific enzymes from *Methanopyrus kandleri*. *Methods in Enzymology* 331, 317-353.

Gottschalk, G. and Thauer, R.K. (2001) The Na⁺-translocating methyltransferase complex from methanogenic archaea. *Biochim. Biophys. Acta* 1505, 28-36.

Buurman, G., Afting, C. and Thauer, R.K. (2001) The metal-free hydrogenase from methanogenic archaea. In *Hydrogen as a fuel* (Cammack, R., Frey, M., Robson, R., eds.) Taylor & Francis, London, New York, chapter 8.4, pp. 167-169.

Thauer, R.K. (2001) Nickel to the fore. *Science* 293, 1264-1265.

Vorholt, J.A. and Thauer, R.K. (2002) Molybdenum and tungsten enzymes in C1 metabolism. In *Metal Ions in Biological Systems, vol. 39* (Sigel, A. & Sigel, H., eds) Marcel Dekker, Inc., New York, pp. 571-620.

Brioukhanov, A.L., Thauer, R.K. and Netrusov, A.I. (2002) Catalase and superoxide dismutase in the cells of strict anaerobic microorganisms. *Microbiologia* 71, 281-285.

Shima, S., Warkentin, E., Thauer, R.K. and Ermler, U. (2002) Structure and function of enzymes involved in the methanogenic pathway utilizing carbon dioxide and molecular hydrogen. *J. Biosci. Bioeng.* 93, 519-530.

Shima, S., Thauer, R.K. and Ermler, U. (2004) Hyperthermophilic and salt-dependent formyltransferase from *Methanopyrus kandleri*. *Biochem. Soc. Trans.* 32, 269-272.

Shima, S. and Thauer, R.K. (2005) Methyl-coenzyme M reductase and the anaerobic oxidation of methane in methanotrophic Archaea. *Curr. Opin. Microbiol.* 8, 643-648.

Kato, N., Yurimoto, H. and Thauer, R.K. (2006) The physiological role of the ribulose monophosphate pathway in bacteria and Archaea. *Bioscience, Biotechnology and Biochemistry (BBB)* 70, 10-21.

Shima, S. and Thauer, R.K. (2006) Anaerobic methane oxidation by archaea: a biochemical approach. *Bioscience & Industry* 64, 23-26.

Thauer, R.K. and Shima, S. (2006) Methane and microbes. *Nature (News and Views)* 440, 878-879.

Shima, S. and Thauer, R.K. (2007) A third type of hydrogenase catalyzing H₂ activation. *The Chem. Rec.* 7 (1), 37-46

Reviews R. Thauer

Thauer, R.K. and Shima S. (2007) Methyl-coenzyme M reductase in methanogens and methanotrophs. In *Archaea, Evolution, Physiology and Molecular Biology* (Garrett, R. & Klenk, H.-P., eds) Blackwell Publishing, Inc. Malden, USA, pp 275-283.

Jaun, B. and Thauer, R.K. (2007) Methyl-coenzyme M reductase and its nickel corphin coenzyme F₄₃₀ in methanogenic archaea. In *Nickel and its Surprising Impact in Nature*, Vol. 2 of *Metal Ions in Life Sciences* (Sigel, A., Sigel, H., Sigel, R.K.O., eds). John Wiley & Sons, Ltd, Chichester, UK, pp 323-356.

Thauer, R.K., Stackebrandt, E. and Hamilton, W.A. (2007) Energy Metabolism of Sulphate Reducing Bacteria. In *Sulphate-Reducing Bacteria: Environmental and Engineered Systems* (Barton, L.L. & Hamilton, W.A., eds) Cambridge University Press. 1-37

Thauer, R.K. (2007) A fifth pathway of carbon fixation. *Science* 318, 1732-3

Thauer, R.K. and Shima, S. (2008) Methane as fuel for anaerobic microorganisms. *Annals of the New York Academy of Sciences*. 1125, 158-170

Thauer, R. K., Kaster, A.K., Seedorf, H., Buckel, W., and Hedderich, R. (2008) Methanogenic archaea: ecologically relevant differences in energy conservation. *Nature Reviews Microbiology* 6, 579-591.

