



## Robert Waymouth

Robert Eckles Swain Professor in Chemistry and Professor, by courtesy, of Chemical Engineering

 Curriculum Vitae available Online

### CONTACT INFORMATION

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### Bio

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#### BIO

Robert Eckles Swain Professor in Chemistry Robert Waymouth investigates new catalytic strategies to create useful new molecules, including sustainable polymers, synthetic fuels, and bioactive molecules. In one such breakthrough, Professor Waymouth and IBM researcher Jim Hedrick opened a new path for production of environmentally sustainable plastics and improved plastics recycling, earning recognition in the 2012 Presidential Green Chemistry Award.

Born in 1960 in Warner Robins, Georgia, Robert Waymouth studied chemistry and mathematics at Washington and Lee University in Lexington, Virginia (B.S. and B.A., respectively, both summa cum laude, 1982). He developed an interest in synthetic and mechanistic organometallic chemistry during his doctoral studies in chemistry at the California Institute of Technology under Professor R.H. Grubbs (Ph.D., 1987). His postdoctoral research with Professor Piero Pino at the Institut für Polymere, ETH Zurich, Switzerland, focused on catalytic hydrogenation with chiral metallocene catalysts. He joined the Stanford University faculty as assistant professor in 1988, becoming full professor in 1997 and in 2000 the Robert Eckles Swain Professor of Chemistry.

Today, the Waymouth Group applies mechanistic principles to develop new concepts in catalysis, with particular focus on the development of organometallic and organic catalysts for the synthesis of complex macromolecular architectures. In organometallic catalysis, the group devised a highly selective alcohol oxidation catalyst that selectively oxidizes unprotected polyols and carbohydrates to alpha-hydroxyketones. The Waymouth group pioneered the development of catalysts that can access multiple kinetic states during a polymerization reaction in order to control sequence distribution. They devised a novel strategy for the synthesis of elastomeric polypropylene utilizing a metallocene catalyst whose structure was designed to interconvert between chiral and achiral coordination geometries on the timescale of the synthesis of a single polymer chain.

In collaboration with Jim Hedrick of IBM laboratories, the Waymouth Group has developed an extensive platform of organic catalysts for the controlled ring-opening polymerization of lactones, carbonates and other heterocyclic monomers. Mechanistic studies of nucleophilic N-heterocyclic carbene catalysts revealed an unusual zwitterionic ring-opening polymerization method which enabled the synthesis of high molecular weight cyclic polymers, a novel topology for these biodegradable and biocompatible macromolecules. In collaboration with the Wender group, the Waymouth group has devised selective organocatalytic strategies for the synthesis

of functional degradable polymers and oligomers that function as "molecular transporters" to deliver drugs and probes into cells. These efforts combine elements of mechanistic organic and organometallic chemistry, polymer synthesis, and homogeneous catalysis to rationally design new macromolecular structures.

## ACADEMIC APPOINTMENTS

- Professor, Chemistry
- Professor (By courtesy), Chemical Engineering
- Member, Bio-X
- Faculty Fellow, Stanford ChEM-H
- Affiliate, Stanford Woods Institute for the Environment

## ADMINISTRATIVE APPOINTMENTS

- Co-chair: Stanford Task Force on Advancing the Culture of Laboratory Safety, Stanford University, (2013-2014)

