

JEFFREY P. OSBORNE

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TEACHING

<i>Program Director of Medical Practicum, Manchester University</i>	8/16-present
<i>Associate Professor of Chemistry (tenured), Manchester University</i>	5/10-present
<i>Assistant Professor of Chemistry, Manchester University (formerly Manchester College)</i>	8/04-4/10

Courses: Chemical Science, Introduction to Organic Chemistry Lab, General Chemistry I and Lab, General Chemistry II and Lab, Environmental Chemistry, Organic Chemistry I and Lab, Physical Chemistry II and Lab, Biochemistry I and Lab, Biochemistry II and Lab, Instrumental Analysis Lab, Internship, Special Problems, Medical Practicum, Intensive Studies in Spanish.

RESEARCH

<i>Principal Investigator, Manchester University</i>	
Process Oriented Guided Inquiry Learning activities.	8/11-present
Health care development in indigenous, rural, northern Nicaragua (MedicalPracticum.org).	6/07-present
Converting campus cafeteria waste vegetable oil to biodiesel for campus vehicles.	9/05-6/07
Compiling biocatalysis/biodegradation database pathways.	4/05-present
Biodegradation of persistent hydrocarbons and pharmaceuticals.	2/05-present
<i>Postdoctoral Research Associate, University of Minnesota</i>	
Laboratory of Lawrence P. Wackett. Biodegradation of pollutants using naturally occurring and genetically modified bacteria.	7/00-6/04
<i>Graduate Research Assistant, University of Illinois at Urbana-Champaign</i>	
Laboratory of Robert B. Gennis. Structure and function relationships of cytochrome oxidase membrane proteins in respiratory chain.	1/92-12/98

EDUCATION

Ph.D., Biochemistry	University of Illinois at Urbana-Champaign	1999
B.A., Chemistry, Biology	Goshen College	1992
A.A., Liberal Arts	Hesston College	1988

GRANTS

<i>Manchester University Peace Studies/Conflict Resolution Grant</i>	\$1500	2017
"Improving Relationships and Cooperation between the Medical Practicum and the Alto Wangki-Bocay Mayangna"		
<i>H.C. Gemmer Family Christian Foundation</i>	\$3000	2016
"Medicines and Medical/Dental Supplies for the 2017 Manchester University Medical Practicum"		
<i>H.C. Gemmer Family Christian Foundation</i>	\$2600	2014
"Medicines and Medical Supplies for the 2015 Manchester University Medical Practicum"		
<i>Manchester University Peace Studies/Conflict Resolution Secrist Funds</i>	\$1500	2014
"Improving Relationships and Cooperation between the Medical Practicum and the Alto Wangki/Bocay People"		
<i>Manchester College Peace Studies/Conflict Resolution Secrist Funds</i>	\$1500	2012
"Relationship Building and Multilateral Organization in Río Coco, Nicaragua Communities for January 2013 Medical Practicum"		
<i>Manchester College Peace Studies/Conflict Resolution Secrist Funds</i>	\$1500	2010
"Relationship Building and Multilateral Organization in Río Coco, Nicaragua Communities for January 2011 Medical Practicum"		

<i>Manchester College Faculty Research and Artistic Endeavor</i>	\$750	2009
“Researching the January 2010 Medical Practicum Site in Nicaragua”		
<i>H.C. Gemmer Family Christian Foundation</i>	\$1500	2008
“Medicines for Manchester College Medical Practicum”		
<i>Plowshares</i>	\$2500	2008
“Spanish Language Study and Visiting Potential Medical Practicum Sites in Nicaragua”		
<i>Plowshares</i>	\$1325	2007
“Language Study and Medical Practicum Site Selection in Nicaragua”		
<i>Manchester College Summer Research Program</i>	\$8600	2007
“Characterization of Styrene Oligomer, Ritalinic Acid and other Novel Biodegradation Pathways”		
<i>Indiana Academy of Science Senior Grant</i>	\$3000	2006
“Biodegradation of Styrene Oligomers”		
<i>Manchester College Summer Research Program</i>	\$9475	2006
“Identification of Novel Biodegradation Pathways”		
<i>Chartwells Education Dining Services</i>	\$600	2005
“Biodiesel from Waste Vegetable Oil”		
<i>Plowshares Faculty Development</i>	\$2000	2005
“Production of Methane from Biomass”		
<i>The Dorothy and Moses Passer Education Fund</i>	\$600	2004
“Attend Conference on Chemistry for Non-Science Majors”		

