

1. Adamo, R., Saksena, R. and Kovac, P. (2005) Synthesis of the beta anomer of the spacer-equipped tetrasaccharide side chain of the major glycoprotein of the *Bacillus anthracis* exosporium. *Carbohydr Res*, **340**, 2579-2582.
2. Albers, S.V., Elferink, M.G., Charlebois, R.L., Sensen, C.W., Driessen, A.J. and Konings, W.N. (1999) Glucose transport in the extremely thermoacidophilic *Sulfolobus solfataricus* involves a high-affinity membrane-integrated binding protein. *J Bacteriol*, **181**, 4285-4291.
3. Altman, E., Brisson, J.R., Gagne, S.M., Kolbe, J., Messner, P. and Sleytr, U.B. (1992) Structure of the glycan chain from the surface layer glycoprotein of *Clostridium thermohydrosulfuricum* L77-66. *Biochim Biophys Acta*, **1117**, 71-77.
4. Altman, E., Brisson, J.R., Messner, P. and Sleytr, U.B. (1990) Chemical characterization of the regularly arranged surface layer glycoprotein of *Clostridium thermosaccharolyticum* D120-70. *Eur J Biochem*, **188**, 73-82.
5. Altman, E., Brisson, J.R., Messner, P. and Sleytr, U.B. (1991) Structure of the glycan chain from the surface layer glycoprotein of *Bacillus alvei* CCM 2051. *Biochem Cell Biol*, **69**, 72-78.
6. Altman, E., Schaffer, C., Brisson, J.R. and Messner, P. (1995) Characterization of the glycan structure of a major glycopeptide from the surface layer glycoprotein of *Clostridium thermosaccharolyticum* E207-71. *Eur J Biochem*, **229**, 308-315.
7. Altman, E., Schaffer, C., Brisson, J.R. and Messner, P. (1996) Isolation and characterization of an amino sugar-rich glycopeptide from the surface layer glycoprotein of *Thermoanaerobacterium thermosaccharolyticum* E207-71. *Carbohydr Res*, **295**, 245-253.
8. Bader, J.A., Klesius, P.H. and Vinitnantharat, S. (1997) Comparison of whole-cell antigens of pressure- and formalin-killed *Flexibacter columnaris* from channel catfish (*Ictalurus punctatus*). *Am J Vet Res*, **58**, 985-988.
9. Bedouet, L., Arnold, F., Robreau, G., Batina, P., Talbot, F. and Binet, A. (1998) Evidence for an heterogeneous glycosylation of the *Clostridium tyrobutyricum* ATCC 25755 flagellin. *Microbios*, **94**, 183-192.
10. Bedouet, L., Arnold, F., Robreau, G., Batina, P., Talbot, F. and Malcoste, R. (1998) Partial analysis of the flagellar antigenic determinant recognized by a monoclonal antibody to *Clostridium tyrobutyricum*. *Microbiol Immunol*, **42**, 87-95.
11. Beguin, P. and Eisen, H. (1978) Purification and partial characterization of three extracellular cellulases from *Cellulomonas* sp. *Eur J Biochem*, **87**, 525-531.
12. Beguin, P. and Lemaire, M. (1996) The cellulosome: an exocellular, multiprotein complex specialized in cellulose degradation. *Crit Rev Biochem Mol Biol*, **31**, 201-236.
13. Bensing, B.A., Gibson, B.W. and Sullam, P.M. (2004) The *Streptococcus gordonii* platelet binding protein GspB undergoes glycosylation independently of export. *J Bacteriol*, **186**, 638-645.
14. Benz, I. and Schmidt, M.A. (2001) Glycosylation with heptose residues mediated by the *aah* gene product is essential for adherence of the AIDA-I adhesin. *Mol Microbiol*, **40**, 1403-1413.
15. Bock, K., Schuster-Kolbe, J., Altman, E., Allmaier, G., Stahl, B., Christian, R., Sleytr, U.B. and Messner, P. (1994) Primary structure of the O-glycosidically

- linked glycan chain of the crystalline surface layer glycoprotein of *Thermoanaerobacter thermohydrosulfuricus* L111-69. Galactosyl tyrosine as a novel linkage unit. *J Biol Chem*, **269**, 7137-7144.
16. Bozal, N. and Guinea, J. (1997) Assembly Properties of a Glycoprotein Produced by *Pseudoalteromonas antarctica*, NF3. *J Colloid Interface Sci*, **192**, 286-293.
 17. Brahamsha, B. and Greenberg, E.P. (1988) Biochemical and cytological analysis of the complex periplasmic flagella from *Spirochaeta aurantia*. *J Bacteriol*, **170**, 4023-4032.
 18. Brechtel, E., Matuschek, M., Hellberg, A., Egelseer, E.M., Schmid, R. and Bahl, H. (1999) Cell wall of *Thermoanaerobacterium thermosulfurigenes* EM1: isolation of its components and attachment of the xylanase XynA. *Arch Microbiol*, **171**, 159-165.
 19. Brimer, C.D. and Montie, T.C. (1998) Cloning and comparison of *fliC* genes and identification of glycosylation in the flagellin of *Pseudomonas aeruginosa* a-type strains. *J Bacteriol*, **180**, 3209-3217.
 20. Brockl, G., Behr, M., Fabry, S., Hensel, R., Kaudewitz, H., Biendl, E. and König, H. (1991) Analysis and nucleotide sequence of the genes encoding the surface-layer glycoproteins of the hyperthermophilic methanogens *Methanothermobacter fervidus* and *Methanothermobacter sociabilis*. *Eur J Biochem*, **199**, 147-152.
 21. Burchard, R.P. and Sorongon, M.L. (1998) A gliding bacterium strain inhibits adhesion and motility of another gliding bacterium strain in a marine biofilm. *Appl Environ Microbiol*, **64**, 4079-4083.
 22. Calabi, E., Ward, S., Wren, B., Paxton, T., Panico, M., Morris, H., Dell, A., Dougan, G. and Fairweather, N. (2001) Molecular characterization of the surface layer proteins from *Clostridium difficile*. *Mol Microbiol*, **40**, 1187-1199.
 23. Cerquetti, M., Molinari, A., Sebastianelli, A., Diociaiuti, M., Petruzzelli, R., Capo, C. and Mastrantonio, P. (2000) Characterization of surface layer proteins from different *Clostridium difficile* clinical isolates. *Microb Pathog*, **28**, 363-372.