## HONORS AND AWARDS

- Presidential Green Chemistry Challenge Award, Environmental Protection Agency (2012)
- Cooperative Research Award in Polymer Science and Engineering, American Chemical Society PMSE Division (2009)
- Bass Fellow in Undergraduate Education, Stanford University (2005)
- Alexander von Humboldt Stiftung Award, Alexander von Humboldt Foundation (2001)
- Walter J. Gores Award for Excellence in Teaching, Stanford University (1997)
- Wilhelm Manchot Professorship, Technical University of Munich, Wilhelm Manchot Foundation (1997)
- Alan T. Waterman Award, National Science Foundation (1996)
- Arthur C. Cope Scholar Award, American Chemical Society (1995)
- Fresenius Award, Phi Lambda Upsilon, Honorary Chemical Society (1995)
- Bing Fellowship, Undergraduate Teaching Award, Stanford University (1994)
- A.P. Sloan Fellow, A.P. Sloan Foundation (1993)
- Undergraduate Teaching Award, Phi Beta Kappa, Stanford University (1993)
- Union Carbide Innovation Award, Union Carbide (1993)
- Young Investigator, National Science Foundation (1992)
- James L. Howe Chemistry Award, Blue Ridge Section, American Chemical Society (1982)

## BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Science Advisory Board Member, KAUST Catalysis Center (2014 - 2017)
- International Advisory Board Member, International Symposium on Homogeneous Catalysis (2008 - present)
- Editorial Board Member, Journal of Polymer Science, Chemistry (2000 - present)

## PROFESSIONAL EDUCATION

- Postdoc, Institut für Polymere, ETH Zurich, Switzerland, Catalysis (1988)
- PhD, California Institute of Technology, Chemistry (1987)
- BS, Washington and Lee University, Chemistry (1982)
- BA, Washington and Lee University, Mathematics (1982)

## PATENTS

- Robert Waymouth, Gregg Barcan, Xiangyi Zhang. "United States Patent 9556308 B1 Dithiolane Carbonate Monomers and Polymers Thereof", Leland Stanford Junior University, Jan 31, 2017

- Christina Cooley, James Hedrick, Matthew Kiesewetter, Fredrik Nederberg, Robert M. Waymouth, Paul A. Wender. "United States Patent 7,939,621 B2 Cyclic carbonate monomers and oligocarbonate molecular transporters", Leland Stanford Junior University, May 10, 2011

## LINKS

- Waymouth Group: <http://waymouthlab.stanford.edu/>

## Teaching

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### COURSES

#### 2018-19

- Chemical Principles I: CHEM 31A (Aut)

#### 2017-18

- Advanced Inorganic Chemistry: CHEM 155, CHEM 255 (Spr)
- Chemical Principles I: CHEM 31A (Aut)

#### 2016-17

- Advanced Inorganic Chemistry: CHEM 155, CHEM 255 (Spr)
- Chemical Principles I: CHEM 31A (Aut)

#### 2015-16

- Advanced Inorganic Chemistry: CHEM 155, CHEM 255 (Spr)
- Chemical Principles I: CHEM 31A (Aut)

### STANFORD ADVISEES

#### Doctoral Dissertation Reader (AC)

Yunhao Bai, Zihua Chen, Ethan Crace, Amy Frankhouser, Wakuna Galega, David Hanifi, Chao-I Hung, Holden Lai, Andrew Lankenau, Ziyi Pan, Hannah Rhoda, Jessica Su, Cody Wrasman

#### Postdoctoral Faculty Sponsor

Tim Blake, Trevor Del Castillo, Ralph Lange, Benjamin Matson

#### Doctoral Dissertation Advisor (AC)

Keith Armstrong, Conor Galvin, Caleb Jadrich, Daniel Marron, Rebecca McClellan, Vince Pane, Summer Ramsay-Burrough

#### Postdoctoral Research Mentor

David Walton

## Publications

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### PUBLICATIONS

- **Block copolymer composition drives function of self-assembled nanoparticles for delivery of small-molecule cargo** *JOURNAL OF POLYMER SCIENCE PART A-POLYMER CHEMISTRY*  
Maikawa, C. L., Sevit, A., Lin, B., Wallstrom, R. J., Mann, J. L., Yu, A. C., Waymouth, R. M., Appel, E. A.  
2019; 57 (12): 1322–32
- **Oligo(serine ester) Charge-Altering Releasable Transporters: Organocatalytic Ring-Opening Polymerization and their Use for in Vitro and in Vivo mRNA Delivery** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Benner, N. L., McClellan, R. L., Turlington, C. R., Haabeth, O. W., Waymouth, R. M., Wender, P. A.  
2019; 141 (21): 8416–21