DISTINCTIONS

Swiss Federal Institute of Aquatic Science and Technology (EAWAG)	7/14 - present
Biocatalysis/Biodegradation Database International Scientific Advisory Board	
University of Minnesota Biocatalysis/Biodegradation Database International Scientific Advisory Board	5/12 - 6/14
Honorary Member of Alpha Mu Gamma Honor Society (Foreign Language)	10/10
Dean’s Award for Excellence	5/09

SCIENTIFIC WEB PUBLICATIONS

- Osborne, J. P. and Planer, J. (2012) “Nitrate (Anaerobic) Pathway Map.” Available from EAWAG Biocatalysis/Biodegradation Database: http://eawag-bbd.ethz.ch/nit/nit_map.
- Sanchez, E., Cullen, M., and Osborne, J. P. (2012) “Iminodisuccinate Pathway Map.” Available from EAWAG Biocatalysis/Biodegradation Database: http://eawag-bbd.ethz.ch/ids/ids_map.html.
- Burkett, A., and Osborne, J. P. (2012) “1,5-Anhydrofructose (Fungal) Pathway Map.” Available from EAWAG Biocatalysis/Biodegradation Database: http://eawag-bbd.ethz.ch/stc2/stc2_map.html.
- Burkett, A., and Osborne, J. P. (2012) “Starch Oligomer Pathway Map.” Available from EAWAG Biocatalysis/Biodegradation Database: http://eawag-bbd.ethz.ch/stc/stc_map.html.
- Collins, L., and Osborne, J. P. (2012) “Cocaine Pathway Map.” Available from EAWAG Biocatalysis/Biodegradation Database: http://eawag-bbd.ethz.ch/coc/coc_map.html.
- Mills-Groninger, F., Carpenter, M., and Osborne, J. P. (2011) “Cypermethrin Pathway Map.” Available from EAWAG Biocatalysis/Biodegradation Database: http://eawag-bbd.ethz.ch/cyp/cyp_map.html.
- Johnson, W., and Osborne, J. P. (2011) “Permethrin Pathway Map.” Available from EAWAG Biocatalysis/Biodegradation Database: http://eawag-bbd.ethz.ch/per/per_map.

BOOKS AND CHAPTERS

- Osborne, J. P., (1999) *Structure and Function Relationships in Cytochrome bo_3 Oxidase and Cytochrome $bd-I$ Oxidase from Escherichia coli*. Ph.D. Dissertation, University of Illinois at Urbana-Champaign. UMI, Ann Arbor (AAT 9944956).
- Osborne, J. P., Musser, S. M., Schultz, B. E., Edmondson, D. E., Chan, S. I., and Gennis, R. B. (1998) “Rapid Formation of a Ubisemiquinone Species Upon Oxidation of Quinol by the Cytochrome bo_3 from

Escherichia coli” in *Oxygen Homeostasis and Its Dynamics* (Ishimura, Y., Shimada, H., & Suematsu, M., Eds.) pp 33-39, Springer-Verlag, Tokyo.