 24. Chakrabarty, A.K., Maire, M.A. and Lambert, P.H. (1982) SDS-PAGE analysis of *M. leprae* protein antigens reacting with antibodies from sera from lepromatous patients and infected armadillos. *Clin Exp Immunol*, **49**, 523-531.
 25. Charlton, S., Moir, A.J., Baillie, L. and Moir, A. (1999) Characterization of the exosporium of *Bacillus cereus*. *J Appl Microbiol*, **87**, 241-245.
 26. Che, F.S., Nakajima, Y., Tanaka, N., Iwano, M., Yoshida, T., Takayama, S., Kadota, I. and Isogai, A. (2000) Flagellin from an incompatible strain of *Pseudomonas avenae* induces a resistance response in cultured rice cells. *J Biol Chem*, **275**, 32347-32356.
 27. Chen, J.R., Lin, J.H., Weng, C.N. and Lai, S.S. (1998) Identification of a novel adhesin-like glycoprotein from *Mycoplasma hyopneumoniae*. *Vet Microbiol*, **62**, 97-110.
 28. Christian, R., Schulz, G., Schuster-Kolbe, J., Allmaier, G., Schmid, E.R., Sleytr, U.B. and Messner, P. (1993) Complete structure of the tyrosine-linked saccharide moiety from the surface layer glycoprotein of *Clostridium thermohydrosulfuricum* S102-70. *J Bacteriol*, **175**, 1250-1256.
 29. Cocera, M., Lopez, O., Coderch, L., Mercade, M.E., Parra, J.L., de la Maza, A. and Guinea, J. (2001) Partitioning of SDS in liposomes coated by the exopolymer

- excreted by *Pseudoalteromonas antarctica* NF3 as a measure of vesicle protection against this surfactant. *J Biomater Sci Polym Ed*, **12**, 255-266.
30. Cowlishaw, D.A. and Smith, M.C. (2001) Glycosylation of a *Streptomyces coelicolor* A3(2) cell envelope protein is required for infection by bacteriophage phi C31. *Mol Microbiol*, **41**, 601-610.
 31. Cowlishaw, D.A. and Smith, M.C. (2002) A gene encoding a homologue of dolichol phosphate-beta-D-mannose synthase is required for infection of *Streptomyces coelicolor* A3(2) by phage (phi)C31. *J Bacteriol*, **184**, 6081-6083.
 32. Cuezco de Gines, S., Maldonado, M.C. and Font de Valdez, G. (2000) Purification and characterization of invertase from *Lactobacillus reuteri* CRL 1100. *Curr Microbiol*, **40**, 181-184.
 33. Curtis, M.A., Thickett, A., Slaney, J.M., Rangarajan, M., Aduse-Opoku, J., Shepherd, P., Paramonov, N. and Hounsell, E.F. (1999) Variable carbohydrate modifications to the catalytic chains of the RgpA and RgpB proteases of *Porphyromonas gingivalis* W50. *Infect Immun*, **67**, 3816-3823.
 34. Daubenspeck, J.M., Zeng, H., Chen, P., Dong, S., Steichen, C.T., Krishna, N.R., Pritchard, D.G. and Turnbough, C.L., Jr. (2004) Novel oligosaccharide side chains of the collagen-like region of BclA, the major glycoprotein of the *Bacillus anthracis* exosporium. *J Biol Chem*, **279**, 30945-30953.
 35. Degnan, B.A., Fontaine, M.C., Doebereiner, A.H., Lee, J.J., Mastroeni, P., Dougan, G., Goodacre, J.A. and Kehoe, M.A. (2000) Characterization of an isogenic mutant of *Streptococcus pyogenes* Manfredo lacking the ability to make streptococcal acid glycoprotein. *Infect Immun*, **68**, 2441-2448.
 36. Degnan, B.A., Palmer, J.M., Robson, T., Jones, C.E., Fischer, M., Glanville, M., Mellor, G.D., Diamond, A.G., Kehoe, M.A. and Goodacre, J.A. (1998) Inhibition of human peripheral blood mononuclear cell proliferation by *Streptococcus pyogenes* cell extract is associated with arginine deiminase activity. *Infect Immun*, **66**, 3050-3058.
 37. Dobson, W.J. and McCurdy, H.D. (1979) The function of fimbriae in *Myxococcus xanthus*. I. Purification and properties of *M. xanthus* fimbriae. *Can J Microbiol*, **25**, 1152-1160.
 38. Doig, P., Kinsella, N., Guerry, P. and Trust, T.J. (1996) Characterization of a post-translational modification of *Campylobacter* flagellin: identification of a sero-specific glycosyl moiety. *Mol Microbiol*, **19**, 379-387.
 39. Dong, S., Chesnokova, O.N., Turnbough, C.L., Jr. and Pritchard, D.G. (2009) Identification of the UDP-N-acetylglucosamine 4-epimerase involved in exosporium protein glycosylation in *Bacillus anthracis*. *J Bacteriol*, **191**, 7094-7101.
 40. Easton, D.M., Totsika, M., Allsopp, L.P., Phan, M.D., Idris, A., Wurpel, D.J., Sherlock, O., Zhang, B., Venturini, C., Beatson, S.A. *et al.* Characterization of EhaJ, a New Autotransporter Protein from Enterohemorrhagic and Enteropathogenic *Escherichia coli*. *Front Microbiol*, **2**, 120.
 41. Egelseer, E.M., Danhorn, T., Pleschberger, M., Hotzy, C., Sleytr, U.B. and Sara, M. (2001) Characterization of an S-layer glycoprotein produced in the course of S-layer variation of *Bacillus stearothermophilus* ATCC 12980 and sequencing and cloning of the sbsD gene encoding the protein moiety. *Arch Microbiol*, **177**,

- 70-80.
42. Eichler, J. (2000) Novel glycoproteins of the halophilic archaeon *Haloferax volcanii*. *Arch Microbiol*, **173**, 445-448.
 43. Eichler, J. and Adams, M.W. (2005) Posttranslational protein modification in Archaea. *Microbiol Mol Biol Rev*, **69**, 393-425.
 44. Emery, D.L., Clark, B.L., Stewart, D.J., O'Donnell, I.J. and Hewish, D.R. (1984) Analysis of the outer membrane proteins of *Bacteroides nodosus*, the causal organism of ovine footrot. *Vet Microbiol*, **9**, 155-168.
