

Referencias bibliográficas

- Aelterman, P., Rabaey, K., Pham, H., Boon, N. y Verstraete, W. 2006a. Continuous electricity generation at high voltages and currents using stacked microbial fuel cells. *Environ. Sci. Technol.* 40: 3388–3394.
- Aelterman, P., Rabaey, K., Caluwaert, P. y Verstraete, W. 2006b. Microbial fuel cell for wastewater treatment. *Water Sci. Technol.* 54:9-15.
- Alberty, R. 2003. *Thermodynamics of Biochemical Reactions*; John Wiley & Sons: Nueva York, EEUU.
- Allen, R. y Bennetto, H. 1993. Microbial fuel cells: electricity production from carbohydrates. *Appl. Biochem. Biotechnol.* 39:27-40.
- Alzate-Gaviria, L., Sebastian, P. y Perez-Hernandez, L. 2007. Comparison of two anaerobic systems for hydrogen production from the organic fraction of municipal solid waste and synthetic wastewater. *Int. J. Hydrogen Energy.* 32: 3141-3146.
- Alzate-Gaviria, L., Fuentes-Albarrán C., Álvarez-Gallegos A. y Sebastian P. 2008. Generación de electricidad a partir de una celda microbiana de combustible microbiana tipo pem. *Interciencia.* 33: 503-509.
- Amend, P. y Shock, L. 2001. Energetics of overall metabolic reactions of thermophilic and hyperthermophilic Archaea and Bacteria. *FEMS Microbiol. Rev.* 25:175-243.
- Angenent, L., Karim, K., AL-Dahhan, M., Wrenn, B. y Domingues-Espinosa, R. 2004. Production of bioenergy and biochemicals from industrial and agricultural wastewater. *Trends Biotechnol.* 22:477-485.
- APHA. 1998. *Standard Methods for the Examination of Water and Wastewater.* 18th ed. APHA, AWWA, WEF. 1170 pp. Washington, DC, EEUU.
- Aston, W. y Turner, A. 1984. *Biotechnology & Genetic Engineering Reviews.* 1:89-120.
- Bard, J., Parsons, R. y Jordan, J. 1985. *Standard Potentials in Aqueous Solution*; Marcel Dekker: Nueva York, EEUU.
- Bard, J. y Faulkner, R. 2001. *Electrochemical Methods: Fundamentals and Applications*, 2nd ed.; John Wiley & Sons: Nueva York, EEUU.
- Barton C., Gallaway, J. y Atanassov, P., 2004. *Chem. Rev.* 104 (10): 4867-4886.

- Bond, R., Holmes, E., Tender, L. y Lovley, D. 2002. Electrode-reducing microorganisms that harvest energy from marine sediments. *Scienc.* 295: 483-485.
- Bond, R. y Lovley, D. 2003. Electricity production by *Geobacter sulfurreducens* attached to electrodes. *Appl. Environ. Microbiol.* 69:1548–1555.
- Bond, R. y Lovley, D. 2005. Evidence for Involvement of an Electron Shuttle in Electricity Generation by *Geothrix fermentans*. *Appl. Environ. Microbiol.* 71:2186–2189.
- Borole, A., O'Neill, H., Tsouris, C. y Cesar, A. 2008. Microbial fuel cell operating at low pH using the acidophile acidiphilium cryptum. *Biotechnol. Lett.* 30:136-1372.
- Buchi. 1999. Portable fuel cells. In: Proceedings of International Conference. [chapter 7]. Luzern, U. Bossel, Switzerlan.
- Bullen, A., Arnot, T., Lakeman, J. y Walsh, F. 2006. Biofuel cells and their development. *Biosens. Bioelectron.* 21:2015-2045.
- Calabrese Barton, S., Gallaway, J. y Atanassov, P. 2004. Enzymatic Biofuel Cells for Implantable and Microscale Devices. *Chemical Reviews*, 104(10), 4867-4886.
- Carmona-Martínez, A., Fernández-Ortiz, J. y Poggi-Varaldo, H. 2006. Caracterización de una celda de combustible microbiana para el tratamiento de efluentes contaminados. Grupo de Biotecnología Ambiental y Procesos Anaerobios, Dept. Biotecnología y Bioingeniería. Centro de Investigación y de Estudios Avanzados del I.P.N. México D.F.
- Chang, I., Jang, J., Gil, G., Kim, M., Kim, H., Cho, B. y Kim, B. 2004. Continuous determination of biochemical oxygen demand using microbial fuel cell type biosensor. *Biosensors & Bioelectronics* 19:607-613.
- Chang, I., Moon, H., Jang, J. y Kim, B. 2005. Improvement of a microbial fuel cell performance as BOD sensor using respiratory inhibitors. *Biosensors&Bioelectronics.* 20:1856-1859.
- Chaudhuri, S. y Lovley, D. 2003. Electricity generation by direct oxidation of glucose in mediatorless microbial fuel cells. *Nat. Biotechnol.* 21:122-1232.
- Cheng, S., Liu, H. y Logan, B. 2006a. Power densities using different cathode catalysts (Pt and CoTMPP) and polymer binders (Nafion and PTFE) in single chamber microbial fuel cells. *Environ. Sci. Technol.* 40:364-369.

