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Appointments:

- 2011-Pres. Director, Microbial Biology Graduate Program, Rutgers University
- 2010-Pres. Distinguished Professor, Department of Biochemistry and Microbiology, Rutgers U.
- 2003-08 Director, Biotechnology Center for Agriculture and the Environment, Rutgers U.
- 2001-03 Acting Director, Biotechnology Center for Agriculture and the Environment
- 2001-10 Professor of Biochemistry and Microbiology, Biotechnology Center for Agriculture and the Environment, Rutgers University
- 1996-01 Associate Professor of Biochemistry and Microbiology, Biotechnology Center for Agriculture and the Environment, Rutgers University
- 1995-10 Director, School of Environmental and Biological Sciences Biotech Core Facility
- 1990-96 Assistant Professor of Biochemistry and Microbiology, Biotechnology Center for Agriculture and the Environment, Rutgers University
- 1990-10 Resident Member, Biotechnology Center for Agriculture and the Environment, Rutgers University
- 1988-90 Postdoctoral Research Associate, Department of Microbiology, University of Iowa, Iowa City (Advisor: D. T. Gibson)
- 1987-88 Postdoctoral Research Associate, Department of Microbiology, University of Texas at Austin (Advisor: D. T. Gibson)

Education:

- 1981-87 Ph.D., Cellular and Molecular Biology, The University of Michigan Medical School, Ann Arbor (Advisor: R. H. Olsen)
- 1977-81 B.S., Biology, Calvin College, Grand Rapids, MI

Publications:

- Stedtfeld, R. D., T. M. Stedtfeld, H. Waseem, M. Fitschen-Brown, X. Guo, B. Chai, M. R. Williams, T. Shook, A. Logan, A. Graham, J. C. Chae, W. J. Sul, J. VanHouten, J. R. Cole, G. J. Zylstra, J. M. Tiedje, B. L. Upham, and S. A. Hashsham. 2017. Isothermal assay targeting class 1 integrase gene for environmental surveillance of antibiotic resistance markers. *J Environ Manage* 198:213-220.
- Ahn, E., K. Y. Choi, B. S. Kang, G. J. Zylstra, D. Kim, and E. Kim. 2017. Salicylate degradation by a cold-adapted *Pseudomonas* sp. *Ann Microbiol* 67:417-424.
- Chai, B., T. V. Tsoi, S. Iwai, C. Liu, J. A. Fish, C. Gu, T. A. Johnson, G. Zylstra, B. J. Teppen, H. Li, S. A. Hashsham, S. A. Boyd, J. R. Cole, and J. M. Tiedje. 2016. *Spingomonas wittichii* strain RW1 genome-wide gene expression shifts in response to dioxins and clay. *PLoS One* 11:e0157008.
- Ambrose, K. V., Z. Tian, Y. Wang, J. Smith, G. Zylstra, B. Wang, and F. C. Belanger. 2015. Functional characterization of salicylate hydroxylase from the fungal endophyte *Epichloe*

