

ZBIGNIEW LEWANDOWSKI

Professor - Civil Engineering
Center for Biofilm Engineering
Montana State University-Bozeman
366 EPS - P.O. Box 173980
Bozeman, MT 59717
Phone: 406-994-4770/Fax: 406-994-6098
e-mail: zl@biofilm.montana.edu

PROFESSIONAL PREPARATION

INSTITUTIONS	FIELD OF STUDY	DEGREE	YEARS
Polish National Academy of Sciences	Environmental Engineering	Ph.D.	1971-1976
Technical University of Gliwice, Poland	Sanitary Engineering	M.S.	1964-1969

APPOINTMENTS

1996-present	Professor, Dept. of Civil Engineering, Montana State University
1992-1996	Associate Professor, Dept. of Civil Engineering, Montana State University
1990-1992	Associate Director for Research and Research Professor, Center for Biofilm Engineering, Montana State University
1986-1990	Senior Research Engineer, Institute for Biological & Chemical Process Analysis, Montana State University
1985-1986	Visiting Scientist, U.S. National Academy of Sciences
1970-1985	Various research and administrative positions, Polish Academy of Sciences

BOOKS

Fundamentals of Biofilm Research. Z. Lewandowski and H. Beyenal. CRC Press Inc. Lewis Publishers. Boca Raton, 2007

Special Edition of Water Science and Technology on Biofilm Structure and Activity (2005). Editors: Z. Lewandowski and H. Beyenal. 52,7,2005. ISSN 0273-1223

Biofouling and Biocorrosion in Industrial Water Systems. G. Geesey, Z. Lewandowski, H-C. Flemming (Ed.). CRC Press Inc. Lewis Publishers. Boca Raton, 1994

PAPERS

Dewan A., Beyenal H., Lewandowski Z. Scaling up microbial fuel cells. Environmental Science and Technology. 42:7643 – 7648 (2008).

Angathevar Veluchamy R. R., Beyenal H. Lewandowski Z. Characterizing temporal development of biofilm porosity using artificial neural networks. Water Science and Technology. 57:1867 – 1872 (2008).

Lewandowski Z., Beyenal H., Myers J., Stookey D. (2007). The effect of detachment on biofilm structure and activity: the oscillating pattern of biofilm accumulation. Water Science and Technology. 55:429-436 (2007).

Marsili, E., Beyenal, H., Di Palma, L., Merli, C., Dohnalkova, A., Amonette, J.E., Lewandowski, Z. (2007). Uranium immobilization by sulfate reducing biofilm grown on hematite, dolomite, and calcite. *Environ. Sci. Technol.* 41:8349–8354 (2007).

Rani, S.A., B. Pitts, H. Beyenal, R.A. Veluchamy, Z. Lewandowski, W.M. Davison, K. Buckingham-Meyer, and P.S. Stewart, "Spatial Patterns of DNA Replication, Protein Synthesis and Oxygen Concentration Within Bacterial Biofilms Reveal Diverse Physiological States," *J. Bacteriol.*, 189(11):4223-4233 (2007)

Menicucci J., Beyenal H., Marsili E., Angathevar Veluchamy R.R , Demir G. and Lewandowski Z. (2006) A procedure for determining maximum sustainable power generated by microbial fuel cells. *Environmental Science and Technology* 40:1062 – 1068.

Marsili E., Beyenal H., De Palma L., Merli C., Dohnalkova A., Amotette J., Lewandowski Z. (2005) Uranium removal by sulfate reducing biofilms in the presence of carbonates. *Wat. Sci. Tech.* 52:49-58.

Shantaram A., Beyenal H., Angathevar Veluchamy R., Lewandowski Z. (2005). Wireless sensors powered by microbial fuel cells. *Environmental Science and Technology.* 39:5037-5042.