- Cheng, S., Liu, H. y Logan, B. 2006b. Increased power generation in a continuous flow MFC with advective flow through the porous anode and reduced electrode spacing. *Environ. Sci. Technol.* 40:2426-2432.
- Cohen, B. 1931. The bacterial culture as an electrical half-cell. *J. Bacteriol.* 21:18-19.
- Cooney, M., Roschi, E., Marison, I., Comninellis, C. y vonStockar, U. 1996. Physiologic studies with the sulfate-reducing bacterium *Desulfovibrio desulfuricans*: evaluation for use in a biofuel cell. *Enzyme Microb. Technol.* 18(5):358–365.
- Davis, F. y Higson, S. 2006. Biofuel cells. Recent advances and applications. *Biosensors and Bioelectronics*.22:1224-1235
- Di Lorenzo, M., Curtis, T., Head, I. y Scott, K. 2009. A single-chamber microbial fuel cell as a biosensor for wastewaters. *Water Research.* 43:3145-3154.
- Du, Z., Li, H. y Gu, T. 2007. A estate of the art review on microbial fuel cells: A promising technology for wastewater treatment and bioenergy. *Biotechnol. Adv.* 25:464-482.
- Eaton, A., Greenberg, A. y Clesceri, S. 2005. Standard methods for the examination of water and wastewater. American Public Health Association, American Water Works Association, Water Environment Federation, Washington DC, EEUU.
- Fan, Y., Hu, H. y Liu, H. 2007. Enhanced coulombic efficiency and powerdensityof air-cathode microbialfuel cellswithan improved cell configuration. *Journal of Power Sources.* 171:348-354.
- Feng, Y., Wang, X., Logan, B. y Lee, H. 2008. Brewery wastewater treatment using air-cathode microbial fuel cells. *App. Microbiol. Biotechnol.* 78:873-880.
- Franks, A., Nevin, K., Jia, H., Izallalen, M., Woodard, T.L. y Lovley, D. 2009. Novel strategy for three-dimensional real-time imaging of microbial fuel cell communities: monitoring the inhibitory effects of proton accumulation within the anode biofilm. *Energ. Environ. Sci.* 2:113–119.
- Franks, A., Nevin, K., Glaven, R. y Lovley, D. 2010. Microtoming Coupled to Microarray Analysis to Evaluate the Spatial Metabolic Status of *Geobacter sulfurreducens* Biofilms. *ISME J.*
- Freguia, S., Rabaey, K., Yuan, Z. y Keller, J. 2008. Syntrophic processes drive the conversion of glucose in microbial fuel cell anodes. *Environ. Sci. Technol.* 42:7937-7943.
- Freguia, S., Teh, E., Boon, N., Leung, K., Keller, J. y Rabaey, K. 2009. Microbial fuel cells operating on mixed fatty acids. *Bioresour. Technol.* 101:1233-1238.

- Froelich, P., Klinkhammer, G., Bender, L., Luedtke, N., Heath, G., Cullen, D., Dauphin, P., Hammond, D., Hartman, B. y Maynard, V. 1979. Early oxidation of organic matter in pelagic sediments of the eastern equatorial Atlantic; suboxic diagenesis. *Geochim. Cosmochim. Acta* 43:1075-1090
- Galvani, L., 1791. De bononiensi scientiarum et artium instituto atque academia Comentarrii 7:363-418.
- Gálvez, A., Greenman, J. y Ieropoulos, I. 2009. Treatment with microbial fuel cells; scale-up through plurality. *Bioresour. Technol.* 100:5085-5091.
- Gil, G., Chang, I., Kim, B., Kim, M., Jang, J., Park, H. y Kim, H., 2003. Operational parameters affecting the performance of a mediator-less microbial fuel cell. *Biosensors and Bioelectronics* 18:327-334.
- Glen, D. 1994. Ecology of slugs in cereals in relation to crop damage and control. In: Leather SR, Walters KFA, Mills NJ, y col., editors. Populations, and patterns in ecology, intercept.
- Glover, C. 1998. Reinvasion of cleared areas by the slug *Deroceras reticulatum*. Project report for MSc in crop protection. University of Bristol. Reino Unido
- Gorby, Y., Yanina, S., McLean, J., Rosso, K., Moyles, D., Dohnalkova, A., Beveridge, T., Chang, I., Kim, B., Kim K., Culley, D., Reed, S., Romine, M., Saffarini, D., Hill, E., Shi, L., Elias, D., Kennedy, D., Pinchuk, G., Watanabe, K., Ishii, S., Logan, B., Nealson, K, y Fredrickson, J. 2006 Electrically conductive bacterial nanowires produced by *Shewanella oneidensis* strain MR-1 and other microorganisms. *Proc Natl Acad Sci U S A.* 103:11358-11363.
- Greenman, J., Holland, Kelly, Kendall, McFarland y Melhuish., C. 2003. Towards robot autonomy in the natural world: a robot in predator's clothing. *Mechatronics.* 13:195-228.
- Gregory, K., Bond, D. y Lovley, D. 2004. Graphite electrodes as electron donors for anaerobic respiration. *Environ Microbiol.* 6:596-604.
- Gregory, K. y Lovley, D. 2005. Remediation and recovery of uranium from contaminated subsurfaces environments with electrodes. *Environ. Sci. Technol.* 39:8943-8947.
- Grove, W. 1839. On Voltaic Series and the Combination of Gases by Platinum. *The London and Edinburgh Philosophical Magazine and Journal of Science.* Ser. 3, Vol. 14, pp 127-130, 1839.
- Habermann, W. y Pommer, E. 1991. Biological fuel cells with sulphide storage capacity. *Appl. Microbiol. Biotechnol.* 35:128-133.