- festucae*. Nature Sci Rep 5:10939.
- Masuda, H., Y. Shiwa, H. Yoshikawa, and G. J. Zylstra. 2014. Draft genome sequence of the versatile alkane-degrading bacterium *Aquabacterium* sp. strain NJ1. Genome Announcements 2:e01271-14.
- Theisen, J., G. J. Zylstra, and N. Yee. 2013. Genetic evidence for a molybdopterin-containing tellurate reductase. Appl. Env. Microbiol. 79:3171-3175.
- Masuda, H., K. McClay, R. J. Steffan, and G. J. Zylstra. 2012. Biodegradation of tetrahydrofuran and 1,4-dioxane by soluble diiron monooxygenase in *Pseudonocardia* sp. strain ENV478. J. Mol. Microbiol. Biotechnol. 22:312-316.
- Chang, H. K., G. J. Zylstra, and J.-C. Chae. 2012. Genome sequence of *n*-alkane degrading *Hydrocarboniphaga effusa* strain AP103T (ATCC BAA-332T). J. Bacteriol. 194:5120.
- Yoo, M., D. Kim, K. Y. Choi, J.-C. Chae, G. J. Zylstra, and E. Kim. 2012. Draft genome sequence and comparative analysis of the superb aromatic hydrocarbon degrader *Rhodococcus* sp. strain DK17. J. Bacteriol. 194:4440.
- Masuda, H., K. McClay, R. J. Steffan, and G. J. Zylstra. 2012. Characterization of three propane-inducible oxygenases in *Mycobacterium* sp. strain ENV421. Lett. Appl. Microbiol. 55:175-81.
- Callaghan, A. V., B. E. L. Morris, I. A. C. Pereira, M. J. McInerney, R. N. Austin, J. T. Groves, J. J. Kukor, J. M. Suflita, L. Y. Young, G. J. Zylstra, and B. Wawrik. 2012. The genome sequence of *Desulfatibacillum alkenivorans* AK-01: a blueprint for anaerobic alkane oxidation. Env. Microbiol. 14:101-13.
- Kim, D., M. Yoo, K. Y. Choi, B. S. Kang, T. K. Kim, S. G. Hong, G. J. Zylstra, and E. Kim. 2011. Differential degradation of bicyclics with aromatic and alicyclic rings by *Rhodococcus* sp. strain DK17. Appl. Environ. Microbiol. 77:8280-8287.
- Yoo, M., D. Kim, G. J. Zylstra, B. S. Kang, and E. Kim. 2011. Biphenyl hydroxylation enhanced by an engineered *o*-xylene dioxygenase from *Rhodococcus* sp. strain DK17. Res. Microbiol. 162:724-728.
- Atlas, R. M., D. J. Grimes, T. C. Hazen, J. Spain, J. M. Suflita, A. Reid, S. Maloy, C. E. Cerniglia, G. M. King, N. E. Kinner, J. E. Kostka, K. Lee, F. Loeffler, R. C. Prince, P. Sobecky, R. J. Steffan, A. P. Teske, B. Van Mooy, A. D. Venosa, L. P. Wackett, C. H. Ward, L. Young, and G. J. Zylstra. 2011. Microbes & Oil Spills FAQ. American Academy of Microbiology & American Society for Microbiology, Washington, D.C.
- Wawrik, B., T. Doolotkeldieva, D. Kutliev, L. Kerkhof, G. J. Zylstra, and J. J. Kukor. 2011. Bioprospecting uncultured microbial biodiversity, p. 21-40. In: B. E. Ponman and J. S. Miller (eds.), Realizing Nature's Potential: Proceedings of the William L. Brown Symposium Honoring Dr. Gordon Cragg. Missouri Botanical Garden Press, St. Louis, MO.
- Kim, D., K. Y. Choi, M. Yoo, J. N. Choi, C. H. Lee, G. J. Zylstra, B. S. Kang, and E. Kim. 2010. Benzylic and aryl hydroxylations of *m*-xylene by *o*-xylene dioxygenase from *Rhodococcus* sp. strain DK17. Appl. Microbiol. Biotech. 86:1841-1847.
- Kim, D., C. H. Lee, J. N. Choi, K. Y. Choi, G. J. Zylstra, and E. Kim. 2010. Aromatic hydroxylation of indan by the *o*-xylene-degrading *Rhodococcus* sp. strain DK17. Appl. Environ. Microbiol. 76:375-377.
- Ni Chadhain, S. and G. J. Zylstra. 2010. Functional Gene Diversity, Biogeography, and Dynamics, p. 2413-2422. In K. N. Timmis (ed.), Handbook of Hydrocarbon and Lipid Microbiology. Springer Verlag GmbH, Heidelberg.
- Chang, H.-K. and G. J. Zylstra. 2010. Xanthomonads, p. 1805-1811. In K. N. Timmis (ed.),