 45. Erickson, P.R. and Herzberg, M.C. (1993) Evidence for the covalent linkage of carbohydrate polymers to a glycoprotein from *Streptococcus sanguis*. *J Biol Chem*, **268**, 23780-23783.
 46. Espitia, C., Espinosa, R., Saavedra, R., Mancilla, R., Romain, F., Laqueyrie, A. and Moreno, C. (1995) Antigenic and structural similarities between *Mycobacterium tuberculosis* 50- to 55-kilodalton and *Mycobacterium bovis* BCG 45- to 47-kilodalton antigens. *Infect Immun*, **63**, 580-584.
 47. Espitia, C. and Mancilla, R. (1989) Identification, isolation and partial characterization of *Mycobacterium tuberculosis* glycoprotein antigens. *Clin Exp Immunol*, **77**, 378-383.
 48. Faguy, D.M., Bayley, D.P., Kostyukova, A.S., Thomas, N.A. and Jarrell, K.F. (1996) Isolation and characterization of flagella and flagellin proteins from the Thermoacidophilic archaea *Thermoplasma volcanium* and *Sulfolobus shibatae*. *J Bacteriol*, **178**, 902-905.
 49. Fletcher, C.M., Coyne, M.J., Bentley, D.L., Villa, O.F. and Comstock, L.E. (2007) Phase-variable expression of a family of glycoproteins imparts a dynamic surface to a symbiont in its human intestinal ecosystem. *Proc Natl Acad Sci U S A*, **104**, 2413-2418.
 50. Fletcher, C.M., Coyne, M.J., Villa, O.F., Chatzidaki-Livanis, M. and Comstock, L.E. (2009) A general O-glycosylation system important to the physiology of a major human intestinal symbiont. *Cell*, **137**, 321-331.
 51. Gandolfi-Donadio, L., Gola, G., de Lederkremer, R.M. and Gallo-Rodriguez, C. (2006) Synthesis of alpha-D-Gal f-(1-->2)-D-galactitol and alpha-D-Gal f-(1-->2)[beta-D-Gal f-(1-->3)]-D-galactitol, oligosaccharide derivatives from *Bacteroides cellulosolvens* glycoproteins. *Carbohydr Res*, **341**, 2487-2497.
 52. Garcia-Patrone, M. and Tandecarz, J.S. (1995) A glycoprotein multimer from *Bacillus thuringiensis* sporangia: dissociation into subunits and sugar composition. *Mol Cell Biochem*, **145**, 29-37.
 53. Gerwig, G.J., de Waard, P., Kamerling, J.P., Vliegthart, J.F., Morgenstern, E., Lamed, R. and Bayer, E.A. (1989) Novel O-linked carbohydrate chains in the cellulase complex (cellulosome) of *Clostridium thermocellum*. 3-O-Methyl-N-acetylglucosamine as a constituent of a glycoprotein. *J Biol Chem*, **264**, 1027-1035.
 54. Gerwig, G.J., Kamerling, J.P., Vliegthart, J.F., Morag, E., Lamed, R. and Bayer, E.A. (1991) Primary structure of O-linked carbohydrate chains in the cellulosome of different *Clostridium thermocellum* strains. *Eur J Biochem*, **196**, 115-122.
 55. Gerwig, G.J., Kamerling, J.P., Vliegthart, J.F., Morag, E., Lamed, R. and

- Bayer, E.A. (1992) Novel oligosaccharide constituents of the cellulase complex of *Bacteroides cellulosolvens*. *Eur J Biochem*, **205**, 799-808.
56. Gerwig, G.J., Kamerling, J.P., Vliegthart, J.F., Morag, E., Lamed, R. and Bayer, E.A. (1993) The nature of the carbohydrate-peptide linkage region in glycoproteins from the cellulosomes of *Clostridium thermocellum* and *Bacteroides cellulosolvens*. *J Biol Chem*, **268**, 26956-26960.
57. Gilkes, N.R., Langsford, M.L., Kilburn, D.G., Miller, R.C., Jr. and Warren, R.A. (1984) Mode of action and substrate specificities of cellulases from cloned bacterial genes. *J Biol Chem*, **259**, 10455-10459.
58. Goldman, S., Hecht, K., Eisenberg, H. and Mevarech, M. (1990) Extracellular Ca²⁺(+)-dependent inducible alkaline phosphatase from extremely halophilic archaeobacterium *Haloarcula marismortui*. *J Bacteriol*, **172**, 7065-7070.
59. Gonzalez-Zamorano, M., Mendoza-Hernandez, G., Xolalpa, W., Parada, C., Vallecillo, A.J., Bigi, F. and Espitia, C. (2009) Mycobacterium tuberculosis glycoproteomics based on ConA-lectin affinity capture of mannosylated proteins. *J Proteome Res*, **8**, 721-733.
60. Grass, S., Buscher, A.Z., Swords, W.E., Apicella, M.A., Barenkamp, S.J., Ozchlewski, N. and St Geme, J.W., 3rd. (2003) The *Haemophilus influenzae* HMW1 adhesin is glycosylated in a process that requires HMW1C and phosphoglucomutase, an enzyme involved in lipooligosaccharide biosynthesis. *Mol Microbiol*, **48**, 737-751.
61. Greller, G., Riek, R. and Boos, W. (2001) Purification and characterization of the heterologously expressed trehalose/maltose ABC transporter complex of the hyperthermophilic archaeon *Thermococcus litoralis*. *Eur J Biochem*, **268**, 4011-4018.
62. Grogan, D.W. (1989) Phenotypic characterization of the archaeobacterial genus *Sulfolobus*: comparison of five wild-type strains. *J Bacteriol*, **171**, 6710-6719.
63. Guerry, P., Ewing, C.P., Schoenhofen, I.C. and Logan, S.M. (2007) Protein glycosylation in *Campylobacter jejuni*: partial suppression of pglF by mutation of pseC. *J Bacteriol*, **189**, 6731-6733.
64. Hanna, E.S., Roque-Barreira, M.C., Bernardes, E.S., Panunto-Castelo, A., Sousa, M.V., Almeida, I.C. and Brocchi, M. (2007) Evidence for glycosylation on a DNA-binding protein of *Salmonella enterica*. *Microb Cell Fact*, **6**, 11.
65. Hartmann, M., Barsch, A., Niehaus, K., Puhler, A., Tauch, A. and Kalinowski, J. (2004) The glycosylated cell surface protein Rpf2, containing a resuscitation-promoting factor motif, is involved in intercellular communication of *Corynebacterium glutamicum*. *Arch Microbiol*, **182**, 299-312.
