Juergen Wiegel Professor of Microbiology

Dept. of Microbiology; Dept. of Biochemistry & Molecular Biology; Inst. of Ecology
University of Georgia, Athens, GA 30602-2605 USA

Education and Professional Experience: Handelskammer Hannover (Germany): **1960** Horticulture-Gehilfen Pruefung) **1960-1961** Horticulturist, Berlin Spandau
University of Goettingen (Germany): **1968** Vordiplom (BS) Chemistry; **1969** Diplom (MS) Organic Chemistry, **1973** Dr. rer nat. (Ph.D.) Microbiology; **1982** Dr. habil (Dr. Sci) Microbiology, **1969-1984** Microbiologist/Dipl. Chemist at Dept. of Microbiology,
Univ. of Gorgia (USA): 1977-1979, Postdoc Biochemistry w/ G. Ljungdahl and H. Peck, jr.; **1982-1985** Visiting Associate Professor, Dept. Microbiology; **1985-1990** Associate Professor ;Dept. of Microbiology, **1990-present** Professor, Dept. of Microbiology; **1983-present** Adjunct Professor at the Institute of Ecology, 1989-present Adjunct Professor Dept. of Biochemistry and Ctr. for Biological Research Recovery

Panel Member for USDA, Doe, NSF; ONR;
Co-Organizer of Art of Anaerobes Symposium (1996), Thermophiles 96 (1996) several Int. Organizing /Scientific committees.

HONORS: 1)1992 Fulbright fellowship; *2)* 1996 novel bacterium named *Thermoanaerobacter wiegelii*, 3) 1997 P.R. Edward Award for Outstanding service and Accomplishments in Microbiology Southeastern Branch of ASM;4) Bergey's Manual Prize 2007.

Past Research Areas: 1) Isolation of dinitrogen-fixing microorganisms; 2) Anaerobic degradation of haloaromatic compounds including PCBs and chlorophenols

Present Research Areas: Extremophiles: biodiversity/ecology, phylogeny, physiology/biochemistry; industrial applications (Over 20 novel taxa including novel families and orders described) of 1) (alkali)thermophilic anaerobes 2) haloalkalithermophiles degrading various monomeric and polymeric substrates.

Selected Related Publications -- from a total of 195 Reviews and Peer-reviewed Journal Articles:

J. Wiegel and M. Dykstra. **1984.** *Clostridium thermocellum*: Adhesion and sporulation while adhered to cellulose and hemicellulose. **Eur. J. Appl. Microbiol. Biotechnol**. 20:59-65

J. Wiegel, Ch.P. Mothershed, and J. Puls. **1985.** Differences in xylan degradation by various non-cellulolytic thermophilic anaerobes and *Clostridium thermocellum*. **Appl. Environ. Microbiol**. 49:656-659.

D. Freier, Ch.P. Mothershed, and **J. Wiegel**. **1988**. *Clostridium thermocellum* characterization of strain JW20. **Appl. Environ. Microbiol.**, 54:104-111.

J. Wiegel, L. H. Carreira, R. Garrison, N. E. Rabek, and L. G. Ljungdahl. 1991. Calcium magnesium acetate (CMA) Manufacture from glucose by fermentation with thermophilic homoacetogenic bacteria. Chapter 16 In: **"Calcium Magnesium Acetate"**, Eds., D. L. Wise, Y. A. Levendis and M. Metghalchi. pp. 359-418. **Elsevier Science Publisher, Amsterdam-New York.**

W. Shao, S. DeBlois, and **J. Wiegel. 1995.** A high-molecular weight, cell-associated xylanase isolated from exponentially growing *Thermoanaerobacterium* sp. strain JW/SL-YS485. Appl. Environ. Microbiol. 61:937-940

S. Liu, F.C. Gherardini, M. Matuschek, H. Bahl, and **J. Wiegel. 1996.** Cloning, sequencing, and expression of the gene encoding a large S-layer-associated endoxylanase from *Thermoanaerobacterium* sp. strain JW/SL-YS 485 in *Escherichia coli*. **J. Bacteriol**. 178:1539-1547.

V. Mai and **J. Wiegel**. 1999. Recombinant DNA applications in thermophiles. Chapter 41 *IN* ASM **Manual of Industrial Microbiology and Biotechnology**, 2nd Edition (Ed. in Chief: A.L. Demain and J.E. Davis; Section Ed. Hershberger) ASM Press Washington DC. pp. 511-519.

F. Canganella and **J. Wiegel**, 1999. Cultivation of *Clostridium thermobutyricum* in a rotary fermentor system. **J. Industrial Microbiology and Biotechnology**, 24:7-13

V. Mai, **J. Wiegel** and W. Lorenz . 2000. Cloning, sequencing,, and characterization of the bifunctional xylose-arabinosidase from the anaerobic thermophile *Thermoanaerobacter ethanolicus*. **Gene** 247:137-143

D.E. Byrer, F.R. Rainey, and **J.Wiegel**. 2000.Novel Strains of *Moorella thermoacetica* form unusually heat resistant spores. Arch. Microbiol. 174: (5) 334_339. Electronic version: DOI 10.10007/s002030000211

J. Wiegel and Q. Wu. 2000. Microbial Dehalogenation of polychlorinated biphenyls. **FEMS Microbial Ecology** 32: 1-15, 2000 (containing over 20 citations of publications from work done in J. Wiegel's group)

I. Utkin, C. Woese, and **J. Wiegel. 1994.** Isolation and characterization of *Desulfitobacterium dehalogenans* gen. nov. sp. nov., an anaerobic bacterium which reductively dechlorinates chlorophenolic compounds. **Int. J. Syst. Bacteriol.** 44:612-619.