PEER-REVIEWED ARTICLES

18. Seffernick, J. L., Aleem, A., Osborne, J. P., Johnson, G., Sadowsky, M. J., and Wackett, L. P. (2007) “Hydroxyatrazine N-ethylaminohydrolase (AtzB): an amidohydrolase superfamily enzyme catalyzing deamination and dechlorination” *Journal of Bacteriology*, 189(19), 6989-6997.
17. Yang, K., Zhang, J., Vakkasoglu, A., Hielscheer, R., Osborne, J. P., Hemp, J., Miyoshi, M., Hellwig, P. and Gennis, R. (2007) “Glutamate 107 in Subunit I of the Cytochrome *bd* Quinol Oxidase from *Escherichia coli* is Protonated and is Near the Heme d/Heme *b*₅₉₅ Binuclear Center” *Biochemistry*, 46(11), 3270-3278.
16. Brim, H., Osborne, J. P., Kostandarithes, H. M., Fredrickson, J. K., Wackett, L. P. and Daly, M. J. (2006) “*Deinococcus radiodurans* Engineered for Complete Toluene Degradation Facilitates Cr(VI) Reduction” *Microbiology* 152(8), 2469-2477.
15. Zhang, J., Hellwig, P., Osborne, J. P., Gennis R. B. (2004). “Arginine-391 in Subunit I of the Cytochrome *bd* Quinol Oxidase from *E. coli* Stabilizes the Reduced Form of the Hemes and Is Essential for Quinol Oxidase Activity.” *Journal of Biological Chemistry*, 279(52), 53980-53987.
14. Zhang, J, Osborne, J. P., Gennis, R. B., Wang, X. (2004) “Proton NMR Study of the Heme Environment in Bacterial Quinol Oxidases.” *Archives of Biochemistry and Biophysics*, 421(2), 186-191.
13. Seffernick, J. L., McTavish, H., Osborne, J. P., de Souza, M. L., Sadowsky, M. J., Wackett, L. P. (2002) “Atrazine Chlorohydrolase from *Pseudomonas* Sp. Strain ADP Is a Metalloenzyme.” *Biochemistry*, 41, 14430-14437.
12. Shapir, N., Osborne, J. P., Johnson, G., Sadowsky, M. J., and Wackett, L. P. (2002) “Purification, Substrate Range, and Metal Center of AtzC: the N-Isopropylammelide Aminohydrolase Involved in Bacterial Atrazine Metabolism.” *Journal of Bacteriology*, 184, 5376-5384.
11. Zhang, J., Hellwig, P., Osborne, J. P., Huang, H., Moenne-Loccoz, P., Konstantinov, A. A., Gennis, R. B. (2001) “Site-Directed Mutation of the Highly Conserved Region near the Q-Loop of the Cytochrome *bd* Quinol Oxidase from *Escherichia coli* Specifically Perturbs Heme *b*₅₉₅.” *Biochemistry*, 40, 8548-8556.