66. Herrmann, J.L., Delahay, R., Gallagher, A., Robertson, B. and Young, D. (2000) Analysis of post-translational modification of mycobacterial proteins using a cassette expression system. *FEBS Lett*, **473**, 358-362.
67. Herzberg, M.C., Erickson, P.R., Kane, P.K., Clawson, D.J., Clawson, C.C. and Hoff, F.A. (1990) Platelet-interactive products of *Streptococcus sanguis* protoplasts. *Infect Immun*, **58**, 4117-4125.
68. Hirai, H., Takai, R., Iwano, M., Nakai, M., Kondo, M., Takayama, S., Isogai, A. and Che, F.S. Glycosylation regulates the specific induction of rice immune responses by *Acidovorax avenae* flagellin. *J Biol Chem*.

69. Hoiczky, E. and Baumeister, W. (1997) Oscillin, an extracellular, Ca²⁺-binding glycoprotein essential for the gliding motility of cyanobacteria. *Mol Microbiol*, **26**, 699-708.
70. Huang, L., Forsberg, C.W. and Thomas, D.Y. (1988) Purification and characterization of a chloride-stimulated cellobiosidase from *Bacteroides succinogenes* S85. *J Bacteriol*, **170**, 2923-2932.
71. Iki, K., Kawahara, K., Sawamura, S., Arakaki, R., Sakuta, T., Sugiyama, A., Tamura, H., Sueda, T., Hamada, S. and Takada, H. (1997) A novel component different from endotoxin extracted from *Prevotella intermedia* ATCC 25611 activates lymphoid cells from C3H/HeJ mice and gingival fibroblasts from humans. *Infect Immun*, **65**, 4531-4538.
72. Jarrell, K.F., Bayley, D.P. and Kostyukova, A.S. (1996) The archaeal flagellum: a unique motility structure. *J Bacteriol*, **178**, 5057-5064.
73. Josenhans, C., Ferrero, R.L., Labigne, A. and Suerbaum, S. (1999) Cloning and allelic exchange mutagenesis of two flagellin genes of *Helicobacter felis*. *Mol Microbiol*, **33**, 350-362.
74. Josenhans, C., Vossebein, L., Friedrich, S. and Suerbaum, S. (2002) The *neuA/flmD* gene cluster of *Helicobacter pylori* is involved in flagellar biosynthesis and flagellin glycosylation. *FEMS Microbiol Lett*, **210**, 165-172.
75. Kanaoka, M., Fukita, Y., Taya, K., Kawanaka, C., Negoro, T. and Agui, H. (1987) Antitumor activity of streptococcal acid glycoprotein produced by *Streptococcus pyogenes* Su. *Jpn J Cancer Res*, **78**, 1409-1414.
76. Kanaoka, M., Negoro, T., Kawanaka, C., Agui, H. and Nabeshima, S. (1991) Streptococcal antitumor protein: expression in *Escherichia coli* cells and properties of the recombinant protein. *Agric Biol Chem*, **55**, 743-750.
77. Karjalainen, T., Waligora-Dupriet, A.J., Cerquetti, M., Spigaglia, P., Maggioni, A., Mauri, P. and Mastrantonio, P. (2001) Molecular and genomic analysis of genes encoding surface-anchored proteins from *Clostridium difficile*. *Infect Immun*, **69**, 3442-3446.
78. Kawamura, T. and Shockman, G.D. (1983) Purification and some properties of the endogenous, autolytic N-acetylmuramoylhydrolase of *Streptococcus faecium*, a bacterial glycoenzyme. *J Biol Chem*, **258**, 9514-9521.
79. Khmelenina, V.N., Kalyuzhnaya, M.G., Sakharovsky, V.G., Suzina, N.E., Trotsenko, Y.A. and Gottschalk, G. (1999) Osmoadaptation in halophilic and alkaliphilic methanotrophs. *Arch Microbiol*, **172**, 321-329.
80. Kim, B.K., Pihl, T.D., Reeve, J.N. and Daniels, L. (1995) Purification of the copper response extracellular proteins secreted by the copper-resistant methanogen *Methanobacterium bryantii* BKYH and cloning, sequencing, and transcription of the gene encoding these proteins. *J Bacteriol*, **177**, 7178-7185.
81. Kluepfel, D., Vats-Mehta, S., Aumont, F., Shareck, F. and Morosoli, R. (1990) Purification and characterization of a new xylanase (xylanase B) produced by *Streptomyces lividans* 66. *Biochem J*, **267**, 45-50.
82. Kondo, E., Kurata, T., Naigowit, P. and Kanai, K. (1996) Evolution of cell-surface acid phosphatase of *Burkholderia pseudomallei*. *Southeast Asian J Trop Med Public Health*, **27**, 592-599.
83. Koning, S.M., Elferink, M.G., Konings, W.N. and Driessen, A.J. (2001) Cellobiose

- uptake in the hyperthermophilic archaeon *Pyrococcus furiosus* is mediated by an inducible, high-affinity ABC transporter. *J Bacteriol*, **183**, 4979-4984.
84. Koning, S.M., Konings, W.N. and Driessen, A.J. (2002) Biochemical evidence for the presence of two alpha-glucoside ABC-transport systems in the hyperthermophilic archaeon *Pyrococcus furiosus*. *Archaea*, **1**, 19-25.
 85. Konrad, Z. and Eichler, J. (2002) Protein glycosylation in *Haloferax volcanii*: partial characterization of a 98-kDa glycoprotein. *FEMS Microbiol Lett*, **209**, 197-202.
 86. Kozloff, L.M., Turner, M.A. and Arellano, F. (1991) Formation of bacterial membrane ice-nucleating lipoglycoprotein complexes. *J Bacteriol*, **173**, 6528-6536.
 87. Kuo, C., Takahashi, N., Swanson, A.F., Ozeki, Y. and Hakomori, S. (1996) An N-linked high-mannose type oligosaccharide, expressed at the major outer membrane protein of *Chlamydia trachomatis*, mediates attachment and infectivity of the microorganism to HeLa cells. *J Clin Invest*, **98**, 2813-2818.
 88. Kus, J.V., Kelly, J., Tessier, L., Harvey, H., Cvitkovitch, D.G. and Burrows, L.L. (2008) Modification of *Pseudomonas aeruginosa* Pa5196 type IV Pilins at multiple sites with D-Araf by a novel GT-C family Arabinosyltransferase, TfpW. *J Bacteriol*, **190**, 7464-7478.
