

## Curriculum Vitae

### Personal data

<i>Name</i>	Vincent J. Denef	<i>Telephone</i>	+1 (734) 764-6481 (work)
<i>Nationality</i>	Belgian	<i>E-mail</i>	vdenef@umich.edu
<i>Office address</i>	Department of Ecology and Evolutionary Biology 1141 Kraus Natural Science Building University of Michigan 830 N. University Ann Arbor, MI 48109		

### Education/Employment

2012 - ... : **Assistant Professor**, Ecology and Evolutionary Biology, University of Michigan, Ann Arbor, MI, USA.  
 2005 – 2011: **Post-doctoral researcher**, Banfield Laboratory, University of California Berkeley, USA.  
 2001 – 2005: **Ph.D.** in Applied Biological Sciences, LabMET, Universiteit Gent, Belgium.  
 2000 – 2005: **Visiting Scholar** at the Center for Microbial Ecology, Michigan State University, USA.  
 1996 – 2001: **Bachelor/Master** Bio-engineering, magna cum laude, University of Leuven, Belgium.  
 2008: **Teaching assistant**, NSF International Antarctic Biology Course, McMurdo Station, Antarctica.  
 2003: Advanced Bacterial Genetics **Summer Course** (Cold Spring Harbor Laboratory, NY, USA).  
 2002: Microbial Diversity **Summer Course** (Marine Biological Laboratory, Woods Hole, MA, USA).

### Publications

\* **Mentored undergraduate student author**  
 \*\* **Mentored graduate student author**  
 \*\*\* **Mentored post-doctoral researcher author**  
 \*\*\*\* **Mentored research technician author**

- Berry, M.A.\*\*\*\*, J.D. White, T.W. Davis, S. Jain, T.H. Johengen, G.J. Dick, O. Sarnelle and **V.J. Denef**. Are oligotypes meaningful ecological and phylogenetic units? A case study of Microcystis in freshwater lakes. *Front Microbiol*, in press.
- Berry, M.A.\*\*\*\*, T.W. Davis, R.M. Cory, M.B. Duhaime, T.H. Johengen, G.W. Kling, J.A. Marino, P.A. Den Uyl, D. Gossiaux, G.J. Dick, **V.J. Denef**. Cyanobacterial harmful algal blooms are a biological disturbance to western Lake Erie bacterial communities. *Environ Microbiol*, in press.
- Paez-Espino, D., Chen I.A., Palaniappan, K., Ratner, A., Chu, K., Szeto, E., Pillay, M., Huang, J., Markowitz, V.M. Nielsen, T., Huntemann, M., Reddy, TBK, Pavlopoulos, G.A., Sullivan, M.B., Campbell, B.J., Chen, F. McMahon, K., Hallam, S.J., **Denef, V.J.**, Cavicchioli, R., Caffrey, S.M., Streit, W.R., Webster, J., Handley, K.M., Salekdeh, G.H., Tsesmetzis, N., Setubal, J.C., Pope, P.B., Liu, W., Rivers, A.R., Ivanova, N.N., Kyrpides, N.C. (2017). IMG/VR: a database of cultured and uncultured DNA Viruses and retroviruses. *Nucl Acids Res* 45: D457-D465.
- Fujimoto, M.\*\*\*, Cavaletto, J., Liebig, J.R., McCarthy, A.\*\*\*\*, Vanderploeg, H.A., and **V.J. Denef**. (2016). Spatiotemporal distribution of bacterial populations along a freshwater estuary to pelagic gradient in Lake Michigan. *J Great Lakes Res* 42: 1036-1048.
- Denef, V.J.**, M. Fujimoto\*\*\*, M.A. Berry\*\*\*\*, and M.L. Schmidt\*\*. (2016). Seasonal succession leads to habitat-dependent differentiation in ribosomal RNA:DNA ratios among freshwater lake bacteria. *Front Microbiol* 7: 606.
- Cory, R.M., Davis, T.W., Dick, G.J., Johengen, T., **Denef, V.J.**, Berry, M.A.\*\*\*\*, Page, S.E., Watson, S.B., Yuhas, K. and G.W. Kling. (2016). Seasonal dynamics in dissolved organic matter, hydrogen peroxide, and cyanobacterial blooms in Lake Erie. *Front. Mar. Sci.* 3: 54.
- Denef, V.J.**, R.S. Mueller, E. Chiang\*, J.R. Liebig, H.A. Vanderploeg. (2016). *Chloroflexi* CL500-11 populations that predominate deep lake hypolimnion bacterioplankton rely on nitrogen-rich DOM metabolism and C1 compound oxidation. *Appl Env Microbiol* 82(5):1423-32 **[AEM spotlight article]**
- Schmidt, M.L.\*\*, J.D. White, and **V.J. Denef** (2016). Phylogenetic conservation of freshwater lake habitat preference varies between abundant bacterioplankton phyla. *Environ Microbiol* 18(4): 1212–1226.