- Hau, H. y Gralnick, J. 2007. Ecology and biotechnology of the genus *Shewanella*. *Annu. Rev. Microbiol.* 61:237-258.
- He, Z., Minteer, S. y Angenent, L. 2005. Electricity generation from artificial wastewater using an upflow microbial fuel cell. *Environ. Sci. Technol.* 39:5262-5267.
- He, Z., Huang, Y., Manohar, A. y Mansfeld, F. 2008. Effect of electrolyte pH on the rate of the anodic and cathodic reactions in an aircathode microbial fuel cell. *Bioelectrochemistry.* 74:78-82.
- Heilmann, J. y Logan, B. 2006. Production of electricity from proteins using a single chamber microbial fuel cell. *Water Env. Res.* 78:531-537.
- Higgins, I. y Hill, H. 1985. *Essays in Biochemistry*. Eds. P.N. Campbell and R.D. Marshall, Academic Press, 21:119-145.
- Holmes, D., Nicoll, J., Bond, D. y Lovley, D. 2004a. Potential role of a novel psychrotolerant *Geobacteraceae*, *Geopsychrobacter electrodiphilus* gen. nov., sp. nov., in electricity production by the marine sediment fuel cell. *Appl. Environ. Microbiol.* 70:6023-6030.
- Holmes, D., Bond, D, O'Neill, Reimers, Tender, L. y Lovley, D. 2004b. Microbial communities associated with electrodes harvesting electricity from a variety of aquatic sediments. *Microb. Ecol.* 48:178-190.
- Hoogers, G. 2003. Ed. *Fuel Cell Technology Handbook*; CRC Press: Boca Raton, Florida, EEUU.
- Hyun, C., Tamiya, E., Takeuchi, T., Karube, I. y Inoue, N., 1993. Novel BOD sensor based on bacterial luminescence. *Biotechnology and Bioengineering.* 41:1107-1111.
- Ieropoulos, I., Greenman, J. y Melhuish C. 2003a. Imitating Metabolism: Energy Autonomy in Biologically Inspired Robots. In *2003 2nd International Symposium on Imitation in Animals and Artifacts (AISB '03)*, pages 191-194. SSAISB. Brighton, Reino Unido.
- Ieropoulos, I., Melhuish, C. y Greenman, J. 2003b. Artificial Metabolism: Towards True Energetic Autonomy in Artificial Life. In *Advances in Artificial Life, 7th European Conference in Artificial Life (ECAL 2003)*, pages 792-799. Springer-Verlag, Berlin Heidelberg, Alemania.
- Ieropolous, I., Melhuish, C. y Greenman, J. 2004. Energetically autonomous robots, Proceedings of the Eighth Intelligent Autonomous Systems Conference (IAS-8), pp. 128-135. Amsterdam, Paises Bajos.
- Ieropoulos, I., Melhuish, C., Greenman, J. y Horsfield, I. 2005a. Artificial symbiosis: Towards a robot-microbe partnership. In *Proceedings of Towards Autonomous Robotic Systems (TAROS '05) Conference*, pages 89-93.

Ieropoulos, I., Melhuish, C., Greenman, J. y Horsfield, I. 2005b. Artificial symbiosis: Towards a robot-microbepartnership. In Proceedings of Towards Autonomous Robotic Systems (TAROS '05) Conference, pages 89-93.

Ieropoulos, I., Greenman, J., Melhuish, C. y Hart, J. 2005c. Comparison of three different types of microbial fuel cell. *Enzyme and Microbial Technology*. 37(2):238-245.

Jang, J., Barford, J., Lindawati, F. y Renneberg, R., 2004a. Application of biochemical oxygen demand (BOD) biosensor for optimization of biological carbon and nitrogen removal from synthetic wastewater in a sequencing batch reactor system. *Biosensors & Bioelectronics*. 19:805-812.

Jang, J., Pham, T., Chang, I., Khan, K., Moon, Cho y Kim, B. 2004b. Construction and operation of a novel mediator- and membrane –less microbial fuel cell. *Proc. Biochem*. 39:1007-1012.

Kang, K., Jang, J., Pham, T., Moon, H., Chang, I., Kim, B., 2003. A microbial fuel cell with improved cathode reaction as a low biochemical oxygen demand. *Biotechnology Letters*. 25: 1357-1361.

Kendall, K. y Prica, M. 1994.1st European Fuel Cell Forum. p.163-70. U. Bossel, Luzern, Switzerland

Kim, H., Hyun, M., Chang, I. y Kim, B. 1999. A microbial fuel Cell type lactate biosensor using metal reducing bacterium, *Shewanella putrifaciens*. *J. Microbiol. Biotechnol*. 9:365-367.

Kim y Kwon. 1999. Biochemical oxygen demand sensor using *Serratia marcescens* LSY 4. *Biosensors & Bioelectronics*. 14:1-7.

Kim, N., Choi, Y., Jung, S. y Kim, S. 2000. Effect of initial carbon sources on the performance of microbial fuel cells containing. *Proteus vulgaris*. *Biotechnol. Bioeng*. 70:109-114.

Kim, H., Park, H., Hyun, M., Chang, I., Kim, M. y Kim, B. 2002a. A mediator-less microbial fuel cell using a metal reducing bacterium, *Shewanella putrefaciens*. *Enzyme and Microbial Technology*. 30,2:145-152.

Kim, J., Cho, J., Lee, J., Hahm, K., Park, D. y Kim, S., 2002b. *Appl. Biochem. Biotechnol*. 98:753-764.

Kim, B., Chang, I., Gil, G., Park, H. y Kim, H., 2003a. Novel BOD sensor using mediator-less microbial fuel cell. *Biotechnology Letters*. 25:541-545.