 89. Lewis, L.O., Yousten, A.A. and Murray, R.G. (1987) Characterization of the surface protein layers of the mosquito-pathogenic strains of *Bacillus sphaericus*. *J Bacteriol*, **169**, 72-79.
 90. Li, Z., Dumas, F., Dubreuil, D. and Jacques, M. (1993) A species-specific periplasmic flagellar protein of *Serpulina* (*Treponema*) *hyodysenteriae*. *J Bacteriol*, **175**, 8000-8007.
 91. Lindenthal, C. and Elsinghorst, E.A. (1999) Identification of a glycoprotein produced by enterotoxigenic *Escherichia coli*. *Infect Immun*, **67**, 4084-4091.
 92. Logan, S.M. (2006) Flagellar glycosylation - a new component of the motility repertoire? *Microbiology*, **152**, 1249-1262.
 93. Lower, B.H. and Kennelly, P.J. (2002) The membrane-associated protein-serine/threonine kinase from *Sulfolobus solfataricus* is a glycoprotein. *J Bacteriol*, **184**, 2614-2619.
 94. Ma, Y. and Daniel, T.M. (1983) Isolation, characterization, and specificity of a glycoprotein antigen from *Mycobacterium kansasii*. *Am Rev Respir Dis*, **128**, 1059-1064.
 95. Maeba, P.Y. (1986) Isolation of a surface glycoprotein from *Myxococcus xanthus*. *J Bacteriol*, **166**, 644-650.
 96. Mahne, M., Tauch, A., Puhler, A. and Kalinowski, J. (2006) The *Corynebacterium glutamicum* gene *pmt* encoding a glycosyltransferase related to eukaryotic protein-O-mannosyltransferases is essential for glycosylation of the resuscitation promoting factor (Rpf2) and other secreted proteins. *FEMS Microbiol Lett*, **259**, 226-233.
 97. Matz, L.L., Beaman, T.C. and Gerhardt, P. (1970) Chemical composition of exosporium from spores of *Bacillus cereus*. *J Bacteriol*, **101**, 196-201.
 98. Mauri, P.L., Pietta, P.G., Maggioni, A., Cerquetti, M., Sebastianelli, A. and Mastrantonio, P. (1999) Characterization of surface layer proteins from

- Clostridium difficile by liquid chromatography/electrospray ionization mass spectrometry. *Rapid Commun Mass Spectrom*, **13**, 695-703.
99. McBride, J.W., Yu, X.J. and Walker, D.H. (2000) Glycosylation of homologous immunodominant proteins of Ehrlichia chaffeensis and Ehrlichia canis. *Infect Immun*, **68**, 13-18.
 100. McManus, J.D., Brune, D.C., Han, J., Sanders-Loehr, J., Meyer, T.E., Cusanovich, M.A., Tollin, G. and Blankenship, R.E. (1992) Isolation, characterization, and amino acid sequences of auracyanins, blue copper proteins from the green photosynthetic bacterium Chloroflexus aurantiacus. *J Biol Chem*, **267**, 6531-6540.
 101. Meier, B., Brunotte, C.M., Franz, B., Warlich, B., Petermann, M., Ziesenis, A., Schubert, H.J., Habermehl, G.G., Petzoldt, K. and Leibold, W. (1992) Isolation of a high-molecular mass glycoprotein from culture supernatant of an arthritogenic strain of the bacteria Erysipelothrix rhusiopathiae reacting with "inductive" monoclonal antibodies derived from rats with erysipelas polyarthritidis. *Biol Chem Hoppe Seyler*, **373**, 715-721.
 102. Meldgaard, M. and Svendsen, I. (1994) Different effects of N-glycosylation on the thermostability of highly homologous bacterial (1,3-1,4)-beta-glucanases secreted from yeast. *Microbiology*, **140 (Pt 1)**, 159-166.
 103. Menozzi, F.D., Bischoff, R., Fort, E., Brennan, M.J. and Locht, C. (1998) Molecular characterization of the mycobacterial heparin-binding hemagglutinin, a mycobacterial adhesin. *Proc Natl Acad Sci U S A*, **95**, 12625-12630.
 104. Messner, P. (1997) Bacterial glycoproteins. *Glycoconj J*, **14**, 3-11.
 105. Messner, P., Bock, K., Christian, R., Schulz, G. and Sleytr, U.B. (1990) Characterization of the surface layer glycoprotein of Clostridium symbiosum HB25. *J Bacteriol*, **172**, 2576-2583.
 106. Messner, P., Christian, R., Kolbe, J., Schulz, G. and Sleytr, U.B. (1992) Analysis of a novel linkage unit of O-linked carbohydrates from the crystalline surface layer glycoprotein of Clostridium thermohydrosulfuricum S102-70. *J Bacteriol*, **174**, 2236-2240.
 107. Messner, P., Christian, R., Neuninger, C. and Schulz, G. (1995) Similarity of "core" structures in two different glycans of tyrosine-linked eubacterial S-layer glycoproteins. *J Bacteriol*, **177**, 2188-2193.
 108. Messner, P. and Schaffer, C. (2003) Prokaryotic glycoproteins. *Fortschr Chem Org Naturst*, **85**, 51-124.
 109. Messner, P., Steiner, K., Zarschler, K. and Schaffer, C. (2008) S-layer nanoglycobiology of bacteria. *Carbohydr Res*, **343**, 1934-1951.
 110. Morris, E.J., Ganeshkumar, N., Song, M. and McBride, B.C. (1987) Identification and preliminary characterization of a Streptococcus sanguis fibrillar glycoprotein. *J Bacteriol*, **169**, 164-171.
 111. Moskophidis, M. and Muller, F. (1984) Molecular characterization of glycoprotein antigens on surface of Treponema pallidum: comparison with nonpathogenic Treponema phagedenis biotype Reiter. *Infect Immun*, **46**, 867-869.
 112. Moskophidis, M. and Muller, F. (1985) Identification of glycosylated protein antigens of Treponema pallidum and Treponema phagedenis. *Zentralbl Bakteriell Mikrobiol Hyg A*, **259**, 468-476.

113. Oberli, M.A., Tamborrini, M., Tsai, Y.H., Werz, D.B., Horlacher, T., Adibekian, A., Gauss, D., Moller, H.M., Pluschke, G. and Seeberger, P.H. Molecular analysis of carbohydrate-antibody interactions: case study using a *Bacillus anthracis* tetrasaccharide. *J Am Chem Soc*, **132**, 10239-10241.