Rhoads A., Beyenal H., Lewandowski Z. (2005). A Microbial Fuel Cell Using Anaerobic Respiration As An Anodic Reaction And Biomineralized Manganese As A Cathodic Reactant. *Environmental Science and Technology.* 39:4666 – 4671.

Lewandowski Z., Beyenal H. (2005). Biofilms: Their structure, activity, and effect on membrane filtration. *Water Science and Technology.* 51:181-192.

Beyenal H., Lewandowski Z. (2005). Modeling mass transport and microbial activity in stratified biofilms. *Chemical Engineering Science.* 60:4337-4348

Campbell S. Geesey G., Lewandowski Z., Jackson G. (2004) Influence of the distribution of the manganese oxidizing bacterium, *Leptothrix discophora*, on ennoblement of type 316L stainless steel. *Corrosion*, 60:670-680

Beyenal, H., Donovan, C., Lewandowski, Z., and Harkin, G. (2004) Three-dimensional biofilm structure quantification. *Journal of Microbiological Methods* 59 (3), 395-413.

Beyenal H., Lewandowski Z.(2004). Dynamics of lead immobilization in sulfate reducing biofilms. *Water Research.* 38:2726-2736.

Beyenal H., Sani R.K., Peyton B., Dohnalkova A.C., Amonette J., Lewandowski Z. (2004). Uranium immobilization by sulfate reducing biofilms. *Environmental Science and Technology.* 38:2067-2074.

Beyenal H., Lewandowski Z., Harkin G. (2004). Quantifying biofilm structure: facts and fiction. *Biofouling.* 20:1-23.

Beyenal H., Davis C.C., Lewandowski Z. (2004). An improved Severinghaus-type carbon dioxide microelectrode for use in biofilms. *Sensors and Actuators.* B97, 202-210.

Z. Lewandowski, H. Beyenal and D. Stookey. (2004). Reproducibility of Biofilm Processes and the Meaning of Steady State in Biofilm Reactors. *Water Science and Technology* 2004; 49(11):359–364.

Jesaitis J.J., Franklin M.J. Berglund D., Sasaki M., Connie I.L., Bleazard J.B., Duffy J.E., Beyenal H., Lewandowski Z. (2003). Compromised host Defense on *Pseudomonas aeruginosa* biofilms: Characterization of neutrophil and biofilm interactions. *The Journal of Immunology*, 2003, 171:4329-4339.

Yurt N., Beyenal H., Sears J., Lewandowski Z. (2003). Quantifying selected growth parameters of *Leptothrix discophora* SP-6 in biofilms from oxygen concentration profiles. *Chemical Engineering Science*. 58:4557-4566

Shi X., Avci R., Geiser M., Lewandowski Z. (2003). Comparative study in chemistry of Microbially and electrochemically induced pitting of 316L stainless steel. *Corrosion Science* 45 (2003) 2577-2595.

Lewandowski Z., Cloete T.E., Dexter S.C., Dickinson W.H., Kikuchi Y., Little B., Mansfeld F., Rossmoore H., Sand W., Videla H.A. (2003) MIC Issues: Commentary from the Corrosion 2002 MIC Panel Discussion. *Corrosion* 2003. Paper #03560. NACE International.

Campbell S., Geesey G., Lewandowski Z., Jackson G. (2003). Influence of the Distribution of the Manganese Oxidizing Bacterium, *Leptothrix discophora*, on Ennoblement of 316L Stainless Steel. *Corrosion* 2003. Paper #03566. NACE International.

Lewandowski Z., Beyenal H. (2003). Biofilm monitoring: a perfect solution in search of a problem. *Water Science & Technology* 47:9–18

Webb D, Hamilton M.A., Harkin G.J., Lawrence S, Camper A.K., Lewandowski Z. (2003) Assessing technician effects when extracting quantities from microscope images. *J Microbiol Methods*. 53:97-106

Beyenal H., Chen S.N., Lewandowski Z. (2003). The double substrate growth kinetics of *Pseudomonas aeruginosa*. *Enzyme and Microbial Technology*: 32:92-98.