- Handbook of Hydrocarbon and Lipid Microbiology. Springer Verlag GmbH, Heidelberg.
- Chang, H.-K., J. J. Dennis, and G. J. Zylstra. 2009. Involvement of two transport systems and a specific porin in the uptake of phthalate by *Burkholderia* spp. *J. Bacteriol.* 191:4671-4673.
- Sul, W. J., J. Park, J. F. Quensen III, J. L. M. Rodrigues, L. Seliger, T. V. Tsoi, G. J. Zylstra, and J. M. Tiedje. 2009. DNA-stable isotope probing integrated with metagenomics: retrieval of biphenyl dioxygenase genes from PCB-contaminated river sediment. *Appl. Environ. Microbiol.* 75:5501-5506.
- Ahn, Y.-B., J.-C. Chae, G. J. Zylstra, and M. M. Haggbloom. 2009. Degradation of phenol via phenylphosphate and carboxylation to 4-hydroxybenzoate by a newly isolated strain of the sulfate-reducing bacterium *Desulfobacterium anilini*. *Appl. Environ. Microbiol.* 75:4248-4253.
- Schuler, L., Y. Jouanneau, S. M. Ní Chadhain, C. Meyer, M. Pouli, G. J. Zylstra, P. Hols, S. N. Agathos. 2009. Characterization of a ring-hydroxylating dioxygenase from phenanthrene-degrading *Sphingomonas* sp. strain LH128 able to oxidize benz[a]anthracene. *Appl. Microbiol. Biotechnol.* 83:465-475.
- Dushenkov, V., J. Akimaliev, K. Buriev, M. A. Lila, Y. Nuraliev, G. Pichkhadze, L. Struwe, J. F. White, G. J. Zylstra, I. Raskin. 2008. The role of the ICBG program in building new pharmaceutical capabilities in Central Asia. *In Proceedings of the First Congress of Phytotherapist and Phytopharmacologists of Tajikistan. International Institute for the Study of Avicenna Heritage and Pharmacology, Dushanbe, Tajikistan.*
- Yoo, M. S. U. Choi, K. Y. Choi, G. H. Yon, J. C. Chae, D. Kim, G. J. Zylstra, and E. Kim. 2008. Trisindoline synthesis and anticancer activity. *Biochem. Biophys. Res. Commun.* 376:96-99.
- Chang, H.-K., and G. J. Zylstra. 2008. Examination and expansion of the substrate range of *m*-hydroxybenzoate hydroxylase. *Biochem. Biophys. Res. Commun.* 371:149-153.
- Kwon, N.R., J.-C. Chae, K. Y. Choi, M. Yoo, G. J. Zylstra, Y. M. Kim, B. S. Kang, and E. Kim. 2008. Identification of functionally important amino acids in a novel indigo-producing oxygenase from *Rhodococcus* sp. strain T104. *Appl. Microbiol. Biotechnol.* 79:417-422.
- Chae, J.-C., B. Song, G. J. Zylstra. 2008. Identification of genes coding for hydrolytic dehalogenation in the metagenome derived from a denitrifying 4-chlorobenzoate degrading consortium. *FEMS Microbiol. Lett.* 281:203-209.
- Schuler, L., S. M. Ní Chadhain, Y. Jouanneau, C. Meyer, G. J. Zylstra, P. Hols, S. N. Agathos. 2008. Characterization of a novel angular dioxygenase from fluorene-degrading *Sphingomonas* sp. strain LB126. *Appl. Environ. Microbiol.* 74:1050-1057.
- Callaghan, A. V., B. Wawrik, S. Ní Chadhain, L. Y. Young, and G. J. Zylstra. 2008. Anaerobic alkane-degrading strain AK-01 contains two alkylsuccinate synthase genes. *Biochem. Biophys. Res. Commun.* 366:142-148.
- Perry, L. L., and G. J. Zylstra. 2007. Cloning of a gene cluster involved in the catabolism of *p*-nitrophenol by *Arthrobacter* sp. strain JS443 and characterization of the *p*-nitrophenol monooxygenase. *J. Bacteriol.* 189:7563-7572.
- Ní Chadhain, S. M., E. M. Moritz, E. Kim, and G. J. Zylstra. 2007. Identification, cloning, and characterization of a multicomponent biphenyl dioxygenase from *Sphingomonas yanoikuyae* B1. *J. Ind. Microbiol. Biotechnol.* 34:605-613.
- Chae, J.-C., E. Kim, E. Bini, and G. J. Zylstra. 2007. Comparative analysis of the catechol 2,3-dioxygenase gene locus in thermoacidophilic archaeon *Sulfolobus solfataricus* strain 98/2. *Biochem. Biophys. Res. Commun.* 357:815-819.