- Shetty, A.R., de Gannes, V., Obi, C.C., Lucas, S., Lapidus, A., Cheng, J.F., Goodwin, L.A., Pitluck, S., Peters, L., Mikhailova, N. and Teshima, H., Han, C., Tapia, R., Land, M., Hauser, L.J., Kyrpides, N., Ivanova, N., Pagani, I., Chain, P.S.G., **Denef, V.J.**, Woyke, T., and Hickey, W.J. (2015). Complete genome sequence of the phenanthrene-degrading soil bacterium *Delftia acidovorans* Cs1-4. *Stand Genomic Sci* 10(1):1-10.
- McCarthy, A.\*\*\*\*, Chiang\*, E., Schmidt, M.L.\*\*\*, and **Denef, V.J.** (2015). RNA preservation agents and nucleic acid extraction method bias perceived bacterial community composition. *PLoS One* 10 (3), e0121659.
- Lennon, J.T., and **Denef, V.J.** (2015). *Evolutionary Ecology of Microorganisms: from the Tamed to the Wild. Manual of Environmental Microbiology* (ASM Press, Washington, DC).
- Yelton, A.P., Comolli, L.R., Justice, N.B., Castelle, C. **Denef, V.J.**, Thomas, B.C. Banfield, J.F. 2013. Comparative genomics in acid mine drainage biofilm communities reveals metabolic and structural differentiation of co-occurring archaea. *BMC genomics* 14(1):485.
- Denef V.J.**, J.F. Banfield. 2012. *In situ* evolutionary rate measurements show ecological success of recently emerged bacterial hybrids. *Science* 336(6080):462-6. [recommended as being of special significance in its field by F1000 Faculty <http://f1000.com/717960409>]
- Weinberger, A.D., C.L. Sun, M.M. Pluciński, **V.J. Denef**, B.C. Thomas, P. Horvath, R. Barrangou, M.S. Gilmore, W.M. Getz, J.F. Banfield. 2012. Persisting Viral Sequences Shape Microbial CRISPR-based Immunity. *PLoS Comput Biol.* 8(4):e1002475.
- Belnap, C.P., C. Pan, **V.J. Denef**, N.C. VerBerkmoes, N.F. Samatova, R.L. Hettich, J.F. Banfield. 2011. Quantitative proteomic analyses of the response of acidophilic microbial communities to different pH conditions. *ISME J.* 5(7):1152-61.
- Morowitz, M.J., **V.J. Denef**, E. Costello, B. Thomas, D.A. Relman, J.F. Banfield. 2011. Strain-resolved community genomic analysis of gut microbial colonization in a premature infant. *Proc Natl Acad Sci U S A* 108(3): 1128–1133.
- Wilmes P., B.P. Bowen, B.C. Thomas, R.S. Mueller, **V.J. Denef**, N.C. VerBerkmoes, R.L. Hettich, T.R. Northern, J.F. Banfield. 2010. Metabolome-Proteome Differentiation Coupled to Microbial Divergence. *mBio* 1(5): e00246-10
- Mueller, R.S, **V.J. Denef**, L.H. Kalnejais, K.B. Suttle, B.C. Thomas, P. Wilmes, R. Smith, D.K. Nordstrom, M.B. Shah, N.C. VerBerkmoes, R.L. Hettich, and J.F. Banfield. 2010. Ecological distribution and population physiology defined by proteomics in a natural microbial community. *Molecular Systems Biology* 6:374.
- Denef, V.J.**, Mueller, R.S., and Banfield J.F. 2010. Winogradsky review: AMD biofilms: using model communities to study microbial evolution and ecological complexity in nature. *ISME J.* 4(5):599-610.
- Denef, V.J.**, L. Kalnejais, P., Mueller, R.S., Wilmes, B. Baker, Brian C. Thomas, N.C. VerBerkmoes, R.L. Hettich, and J.F. Banfield. 2010. Proteogenomic basis for ecological divergence of closely related bacteria in natural acidophilic microbial communities. *Proc Natl Acad Sci U S A* 107(6):2383-90.
- Parnell, J.J., **Denef, V.J.**, Park, J., Tsoi, T.V., and Tiedje, J.M. 2010. Environmentally Relevant Parameters Affecting PCB Degradation: Carbon Source- and Growth Phase-Mitigated Effects of the Expression of the Biphenyl Pathway and Associated Genes in *B. xenovorans* LB400. *Biodegradation* 21(1):147-56.
- Goltsman, D.S.A., **V.J. Denef**, S.W. Singer, N.C. VerBerkmoes, M. Lefsrud, R. Muller, G.J. Dick, C. Sun, K. Wheeler, A. Zemla, B.J. Baker, L. Hauser, M. Land, M.B. Shah, M.P. Thelen, R.L. Hettich, and J.F. Banfield. 2009. Community genomic and proteomic analysis of chemoautotrophic, iron-oxidizing "L. rubarum" and *L. ferrodiazotrophum* in AMD biofilms. *Appl. Environ. Microbiol.* 75(13): 4599-4615.
- VerBerkmoes, N.C., **V.J. Denef**, R.L. Hettich, and J.F. Banfield. 2009. Community proteomic functional analysis of natural microbial communities. *Nat. Rev. Microbiol.* 7, 196-205.
- Wilmes, P., S.L. Simmons, **V.J. Denef**, and J.F. Banfield. 2009. The dynamic genetic repertoire of microbial communities. *FEMS Microbiol Rev* 33(1), 109-132.
- Denef, V.J.**, N.C. VerBerkmoes, M.B. Shah, P. Abraham, M. Lefsrud, R.L. Hettich, and J.F. Banfield. 2009. Proteomics-inferred genome typing (PIGT) demonstrates inter-population recombination as a strategy for environmental adaptation. *Environ Microbiol.* 11(2), 313-325.
- Simmons, S., G. DiBartolo, **V.J. Denef**, D.S.A. Goltsman, M.P. Thelen, and J.F. Banfield. 2008 Population genomic analysis of strain variation in *Leptospirillum* group II bacteria involved in AMD formation. *PLoS Biol.* 6(7): e177.
- Denef, V.J.**, M.B. Shah, N.C. VerBerkmoes, R.L. Hettich, J.F. Banfield. 2007. Implications of strain- and species-level sequence divergence for community and isolate shotgun proteomic analyses. *J. Prot. Res.* 6(8), 3152-3161.