- **Dual catalysis for the copolymerisation of epoxides and lactones.** *Chemical communications (Cambridge, England)*  
Clayman, N. E., Morris, L. S., LaPointe, A. M., Keresztes, I., Waymouth, R. M., Coates, G. W.  
2019
- **Programmable High-Throughput Platform for the Rapid and Scalable Synthesis of Polyester and Polycarbonate Libraries.** *Journal of the American Chemical Society*  
Lin, B., Hedrick, J. L., Park, N. H., Waymouth, R. M.  
2019
- **Effect of Redox Active Ligands on the Electrochemical Properties of Manganese Tricarbonyl Complexes.** *Inorganic chemistry*  
Matson, B. D., McLoughlin, E. A., Armstrong, K. C., Waymouth, R. M., Sarangi, R.  
2019
- **Local Delivery of Ox401, Cd80, and Cd86 mRNA Kindles Global Anticancer Immunity** *CANCER RESEARCH*  
Haabeth, O., Blake, T. R., McKinlay, C. J., Tveita, A. A., Sallets, A., Waymouth, R. M., Wender, P. A., Levy, R.  
2019; 79 (7): 1624–34
- **X-ray Absorption Spectroscopy and Theoretical Investigation of the Reductive Protonation of Cyclopentadienyl Cobalt Compounds.** *Inorganic chemistry*  
McLoughlin, E. A., Giles, L. J., Waymouth, R. M., Sarangi, R.  
2019
- **Mechanistic Study of Ruthenium-Catalyzed C-H Hydroxylation Reveals an Unexpected Pathway for Catalyst Arrest.** *Journal of the American Chemical Society*  
Mack, J. B., Walker, K. L., Robinson, S. G., Zare, R. N., Sigman, M. S., Waymouth, R. M., Du Bois, J.  
2019
- **Block copolymer composition drives function of self-assembled nanoparticles for delivery of small-molecule cargo.** *Journal of polymer science. Part A, Polymer chemistry*  
Maikawa, C. L., Sevit, A., Lin, B., Wallstrom, R. J., Mann, J. L., Yu, A. C., Waymouth, R. M., Appel, E. A.  
2019; 57 (12): 1322–32
- **Synthesis, Characterization, and Reactivity of Hydroxycyclopentadienyl Cobalt Complexes** *ORGANOMETALLICS*  
Wu, W., Solis-Ibarra, D., Walker, K. L., Waymouth, R. M.  
2018; 37 (19): 3298–3302
- **Protonation of a Cobalt Phenylazopyridine Complex at the Ligand Yields a Proton, Hydride, and Hydrogen Atom Transfer Reagent.** *Journal of the American Chemical Society*  
McLoughlin, E. A., Waldie, K. M., Ramakrishnan, S., Waymouth, R. M.  
2018
- **Carving Out Pores in Redox-Active One-Dimensional Coordination Polymers.** *Angewandte Chemie (International ed. in English)*  
Clayman, N. E., Manuppil, M. A., Umeyama, D., Rudenko, A. E., Karunadasa, H. I., Waymouth, R. M.  
2018
- **mRNA vaccination with charge-altering releasable transporters elicits human T cell responses and cures established tumors in mice.** *Proceedings of the National Academy of Sciences of the United States of America*  
Haabeth, O. A., Blake, T. R., McKinlay, C. J., Waymouth, R. M., Wender, P. A., Levy, R.  
2018
- **Ligand-Induced Reductive Elimination of Ethane from Azopyridine Palladium Dimethyl Complexes.** *Journal of the American Chemical Society*  
Rudenko, A. E., Clayman, N. E., Walker, K. L., Maclaren, J. K., Zimmerman, P. M., Waymouth, R. M.  
2018
- **Functional DNA Delivery Enabled by Lipid-Modified Charge-Altering Releasable Transporters (CARTs)** *BIOMACROMOLECULES*  
Benner, N. L., Near, K. E., Bachmann, M. H., Contag, C. H., Waymouth, R. M., Wender, P. A.  
2018; 19 (7): 2812–24
- **Enhanced mRNA delivery into lymphocytes enabled by lipid-varied libraries of charge-altering releasable transporters.** *Proceedings of the National Academy of Sciences of the United States of America*  
McKinlay, C. J., Benner, N. L., Haabeth, O. A., Waymouth, R. M., Wender, P. A.