Search the CBE Publications database for more of Dr. Lewandowski's papers.

SYNERGISTIC ACTIVITIES

Offered a new course at Montana State University, ENVE 545, Chemical Sensors for Environmental Biotechnology.

Organized a Microsensors Laboratory at Montana State University

Developed several novel microelectrodes and techniques to measure chemical gradients in biofilms at microscale.

Applied Nuclear Magnetic Resonance Imaging to visualize flow velocity near biofilms.

Developed a software for quantifying biofilm heterogeneity from microscope images.

COLLABORATORS & OTHER AFFILIATIONS

Collaborators

Montana State University:

Marty Hamilton, Professor, Department of Mathematics
William Costerton, Director, Center for Biofilm Engineering
Al Jesaitis, Professor, Department of Microbiology
Gill Geesey, Professor, Department of Microbiology
Richard Geer, Professor, Department of Chemistry
Gary Harkin, Associate Professor, Department of Computer Science
Chris Yakymyshyn, Assistant Professor, Department of Electrical Engineering

Other Universities:

Eiichi Fukushima, Director, New Mexico Resonance [Nuclear Magnetic Resonance facilities], Albuquerque, NM
Bruce Rittmann, Professor, Northwestern University, Evanstone
Brenda Little, Senior Scientist, Naval Research Laboratory, Stennis Space Center. Mississippi
Brent Peyton, Assistant Professor, Washington State University
James Amonette, Scientist, Pacific Northwest Laboratories
Allan Hamilton, University of Aberdeen, Scotland
Santiago Villaverde, University of Valladolid, Spain
Bjoern Christensen, University of Trondheim, Norway
Janine Flood, University of New South Wales, Sydney, Australia
Per Nielsen, Professor, University of Aalborg, Denmark

Graduate and Post-doctoral Advisors:

PhD advisors: Professors Zbigniew Brulinski and Jan Paluch, both deceased
Post-doctoral adviser at the Technical University of Vienna, Austria Professor Wilhelm von der Emde, retired

Thesis Advisor and Post-graduate-Scholar Sponsor:

Abrahamson Michael, GRA (MS, Environmental Engineering)
Dickinson Wayne, GRA (PhD, Chemistry)
Huang Wei, GRA (MS, Computer Science)
Nguyen Duy, GRA (MS, Chemical Eng.)
Yang Shunong, GRA (MS, Environmental Eng.)
Ramu Kallepali (Environmental Engineering)
Rasmussen Kjetil (MS, Environmental Engineering)
Fuchu Xia (PhD, Environmental Engineering)
Tripathi Vijay (MS, Environmental Engineering)
Lu Xiofeng (MS, Microbiology)
Mirpuri Raj (PhD, Chemical Engineering)
Tripp Dusty (MS, Environmental Engineering)
Lafond Rene (MS, Environmental Engineering)
Billings-Sandoval Kathy (Ph.D., Microbiology)
Ximing Yang (MS, Computer Science)
Gronenboom Mark (Ph.D. Mechanical Engineering)
Kenk Charis (MS Chemical Engineering)
Oleson Bo (PhD Environmental Engineering – University of Aalborg, Denmark)

Beyenal Nurdan (MS Chemical Engineering)
Scott Campbell (MS Microbiology)
Funk Tom, GRA (MS, Electrical Eng.)
Morrison Mike, GRA (PhD, Chemistry)
Yang Shunong, GRA (MS, Environmental Eng.)
Rush Theresa (Environmental Engineering)

Post-doctoral Associates:

Dirk de Beer presently with Max Planck Institute for Marine Biology, Bremen, Germany
Santiago Villaverde, presently Assistant Professor, University of Valladolid, Spain
Haluk Beyenal, presently a Post-doctoral Associate, Center for Biofilm Engineering