- Lo, I., **V.J. Denef**, N.C. Verberkmoes, M.B. Shah, D. Goltsman, G. DiBartolo, G.W. Tyson, E.E. Allen, R.J. Ram, J.C. Detter, P.M. Richardson, M.P. Thelen, R.L. Hettich, and J.F. Banfield. 2007. Strain-resolved community proteomics reveals that recombination shapes the genomes of acidophilic bacteria. *Nature* 446(7135):537-541.
- Denef, V.J.** 2007. Biodegradation of organic anthropogenic pollutants by *Burkholderia* species. In: *Burkholderia: Molecular Biology and Genomics*. Coenye, T. and Vandamme, P., eds. (Horizon Scientific Press, UK)
- Chain, P.S.G.\*, **V.J. Denef\***, K.T. Konstantinidis, L.M. Vergez, L. Agullo, V.L. Reyes, L. Hauser, M. Cordova, L. Gomez, M. Gonzalez, M. Land, V. Lao, F. Larimer, J.J. LiPuma, E. Mahenthiralingam, S.A. Malfatti, C.J. Marx, J.J. Parnell, A. Ramette, P. Richardson, M. Seeger, D. Smith, T. Spilker, W.J. Sul, T.V. Tsoi, L.E. Ulrich, I.B. Zhulin, and J.M. Tiedje. 2006. *Burkholderia xenovorans* LB400 harbors a multi-replicon, 9.7 M bp genome shaped for versatility. *Proc. Natl. Acad. Sc. USA* 103(42):15280-15287. \* contributed equally
- Parnell, J.J., J. Park, **V.J. Denef**, T.V. Tsoi, S.A Hashsham, J. Quensen III, and J.M. Tiedje. 2006. Coping with PCB toxicity: The physiological and genome-wide response of *Burkholderia xenovorans* LB400 to PCB (polychlorinated biphenyl)-mediated stress. *Appl. Environ. Microbiol.* 72(10):6607-6614.
- Denef, V.J.**, J.A. Klappenbach, J.L.M. Rodrigues, M.A. Patrauchan, C. Florizone, T.V. Tsoi, W. Verstraete, L.D. Eltis, and J.M. Tiedje. 2006. Genetic analysis of the three benzoate catabolic pathways and their associated oxidative stress response in *Burkholderia xenovorans* LB400. *Appl. Environ. Microbiol.* 72(1):585-96.
- Denef, V.J.**, M.A. Patrauchan, C. Florizone, J. Park, T.V. Tsoi, W. Verstraete, J.M. Tiedje, and L.D. Eltis. 2005. Carbon source and growth phase specific expression of biphenyl, benzoate and C<sub>1</sub> metabolic pathways in *Burkholderia xenovorans* LB400. *J. Bacteriol.* 187(23):7996-8005.
- Denef, V.J.**, J. Park, T.V. Tsoi, J.-M. Rouillard, H. Zhang, J.A. Wibbenmeyer, W. Verstraete, E. Gulari, S.A. Hashsham, and J.M. Tiedje. 2004. Biphenyl and benzoate metabolism in a genomic context: Outlining genome-wide metabolic networks in *Burkholderia xenovorans* LB400. *Appl Environ Microbiol* 70(8):4961-70
- Denef, V.J.**, J. Park, J. L. Rodrigues, T. V. Tsoi, S. A. Hashsham, J. M. Tiedje. 2003. Validation of a more sensitive method for using spotted oligonucleotide DNA microarrays for functional genomics studies on bacterial communities. *Environ. Microbiol.* 5(10):933-43.