2018; 115 (26): E5859–E5866

- **Transfer Hydrogenation of Aldehydes, Allylic Alcohols, Ketones, and Imines Using Molybdenum Cyclopentadienone Complexes** *ORGANOMETALLICS*  
Wu, W., Seki, T., Walker, K. L., Waymouth, R. M.  
2018; 37 (9): 1428–31
- **Catalysis as an Enabling Science for Sustainable Polymers.** *Chemical reviews*  
Zhang, X., Fevre, M., Jones, G. O., Waymouth, R. M.  
2018; 118 (2): 839–85
- **Pd-Catalyzed Aerobic Oxidation Reactions: Strategies To Increase Catalyst Lifetimes** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Ho, W. C., Chung, K., Ingram, A. J., Waymouth, R. M.  
2018; 140 (2): 748–57
- **Biodegradation of polystyrene wastes in yellow mealworms (larvae of *Tenebrio molitor* Linnaeus): Factors affecting biodegradation rates and the ability of polystyrene-fed larvae to complete their life cycle** *CHEMOSPHERE*  
Yang, S., Brandon, A., Flanagan, J., Yang, J., Ning, D., Cai, S., Fan, H., Wang, Z., Ren, J., Benbow, E., Ren, N., Waymouth, R. M., Zhou, et al  
2018; 191: 979–89
- **Delivery of Inorganic Polyphosphate into Cells Using Amphipathic Oligocarbonate Transporters** *ACS Cent. Sci.*  
Fernandes Cunha, G., McKinlay, C., Vargas, J., Jessen, H., Waymouth, R., Wender, P.  
2018
- **Delivery of Inorganic Polyphosphate into Cells Using Amphipathic Oligocarbonate Transporters.** *ACS central science*  
Fernandes-Cunha, G. M., McKinlay, C. J., Vargas, J. R., Jessen, H. J., Waymouth, R. M., Wender, P. A.  
2018; 4 (10): 1394–1402
- **Expanding the range of polyhydroxyalkanoates synthesized by methanotrophic bacteria through the utilization of omega-hydroxyalkanoate co-substrates.** *AMB Express*  
Myung, J., Flanagan, J. C., Waymouth, R. M., Criddle, C. S.  
2017; 7 (1): 118-?
- **Formation of Polymeric Nanocubes by Self-Assembly and Crystallization of Dithiolane-Containing Triblock Copolymers.** *Angewandte Chemie (International ed. in English)*  
Margulis, K., Zhang, X., Joubert, L., Bruening, K., Tassone, C. J., Zare, R. N., Waymouth, R. M.  
2017
- **Recent Progress on the Synthesis of Cyclic Polymers via Ring-Expansion Strategies** *JOURNAL OF POLYMER SCIENCE PART A-POLYMER CHEMISTRY*  
Chang, Y. A., Waymouth, R. M.  
2017; 55 (18): 2892–2902
- **Mechanism of Catalytic Oxidation of Styrenes with Hydrogen Peroxide in the Presence of Cationic Palladium(II) Complexes** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Walker, K. L., Dornan, L. M., Zare, R. N., Waymouth, R. M., Mudoon, M. J.  
2017; 139 (36): 12495–503
- **Cyclopentadienyl Cobalt Complexes as Precatalysts for Electrocatalytic Hydrogen Evolution** *EUROPEAN JOURNAL OF INORGANIC CHEMISTRY*  
Waldie, K. M., Kim, S., Ingram, A. J., Waymouth, R. M.  
2017; 2755–61
- **Multielectron Transfer at Cobalt: Influence of the Phenylazopyridine Ligand** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Waldie, K. M., Ramakrishnan, S., Kim, S., Maclaren, J. K., Chidsey, C. E., Waymouth, R. M.  
2017; 139 (12): 4540–4550
- **1,2-Dithiolane-Derived Dynamic, Covalent Materials: Cooperative Self-Assembly and Reversible Cross-Linking.** *Journal of the American Chemical Society*  
Zhang, X., Waymouth, R. M.  
2017
- **Urea Anions: Simple, Fast, and Selective Catalysts for Ring-Opening Polymerizations** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Lin, B., Waymouth, R. M.  
2017; 139 (4): 1645–1652