10. Veselov, A. V., Osborne, J. P., Gennis, R. B., Scholes, C. P. (2000) “Q-Band ENDOR (Electron Nuclear Double Resonance) of the Heme *o*₃ Liganding Environment at the Binuclear Center in Cytochrome *bo*₃ from *Escherichia coli*.” *Journal of the American Chemical Society*, 122, 8712-8716.
9. Veselov, A. V., Osborne, J. P., Gennis, R. B. and Scholes, C. P. (2000) “Q-Band ENDOR (Electron Nuclear Double Resonance) of the High-Affinity Ubisemiquinone Center in Cytochrome *bo*₃ from *Escherichia coli*.” *Biochemistry*, 39, 3169-3175.
8. Musatov, A., Ortega-Lopez, J., Demler, B., Osborne, J. P., Gennis, R. B., Robinson, N. C. (1999) “Detergent-Solubilized *Escherichia coli* Cytochrome *bo*₃ Ubiquinol Oxidase: A Monomeric, Not a Dimeric Complex.” *FEBS Letters*, 457(1), 153-156.
7. Osborne, J. P., Cosper, N. J., Stålhandske, C. M. V., Scott, R. A., Alben, J. O. and Gennis, R. B. (1999) “Cu XAS Shows a Change in Ligation of Cu_B Upon Reduction of Cytochrome *bo*₃ Oxidase from *Escherichia coli*.” *Biochemistry*, 38, 4526-4532.
6. Osborne, J. P. and Gennis, R. B. (1999) “Sequence Analysis of Cytochrome *bd* Oxidase Suggests a Revised Topology for Subunit I.” *Biochimica et Biophysica Acta*, 1410, 32-50.
5. Borisov, V., Arutyunyan, A. M., Osborne, J. P., Gennis, R. B. and Konstantinov, A. A. (1999) “Magnetic Circular Dichroism Used to Examine the Interaction of *Escherichia coli* Cytochrome *bd* with Ligands.” *Biochemistry*, 38, 740-750.
4. Larsen, R. W., Osborne, J., Langley, T., and Gennis, R. B. (1998) “Volume Changes Associated with CO Photodissociation from Fully Reduced Cytochrome *bo*₃ from *Escherichia coli*.” *Journal of the American Chemical Society*, 120, 8887-8888.
3. Watmough, N. J., Katsonouri, A., Little, R. H., Osborne, J. P., Furlong-Nickels, E., Gennis, R. B., Brittain, T., and Greenwood, C. (1997) “A Conserved Glutamic Acid in Helix VI of Cytochrome *bo*₃ Influences a Key Step in Oxygen Reduction.” *Biochemistry*, 36, 13736-13742.
2. Sun, J., Kahlow, M. A., Kaysser, T. M., Osborne, J. P., Hill, J. J., Rohlf, R. J., Hille, R., Gennis, R. B., and Loehr, T. M. (1996) “Resonance Raman Spectroscopic Identification of a Histidine Ligand of *b*₅₉₅ and the Nature of the Ligation of Chlorin *d* in the Fully Reduced *Escherichia coli* Cytochrome *bd* Oxidase.” *Biochemistry*, 35, 2403-2412.