114. Okuda, S. and Weinbaum, G. (1968) An envelope-specific glycoprotein from *Escherichia coli* B. *Biochemistry*, **7**, 2819-2825.
115. Ong, E., Kilburn, D.G., Miller, R.C., Jr. and Warren, R.A. (1994) *Streptomyces lividans* glycosylates the linker region of a beta-1,4-glycanase from *Cellulomonas fimi*. *J Bacteriol*, **176**, 999-1008.
116. Paramonov, N., Rangarajan, M., Hashim, A., Gallagher, A., Aduse-Opoku, J., Slaney, J.M., Hounsell, E. and Curtis, M.A. (2005) Structural analysis of a novel anionic polysaccharide from *Porphyromonas gingivalis* strain W50 related to Arg-gingipain glycans. *Mol Microbiol*, **58**, 847-863.
117. Peters, J., Nitsch, M., Kuhlmoorgen, B., Golbik, R., Lupas, A., Kellermann, J., Engelhardt, H., Pfander, J.P., Muller, S., Goldie, K. *et al.* (1995) Tetrabrachion: a filamentous archaeobacterial surface protein assembly of unusual structure and extreme stability. *J Mol Biol*, **245**, 385-401.
118. Peters, J., Peters, M., Lottspeich, F., Schafer, W. and Baumeister, W. (1987) Nucleotide sequence analysis of the gene encoding the *Deinococcus radiodurans* surface protein, derived amino acid sequence, and complementary protein chemical studies. *J Bacteriol*, **169**, 5216-5223.
119. Pethe, K., Puech, V., Daffe, M., Josenhans, C., Drobecq, H., Locht, C. and Menozzi, F.D. (2001) *Mycobacterium smegmatis* laminin-binding glycoprotein shares epitopes with *Mycobacterium tuberculosis* heparin-binding haemagglutinin. *Mol Microbiol*, **39**, 89-99.
120. Peyret, J.L., Bayan, N., Joliff, G., Gulik-Krzywicki, T., Mathieu, L., Schechter, E. and Leblon, G. (1993) Characterization of the *cspB* gene encoding PS2, an ordered surface-layer protein in *Corynebacterium glutamicum*. *Mol Microbiol*, **9**, 97-109.
121. Plummer, C., Wu, H., Kerrigan, S.W., Meade, G., Cox, D. and Ian Douglas, C.W. (2005) A serine-rich glycoprotein of *Streptococcus sanguis* mediates adhesion to platelets via GPIb. *Br J Haematol*, **129**, 101-109.
122. Porstendorfer, D., Gohl, O., Mayer, F. and Averhoff, B. (2000) ComP, a pilin-like protein essential for natural competence in *Acinetobacter* sp. Strain BD413: regulation, modification, and cellular localization. *J Bacteriol*, **182**, 3673-3680.
123. Rangarajan, M., Hashim, A., Aduse-Opoku, J., Paramonov, N., Hounsell, E.F. and Curtis, M.A. (2005) Expression of Arg-Gingipain RgpB is required for correct glycosylation and stability of monomeric Arg-gingipain RgpA from *Porphyromonas gingivalis* W50. *Infect Immun*, **73**, 4864-4878.
124. Rangarajan, M., Smith, S.J., U, S. and Curtis, M.A. (1997) Biochemical characterization of the arginine-specific proteases of *Porphyromonas gingivalis* W50 suggests a common precursor. *Biochem J*, **323 (Pt 3)**, 701-709.
125. Recht, J. and Kolter, R. (2001) Glycopeptidolipid acetylation affects sliding motility and biofilm formation in *Mycobacterium smegmatis*. *J Bacteriol*, **183**, 5718-5724.
126. Rosales-Borjas, D.M., Zambrano-Villa, S., Elinos, M., Kasem, H., Osuna, A.,

- Mancilla, R. and Ortiz-Ortiz, L. (1998) Rapid screening test for tuberculosis using a 38-kDa antigen from *Mycobacterium tuberculosis*. *J Clin Lab Anal*, **12**, 126-129.
127. Roy, K., Hamilton, D., Ostmann, M.M. and Fleckenstein, J.M. (2009) Vaccination with EtpA glycoprotein or flagellin protects against colonization with enterotoxigenic *Escherichia coli* in a murine model. *Vaccine*, **27**, 4601-4608.
128. Saksena, R., Adamo, R. and Kovac, P. (2006) Synthesis of the tetrasaccharide side chain of the major glycoprotein of the *Bacillus anthracis* exosporium. *Bioorg Med Chem Lett*, **16**, 615-617.
129. Schaffer, C., Dietrich, K., Unger, B., Scheberl, A., Rainey, F.A., Kahlig, H. and Messner, P. (2000) A novel type of carbohydrate-protein linkage region in the tyrosine-bound S-layer glycan of *Thermoanaerobacterium thermosaccharolyticum* D120-70. *Eur J Biochem*, **267**, 5482-5492.
130. Schirm, M., Schoenhofen, I.C., Logan, S.M., Waldron, K.C. and Thibault, P. (2005) Identification of unusual bacterial glycosylation by tandem mass spectrometry analyses of intact proteins. *Anal Chem*, **77**, 7774-7782.
131. Schirm, M., Soo, E.C., Aubry, A.J., Austin, J., Thibault, P. and Logan, S.M. (2003) Structural, genetic and functional characterization of the flagellin glycosylation process in *Helicobacter pylori*. *Mol Microbiol*, **48**, 1579-1592.
132. Schoenhofen, I.C., Lunin, V.V., Julien, J.P., Li, Y., Ajamian, E., Matte, A., Cygler, M., Brisson, J.R., Aubry, A., Logan, S.M. *et al.* (2006) Structural and functional characterization of PseC, an aminotransferase involved in the biosynthesis of pseudaminic acid, an essential flagellar modification in *Helicobacter pylori*. *J Biol Chem*, **281**, 8907-8916.
133. Serganova, I., Ksenzenko, V., Serganov, A., Meshcheryakova, I., Pyatibratov, M., Vakhrusheva, O., Metlina, A. and Fedorov, O. (2002) Sequencing of flagellin genes from *Natrialba magadii* provides new insight into evolutionary aspects of archaeal flagellins. *J Bacteriol*, **184**, 318-322.