- Kim, M., Youn, S., Shin, S., Jang, J., Han, S., Hyun, M., Gadd, G. y Kim, H., 2003b. Practical field application of a novel BOD monitoring system. *Journal of Environmental Monitoring*. 5:640-643.
- Kim, B., Park, H., Kim, H., Kim, G., Chang, I., Lee, J. y Phung, N. 2004. Enrichment of microbial community generating electricity using a fuel-cell-type electrochemical cell. *App. Microbiol. and Biotechnol.* 63:672-681
- Kim, J., Min, B. y Logan, B. 2005. Evaluation of procedures to acclimate a microbial fuel cell for electricity production. *Appl. Microbiol. Biotechnol.* 68:23-30.
- Kumlanghan, A., Liu, J., Thavarungkul, P., Kanatharana, P. y Mattiasson, B., 2007. Microbial fuel cell-based biosensor for fast analysis of biodegradable organic matter. *Biosensors & Bioelectronics*. 22:2939-2944.
- Lanthier, M., Gregory, K. y Lovley, D. 2008. Growth with high planktonic biomass in *Shewanella oneidensis* fuel cells. *FEMS Microbiol. Lett.* 278:29-35.
- Larminie, J. y Dicks, A. 2000. Fuel Cell Systems Explained; John Wiley & Sons. Chichester Reino Unido.
- Lee, J., Phung, I., Chang, B. Kim, H. y Sung, H. 2003. Use of acetate for enrichment of electrochemically active microorganisms and their 16S rDNA analyses. *FEMS Microbiol. Lett.* 223: 185-191.
- Lee, H., Parameswaran, P., Kato-Marcus, A., Torres, C. y Rittmann, B. 2008. Evaluation of energy-conversion efficiencies in microbial fuel cells (MFCs) utilizing fermentable and non-fermentable substrates. *Water Res.* 42:1501-1510.
- Lee, H., Torres, C. y Rittmann, B. 2009. Effects of Substrate Diffusion and Anode Potential on Kinetic Parameters for Anode-Respiring Bacteria. *Environ. Scienc. Technol.* 43:7571-7577.
- Liu, J. y Mattiasson, B. 2002. Microbial BOD sensors for wastewater analysis. *Water Research*. 36: 3786-3802.
- Liu, H. y Logan, B. 2004. Electricity generation using an air-cathode single chamber microbial fuel cell in the presence and absence of a proton exchange membrane. *Environmental Science & Technology*. 38, 4040–4046.
- Liu, H., Ramnarayanan, R. y Logan, B. 2004. Production of electricity during wastewater treatment using a single chamber microbial fuel cell. *Environ. Sci. Technol.* 38:2281-2285.
- Liu, H., Cheng, S. y Logan, B. 2005a. Production of electricity from acetate or butyrate using a single-chamber microbial fuel cell. *Environ. Sci. Technol.* 39:658-662

- Liu, H., Cheng, S. y Logan, B. 2005b. Power generation in fed-batch microbial fuel cell as a function of ionic strength, temperature, and reactor configuration. *Environ. Sci. Technol.* 39:5488-5493.
- Logan, B. 2004. Extracting hydrogen and electricity from renewable resources. *Env. Sci. Technol.* 38: 160A-167^a
- Logan, B., Murano, C., Scott, K., Gray, N. y Head, I. 2005a. Electricity generation from cysteine in a microbial fuel cell.. *Water Research.* 39: 942-952
- Logan, B., Cassandro, M., Scott, K., Gray, N. y Head, I., 2005b. Electricity generation from cysteine in a microbial fuel cell. *Water Research*, 39:942-952.
- Logan, B. y Regan, J. 2006a. Microbial fuel cells: Challenges and applications. *Environ. Sci. Technol.* 40: 5172-5180.
- Logan, B. y Regan, J. 2006b. Electricity-producing bacterial communities in microbial fuel cells. *Trends Microbiol.* 14:512-518.
- Logan, B. Hamelers, B., Rozendal, R., Schröder, U., Keller, J., Freguia, S., Aelterman, P., Verstraete, W. y Rabaey, K. 2006c. Microbial fuel cells: methodology and technology. *Environ Sci Technol.* 40:5181-92.
- Logan, B., Cheng, S., Watson, V. y Estadt, G. 2007. Graphite fiber brush anodes for increased power production in air- cathode microbial fuel cells. *Env. Sci. Technol.* 41:3341-3346.
- Logan, B. 2009. Exoelectrogenic bacteria that power microbial fuel cells. *Nat. Rev. Microbiol.* 7: 375-381.
- Lovley, D. y Phillips, E. 1998. Novel of microbial energy metabolism: Organism carbon oxidation coupled to dissimilatory reduction of iron and manganese. *Appl. Env. Microbiol.* 54:1472-1480.
- Lovley, D. 2006. Microbial energizers: Fuel cells that keep on going. *Microbe*, 1:323-329.
- Lovley, D. 2008. Extracellular electron transfer: wires, capacitors, iron lungs, and more. *Geobiol.* 6: 225-231.
- Lovley, D. y Nevin, K. 2008. "Chapter 23: Electricity production with electricigens", *In J. Wall et al. (ed.), Bioenergy. ASM Press, Washington, DC.:* 295-306..
- Lowy, D., Tender, L., Zeikus, J., Park, D. y Lovley, D. 2006. "Harvesting energy from the marine sediment-water interface II - Kinetic activity of anode materials", *Biosensors and Bioelectronics*, 2111: 2058-2063.