X. Zhang and **J. Wiegel. 1994**. Reversible conversion of 4-hydroxybenzoate and phenol by *Clostridium hydroxybenzoicum.* Appl. Environ. Microbiol. 60:4182-4185.

I. Utkin, D. D. Dalton, and **J. Wiegel. 1995**. Specificity of reductive dechlorination of substituted ortho-chlorophenols by *Desulfitobacterium dehalogenans* JW/IU-DC1. **Appl. Environ. Microbiol**. 61:346-351 F. Rainey, R. Tanner and **J. Wiegel**. **2006** Family *Clostridiaceae* In *The Prokaryote: A Handbook on the Biology of Bacteria: Vol. 4: Bacteria: Firmicutes, Cyanobacteria*, 3rd edn. release 3.20., New York: Springer-Verlag, pp. 4:654–678 (DOI: 10.1007/0-387-30744-3_20

N. Mesbah and **J. Wiegel. 2006**. Isolation, cultivation and characterization of alkalithermophiles. IN: **Methods in Microbiology**. (Ed. A Oren and F. A. Rainey) Academic Press / Elsevier.pp. 451-468

M. V. Tyurin, L. R. Lynd, and **J. Wiegel. 2006.** Gene transfer systems for obligately anaerobic thermophilic bacteria.IN: **Methods in Microbiology**. (Ed. A Oren and F. A. Rainey) Academic Press / Elsevier. pp. 309-330

. Mesbah N. David, M. Hedrick, B. Peacock, A. D. Rohde, M..& **Wiegel**,.**J. 2007**. *Natranaerobius thermophilus* gen. nov. sp. nov., a halophilic, alkalithermophilic bacterium from soda lakes of the Wadi An Natrun, Egypt. and proposal of *Natranaerobiacea*e fam. nov. and *Natranaerobiales* ord. nov. **Int. J. Syst. Evol. Microbiol. 57:** 2507-2512

Lee, Y.J., R. I. Mackie. I. K. O. Cann, & **J. Wiegel**. *Caldanaerobius fijiensis* gen. nov., sp. nov., a new inulin-degrading, ethanol-producing thermophilic bacterium from a Fijian hotspring sediment, and reclassification of *Thermoanaerobacterium polysaccharolyticum* and *Thermoanaerobacterium zeae* as *Caldanaerobius polysaccharolyticus* comb. nov. and *Caldanaerobius zeae* comb. nov. **Int. J. Syst. Evol. Microbiol. 54:** 666-670 M.

Salameh and **J. Wiegel**. **2007** Lipases from extremophiles and potential for industrial applications Chapter 7. in Advances in Applied Microbiology 61: 253-283

Salameh, M..A. & **J. Wiegel**. **2007.** Purification and characterization of two highly thermophilic alkaline lipases from *Thermosyntropha lipolytica*.**Appl. Environ. Microbiol. 73:** 7725-7731

Lupa, B, D. Lyon, L. N. Shaw , M.Sieprawska-Lupa,& **J. Wiegel. 2008.** Properties of the reversible non-oxidative vanillate4-hydroxybenzoate decarboxylase from Bacillus subtilis .**Can. J. Microbiol. 54:**75-81

Zhao W., Ch. L. Zhang, C.S. Romanek & **J. Wiegel. 2008**. *Caldalkalibacillus uzonensis* sp. nov., and emended description of the genus *Caldalkalibacillus.* **Int. J. Syst. Evol. Microbiol. : (in press)**

Kevbrin V. Y., Boltyanskaya, E. Garnova **& J. Wiegel. 2008**. *Anaerobranca zarvarzinii* sp. nov. an anaerobic, alkalithermophilic bacterium isolated from Kamchtka thermal fields. **Int. J. Syst. Evol. Microbiol. (in press)**

N. Mesbah & J.Wiegel 2008. Haloalkalithermophiles. Annals N.Y. Acad. Sciences (in press)

I. Wagner a& J.Wiegel 2008 Diversity of thermophilic Anaerobes. Annals N.Y. Acad. Sciences (in Press)

Books:

Incredible Anaerobes:From Physiologogy toGenomes to fuels. (**J. Wiegel**, R. Mayer and M. W.W.Adams**,** eds) Annals New York Academy of Sciences (in press)

Patents

L. G. Ljungdahl and J. K. W. **Wiegel (1981a)** Anaerobic thermophilic culture system. United States Patent 4,292,406.

L. G. Ljungdahl and J. K. W. **Wiegel (1981b)** Anaerobic thermophilic culture. United States Patent 4,292,407.

M. Seyfried, **J. Wiegel**, and G. Whited **(2004)** Enzymes which dehydrate glycerol. United States Patent6,803,218. (International patent filed (Sept., 2000)