### Invited presentations (since 2013)

- Cyanobacterial harmful algal blooms are a biological disturbance to western Lake Erie bacterial communities.  
*Association of Environmental Engineering and Science Professors (AEESP) biennial Research and Education Conference, June 18-21, 2017.*
- The difference a species makes: impact of invasive species on freshwater microbial communities.  
*Water @ Michigan, January 21, 2016.*
- The difference a species makes: are invasive species tuning the invisible engine of the freshwater world.  
*14<sup>th</sup> Conference on Aquatic Microbial Ecology, Uppsala, Sweden, August 23-28, 2015.*
- Something old, something new, something borrowed, something green.  
*EDAMAME summer course, Kellogg Biological Station, June 30, 2015.*
- Seasonal and spatial distribution of free living and particle-associated bacteria in Lake Michigan in the context of dreissenid mussel invasion.  
*Great Lakes/HABs omics workshop, NSF- and NOAA-sponsored workshop on cyanobacterial harmful algal blooms, Bowling Green, OH, April 13-15, 2015.*
- Do invasive zebra mussels alter structure of and carbon processing by bacterioplankton communities in lakes?  
*Kellogg Biological Station Seminar Series, November 21, 2014*
- The difference a species makes: are invasive species tuning the invisible engine of the freshwater world.  
*University of Michigan Microbial Ecology Working Group, October 30, 2014.*
- Population and community genomics-based insights into eco-evolutionary microbial dynamics.  
*Ecological Society of America, 98<sup>th</sup> Annual Meeting, Minneapolis, MN, August 4-9, 2013.*
- In situ* evolutionary rate measurements show ecological success of recently emerged bacterial hybrids  
*Workshop on linking microbial ecology and evolution (COST 1103), Berlin, Germany. June 25-27, 2013.*
- Studying evolutionary dynamics and ecological complexity of microbial communities in nature.  
*Annis Water Resources Institute, Grand Valley State University, Muskegon, MI. November 9, 2012.*
- Microbial community interactions: Lessons from a natural model system  
*Microbial Metagenomics Summer Course, Michigan State University, East Lansing, MI. June 13, 2012.*