- Lu, N., Zhou, S., Zhuang, L., Zhang, J. y Ni, J. 2009. Electricity generation from starch processing wastewater using microbial fuel cell technology. *Biochem. Eng. J.* 43: 246-251.
- Luo, H., Liu, G., Zhang, R., Jin, S. 2009. Phenol degradation in microbial fuel cells. *Chem. Eng. J.* 147: 259-264.
- Marsili, E., Baron, D., Shikhare, I., Coursolle, D., Gralnick, J. y Bond, D. 2008. *Shewanella* secretes flavins that mediate extracellular electron transfer. *Proc Natl Acad Sci EEUU.* 105:3968-3973.
- McFarland, D. y Boesser, T. 1993. In: Intelligent behavior in animals and robots. Cambridge, MA: MIT Press; p. 305.
- McFarland, D. 1995. Autonomy and self-sufficiency in robots. In: Steels L, Brooks R, editors. The artificial life route to artificial intelligence Building situated embodied agents. New Haven: Lawrence Erlbaum Associates; p. 187-213.
- McFarland, D. y Spier, E. 1997. Basic cycles, utility and opportunism in self-sufficient robots. *J. Rob Auton Sys.* 20: 179-190.
- McFarland, D. 1999. Animal behaviour. 3rd ed. Reading, MA: Addison-Wesley; p. 580.
- Melhuish, C., Ieropoulos, I. y Greenman, J. 2006. Artificial gills for robots: underwater energy autonomy with MFCs. In Proceedings of the TAROS'06 conference, 4th-6th September, University of Surrey, Guildford, Reino Unido, pp. 118-125, ISBN: 0-9553879-0-6.
- Metcalf y Eddy. 2003. *Wastewater Engineering Treatment and Reuse*. 4a ed. Mc Graw-Hill. Madrid, Espana. 1485 pp.
- Méthé, B., Nelson, K., Eisen, J., Paulsen, I., Nelson, W., Heidelberg, J., Wu, D., Wu, M., Ward, N., Beanan, M., Dodson, R., Madupu, R., Brinkac, L., Daugherty, S., DeBoy, R., Durkin, A., Gwinn, M., Kolonay, J., Sullivan, S., Zafar, N., White, O., Tran, B., Romero, C., Forberger, H., Weidman, J., Khouri, H., Feldblyum, T., Utterback, T., Van Aken, S., Lovley, D. y Fraser, C. 2002. Genome of *Geobacter sulfurreducens*: metal reduction in subsurface environments. *Science.* 302:1967-1969.
- Meyer, R., Larsen, L. y Revsbech, N. 2002. Microscale biosensor for measurement of volatile fatty acids in anoxic environments. *Appl. Environ. Microbiol.* 68:1204-1210.
- Min, B. y Logan, B. 2004. Continuous electricity generation from domestic wastewater and organic substrates in a flat plate microbial fuel cell. *Environmental Science and Technology.* 38(21):5809-5814.

- Min, B., Cheng, S. y Logan, B. 2005. Electricity generation using membrane and salt bridge microbial fuel cells. *Water Res.* 39:1675-1686.
- Minteer, S., Liaw, B. y Cooney, M. 2007. Enzyme-based biofuel cells. *Curr. Opin. Biotechnol.* 18: 228-234
- Mitsos, A., Palou-Rivera, I. y Barton, P. 2004. Alternatives for micropower generation processes. *Ind. Eng. Chem. Res.* 43(1):74-84
- Moon, H., Chang, I., Kang, K., Jang, J. y Kim, B. 2004. Improving the dynamic response of a mediator-less microbial fuel cell as a biochemical oxygen demand (BOD) sensor. *Biotechnology Letters.* 26: 1717-1721.
- Morris, J. y Jin, S. 2008. Feasibility of using microbial fuel cell technology for bioremediation of hydrocarbons in groundwater. *J. Environm. Sci. Health A: Tox./Hazard. Subst. Environm. Eng.* 43: 18-23.
- Nevin, K. y Lovley, D. 2002. Mechanisms for Fe(III) oxide reduction in sedimentary environments *Geomicrobiol. J.* 19:141-159.
- Nevin, K., Richter, H., Covalla, S., Johnson, J., Woodard, T., Orloff, A., Jia, H., Zhang, M. y Lovley, D. 2008. Power output and coulombic efficiencies from biofilms of *Geobacter sulfurreducens* comparable to mixed community microbial fuel cells. *Environ. Microbiol.* 10:2505-2514.
- Nevin, K., Kim, B., Glaven, R.H., Johnson, J., Woodard, T., Methe, B., DiDonato, R., Covalla, S., Franks, A., Liu, A. y Lovley, D. 2009. Anode biofilm transcriptomics reveals outer surface components essential for high density current production in *Geobacter sulfurreducens* fuel cells. 20; 4(5)
- Newman, J. 1973. *Electrochemical Systems*. Prentice Hall: Englewood Cliffs, NJ, EEUU.
- Niessen, J., Schroder, U. y Scholz, F. 2004. Exploiting complex carbohydrates for microbial electricity generation - a bacterial fuel cell operating on starch. *Electrochem. Commun.* 6:955-958.
- Oh, S., Min, B. y Logan, B. 2004. Cathode performance as a factor in electricity generation in microbial fuel cells. *Environ. Sci. Technol.* 38:4900-4904.
- Oh, S. y Logan, B. E. 2006. Proton exchange membrane and electrode surface areas as factors that affect power generation in microbial fuel cells. *Appl. Microbiol. Biotechnol.* 70:162-169.
- Oh, S. y Logan, B. 2007. Voltage reversal during microbial fuel cell stack operation. *Power Sources.* 167:11-17.