- Choi, K. Y., D. Kim, J.-C. Chae, G. J. Zylstra, E. Kim. 2007. Requirement of duplicated operons for maximal metabolism of phthalate by *Rhodococcus* sp. strain DK17. *Biochem. Biophys. Res. Commun.* 357:766-771.
- Yano, H., C. E. Garruto, M. Sota, Y. Ohtsubo, Y. Nagata, G. J. Zylstra, P. A. Williams, and M. Tsuda. 2007. Complete sequence determination combined with analysis of transposition/site-specific recombination events to explain genetic organization of the IncP-7 TOL plasmid pWW53 and related mobile genetic elements. *J. Mol. Biol.* 25:11-26.
- Poulain, A. J., S. M. Ní Chadhain, P. A. Ariya, M. Amyot, E. Garcia, P. G. Campbell, G. J. Zylstra, and T. Barkay. 2007. Potential for mercury reduction by microbes in the high arctic. *Appl. Environ. Microbiol.* 73:2230-2238.
- Kim, D., J. S. Lee, K. Y. Choi, Y.-S. Kim, J. N. Choi, S.-K. Kim, J.-C. Chae, G. J. Zylstra, C. H. Lee, and E. Kim. 2007. Effect of substituent size on the regioselectivity of a novel o-xylene dioxygenase from *Rhodococcus* sp. strain DK17. *Enz. Microb. Tech.* 41:221-225.
- Wawrik, B., D. Kutliev, U. A. Abdivasievna, J. J. Kukor, G. J. Zylstra, and L. J. Kerkhof. 2007. Biogeography of Actinomycete communities and Type II polyketide synthase genes in soils collected in New Jersey and Central Asia. *Appl. Environ. Microbiol.* 73:2982-2989.
- Rhine, E. D., S. M. Ní Chadhain, G. J. Zylstra, and L. Y. Young. 2007. The arsenite oxidase genes (*aroAB*) in novel chemoautotrophic arsenite oxidizers. *Biochem. Biophys. Res. Commun.* 354:662-667.
- Choi, K. Y., G. J. Zylstra, and E. Kim. 2007. Benzoate catabolite repression of the phthalate degradation pathway in *Rhodococcus* sp. strain DK17. *J. Bact.* 73:1370-1374.
- Yu, C. L., W. Liu, D. J. Ferraro, E. N. Brown, J. V. Parales, S. Ramaswamy, G. J. Zylstra, D.T. Gibson and R.E. Parales. 2007. Purification, characterization, and crystallization of the components of a biphenyl dioxygenase system from *Sphingobium yanoikuyae* B1. *J. Ind. Microbiol. Biotechnol.* 34:311-324.
- Rozhkova-Novosad, E. A., J.-C. Chae, G. J. Zylstra, E. M. Bertrand, M. Alexander-Ozinskas, D. Deng, L. A. Moe, J. B. van Beilen, M. Danahy, J. T. Groves, and R. N. Austin. 2007. Profiling mechanisms of alkane hydroxylase activity in vivo using the diagnostic substrate norcarane. *Chemical Biology* 14:165-172.
- Bae, H. W., D. Kim, K. Y. Choi, N. R. Kwon, J.-C. Chae, G. J. Zylstra, S.-C. Koh, C.-H. Lee, and E. Kim. 2007. Functional identification of *p*-cumate operons in the terpene-degrading *Rhodococcus* sp. strain T104. *FEMS Microbiol. Lett.* 266:55-59.
- Ní Chadhain, S. M., B. Wawrik, T. Doolotkeldieva, L. J. Kerkhof, J. J. Kukor, and G. J. Zylstra. 2007. High mountain soil as a source of genetic biodiversity, p. 267-271. *In Proceedings of the International Conference "Ecological Characteristics of Biodiversity."* Academy of Sciences of the Republic of Tajikistan, Dushanbe.
- Doolotkeldieva, T., B. Wawrik, G. J. Zylstra, L. J. Kerkhof, and J. J. Kukor. 2007. Biodiversity of soil prokaryotes as sources of new antibiotic compounds, p. 291-296. *In Proceedings of the International Conference "Ecological Characteristics of Biodiversity."* Academy of Sciences of the Republic of Tajikistan, Dushanbe.
- Kukor, J. J., B. Wawrik, and G. J. Zylstra. 2007. Metabolism of Aromatic Compounds, p. 586-595. *In C. A. Reddy, T. J. Beveridge, J. A. Breznak, G. A. Marzluf, T. M. Schmidt, and L. R. Snyder (eds), Methods for General and Molecular Microbiology.* American Society for Microbiology Press, Washington, D.C.
- Chae, J.-C., and G. J. Zylstra. 2006. 4-Chlorobenzoate uptake in *Comamonas* sp. strain DJ-12 is mediated by a tripartite ATP-independent periplasmic (TRAP) transporter. *J. Bact.*

188:8407-8412.

- Ni Chadhain, S. M., J. K. Schaefer, S. Crane, G. J. Zylstra, and T. Barkay. 2006. Analysis of mercuric reductase (*merA*) gene diversity in an anaerobic mercury-contaminated sediment enrichment. *Environ. Microbiol.* 8:1746-1752.
- Vainberg, S., K. McClay, H. Masuda, D. Root, C. Condee, G. J. Zylstra, and R. J. Steffan. 2006. Biodegradation of ether pollutants by *Pseudonocardia* sp. strain ENV478. *Appl. Environ. Microbiol.* 72:5218-5224
- Ni Chadhain, S. M., R. S. Norman, K. Pesce, J. J. Kukor, and G. J. Zylstra. 2006. Microbial dioxygenase gene population shifts during polycyclic aromatic hydrocarbon biodegradation. *Appl. Environ. Microbiol.* 72:4078-4087.
- Chae, J.-C., C.-K. Kim, and G. J. Zylstra. 2005. Characterization of two small cryptic plasmids from *Pseudomonas* sp. strain S-47. *Biochem. Biophys. Res. Commun.* 338:1600-1606.
- Choi, K. Y., D. Kim, W. J. Sul, J.-C. Chae, G. J. Zylstra, Y. M. Kim, E. Kim. 2005. Molecular and biochemical analysis of phthalate and terephthalate degradation by *Rhodococcus* sp. strain DK17. *FEMS Microbiol. Lett.* 252:207-213.
- Wawrik, B., L. Kerkhof, J. J. Kukor, and G. J. Zylstra. 2005. Effect of different carbon sources on community composition of bacterial enrichments from soil. *Appl. Environ. Microbiol.* 71:6776-6783.
- Jang, J. Y., D. Kim, H. W. Bae, K. Y. Choi, J.-C. Chae, G. J. Zylstra, Y. M. Kim, and E. Kim. 2005. Isolation and characterization of a *Rhodococcus* species strain able to grow on *ortho*- and *para*-xylene. *J. Microbiol.* 43: 325-330.
- Zylstra, G. J., and J. J. Kukor. 2005. What is environmental biotechnology? *Curr. Opin. Biotechnol.* 16:243-245.
- Zylstra, G. J., and J. J. Kukor (eds.). 2005. *Current Opinion in Biotechnology* special issue on Environmental Biotechnology. (Volume 16, Number 3, June issue)
- Kim, D., J.-C. Chae, G. J. Zylstra, H.-Y. Sohn, G.-S. Kwon, and E. Kim. 2005. Identification of two-component regulatory genes involved in *o*-xylene degradation by *Rhodococcus* sp. strain DK17. *J. Microbiol.* 43:49-53.
- Wawrik, B., L. Kerkhof, G. J. Zylstra, and J. J. Kukor. 2005. Identification of unique type II polyketide synthase genes in soil. *Appl. Env. Microbiol.* 71:2232-2238.
- Cho, O., K. Y. Choi, G. J. Zylstra, Y.-S. Kim, S.-K. Kim, J. H. Lee, H.-Y. Sohn, G.-S. Kwon, Y. M. Kim, and E. Kim. 2005. Catabolic role of a three-component salicylate oxygenase from *Sphingomonas yanoikuyae* B1 in polycyclic aromatic hydrocarbon degradation. *Biochem. Biophys. Res. Commun.* 18:656-662.
- Kim, D., J.-C. Chae, J. Y. Jang, G. J. Zylstra, Y. M. Kim, B. S. Kang, and E. Kim. 2005. Functional characterization and molecular modeling of methylcatechol 2,3-dioxygenase from *o*-xylene-degrading *Rhodococcus* sp. strain DK17. *Biochem. Biophys. Res. Commun.* 326:880-886.
- Caballero, A., A. Esteve-Núñez, G. J. Zylstra, and J. L. Ramos. 2005. Assimilation of nitrogen from nitrite and trinitrotoluene in *Pseudomonas putida* JLR11. *J. Bacteriol.* 187:396-399.
- Kim, D., J.-C. Chae, G. J. Zylstra, Y.-S. Kim, S.-K. Kim, M. H. Nam, Y. M. Kim, and E. Kim. 2004. Identification of a novel dioxygenase involved in metabolism of *o*-xylene, toluene, and ethylbenzene by *Rhodococcus* sp. strain DK17. *Appl. Environ. Microbiol.* 70:7086-7092.
- Dennis, J. J., and G. J. Zylstra. 2004. Complete sequence and genetic organization of pDTG1, the 83 kilobase naphthalene degradation plasmid from *Pseudomonas putida* strain NCIB