## Current Funding Support

**2016-2018:** University of Michigan M-Cubed Interdisciplinary Funding: Statistical analyses of cyanobacterial harmful algal blooms (Co-PI). PI: Dr. Greg Dick (UM EES); co-PI: Dr. Don Scavia (UM Graham Sustainability Institute). (\$60,000)

**2012-2017:** DOE-JGI Community Sequencing Program: The bacterial component of the microbial loop in the Laurentian Great Lakes and their role in the carbon cycle (PI). 2.0 Tbp of sequencing (16S rRNA gene, bacterial/archaeal and viral metagenomics, transcriptomics).

## Pending Funding Support

**2018-2021:** NSF DEB Core Programs, Population and Community Ecology Program. *Preproposal: Do phycosphere bacteria moderate competitive interactions among freshwater algae?* (PI)

**2018-2021:** NSF DEB Core Programs, Ecosystem Studies Program. *Preproposal: Closing the loop: Adding ecosystem-level feedbacks to the study of local adaptation.* (Co-PI)

## Past Funding Support

**2015-2016:** University of Michigan Water Center: The difference a species makes: how do quagga mussels change the benthic habitat microbiome? (PI) (\$19,078)

**2014-2015:** University of Michigan Water Center: Environmental DNA-based quantification of dreissenid mussels and their impacts on freshwater bacterioplankton: building the foundation for a UM program focused on the interactions between freshwater invasive species and microbial community structure and function (PI); co-PI: Dr. Tom Johengen (UM SNRE-CILER). (\$49,956 - \$39,956 to VJD)

**2014-2015:** University of Michigan Water Center: Building capacity for freshwater science: Integrating microbial genomics, environmental chemistry, and ecosystem processes to understand harmful algal blooms (co-PI); PI: Dr. Gregory Dick (UM EES); co-PI: Dr. Tom Johengen (UM SNRE-CILER). (\$249,485 - \$78,547 to VJD)

**2014-2015:** Michigan Sea Grant (NOAA): A genomic approach to trace the sustenance of the freshwater microbial food web (PI). (\$12,909)

**2012-2014:** University of Michigan M-Cubed Interdisciplinary Funding: Biofuels and Biodiversity (Co-PI). PI: Dr. Nina Lin (UM Chemical Engineering); co-PI: Dr. Bradley Cardinale (UM School of Natural Resources and the Environment). (\$60,000)

## Teaching (since 2013)

**Winter 2017:** Bio 144 – What’s in your DNA? Implications for you and society; BIO200 – Undergraduate Research (Cassandra Huerta); UROP (Kristen Hayden; Rachel Climer)

**Fall 2016:** EEB 446 – Microbial Ecology; BIO200 – Undergraduate Research (Kyle Buffin); UROP (Kristen Hayden; Rachel Climer)

**Summer 2016:** M-Sci class on Lake Erie environmental issues.

**Winter 2016:** Bio 144 – What’s in your DNA? Implications for you and society; BIO200 – Undergraduate Research (Kyle Buffin); UROP (Morgan Meade, Amadeus Twu)

**Fall 2015:** UROP (Morgan Meade, Amadeus Twu)

**Winter 2015:** Bio 144 - Life: decoded. Genomics in Society; EEB400 – Undergraduate Research (Edna Chiang); UROP (Seana Florida, Joseph Batdorff)

**Fall 2014:** EEB 446 – Microbial Ecology; EEB400 – Undergraduate Research (Edna Chiang); UROP (Seana Florida, Joseph Batdorff)

**Winter 2014:** Bio 144 - Life: decoded. Genomics in Society; EEB400 – Undergraduate Research (Edna Chiang); EEB300 – Undergraduate Research (Michelle Park, Natalie Imirzian); UROP (Amelia Waters)

**Fall 2013:** EEB 446 – Microbial Ecology, EEB300 – Undergraduate Research (Edna Chiang); UROP (Amelia Waters)

**Winter 2013:** EEB300 – Undergraduate Research (Edna Chiang)

## Honors

**2005:** Cum laude (Ph.D.), Department of Bio-engineering, University of Ghent, Belgium.

**2001-2005:** Doctoral fellowship, Flemish Fund for Scientific Research (Belgium)

**2003:** Scholarships, funded by CSHL and the Center for Microbial Ecology, to attend the Advanced Bacterial Genetics Summer Course at Cold Spring Harbor Laboratories (NY, USA).