1. Sun, J., Osborne, J. P., Kahlow, M. A., Kaysser, T. M., Hill, J. J., Gennis, R. B., and Loehr, T. M. (1995) "Resonance Raman Studies of *Escherichia coli* Cytochrome *bd* Oxidase. Selective Enhancement of the Three Heme Chromophores of the 'As-Isolated' Enzyme and Characterization of the Cyanide Adduct." *Biochemistry*, 34, 12144-12151. Correction: *Biochemistry* 35, 666 (1996).

STUDENT RESEARCH

27. Meaghan Adams. Spring 2016. "Optimization of Styrene Dimer and Styrene Trimer Synthesis by Clemmensen Reduction"
26. Jessica Noll. Fall 2015. "Three Mealworm Species Detection of Polystyrene Biodegradation by Mass"
25. Allison Weber. Spring 2015. "Synthesis of Styrene Dimer Using Revised Clemmensen Reduction"
24. Kyle Miller. Spring 2015. "Synthesis of Styrene Trimer by Clemmensen Reduction of 1,3,5-Triphenylpentane"
23. Michael Stocker. Spring 2014. "Ritalinic Acid Assay and Biodegradation"
22. Loughlin Wylie. Spring 2014. "Bacteria Degradation of Styrene and Synthesis of 1,3-diphenylpropene"
21. Loughlin Wylie. Fall 2013. "Synthesis of Styrene Dimer"
20. Lucas Shelly. Spring 2013. "Styrene Oligomer Synthesis"
19. Sara Barker. Spring 2013. "Synthesis and Analysis of Styrene Dimer and Trimer through Beta Zeolite Catalysis"
18. Erin Cole. 2010-2011. Senior Research Thesis. "Inhibiting Cancer-Associated PCNA: The Potential to Target Malignant Cell Division while Leaving Healthy Cells Untouched"
17. A.J. Herbel. Spring 2011. "The Purification and Separation of Polystyrene"
16. Kaitlin Johnson. Fall 2010. "The Use of a Zeolite Catalyst to Synthesize Styrene Oligomers"
15. Tony Herber. Fall 2007. "Synthesis, Separation, and Identification of Styrene Trimer for further Study in Bacterial Degradation Pathways"
14. Kelli Gates. Fall 2007. "Kinetic Analysis of Ritalinic Acid Biodegradation"
13. Kelli Gates. Summer 2007 (10 weeks). "Kinetic Analysis of Ritalinic Acid Biodegradation"
12. Tony Herber. Summer 2007 (10 weeks). "Styrene Oligomer Synthesis and Characterization"
11. Jordan Walberry. Summer 2007 (10 weeks). "Styrene Oligomer Synthesis and Characterization and Ritalinic Acid Assays"
10. Levi Hauptert. 2006-2007. Senior Research Thesis. "Potential for Large Scale Photovoltaics in Indiana."
9. Taylor Vice. Spring 2007. "Selective Synthesis of Styrene Trimer"
8. Amanda Patch. Fall 2006. "Biodiesel Production and Analysis"
7. Will Patch. Fall 2006. "Degradation Kinetics of Ritalinic Acid and Alendronate Sodium"
6. Levi Hauptert. Fall 2006. "Biodegradation of Styrene Oligomers"
5. Jason DeWisleare. Fall 2006. "Biodegradation of Large, Polyaromatic Hydrocarbons"
4. Nicole Swoverland. Summer 2006 (10 weeks). "Biodegradation Studies on Styrene Trimer and Pentadecafluorooctanoic Acid"
3. Will Patch. Summer 2006 (10 weeks). "Novel Biodegradation of Alendronate Sodium and Ritalinic Acid"
2. Jason DeWisleare. Spring 2006. "Biodegradation of Environmental Pollutants"
1. Will Patch. Spring 2006. "Synthesis and pH Dependent Chelation Properties of Alendronate Sodium"

SELECTED PRESENTATIONS

42. "1981-2017 Medical Practicum" to President's Leadership Council. 9 March 2017.
41. "33rd Medical Practicum January 2017: Alto Wangki-Bocay, Nicaragua" at Manchester Church of the Brethren. 5 February 2017.
40. "Medical Practicum: 1981-2016" Encore Lecture with Ed Miller at MU 2016 Homecoming. 8 October 2016.
39. "32nd Medical Practicum January 2016: Alto Wangki-Bocay, Nicaragua" to North Manchester Kiwanis. 13 September 2016.
38. "32nd Medical Practicum: January 2016 to Alto Wangki-Bocay" to Alumni Days Interest Session. 25 May 2016.
37. "31st Medical Practicum January 2015: Alto Wangki-Bocay, Nicaragua" at North Manchester Rotary. 24 September 2015.