- Palmore, G., Whitesides, G., 1994. Microbial and enzymatic biofuel cells. In: Himmel, E. (Ed.), *Enzymatic Conversion of Biomass for Fuels Production*, vol. 566. *American Chemical Society*. 271-290.
- Park, D., y Zeikus, J. 1999. Utilization of electrically reduced neutral red by *Actinobacillus succinogenes*: physiological function of neutral red in membrane-driven fumarate reduction and energy conservation. *J. Bacteriol.* 181: 2403-2410.
- Park, D., Laivenieks, M., Guettler, M., Jain, M. y Zeikus, J. 1999. Microbial utilization of electrically reduced neutral red as the sole electron donor for growth and metabolite production. *Appl. Environ. Microbiol.* 65: 2912-2917.
- Park, D. y Zeikus, J., 2000. Electricity Generation in Microbial Fuel Cells Using Neutral Red as an Electronophore. *Appl. Environ. Microbiol.* 66(4):1292-1297
- Park, D., Kim, S., Shin, I. y Jeong, Y. 2000. Electricity production in biofuel cell using modified graphite electrode with Neutral Red. *Biotechnol. Lett.* 22(16),1301-1304
- Park, H., Kim, B., Kim, H., Kim, H., Kim, G., Kim, M., Chang, I., Park, Y. y Chang, H. 2001. A novel electrochemically active and Fe(III)-reducing bacterium phylogenetically related to *Clostridium butyricum* isolated from a microbial fuel cell. *Anaerobe.* 7:297-306.
- Park, D. y Zeikus, J. 2003. Improved fuel cell and electrode designs for producing electricity from microbial degradation. *Biotechnol. Bioeng.* 81: 348-355.
- Pant, D., Van Bogaert, G., Diels, L. y Vanbroekhoven, K. 2009. A review of the substrates used in microbial fuel cells (MFCs) for sustainable energy production. *Bioresour. Technol.* 101:1533-1543.
- Pasco, N., Baronian, K., Jeffries, C., Webber, J. y Hay, J. 2004. MICREDOX(R) – development of a ferricyanide-mediated rapid biochemical oxygen demand method using an immobilized *Proteus vulgaris* biocomponent. *Biosensors & Bioelectronics.* 20(3):524-532.
- Patil, S., Surakasi, V., Koul, S., Ijmulwar, S., Vivek, A., Shouche, Y. y Kapadnis, B. 2009. Electricity generation using chocolate industry wastewater and its treatment in activated sludge based microbial fuel cell and analysis of developed microbial community in the anode chamber. *Bioresour. Technol.* 100:5132-5139.
- Pham, T., Rabaey, K., Aelterman, P., Clauwaert, P., Schampelaire, L., Boon, N. y Verstraete, W. 2006. Microbial fuel cells in relation to conventional anaerobic digestion technology. *Eng. Life Sci.* 6:285-292.
- Pham, T., Boon, N., Aelterman, P., Clauwaert, P., De Schampelaire, L., Vanhaecke, L., De Maeyer, K., Hofte, M., Verstraete, W. y Rabaey, K. 2008. Metabolites produced by *Pseudomonas sp.* enable a

Gram-positive bacterium to achieve extracellular electron transfer. *Appl. Microbiol. Biotechnol.* 77: 1119-1129.

Phung, N., Lee, J., Kang, K., Chang, I., Gadd, G. y Kim, B. 2004. Analysis of microbial diversity in oligotrophic microbial fuel cells using 16S rDNA sequences. *FEMS Microb. Lett.* 233:77-82.

Poggi-Varaldo, Alzate-Gaviria, Nevarez- Morillon y Rinderknecht-Seijas. 2005. A side by side comparison of two systems of sequencing coupled reactors for anaerobic digestion of the organic fraction of municipal solid waste. *Waste Manag. Res.* 23: 270-280.

Potter, M. 1910. On the difference of potential due to the vital activity of microorganisms. *Proc. Univ. Durham Phil. Soc.* 3: 245-249.

Potter, M. 1911. Electrical Effects Accompanying the Decomposition of Organic Compounds. *Proc. R. Soc. Lond.*, B84: 260-276.

Prasad, D., Sivaram, T., Berchmans, S. y Yegnaraman, V. 2006. Microbial fuel cell constructed with a microorganism isolated from sugar industry effluent. *J. Power sources.* 160:991-996

Prasad, D., Arun, S., Murugesan, M., Padmanaban, S., Satyanarayanan, R., Berchmans, S. y Yegnaraman, V. 2007. Direct electron transfer with yeast cells and construction of a mediatorless microbial fuel cell. *Biosen. Bioelectron.* 22:2604-2610.

Rabaey, K., Lissens, G., Siciliano, S. y Verstraete, W. 2003. A microbial fuel cell capable of converting glucose to electricity at high rate and efficiency. *Biotechnol. Lett.* 25:1531-1535.

Rabaey, K., Boon, N., Siciliano, S., Verhaege, M. y Verstraete, W. 2004. Biofuel cells select for microbial consortia that self-mediate electron transfer. *Appl. Environ. Microbiol.* 70:5373-5382.

Rabaey, K., Clauwaert, P., Aelterman, P. y Verstraete, W. 2005a. Tubular microbial fuel cells for efficient electricity generation. *Environ. Sci. Technol.* 39:8077-8082.

Rabaey, K., Boon, N., Hofte, M. y Verstraete, W. 2005b. Microbial phenazine production enhances electron transfer in biofuel cells. *Environ. Sci. Technol.* 39:3401-3408.

Rabaey, K., Ossieur, W., Verhaege, M. y Verstraete, W. 2005c. Continuous microbial fuel cells convert carbohydrates to electricity. *Water Sci. Technol.* 52:515-523.

Rabaey, K. y Verstraete, W. 2005d. Microbial fuel cells: novel biotechnology for energy generation. *Trends Biotechnol.* 23:291-298.

Reguera, G., McCarthy, K., Mehta, T. y Nicoll, J. 2005. *Biotechnol.* 26:450-459.