- 9816-4. *J. Mol. Biol.* 341:753-768.
- Williams, P. A., R. M. Jones, and G. J. Zylstra. 2004. Genomics of Catabolic Plasmids, p. 165-196. In J. L. Ramos (ed.), *Pseudomonas* Volume 1: Genomics, Lifestyle, and Molecular Architecture. Kluwer Academic / Plenum Publishers, New York.
- Palleroni, N. J., A. M. Port, H.-K. Chang, and G. J. Zylstra. 2004. *Hydrocarboniphaga effusa* gen. nov., sp. nov., a novel member of the gamma-Proteobacteria active in alkane and aromatic hydrocarbon degradation. *Int. J. Syst. Evol. Microbiol.* 54:1203-1207.
- Chang, H.-K., P. Mohseni, and G. J. Zylstra. 2003. Characterization and regulation of the genes for a novel anthranilate 1,2-dioxygenase from *Burkholderia cepacia* DBO1. *J. Bacteriol.* 185:5871-5881.
- Austin, R., K. Buzzi, E. Kim, G. J. Zylstra, and J. T. Groves. 2003. Xylene monooxygenase, a membrane-spanning non-heme diiron enzyme that hydroxylates hydrocarbons via a substrate radical intermediate. *J. Biological Inorganic Chem.* 8:733-740.
- Bae, M., W. J. Sul, S.-C. Koh, J. H. Lee, G. J. Zylstra, Y. M. Kim, and E. Kim. 2003. Implication of two glutathione *S*-transferases in the optimal metabolism of *m*-toluate by *Shingomonas yanoikuyae* B1. *Antonie van Leeuwenhoek* 84:25-30.
- Kim, D., Y.-S. Kim, J. W. Jung, G. J. Zylstra, Y. M. Kim, S.-K. Kim, and E. Kim. 2003. Regioselective oxidation of xylene isomers by *Rhodococcus* sp. Strain DK17. *FEMS Microbiol. Lett.* 223:211-214.
- Park, W., C. O. Jeon, A. M. Hohnstock-Ashe, S. C. Winans, G. J. Zylstra, and E. L. Madsen. 2003. Identification and characterization of the conjugal transfer region of the pCg1 plasmid from naphthalene-degrading *Pseudomonas putida* Cg1. *Appl. Environ. Microbiol.* 69:3263-3271.
- Sullivan, R. F., M. A. Holtman, G. J. Zylstra, J. F. White, Jr., and D. Y. Kobayashi. 2003. Taxonomic positioning of two biological control agents for plant diseases as *Lysobacter enzymogenes* based on phylogenetic analysis of 16S rDNA, fatty acid composition and phenotypic characteristics. *J. Appl. Microbiol.* 94:1079-1086.
- Kang, H., S. Y. Hwang, Y. M. Kim, E. Kim, Y.-S. Kim, S.-K. Kim, S. W. Kim, C. E. Cerniglia, K. L. Shuttleworth, and G. J. Zylstra. 2003. Degradation of phenanthrene and naphthalene by a *Burkholderia* species strain. *Can. J. Microbiol.* 49:139-144.
- Duscha, L. A., C. J. Burns, R. J. Colton, K. J. Kearfott, R. J. Samuelson, R. J. Steffan, V. J. Tschinkel, M. E. Uhle, and G. J. Zylstra. 2002. Research opportunities for improving the management of the Department of Energy's transuranic and mixed waste. National Academy Press, Washington, D.C.
- Park, W., P. Padmanabhan, S. Padmanabhan, G. J. Zylstra, and E. L. Madsen. 2002. *nahR*, encoding a LysR-type transcriptional activator, is highly conserved among naphthalene degrading bacteria isolated from a coal tar waste contaminated site and in extracted DNA. *Microbiology* 148:2319-2329.
- Dennis, J. J., and G. J. Zylstra. 2002. Rapid nested deletion generation by differential restriction enzyme digestion. *Biotechniques* 33:310-315.
- Kim, D., Y.-S. Kim, S.-K. Kim, S. W. Kim, G. J. Zylstra, Y. M. Kim, and E. Kim. 2002. Monocyclic aromatic hydrocarbon degradation by *Rhodococcus* sp. strain DK17. *Appl. Environ. Microbiol.* 68:3270-3278.
- Hauser, H., and G. J. Zylstra. 2001. Mammals, plants, bacteria, and soil: common problems and solutions in gene expression and analysis. *Curr. Opin. Biotech.* 12:437-438.
- Hauser, H., and G. J. Zylstra (eds.). 2001. Current Opinion in Biotechnology special issue on