Thauer, R.K. (2008) Biologische Methanbildung: Eine erneuerbare Energiequelle von Bedeutung? In *Die Zukunft der Energie* (Gruss P. und Schüth, F. Herausgeber) Verlag C. H. Beck, pp. 119-137

Jaun, B. and Thauer, R.K (2009) Nickel-alkyl bond formation in the active site of methyl-coenzyme M reductase (MCR). In *Metal-carbon bonds in enzymes and cofactors*, Vol.6 of *Metal Ions in Life Sciences* (Sigel, A., Sigel, H., Sigel, R.K.O., eds). John Wiley & Sons, Ltd, Chichester, UK, pp. 115-132

Shima, S., Thauer, R.K. and Ermler, U. (2009) Carbon monoxide as intrinsic ligands to iron in the active site of [Fe]-hydrogenase. In *Metal-carbon bonds in enzymes and cofactors*, Vol.6 of *Metal Ions in Life Sciences* (Sigel, A., Sigel, H., Sigel, R.K.O., eds). John Wiley & Sons, Ltd, Chichester, UK, pp. 219-240

Thauer, R. K., Kaster, A., Goenrich, M., Schick, M., Hiromoto, T. and Shima, S. (2010) Hydrogenases from methanogenic archaea: structure and function, nickel regulation, and H₂-storage. *Ann. Rev. Biochemistry* 79, 507-536.

Thauer, R. K. (2010) Functionalization of methane in anaerobic microorganisms. *Angewandte Chemie*, 49, 6712-6713.

Thauer, R. K. (2011) Hydrogenases and the global H₂ cycle (2011) *European Journal of Inorganic Chemistry*, 2011, 919-921.

Thauer, R. K. (2011) A novel mechanism of energetic coupling in anaerobes. *Environmental Microbiology Reports* 3, 24-25.

Reviews R. Thauer

Thauer, R. K. (2011) Anaerobic oxidation of methane with sulfate: on the reversibility of the reactions that are catalyzed by enzymes also involved in methanogenesis from CO₂ (2011) *Current opinion in Microbiology* 14, 292-299.

Buckel, W. and Thauer R.K. (2011) Dual Role of S-Adenosylmethionine (SAM⁺) in the Methylation of sp²-Hybridized Electrophilic carbons. *Angewandte Chemie* 50,10492- 10494.

Thauer, R. K. (2012) The Wolfe cycle comes full circle. *PNAS* 109, 15084-15085.

Buckel, W. and Thauer R. K. (2012/13) Energy conservation via electron bifurcating ferredoxin reduction and proton/Na⁺ translocating ferredoxin oxidation. *Biochim Biophys Acta*. 2012 Jul 16. [Epub ahead of print] PMID: 22800682.

Friedrich, B., Schink, B. and Thauer, R. K. (2012) Bioenergy- Chances and Limits. German National Academy of Sciences Leopoldina, pp 1-118 (www.leopoldina.org).

Appel, A. M., Bercaw, J. E., Bocarsly, A. B., Dobbek, H., Dubois, D. L., Dupuis, M., Ferry, J. G., Fujita, E., Hille, R., Kenis, P. J., Kerfeld, C. A., Morris, R. H., Peden, C. H., Portis, A. R., Ragsdale, S. W., Rauchfuss, T. B., Reek, J. N., Seefeldt, L. C., Thauer, R. K. and Waldrop, G. L. (2013) Frontiers, opportunities, and challenges in biochemical and chemical catalysis of CO₂ fixation. *Chemical Reviews* 113, 6621-6658.

Lever, M. A., Rogers, K. L., Lloyd, K. G., Overmann, J., Schink, B., Thauer, R. K., Hoehler, T. M. & Jorgensen, B. B. (2015) Life under Extreme Energy Limitation: A Synthesis of Laboratory- and Field-Based Investigations. *FEMS Microbiology Reviews* 39, 688-728.

Thauer, R. K. (2015) My lifelong passion for biochemistry and anaerobic microorganisms. *Annual Review of Microbiology* 69, 1-30.

Angerer, G., Buchholz, P., Gutzmer, J., Hagelüken, C., Herzig, P., Littke, R., Thauer, R. K. & Wellmer, F.W. (2016)

Rohstoffe für die Energieversorgung der Zukunft: Geologie – Märkte – Umwelteinflüsse. 197 Seiten. Eine Analyse in der Schriftenreihe Energiesysteme der Zukunft der Nationalen Akademie der Wissenschaften Leopoldina, der acatech – Deutsche Akademie der Technikwissenschaften und der Union der deutschen Akademien der Wissenschaften. <http://dnb.d-nb.de> (ISBN: 978-3-9817048-6-0)