- Reimers, C., Tender, L., Fertig, S. y Wang, W. 2001. Harvesting energy from the marine sediment-water interface. *Environ. Sci. Technol.* 35:192-195.
- Reimers, C., Girguis, P., Stecher III, H., Tender, L., Ryckelynck, N. y Whaling, P. 2006. Microbial fuel cell energy from an ocean cold seep. *Geobiology.* 4:123-136.
- Ren, Z., Steinberg, L. y Regan, J. 2008. Electricity production and microbial biofilm characterization in cellulose-fed microbial fuel cells. *Water Sci. Technol.* 58:617-622.
- Riedel, K., Renneberg, R., Kuhn, M. y Scheller, F. 1988. A fast estimation of biochemical oxygen demand using microbial sensors. *Applied and Environmental Microbiology* 28:316-318.
- Riedel, K., Lehmann, K., Tag, K., Renneberg, R. y Kunze, G. 1998. *Arxula Adeninivorans* based sensor for the estimation of BOD. *Analytical Letters.* 31(1):1-12.
- Ringeisen, B., Henderson, E., Wu, P., Pietron, J., Ray, R., Little, B., Biffinger, J. y Jones-Meehan, J. 2006. High Power Density from a Miniature Microbial Fuel Cell Using *Shewanella oneidensis* DSP10, *Environmental Science & Technology.* 40,8:2629-2634
- Risso, C., Sun, J., Zhuang, K. y Mahadevan, R, *Microbiol. Technol.* 77: 689-697.
- Rittmann. 2006. Microbial ecology to manage processes in environmental biotechnology. *Trends Biotechnol.* 24:261-268.
- Rittmann, B., Torres, C. y Marcus, A. 2008a. Understanding the distinguishing features of a microbial fuel cell as a biomass-based renewable energy technology. In *Emerging Environmental Technologies*; Springer: Berlin, Alemania; pp.1-28.
- Rittmann, Krajmalnik-Brown, Halden. 2008b. Pre-genomic, genomic and post.genomic study of microbial communities involved in bioenergy. *Nature.* 6:604-612.
- Rodriguez-Mozes, S., Lopez de Alda, M. y Barcelo, D. 2006. Biosensors as useful tools for environmental analysis. *Analytical and Bioanalytical Chemistry.* 386:1025-1041.
- Rosenbaum, M., Schroder, U. y Scholz, F. 2005. In situ electrooxidation of photobiological hydrogen in a photobioelectrochemical fuel cell based on *Rhodobacter sphaeroides*. *Environ. Sci. Technol.* 39:6328-6333.
- Rozendal, R., Hamelers, H. y Buisman. 2006. Effects of Membrane Cation Transport on pH and Microbial Fuel Cell performance. *Env. Sci. Technol.* 40: 5206-5211.
- Rozendal, R., Hamelers, H., Rabaey, K., Keller, J. y Buisman, C. 2008. Towards practical implementation of bioelectrochemical wastewater treatment. *Trend. Biotechnol.* 26:450-459

- Schroder, U., Niessen, J. y Scholz, F. 2003. A generation of microbial fuel cells with current outputs boosted by more than one order of magnitude. *Angew. Chem. Int. Ed. Engl.* 42:2880-2883.
- Sell, D., Krâmer, P. y Kreysa, G. 1989. Use of an oxygen gas diffusion cathode and a threedimensional packed bed anode in a bioelectrochemical fuel cell. *Appl. Microbiol. Technol.* 31: 211-213.
- Seon, Y., Lee, C., Park, D., Hwang, K. y Joe, Y. 1993. *Biotechnol. Lett.* 15(12):1275-1280.
- South A. 1992. Terrestrial slugs: biology, ecology, and control. Chapman & Hall. Londres, Inglaterra.
- Staniforth, J. y Kendall, K. 1998. Biogas powering a small tubular solid oxide fuel cell. *J Power Sources.* 71:275-7.
- Tan, T. y Wu, C. 1999. BOD sensors using multi-species living or thermally killed cells of a BIOSEED microbial culture. *Sensors and Actuators.* B54,252-260.
- Tanisho, S., Kamiya, N. y Wakao, N. 1989. Microbial fuel cell using. *Enterobacter aerogenes.* *Bioelectrochem. Bioenerg.* 21:25-32.
- Tender, L., Reimers, C., Stecher, H., Holmes, D., Bond, D., Lowy, D., Pilobello, K., Fertig, S. y Lovley, D. 2002. Harnessing microbially generated power on the seafloor. *Nature Biotechnology.* 20:821-825.
- Tender, L., Graya, S., Groveman, E., Lowy, D., Kauffman, P., Melhado, J., Tyce, R., Flynn, D., Petrecca, R. y Dobarro, J. 2008. The first demonstration of a microbial fuel cell as a viable power supply: Powering a meteorological buoy. *Journal of Power Sources.* 179: 571-575
- Thauer, R., Jungermann, K. y Decker, K. 1977. Energy conservation in *chemotrophic* anaerobic bacteria. *Bacteriol. Rev.* 41:100-180.
- Torres, C., Kato-Marcus, A. y Rittmann, B. 2007. Kinetics of consumption of fermentation products by anode-respiring bacteria. *App. Microbiol. Biotechnol.* 77:689-697.
- Torres, C., Kato-Marcus, A. y Rittmann, B. 2008a. Proton transport inside the biofilm limits electrical current generation by anode-respiring bacteria. *Biotechnol. Bioeng.* 100:872-881.
- Torres, C., Lee, H. y Rittmann, B. 2008b. Carbonate species as OH⁻ carriers for decreasing the pH gradient between cathode and anode in biological fuel cells. *Environ. Sci. Technol.* 42:8773-8777
- Tsujimura, S., Wadano, A., Kano, K. y Ikeda, T. 2001. *Enzyme Microb. Technol.* 29(4-5),225-231.