- Expression Vectors and Delivery Systems. (Volume 12, Number 5, October issue)
- Daane, L. L., I. Harjono, G. J. Zylstra, and M. M. Häggblom. 2001. Isolation and characterization of polycyclic aromatic hydrocarbon-degrading bacteria associated with the rhizosphere of salt marsh plants. *Appl. Environ. Microbiol.* 67:2683-2691.
- Austin, R. N., H.-K. Chang, G. J. Zylstra, and J. T. Groves. 2000. The non-heme diiron alkane monooxygenase of *Pseudomonas oleovorans* (AlkB) hydroxylates via a substrate radical intermediate. *J. Am. Chem. Soc.* 122:11747-11748.
- Song, J., J. Sung, Y. M. Kim, G. J. Zylstra, and E. Kim. 2000. Roles of the *meta*- and *ortho*-cleavage pathways for the efficient utilization of aromatic hydrocarbons by *Sphingomonas yanoikuyae* B1. *J. Microbiol.* 38:245-249.
- Chae, J.-C., Y. Kim, Y.-C. Kim, G. J. Zylstra, and C.-K. Kim. 2000. Genetic structure and functional implication of the *pcb* gene cluster for hydrolytic dechlorination of 4-chlorobenzoate from *Pseudomonas* sp. DJ-12. *Gene* 258:109-116.
- Zylstra, G. J., S.-W. Bang, L. M. Newman, and L. Perry. 2000. Microbial degradation of mononitrophenols and mononitrobenzoates, p. 145-160. *In* J. C. Spain (ed.), *Biodegradation of nitroaromatic compounds and explosives*. Lewis Publishers, Boca Raton, Florida.
- Bick, J. A., J. J. Dennis, G. J. Zylstra, J. Nowack, and T. Leustek. 2000. Identification of a new class of 5' adenylylsulfate APS reductase from sulfate assimilating bacteria. *J. Bacteriol.* 182: 135-142.
- Kim, E., and G. J. Zylstra. 1999. Functional analysis of genes involved in biphenyl, naphthalene, phenanthrene, and *m*-xylene degradation by *Sphingomonas yanoikuyae* B1. *J. Ind. Microbiol. Biotechnol.* 23:294-302.
- Chang, H.-K., and G. J. Zylstra. 1999. Characterization of the phthalate permease OphD from *Burkholderia cepacia* ATCC 17616. *J. Bacteriol.* 181:6197-6199.
- Chang, H.-K., and G. J. Zylstra. 1999. Role of quinolinate phosphoribosyl transferase in the degradation of phthalate by *Burkholderia cepacia* DBO1. *J. Bacteriol.* 181:3069-3075.
- Chang, H.-K., and G. J. Zylstra. 1998. Novel organization of the genes for phthalate degradation from *Burkholderia cepacia* DBO1. *J. Bacteriol.* 180:6529-6537
- Kieboom, J., J. Dennis, G. J. Zylstra, and J. A. M. de Bont. 1998. Active efflux of organic solvents in *Pseudomonas putida* S12 is induced by solvents. *J. Bacteriol.* 180:6769-6772
- Dennis, J. J., and G. J. Zylstra. 1998. Improved antibiotic resistance cassettes through restriction site elimination using *Pfu* DNA polymerase PCR. *BioTechniques* 25:772-776.
- Dennis, J. J., and G. J. Zylstra. 1998. Plasposons: modular self-cloning mini-transposon derivatives for the rapid genetic analysis of gram-negative bacterial genomes. *Appl. Environ. Microbiol.* 64:2710-2715.
- Kieboom, J., Dennis, J. J., de Bont, J. A. M. and Zylstra, G. J. 1998. Identification and molecular characterization of an efflux pump involved in *Pseudomonas putida* S12 solvent tolerance. *J. Biol. Chem.* 273:85-91.
- Zylstra, G. J., and E. Kim. 1997. Aromatic hydrocarbon degradation by *Sphingomonas yanoikuyae* B1. *J. Ind. Microbiol. Biotechnol.* 19:408-414.
- Goyal, A. K., and G. J. Zylstra. 1997. Genetics of naphthalene and phenanthrene degradation by *Comamonas testosteroni*. *J. Ind. Microbiol. Biotechnol.* 19:401-407.
- Kim, E., G. J. Zylstra, J. P. Freeman, T. M. Heinze, J. Deck, and C. E. Cerniglia. 1997. Evidence for the role of 2-hydroxychromene-2-carboxylate isomerase in the degradation of anthracene by *Sphingomonas yanoikuyae* B1. *FEMS Microbiol. Lett.* 153:479-484.
- Zylstra, G. J., E. Kim, A. Goyal. 1997. Comparative molecular analysis of genes for polycyclic