Angerer, G., Buchholz, P., Erlach, B., Fuss, S., Gutzmer, J., Hagelüken, C., Haucap, J., Herzig, P., Kulik, J., Littke, R., Posch, P. N., Thauer, R. K. & Wellmer, F.W. (2017)

Rohstoffe für die Energiewende: Wege zu einer sicheren und nachhaltigen Versorgung. 104 Seiten. Stellungnahme der Nationalen Akademie der Wissenschaften Leopoldina, der acatech – Deutsche Akademie der Technikwissenschaften und der Union der deutschen Akademien der Wissenschaften. <http://dnb.d-nb.de> (ISBN: 978-3-8047-3664-1)

Reviews R. Thauer

Martin, W. F. & Thauer, R. K. (2017)

Energy in ancient metabolism. *Cell* 168, 953-955.

Buckel, W. & Thauer, R. K. (2018)

Flavin-based electron bifurcation, ferredoxin, flavodoxin and anaerobic respiration with protons (Ech) or NAD⁺ (Rnf) as electron acceptors: A historical review. *Frontiers in Microbiology*, Volume 9, Article 401, 1-24. DOI: 10.3389/fmicb.2018.00401

Buckel, W. & Thauer, R. K. (2018)

Flavin-based electron bifurcation, a new mechanism of biological energy coupling. *Chemical Reviews* 118, 3862-3886. DOI: 10.1021/acs.chemrev.7b00707

Wellmer, F. W., Buchholz, P., Gutzner, J., Hagelüken, C., Herzig, P., Littke, R. & Thauer, R. K. (2018)

Raw material for future energy supply. Springer. ISBN 978-3-319-91228-8

Published Lectures R. Thauer

Published Lectures (38)

Thauer, R.K. und Rupprecht, E. (1972) C₁-Einheiten-Synthese aus CO₂ in Clostridien: Der reduktive Monocarbonsäurezyklus. Zbl. Bakt. Hyg. I. Abt. Orig. A 220, 420-423.

Rupprecht, E. und Thauer, R.K. (1972) Mechanismus und Regulation der NADH-Ferredoxin-Reduktase aus *Clostridium kluyveri*. Zbl. Bakt. Hyg. I. Abt. Orig. A 220, 416-419.

Thauer, R.K., Fuchs, G. and Scherer, P. (1976) The active species of "CO₂" utilized by enzymes involved in "CO₂" reduction to formate. In *Microbial production and utilization of gases* (Schlegel, H.G., Gottschalk, G. and Pfennig, N., eds.). E. Goltze KG, Göttingen, pp. 157-162.

Fuchs, G., Andress, G. and Thauer, R.K. (1976) CO-oxidation by anaerobic bacteria: Indications for the involvement of a vitamin B₁₂ compound. In *Microbial production and utilization of gases* (Schlegel, H.G., Gottschalk, G. and Pfennig, N., eds.). E. Goltze KG, Göttingen, pp. 231-236.

Jungermann, K., Kern, M., Riebeling, V., and Thauer, R. K. (1976) Function and Regulation of Ferredoxin Redfuction with NADH in Clostridia. In *Microbial production and Utilization of Gases (H₂, CH₄, CO)* (Schlegel, H.G. Gottschalk, G. and Pfenning, N. eds.). E. Goltze KG, Göttingen, pp. 85 - 96.

Thauer, R.K. (1976) Limitation of microbial H₂-formation via fermentation. In *Microbial energy conversion* (Schlegel, H.G. and Barnea, J., eds.). E. Goltze KG, Göttingen, pp. 201-204.

Fuchs, G., Moll, J., Scherer, P. and Thauer, R.K. (1978) Activity, acceptor specificity and function of hydrogenase in *Methanobacterium thermoautotrophicum*. In *Hydrogenases: Their catalytic activity, structure and function* (H.G. Schlegel and K. Schneider, eds.). E. Goltze KG, Göttingen, pp 83-92.

Diekert, G.B., Graf, E.G. and Thauer, R.K. (1979) Carbon monoxide oxidation by *Clostridia*: evidence for the involvement of a corrinoid-like compound. In *Vitamin B₁₂* (B. Zagalak and W. Friedrich, eds.). Walter de Gruyter and Co., Berlin, pp. 1033-1036.