- Valdez-Vazquez, I., Ríos-Leal, E., Esparza-García, F., Cecchi, F. y Poggi-Varaldo, H. 2005. Semi-continuous solid substrate anaerobic reactors for H₂ production from organic waste: Mesophilic versus thermophilic regime. *Int. J. Hydrogen Energy*. 30:1383-1391.
- Vielstich, W., Lamm, A. y Gasteiger, H. 2003. Handbook of Fuel Cells—Fundamentals Technology and Applications, Fundamentals and Survey of Systems, vol. 1. Wiley, Chichester, Reino Unido.
- Von Canstein, H., Ogawa, J., Shimizu, S. y Lloyd, J. 2007. Secretion of Flavins by *Shewanella* species and their role in extracellular electron transfer. *Appl. Environ. Microbiol.* 74: 615-623.
- Walker, A. y Walker, J. 2006. Biological fuel cell and an application as a reserve power source. *J. Power Sourc.* 160:123-129.
- Webb B. 1999. The first mobile robot. In: Nehmzow U, Melhuish C, editors. Towards Intelligent Mobile Robots. Proceedings of a conference held in Bristol; 1999 Mar 26; Bristol. Manchester: University of Manchester. Manchester, Reino Unido.
- Wilcock, W. y Kauffman, P. 1996. Development of a seawater battery for deep-water applications. *Power Sources*. 66:71-75
- Wilkinson S. 1999. A crude but novel carrot powered gastrobot for middle or high school demonstrations. In: Proceedings of the 7th International Conference on Robotics and Applications; Paper # 304-024.
- Wilkinson S. 2000a. Gastronome—a pioneering food powered mobile robot. In: M.H. Hamza (Ed.), IASTED International Conference on Robotics and Applications, Acta Pr., Honolulu, Hawaii. EEUU
- Wilkinson S. 2000b. Gastrobots – benefits and challenges of microbial fuel cells in food powered robot applications. *J Autonomous Robots*. 9(2):99-111.
- Wilkinson Stuart. 2001. “Gastronome” – A Pioneering Food Powered Mobile Robot. Proceedings of the 8th IASTED International Conference on Robotics and Applications, Paper No. 318-037
- Wingard, L., Shaw, C. y Castner, J. 1982. Bioelectrochemical fuel cells. *Enzyme Microb. Technol.* 4(3),137-142.
- Yagishita, T., Sawayama, S., Tsukahara, K. y Ogi, T., 1999. Effects of glucose addition and light on current output in photosynthetic electrochemical cells using *Synechocystis* sp. PCC6714. *J. Biosci. Bioeng.* 88(2),210-214.
- Yan. 1977. Chemical aspects of marine sediments, in: T.F. Yan (Ed.), Chemistry of Marine Sediments, Ann Arbor Science Publishers, Ann Arbor,MI.

- You, S., Zhao, Q. y Jiang, J.Q. 2006. Biological wastewater treatment and simultaneous generating electricity from organic wastewater by microbial fuel cell. *Huan Jing Ke Xue*. 27:1786-1790.
- Zhang, K., Martiny, A., Reppas, N., Barry, K., Malek, J., Chisholm, S. y Church, G. 2006. Sequencing genomes from single cells by polymerase cloning. *Nat. Biotechnol.* 24:680-686.
- Zhang, T., Cui, C., Chen, S., Yang, H. y Shen, P. 2008. The direct electrocatalysis of Escherichia coli through electroactivated excretion in microbial fuel cell. *Electrochem. Comm.* 10:293-297.
- Zhang, Y., Min, B., Huang, L. y Angelidaki, I. 2009a. Generation of electricity and analysis of microbial communities in wheat straw biomass-powered microbial fuel cells. *Appl. Environ. Microbiol.* 75:3389-3395.
- Zhang, C., Li, M., Liu, G., Luo, H. y Zhang, R. 2009b. Pyridine degradation in the microbial fuel cells. *J. Hazard. Mat.* 172:465-471.
- Zhao, F., Harnisch, F., Schroder, U., Scholz, F., Bogdanoff, P. y Herrmann, I. 2005. Application of pyrolysed iron(II) phthalocyanine and CoTMPP based oxygen reduction catalysts as cathode materials in microbial fuel cells. *Electrochem. Commun.* 7:1405-1410.
- Zhao, F., Harnisch, F., Schroder, U., Scholz, F., Bogdanoff, P. y Herrmann, I. 2006. Challenges and constraints of using oxygen cathodes in microbial fuel cells. *Env. Sci. Technol.* 40:5193-5199.
- Zhao, F., Rahunen, N., Varcoe, J., Chandra, A., Avignone-Rossa, C., Thumser, A. y Slade, R. 2008. Activated carbon cloth as anode for sulfate removal in a microbial fuel cell. *Environ. Sci Technol.* 42:4971-4976.
- Zhu, X. y Ni, J. 2009. Simultaneous processes of electricity generation and p-nitrophenol degradation in a microbial fuel cell. *Electrochem. Comm.* 11:274-277.
- Zuo, Y., Maness P. y Logan B. 2006. Electricity production from steam-exploded corn stover biomass. *Energy & Fuels*. 20:1716-1721.
- Zuo, Y., Cheng, S., Call, D. y Logan, B. 2007. Tubular membrane cathodes for scalable power generation in microbial fuel cells. *Env. Sci. Tech.* 41:3347-3353.