- aromatic hydrocarbon degradation. *Genetic Engineering* 19:257-269.
- Kim, E., Aversano, P. J., M. F. Romine, R. P. Schneider, and G. J. Zylstra. 1996. Homology between genes for aromatic hydrocarbon degradation in surface and deep-subsurface *Sphingomonas* strains. *Appl. Environ. Microbiol.* 62:1467-1470.
- Goyal, A. K., and G. J. Zylstra. 1996. Molecular cloning of novel genes for polycyclic aromatic hydrocarbon degradation from *Comamonas testosteroni* strain GZ39. *Appl. Environ. Microbiol.* 62:230-236.
- Wang, Y. Z., Y. Zhou, and G. J. Zylstra. 1995. Molecular analysis of isophthalate and terephthalate degradation by *Comamonas testosteroni* YZW-D. *Environ. Health Persp.* 103:9-12.
- Yabannavar, A., and G. J. Zylstra. 1995. Cloning and characterization of the genes for *p*-nitrobenzoate degradation from *Pseudomonas pickettii* strain YH105. *Appl. Environ. Microbiol.* 61:4284-4290.
- Kim, E. and G. J. Zylstra. 1995. Molecular and biochemical characterization of two *meta*-cleavage dioxygenases involved in biphenyl and *m*-xylene degradation by *Beijerinckia* sp. strain B1. *J. Bacteriol.* 177:3095-3103.
- Zylstra, G. J., X. P. Wang, E. Kim, and V. A. Didolkar. 1994. Cloning and analysis of the genes for polycyclic aromatic hydrocarbon degradation. *Ann. New York Acad. Sci.* 721:386-398.
- Zylstra, G. J. 1993. Molecular analysis of aromatic hydrocarbon degradation, p. 83-115. *In* S. J. Garte (ed.), *Molecular environmental biology*. Lewis Publishers, Inc., Boca Raton.
- Lajoie, C. A., G. J. Zylstra, M. DeFlaun, and P. F. Strom. 1993. Development of field application vectors for bioremediation of soils contaminated with polychlorinated biphenyls. *Appl. Environ. Microbiol.* 59:1735-1741.
- Ensley, B. D. and G. J. Zylstra. 1993. Principles and practices of biotreatment using altered microorganisms, p. 39-64. *In* M. Levin and M. Gealt (ed.), *Biotreatment of industrial and hazardous waste*. McGraw Hill, New York.
- Gibson, D. T., D. L. Cruden, J. D. Haddock, G. J. Zylstra, and J. M. Brand. 1993. Oxidation of polychlorinated biphenyls by *Pseudomonas* sp. strain LB400 and *Pseudomonas pseudoalcaligenes* strain KF707. *J. Bacteriol.* 175:4561-4564.
- Simon, M. J., T. D. Osslund, R. Saunders, B. D. Ensley, W.-C. Suen, D. L. Cruden, D. T. Gibson, G. J. Zylstra. 1993. Sequences of genes encoding naphthalene dioxygenase in *Pseudomonas putida* strains G7 and NCIB 9816-4. *Gene* 127:31-37.
- Brand, J. M., D. L. Cruden, G. J. Zylstra, and D. T. Gibson. 1992. Stereospecific hydroxylation of indan by *Escherichia coli* containing the cloned toluene dioxygenase genes from *Pseudomonas putida* F1. *Appl. Environ. Microbiol.* 58:3407-3409.
- Zylstra, G. J., X. P. Wang, and V. A. Didolkar. 1992. Manipulation of the genes for polycyclic aromatic hydrocarbon degradation, p. 68-71. *In* M. R. Ladisch and A. Bose (ed.), *Harnessing Biotechnology for the 21st Century*. Proceedings of the ninth international biotechnology symposium. American Chemical Society, Washington, D.C.
- Menn, F.-M., G. J. Zylstra, and D. T. Gibson. 1991. Nucleotide sequence of the *todF* gene encoding 2-hydroxy-6-oxo-2,4-heptadienoate hydrolase of *Pseudomonas putida* F1. *Gene* 104:91-94.
- Zylstra, G. J. and D. T. Gibson. 1991. Aromatic hydrocarbon degradation: a molecular approach, p. 183-203. *In* J. K. Setlow (ed.), *Genetic Engineering: Principles and Methods*, volume 13. Plenum Press, New York.
- Zylstra, G. J., S. M. Cuskey, and R. H. Olsen. 1991. Construction of plasmids for use in risk