Tewes, F.J. and Thauer, R.K. (1980) Regulation of ATP-synthesis in glucose fermenting bacteria involved in interspecies hydrogen transfer. In *Anaerobes and Anaerobic Infections*, International Congress of Microbiology, München (G. Gottschalk, N. Pfennig and H. Werner, eds.). G. Fischer Verlag, Stuttgart, pp. 97-104.

Thauer, R.K. und Badziong, W. (1980) ATP-Synthese in Sulfat-reduzierenden Bakterien: Stöchiometrie und Mechanismus. Vierteljahresschrift der Naturforschenden Gesellschaft in Zürich, 125/1, 21-32.

Thauer, R.K. (1981) Nickel tetrapyrroles in methanogenic bacteria: Structure, function and biosynthesis. In *Anaerobic Digestion 1981* (D.E. Hughes et al., eds.). Elsevier Biomedical Press, Amsterdam, pp. 37-44.

Thauer, R.K. (1982) Nickel tetrapyrroles in methanogenic bacteria: Structure, function and biosynthesis. Zbl. Bakt. Hyg. I Abt. Orig. C 3, 265-270.

Published Lectures R. Thauer

Thauer, R.K. (1982) Methanogene Bakterien: Nickelproteine und ein neues Porphinoid. *Nachrichten aus Chemie, Technik u. Laboratorium*, 30, Nr. 11, 923-925.

Thauer, R.K. (1983) Leben ohne Licht und Sauerstoff: Sonderwege biologischer Energieumsetzung in niederen Organismen. In *Fortschrittsberichte aus Naturwissenschaft und Medizin*. Verhandlungen der Gesellschaft Deutscher Naturforscher und Ärzte, 112. Versammlung in Mannheim 1982 (H.A. Staab et al., eds.). Wiss. Verlagsgesellschaft mbH Stuttgart, pp. 133-144.

Thauer, R.K. (1983) Überlegungen zur Kohle- und CO-Verwertung durch anaerobe Bakterien. In *Biotechnologie im Steinkohlenbergbau* (Herausgeber Steinkohlenbergbauverein, Franz-Fischer-Weg 61, 4300 Essen 13, Postfach 130140; Telefon (0201) 105-1). Kolloquium in Essen, 20./21. Januar 1983, pp. 75-81.

Thauer, R.K. and Morris, J.G. (1984) Metabolism of chemotrophic anaerobes. Old views and new aspects. In *The Microbe: 1984 Part II: Prokaryotes and Eukaryotes* (D.P. Kelly and N.G. Carr, eds.). Society for General Microbiology Symposium 36, Cambridge University Press, Cambridge, pp. 123-168.

Thauer, R.K., Ankel-Fuchs, D., Diekert, G., Gilles, H.-H., Graf, E.-G., Jaenchen, R., Moll, J. and Schönheit, P. (1984) Nickel and methanogens. In *Microbial Growth on C₁ Compounds*, Proceedings of the 4th International Symposium (R.L. Crawford and R.S. Hanson, eds.). American Society for Microbiology, Washington D.C., pp. 188-190.

Thauer, R.K. and Kröger, A. (1984) Energy metabolism of two rumen bacteria with special reference to growth efficiency. In *Herbivore Nutrition in the Subtropics and Tropics* (F.M.C. Gilchrist and R.I. Mackie, eds.). The Science Press, Craighall, South Africa, pp. 399-407.

Schönheit, P. and Thauer, R.K. (1984) Metabolism of H₂ and CO₂ by *Methanobacterium*. In *Biotechnological Advances in Processing Municipal Wastes for Fuels and Chemicals*. Proceedings of the First Symposium in Minneapolis, Minnesota, 1984 (A.A. Antonopoulos, ed.). Available from National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161.

Diekert, G., Fuchs, G. and Thauer, R.K. (1985) Properties and function of carbon monoxide dehydrogenase from anaerobic bacteria. In *Microbial Gas Metabolism. Mechanistic, Metabolic and Biotechnical Aspects* (R.K. Poole and C.S. Dow, eds.). Academic Press, London, pp. 115-130.

Thauer, R.K., Brandis-Heep, A., Diekert, G., Gilles, H.-H., Graf, E.-G., Jaenchen, R. and Schönheit, P. (1985) Nickel enzymes in anaerobic metabolism. In *Environmental Regulation of Microbial Metabolism* (J.S. Kulaev, E.A. Dawes and D.W. Tempest, eds.). Academic Press, London, pp. 231-239.