**2002:** Scholarships, funded by Bernard Davis Scholarship and Howard Hughes Medical Institute and The Center for Microbial Ecology, to attend the 2002 Microbial Diversity Summer Course at the Marine Biological Laboratories (Woods Hole, MA, USA).

**2001:** Magna cum laude (M.S.), Department of Bio-engineering, University of Leuven, Belgium.

**1999:** Magna cum laude (B.S.), Department of Bio-engineering, University of Leuven, Belgium.

### **Other scientific activities (since 2013)**

PhD advisor: Marian Schmidt (EEB, 2012 - ...)

Post-doc advisor: Masanori Fujimoto (EEB, 2015)

Research associate supervisor: Michelle Berry (2014-2016), Justin Millar (2014), Ann McCarthy (2012-2014)

Undergraduate researchers: Kathryn Schmidt (2017), Cassandra Huerta (2017), Rachel Climer (2016-2017), Kristen Hayden (2016-2017), Kyle Buffin (2016), Morgan Meade (2015-2016), Amadeus Twu (2015-2016), Joseph Batdorff (2014-2015), Seana Florida (2014-2015), Michelle Park (2014), Amelia Waters (2013 - 2015), Natalie Imirzian (2013 - 2014), Edna Chiang (2012 - 2015), Katherine Hunsberger (Binghamton University, Field work assistant summer 2012), Houraa Daher (Field work assistant, Summer 2012)

PhD committee member: Buck Castillo (EEB), Caroline Van Steendam (CEE), Chia-Chen Wu (CEE), Alison Gould (EEB '16), Timothy Gallagher (EES '16), Alexander Voorhies (EES '14), Brett Baker (EES '14).

MS thesis committee member: Hannah Naughton (SNRE '14)

Honors thesis reader: Katy Lazarus (EEB 2013)

Editorial Board member, Scientific Reports (Nature Publishing Group) (2011 – 2015), Frontiers in Systems Microbiology (2013 – present).

Review panel member for the U.S. Department of Energy's Office of Biological & Environmental Research (DOE-BER), Genomics Sciences Program's "Systems Biology Enabled Research on the Role of Microbial Communities in Carbon Cycling" funding opportunity. (Washington, DC. June 5-6, 2013)

Ad hoc reviewer for Science (2015 – present), Frontiers in Microbiology (2015 – present), Genome Biology and Evolution (2015 – present), Environmental Microbiology (2009 – present), Proceedings of the National Academy of Sciences USA (2009 – present), Genome Research (2009 – 2010), The ISME Journal (2009 – present), Applied and Environmental Microbiology (2006 – present), Journal Of Bacteriology (2007 – 2010), Journal of Clinical Microbiology (2007 – 2008), FEMS Microbiology Letters (2006 – 2007), Archives of Microbiology (2006)

Conference/seminar organization: Chair of session "Microbial Ecology of the Great Lakes, from Genomes to Geochemistry", International Association for Great Lakes Research Annual Meeting (Guelph, ON; 2016); Chair of session "Relevance of bacterial, archaeal, and viral dynamics to Great Lakes ecosystem processes", International Association for Great Lakes Research Annual Meeting (Detroit, MI; 2017); co-organizer of the 3-day Michigan meeting on "Unseen Partners: Manipulating Microbial Communities that Support Life on Earth" (Ann Arbor, MI; 2016) and 1-day EEB Early Career Scientist Symposium on "Humans as a force of ecological and evolutionary change" (Ann Arbor, MI; 2014); Organizer of monthly cross-departmental Microbial Ecology Seminar Series at the University of Michigan (2012-2015).