134. Serganova, I.S., Polosina, I., Kostjukova, A.S., Metlina, A.L., Piatibratov, M.G. and Fedorov, O.V. (1995) [Halophilic archaea flagella: biochemical and genetic analysis]. *Biokhimiia*, **60**, 1261-1267.
135. Shen, N. and Weiner, R.M. (1998) Isolation and characterization of S-layer proteins from a vent prosthecate bacterium. *Microbios*, **93**, 7-16.
136. Sherlock, O., Dobrindt, U., Jensen, J.B., Munk Vejborg, R. and Klemm, P. (2006) Glycosylation of the self-recognizing *Escherichia coli* Ag43 autotransporter protein. *J Bacteriol*, **188**, 1798-1807.
137. Shoham, Y., Lamed, R. and Bayer, E.A. (1999) The cellulosome concept as an efficient microbial strategy for the degradation of insoluble polysaccharides. *Trends Microbiol*, **7**, 275-281.
138. Sleytr, U.B. and Beveridge, T.J. (1999) Bacterial S-layers. *Trends Microbiol*, **7**, 253-260.
139. Sleytr, U.B., Sara, M., Kupcu, Z. and Messner, P. (1986) Structural and chemical characterization of S-layers of selected strains of *Bacillus stearothermophilus* and *Desulfotomaculum nigrificans*. *Arch Microbiol*, **146**, 19-24.
140. Southam, G., Kalmokoff, M.L., Jarrell, K.F., Koval, S.F. and Beveridge, T.J. (1990) Isolation, characterization, and cellular insertion of the flagella from two

- strains of the archaebacterium *Methanospirillum hungatei*. *J Bacteriol*, **172**, 3221-3228.
141. Stephenson, A.E., Wu, H., Novak, J., Tomana, M., Mintz, K. and Fives-Taylor, P. (2002) The Fap1 fimbrial adhesin is a glycoprotein: antibodies specific for the glycan moiety block the adhesion of *Streptococcus parasanguis* in an in vitro tooth model. *Mol Microbiol*, **43**, 147-157.
 142. Stoll, D., Stalbrand, H. and Warren, R.A. (1999) Mannan-degrading enzymes from *Cellulomonas fimi*. *Appl Environ Microbiol*, **65**, 2598-2605.
 143. Strobel, G.A., Talmadge, K.W. and Albersheim, P. (1971) Observations on the structure of the phytotoxic glycopeptide of *Corynebacterium sepeidonicum*. *Biochim Biophys Acta*, **261**, 365-374.
 144. Swanson, A.F. and Kuo, C.C. (1990) Identification of lectin-binding proteins in *Chlamydia* species. *Infect Immun*, **58**, 502-507.
 145. Swanson, A.F. and Kuo, C.C. (1991) The characterization of lectin-binding proteins of *Chlamydia trachomatis* as glycoproteins. *Microb Pathog*, **10**, 465-473.
 146. Swanson, A.F. and Kuo, C.C. (1991) Evidence that the major outer membrane protein of *Chlamydia trachomatis* is glycosylated. *Infect Immun*, **59**, 2120-2125.
 147. Swanson, A.F. and Kuo, C.C. (1994) Binding of the glycan of the major outer membrane protein of *Chlamydia trachomatis* to HeLa cells. *Infect Immun*, **62**, 24-28.
 148. Swanson, A.F. and Kuo, C.C. (1996) The 18-kDa lectin-binding protein of *Chlamydia trachomatis* is different from the 18-kDa histone-like protein. *FEMS Microbiol Lett*, **137**, 189-192.
 149. Sylvestre, P., Couture-Tosi, E. and Mock, M. (2002) A collagen-like surface glycoprotein is a structural component of the *Bacillus anthracis* exosporium. *Mol Microbiol*, **45**, 169-178.
 150. Taguchi, F., Shimizu, R., Inagaki, Y., Toyoda, K., Shiraishi, T. and Ichinose, Y. (2003) Post-translational modification of flagellin determines the specificity of HR induction. *Plant Cell Physiol*, **44**, 342-349.
 151. Takamatsu, D., Bensing, B.A. and Sullam, P.M. (2004) Four proteins encoded in the *gspB-secY2A2* operon of *Streptococcus gordonii* mediate the intracellular glycosylation of the platelet-binding protein GspB. *J Bacteriol*, **186**, 7100-7111.
 152. Taku, A. and Fan, D.P. (1976) Purification and properties of a protein factor stimulating peptidoglycan synthesis in toluene- and LiCl-treated *Bacillus megaterium* cells. *J Biol Chem*, **251**, 1889-1895.
 153. Tamaru, Y., Araki, T., Amagoi, H., Mori, H. and Morishita, T. (1995) Purification and characterization of an extracellular beta-1,4-mannanase from a marine bacterium, *Vibrio* sp. strain MA-138. *Appl Environ Microbiol*, **61**, 4454-4458.
 154. Tamborrini, M., Holzer, M., Seeberger, P.H., Schurch, N. and Pluschke, G. Anthrax spore detection by a luminex assay based on monoclonal antibodies that recognize anthrose-containing oligosaccharides. *Clin Vaccine Immunol*, **17**, 1446-1451.
 155. Tang, G. and Mintz, K.P. Glycosylation of the collagen adhesin EmaA of *Aggregatibacter actinomycetemcomitans* is dependent upon the lipopolysaccharide biosynthetic pathway. *J Bacteriol*, **192**, 1395-1404.
 156. Tani, Y., Tani, M. and Kato, I. (1997) Extracellular 37-kDa antigenic protein from

- Actinobacillus actinomycetemcomitans induces TNF-alpha, IL-1 beta, and IL-6 in murine macrophages. *J Dent Res*, **76**, 1538-1547.
157. Tian, X.X., Li, A., Farrugia, I.V., Mo, X., Crich, D. and Groves, M.J. (2000) Isolation and identification of poly-alpha-(1-->4)-linked 3-O-methyl-D-mannopyranose from a hot-water extract of *Mycobacterium vaccae*. *Carbohydr Res*, **324**, 38-44.
 158. Tian, X.X., Li, A., Zhou, W., Farrugia, I.V. and Groves, M.J. (1999) Isolation and biological activities of an antineoplastic protein-polysaccharide complex (PS4A) obtained from *Mycobacterium vaccae*. *Anticancer Res*, **19**, 237-243.
 159. Todd, S.J., Moir, A.J., Johnson, M.J. and Moir, A. (2003) Genes of *Bacillus cereus* and *Bacillus anthracis* encoding proteins of the exosporium. *J Bacteriol*, **185**, 3373-3378.