Thauer, R.K. (1986) Die biologische Rolle von Nickel. In *Mitteilungen der Deutschen Akademie der Naturforscher Leopoldina Halle/Saale* (H. Bethge, ed.). Leopoldina, Reihe 3, Jahrgang 31, 1985, pp. 133-139.

Published Lectures R. Thauer

Thauer, R.K. (1986) Leben unter extremen Bedingungen. In *Verhandlungen der Gesellschaft Deutscher Naturforscher und Ärzte*, 114. Versammlung in München 1986. Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart, pp. 349-351.

Thauer, R.K. (1986) Ein Nickel-Tetrapyrrol als neues Coenzym. Jahrbuch der Akademie der Wissenschaften in Göttingen, Vandenhoeck and Ruprecht, Göttingen, pp. 54-58.

Van Verseveld, H.W. and Thauer, R.K. (1987) Energetics of C1-compound metabolism. In *Microbial Growth on C1-Compounds*. Proc. 5th. Int. Symposium (H.W. van Verseveld und J.A. Duine, eds.). Martinus Nijhoff Publishers, Dordrecht, Boston, Lancaster, pp. 177-185.

Schink, B. and Thauer, R.K. (1988) Energetics of syntrophic methane formation and the influence of aggregation. In *Granular anaerobic sludge; microbiology and technology*. Proceedings of the GASMAT-Workshop Lunteren, Netherlands, 25-27 October 1987 (G. Lettinga et al., eds.) pp. 5-17.

Thauer, R.K. (1988) Ein neuer Weg zu Synthese und Abbau von Acetyl-Coenzym A: Carbonylierungs-Chemie in anaeroben Bakterien. *Nachr. Chem. Tech. Lab.* 36, 993-997.

Thauer, R.K. (1988) Energy metabolism of anaerobic archaebacteria: A review. In *Anaerobes today*, Proceedings Fifth Anaerobe Discussion Group Symposium, Churchill College, Cambridge, 23-25, 1987 (J.M. Hardie and S.P. Borriella, eds.) pp. 89-94, John Wiley and Sons Ltd., Chichester, New York, Brisbane.

Thauer, R.K. (1989) Structure and function of methyl-CoM reductase, a nickel-porphinoid containing enzyme in methanogenic archaebacteria. In *Mitteilungen der Deutschen Akademie der Naturforscher Leopoldina, Halle/Saale* (H. Bethge, ed.) Leopoldina, Band 61, 269, 113-121.

Hauska, G. and Thauer, R.K. (1990) The Molecular Basis of Bacterial Metabolism. (41. Colloquium der Gesellschaft für Biologische Chemie, 5.-7. April 1990 in Mosbach/Baden). Springer Verlag Berlin Heidelberg New York.

Thauer, R.K. (1991) Energiestoffwechsel in methanogenen Bakterien. In *SFB-Bericht Wachstum und Differenzierung von Zellen* (F. Schneider und W. Wesemann, eds.). VCH Verlagsgesellschaft Weinheim, pp. 248-260.

Fuchs, G., Kröger, A. and Thauer, R.K. (1991) Mechanism of anaerobic degradation of aromatic compounds in Texas lignite by bacteria. In *Bioprocessing and Biotreatment of Coal*, chapter 12, Marcel Dekker, Inc., New York, pp. 245-251.

Thauer, R.K. (1992) Warum Methan in der Atmosphäre ansteigt - Die Rolle von Archaeobakterien. Rheinisch Westfälische Akademie der Wissenschaften, Vorträge N 394. Westdeutscher Verlag GmbH, Opladen, pp. 63-80.

Thauer, R.K., Schwörer, B. and Zirngibl, C. (1993) Enzymes involved in methanogenesis from CO₂. In *Microbial Growth on C₁ Compounds*, Symposium Proceedings Warwick 15-20 August 1992 (Murrell, J.C. and Kelly, D.P. eds) Intercept Ltd. Andover, England, pp. 151-162.

Published Lectures R. Thauer

Thauer, R.K. and Bonacker, L.G. (1994) Biosynthesis of coenzyme F₄₃₀, a nickel porphyrinoid involved in methanogenesis. In *The biosynthesis of the tetrapyrrole pigments* (Chadwick, D.J. and Ackrill, K., eds.) Ciba Foundation Symposium 180. John Wiley and Sons Ltd, Chichester, pp. 210-227.