- assessment research, p. 363-370. In M. A. Levin, R. J. Seidler, and M. Rogul (ed.), *Microbial Ecology: Principles, Methods, and Applications*. McGraw-Hill, Inc., New York.
- Zylstra, G. J., S. Chauhan, and D. T. Gibson. 1990. Degradation of chlorinated biphenyls by *Escherichia coli* containing cloned genes of the *Pseudomonas putida* F1 toluene catabolic pathway, p. 290-302. In *Proceedings of the Sixteenth Annual Hazardous Waste Research Symposium: Remedial Action, Treatment, and Disposal of Hazardous Waste*. (EPA/600/9-90/037).
- Gibson, D. T., G. J. Zylstra, and S. Chauhan. 1990. Biotransformations catalyzed by toluene dioxygenase from *Pseudomonas putida* F1, p. 121-132. In S. Silver, A. M. Chakrabarty, B. Iglewski, and S. Kaplan (ed.), *Pseudomonas: Biotransformations, Pathogenesis, and Evolving Biotechnology*. American Society for Microbiology, Washington, D.C.
- Zylstra, G. J., L. P. Wackett, and D. T. Gibson. 1989. Trichloroethylene degradation by *Escherichia coli* containing the cloned *Pseudomonas putida* F1 toluene dioxygenase genes. *Appl. Environ. Microbiol.* 55:3162-3166.
- Zylstra, G. J. and D. T. Gibson. 1989. Toluene degradation by *Pseudomonas putida* F1: nucleotide sequence of the *todC1C2BADE* genes and their expression in *Escherichia coli*. *J. Biol. Chem.* 264:14940-14946.
- Zylstra, G. J., R. H. Olsen, and D. P. Ballou. 1989. Genetic organization and sequence of the *Pseudomonas cepacia* genes for the alpha and beta subunits of protocatechuate 3,4-dioxygenase. *J. Bacteriol.* 171:5915-5921.
- Zylstra, G. J., R. H. Olsen, and D. P. Ballou. 1989. Cloning, expression, and regulation of the *Pseudomonas cepacia* protocatechuate 3,4-dioxygenase genes. *J. Bacteriol.* 171:5907-5914.
- Spain, J. C., G. J. Zylstra, C. K. Blake, and D. T. Gibson. 1989. Monohydroxylation of phenol and 2,5-dichlorophenol by toluene dioxygenase in *Pseudomonas putida* F1. *Appl. Environ. Microbiol.* 55:2648-2652.
- Zylstra, G. J., W. R. McCombie, D. T. Gibson, and B. A. Finette. 1988. Toluene degradation by *Pseudomonas putida*: genetic organization of the *tod* operon. *Appl. Environ. Microbiol.* 54:1498- 1503.
- Zhang, Y. Z., G. J. Zylstra, R. H. Olsen, and C. A. Reddy. 1986. Identification of cDNA clones for ligninase from *Phanerochaete chrysosporium* using synthetic oligonucleotide probes. *Biochem. Biophys. Res. Commun.* 137:649-656.
- McCombie, W. R., J. B. Hansen, G. J. Zylstra, B. Maurer, and R. H. Olsen. 1983. *Pseudomonas* streptomycin resistance transposon associated with R-plasmid mobilization. *J. Bacteriol.* 155:40- 48.

Patents:

- Coyle, C. L., M. Siskin, D. T. Ferrughelli, M. S. P. Logan, and G. J. Zylstra. 2000. Biological activation of aromatics for chemical processing and/or upgrading of aromatic compounds, petroleum, coal, resid, bitumen, and other petrochemical streams. U.S. Patent #6,156,946.
- Klibanov, A. A., K. Lewis, A. Ferrante, A. L. Coyle, G. J. Zylstra, M. S. P. Logan, and M. J. Grossman. 1998. Solvent resistant microorganisms. U.S. Patent #5,807,735.