36. "31st Medical Practicum January 2015: Alto Wangki-Bocay, Nicaragua" at Manchester Church of the Brethren. 22 March 2015.
35. "Manchester University Medical Practicum" to Adventures in Learning, North Manchester. 26 November 2014.
34. "30th Medical Practicum" to Quester's Sunday school class at the Manchester Church of the Brethren. 27 April 2014.
33. "30th Medical Practicum" to Manchester University President's Leadership Council. 24 April 2014.
32. "29th Medical Practicum" to North Manchester Kiwanis. 24 September 2013.
31. "29th Medical Practicum" at Manchester University College of Pharmacy Spring 2013 Day of Service. 24 April 2013.
30. "A Short History of Lead (Pb)" at Manchester College Discussion Day on Human Rights. 27 February 2013.
29. "28th Medical Practicum January 2011: Rio Coco, Nicaragua" to All Classes Dinner as part of Alumni Days at Manchester College. 1 June 2011.
28. "28th Medical Practicum January 2011: Rio Coco, Nicaragua" to Manchester College Staff Luncheon. 6 April 2011.
27. Chemistry demonstrations to fourth grade class at Manchester Elementary School, 24 March 2011.
26. "Green Chemistry" to the ACS Student Organization at Manchester College, 16 March 2011.
25. "28th Medical Practicum January 2011: Rio Coco, Nicaragua" to Manchester Church of the Brethren Jubilee Sunday school class. 20 February 2011.
24. "28th Medical Practicum January 2011: Rio Coco, Nicaragua" to Manchester Kiwanis. 15 March 2011.
23. "28th Medical Practicum January 2011: Rio Coco, Nicaragua" to Brotherhood Mutual Insurance Company. 27 May 2011.
22. "Energy Issues" to the Shepherd Center, 11 November 2010.
21. "27th Medical Practicum January 2010: Rio Coco, Nicaragua" to North Manchester Rotary. 15 July 2010.
20. "27th Medical Practicum January 2010: Rio Coco, Nicaragua" at Manchester College Alumni Event. Goshen, IN. 5 May 2010.
19. "27th Medical Practicum January 2010: Rio Coco, Nicaragua" at Manchester College Alumni Event. Indianapolis, IN. 25 April 2010.
18. "27th Medical Practicum January 2010: Rio Coco, Nicaragua" to President's Society at Manchester College. 20 April.
17. "27th Medical Practicum January 2010: Rio Coco, Nicaragua" to North Manchester Kiwanis. 30 March 2010.
16. "27th Medical Practicum January 2010: Rio Coco, Nicaragua" at North Manchester Church of the Brethren Coffee House. 21 March 2010.
15. "27th Medical Practicum January 2010: Rio Coco, Nicaragua" to Manchester College Alumni Board. 6 March 2010.
14. "27th Medical Practicum January 2010: Rio Coco, Nicaragua" to Manchester Church of the Brethren Jubilee Sunday school class. 21 February 2010.
13. "26th Medical Practicum January 2009" to Mentone Kiwanis. 5 October 2009.
12. "26th Medical Practicum January 2009" to North Manchester Kiwanis. 1 September 2009.
11. "25th Medical Practicum January 2009" at Coffee House hosted by the Manchester Church of the Brethren. 22 March 2009.
9. "Green Chemistry" at Manchester ACS Student Chapter Meeting. 11 March 2009.
8. "25th Medical Practicum January 2009" to the Huntington Mennonite Fellowship. 1 March 2009.
7. "Cooperative Learning: A Brief Overview" with Greg Clark at Faculty Workshop. 28 August 2008.
6. "Biofuels for Motor Vehicles" at North Manchester Audubon Society Meeting. 26 August 2008.
5. "Biodiesel from Waste Vegetable Oil at Manchester College" to Shepherd's Center. 24 October 2007.
4. "Biodiesel from Waste Vegetable Oil at Manchester College" at a Monday evening Kenapocomoco Coalition meeting. 6 March 2007
3. "Biodiesel from Waste Vegetable Oil at Manchester College" at a campus-wide Convocation as part of the Difficult Dialogues series. 16 November 2006.
2. "Biodiesel from Waste Vegetable Oil at Manchester College" to the Manchester College Environmental Club. 24 October 2005.

1. "Immigration Policy and U.S. Leadership in Science and Technology" at Discussion Days on America's Roles in the World: An International Perspective. Co-presented with Christer Watson. 9 March 2005

UNIVERSITY COMMITTEES

Nursing Program Committee (*Ad Hoc*), 2017-present
Accreditation Steering Committee (*Ad Hoc*), 2016-present
Environmental Studies Council, 2006-present
Biology-Chemistry Council, 2005-present
Post-Bacc, Pre-Pharm, Implementation Committee (*Ad Hoc*), 2013-2016
Discussion Day Committee, 2012-2013
Honors Committee, 2009-2011
Technology Committee, 2008-2009
Faculty Executive Committee, 2007-2008
Campus Safety Committee, 2004-2007

INTERNATIONAL EXPERIENCE

5. Nicaragua 39 weeks since 2007
4. Costa Rica 1/12-7/12
3. Chile 8/11-1/12
2. The Netherlands 8/88-7/89
1. Costa Rica 7/82-7/83

LANGUAGES

3. Dutch
2. Spanish
1. English