Harms, U. and Thauer, R.K. (1998) EPR spectroscopic evidence that in the energy conserving methyltransferase complex from methanogenic Archaea a histidine residue is ligated to the cobamide-cobalt. In *Vitamin B₁₂ and B₁₂-Proteins* (Kräutler, B., Arigoni, D. and Golding, B.T. eds.) Lectures presented at the 4th European Symposium on Vitamin B₁₂ and B₁₂-Proteins. Wiley-VCH Weinheim, pp. 157-165.

Thauer, R.K. (2003) Methanogene Archaea: Vom Treibhauseffekt zum Feuerdrachen. 122. Versammlung der GDNÄ, S. Hirzel Verlag, pp. 131-135

Thauer, R. K. (2008) Of methanotrophic and Methanogenic Archaea. In: *Life Strategies of Microorganisms in the Environment and in Host Organisms* (Amann R., Goebel, W., Reinhold-Hurek, B., Schink, B. and Widdel, F. eds). Nova Acta Leopoldina 96, 41-44 (see also pp. 9- 10)

Miscellaneous R. Thauer

Miscellaneous (19)

- Thauer, R.K.** (1980) Phylogenie der Prokaryonten. *Biologie in unserer Zeit* 10, 194-195.
- Thauer, R.K.** (1981) Fettsäure-Oxidation durch anaerobe Bakterien. *Biologie in unserer Zeit* 11, 159-160.
- Thauer, R.K.** (1982) Ein neuer Mechanismus der autotrophen CO₂-Fixierung in *Clorobium limicola*. *Biologie in unserer Zeit* 12, 30.
- Thauer, R.K.** (1989) Energetics of anaerobes. *Citation Classics, Current Contents, ISI, Philadelphia, USA* 32, Vol. 14, p. 17.
- Thauer, R.K.** (1989) 13 Jahre Mikrobiologie am Fachbereich Biologie der Philipps-Universität Marburg 1976-1989. *Forum Mikrobiologie* 12. Jahrg. Jan./Feb., pp. 8-9.
- Thauer, R.** (1994) Book review: It's a gas. Methanogenesis: Ecology, Physiology, Biochemistry and Genetics. *TIBS* 19, 266.
- Thauer, R.K.** (1994) Arthur-Burkhardt-Preis für E.-L. Winnacker. Arthur-Burkhardt-Stiftung, Stuttgart.
- Thauer, R.K.** (1996) Buchbesprechung "Bioanorganische Chemie" (S. Lippard, J.M. Berg), Springer-Verlag, Heidelberg. *Naturwissenschaften* 3, 141.
- Thauer, R.K.** (1997) Laudatio für Georg Fuchs zur Leibniz-Preisverleihung. *BIOspektrum* 3 (Heft 2), pp. 17-18.
- Thauer, R.K.** (2001) Brauchen wir die Habilitation in den Biowissenschaften noch? *BIOspektrum* 7 (Heft 2), pp. 131-133.
- Thauer, R.K.** (2002) Zum Gedenken an Achim Kröger. *BIOspektrum* 8 (Heft 5), p. 644.
- Thauer, R.K.** (2005) 58 Semester Hochschullehrer der Mikrobiologie am Fachbereich Biologie der Philipps-Universität Marburg. Ergebnisbericht zur Abschiedsvorlesung am 11. Februar 2005. Eigenverlag, pp. 1-106.
- Kreft, J. und Thauer, R.K.** (2006) Emil von Behring-Preis an Werner Göbel und Gerhard Gottschalk. *BIOspektrum* 12 (Heft 4), pp. 428-429.
- Thauer, R. K.** (2008) Leopoldina als nationale Akademie der Wissenschaften. *BIOspektrum* 14 (Heft 6), p. 567.
- ter Meulen, V. and Thauer, R. K.** (2009) Celebrating Achim Trebst's 80th birthday. *Phoptosynthesis Research* 100, 117-119.
- Thauer, R. K.** (2011) Schwer zu widerlegen. Dem Mikrobiologen Wolfgang Buckel zum 70. Geburtstag. *Marburger UniJournal* 36, Seite 56l
- Thauer, R. K.** (2011) Buchbesprechung: Feodor Lynen Sei naiv und mach' ein Experiment. Biographie des Münchener Biochemikers und Nobelpreisträgers von Heike Will. *Angewandte Chemie Int. Ed.* 50, 9537-9538.
- Thauer, R. K. (2017)**
Lothar Jaenicke and C-1-metabolism: his first 25 years of research. *Zeitschrift für Naturforschung Section C – A Journal of Biosciences* 72, 237-243