 160. Tomoeda, M., Inuzuka, M. and Date, T. (1975) Bacterial sex pili. *Prog Biophys Mol Biol*, **30**, 23-56.
 161. Turner, M.A., Arellano, F. and Kozloff, L.M. (1991) Components of ice nucleation structures of bacteria. *J Bacteriol*, **173**, 6515-6527.
 162. Upreti, R.K., Kumar, M. and Shankar, V. (2003) Bacterial glycoproteins: functions, biosynthesis and applications. *Proteomics*, **3**, 363-379.
 163. Uthandi, S., Saad, B., Humbard, M.A. and Maupin-Furlow, J.A. LccA, an archaeal laccase secreted as a highly stable glycoprotein into the extracellular medium by *Haloferax volcanii*. *Appl Environ Microbiol*, **76**, 733-743.
 164. Van Rijssel, M., Gerwig, G.J. and Hansen, T.A. (1993) Isolation and characterization of an extracellular glycosylated protein complex from *Clostridium thermosaccharolyticum* with pectin methylesterase and polygalacturonate hydrolase activity. *Appl Environ Microbiol*, **59**, 828-836.
 165. Vik, A., Aas, F.E., Anonsen, J.H., Bilsborough, S., Schneider, A., Egge-Jacobsen, W. and Koomey, M. (2009) Broad spectrum O-linked protein glycosylation in the human pathogen *Neisseria gonorrhoeae*. *Proc Natl Acad Sci U S A*, **106**, 4447-4452.
 166. Wakai, H., Nakamura, S., Kawasaki, H., Takada, K., Mizutani, S., Aono, R. and Horikoshi, K. (1997) Cloning and sequencing of the gene encoding the cell surface glycoprotein of *Haloarcula japonica* strain TR-1. *Extremophiles*, **1**, 29-35.
 167. Waller, L.N., Stump, M.J., Fox, K.F., Harley, W.M., Fox, A., Stewart, G.C. and Shahgholi, M. (2005) Identification of a second collagen-like glycoprotein produced by *Bacillus anthracis* and demonstration of associated spore-specific sugars. *J Bacteriol*, **187**, 4592-4597.
 168. Webster, J.R., Reid, S.J., Jones, D.T. and Woods, D.R. (1981) Purification and Characterization of an Autolysin from *Clostridium acetobutylicum*. *Appl Environ Microbiol*, **41**, 371-374.
 169. Wehmeier, S., Varghese, A.S., Gurucha, S.S., Tissot, B., Panico, M., Hitchen, P., Morris, H.R., Besra, G.S., Dell, A. and Smith, M.C. (2009) Glycosylation of the phosphate binding protein, PstS, in *Streptomyces coelicolor* by a pathway that resembles protein O-mannosylation in eukaryotes. *Mol Microbiol*, **71**, 421-433.
 170. Weinberg, M.V., Schut, G.J., Brehm, S., Datta, S. and Adams, M.W. (2005) Cold shock of a hyperthermophilic archaeon: *Pyrococcus furiosus* exhibits multiple responses to a suboptimal growth temperature with a key role for membrane-

- bound glycoproteins. *J Bacteriol*, **187**, 336-348.
171. Wimmer, B., Lottspeich, F., Ritter, J. and Bronnenmeier, K. (1997) A novel type of thermostable alpha-D-glucosidase from *Thermoanaerobacter thermohydrosulfuricus* exhibiting maltodextrinohydrolase activity. *Biochem J*, **328 (Pt 2)**, 581-586.
 172. Wyss, C. (1998) Flagellins, but not endoflagellar sheath proteins, of *Treponema pallidum* and of pathogen-related oral spirochetes are glycosylated. *Infect Immun*, **66**, 5751-5754.
 173. Yamaguchi, T., Kasamo, K., Chuman, M., Machigashira, M., Inoue, M. and Sueda, T. (1998) Preparation and characterization of an *Actinomyces naeslundii* aggregation factor that mediates coaggregation with *Porphyromonas gingivalis*. *J Periodontal Res*, **33**, 460-468.
 174. Yang, L.L. and Haug, A. (1979) Purification and partial characterization of a procaryotic glycoprotein from the plasma membrane of *Thermoplasma acidophilum*. *Biochim Biophys Acta*, **556**, 265-277.
 175. Yao, R., Macario, A.J. and Conway de Macario, E. (1992) Immunochemical differences among *Methanosarcina mazei* S-6 morphologic forms. *J Bacteriol*, **174**, 4683-4688.
 176. Yoshida, J., Yoshimura, M., Takamura, S. and Kobayashi, S. (1985) Purification and characterization of an antitumor principle from *Streptococcus hemolyticus*, Su strain. *Jpn J Cancer Res*, **76**, 213-223.
 177. Yoshida, S., Sako, Y. and Uchida, A. (1998) Cloning, sequence analysis, and expression in *Escherichia coli* of a gene coding for an enzyme from *Bacillus circulans* K-1 that degrades guar gum. *Biosci Biotechnol Biochem*, **62**, 514-520.
 178. Zaidi, S.I., Singh, K.P., Raisuddin, S., Jafri, A., Saxena, A.K., Choudhary, S. and Ray, P.K. (1995) Modulation of primary antibody response by protein A in tumor bearing mice. *Immunopharmacol Immunotoxicol*, **17**, 759-773.
 179. Zeituni, A.E., McCaig, W., Scisci, E., Thanassi, D.G. and Cutler, C.W. The native 67-kilodalton minor fimbria of *Porphyromonas gingivalis* is a novel glycoprotein with DC-SIGN-targeting motifs. *J Bacteriol*, **192**, 4103-4110.
 180. Zellner, G., Messner, P., Winter, J. and Stackebrandt, E. (1998) *Methanoculleus palmolei* sp. nov., an irregularly coccoid methanogen from an anaerobic digester treating wastewater of a palm oil plant in north-Sumatra, Indonesia. *Int J Syst Bacteriol*, **48 Pt 4**, 1111-1117.
 181. Zellner, G., Stackebrandt, E., Messner, P., Tindall, B.J., Conway de Macario, E., Kneifel, H., Sleytr, U.B. and Winter, J. (1989) *Methanocorpusculaceae* fam. nov., represented by *Methanocorpusculum parvum*, *Methanocorpusculum sinense* spec. nov. and *Methanocorpusculum bavaricum* spec. nov. *Arch Microbiol*, **151**, 381-390.