- **Charge-altering releasable transporters (CARTs) for the delivery and release of mRNA in living animals** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
McKinlay, C. J., Vargas, J. R., Blake, T. R., Hardy, J. W., Kanada, M., Contag, C. H., Wender, P. A., Waymouth, R. M.  
2017; 114 (4): E448-E456
- **Electrocatalytic Alcohol Oxidation with Ruthenium Transfer Hydrogenation Catalysts** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Waldie, K. M., Flajslik, K. R., McLoughlin, E., Chidsey, C. E., Waymouth, R. M.  
2017; 139 (2): 738-748
- **Fast and selective ring-opening polymerizations by alkoxides and thioureas.** *Nature chemistry*  
Zhang, X., Jones, G. O., Hedrick, J. L., Waymouth, R. M.  
2016; 8 (11): 1047-1053
- **Zwitterionic Ring-Opening Polymerization of N-Substituted Eight-Membered Cyclic Carbonates to Generate Cyclic Poly(carbonate)s** *ACS MACRO LETTERS*  
Chang, Y. A., Rudenko, A. E., Waymouth, R. M.  
2016; 5 (10): 1162-1166
- **Catalytic Carbonylative Spirolactonization of Hydroxycyclopropanols.** *Journal of the American Chemical Society*  
Davis, D. C., Walker, K. L., Hu, C., Zare, R. N., Waymouth, R. M., Dai, M.  
2016; 138 (33): 10693-10699
- **Reversible Electropolymerization of Nickel Complexes Based on Redox-Mediated Ligand Exchange** *CHEMISTRYSELECT*  
Rudenko, A. E., Clayman, N. E., Maclaren, J. K., Waymouth, R. M.  
2016; 1 (13): 3491-3496
- **Selective Catalytic Oxidation of Unprotected Carbohydrates** *ACS CATALYSIS*  
Chung, K., Waymouth, R. M.  
2016; 6 (7): 4653-4659
- **Poly(hydroxyalkanoate)s from Waste Biomass: A Combined Chemical-Biological Approach** *CHEMISTRYSELECT*  
Flanagan, J. C., Myung, J., Criddle, C. S., Waymouth, R. M.  
2016; 1 (10): 2327-2331
- **Methane or methanol-oxidation dependent synthesis of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) by obligate type II methanotrophs** *PROCESS BIOCHEMISTRY*  
Myung, J., Flanagan, J. C., Waymouth, R. M., Criddle, C. S.  
2016; 51 (5): 561-567
- **Cell-Penetrating, Guanidinium-Rich Oligophosphoesters: Effective and Versatile Molecular Transporters for Drug and Probe Delivery** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
McKinlay, C. J., Waymouth, R. M., Wender, P. A.  
2016; 138 (10): 3510-3517
- **Experimental and Theoretical Study of CO<sub>2</sub> Insertion into Ruthenium Hydride Complexes.** *Inorganic chemistry*  
Ramakrishnan, S., Waldie, K. M., Warnke, I., De Crisci, A. G., Batista, V. S., Waymouth, R. M., Chidsey, C. E.  
2016; 55 (4): 1623-1632
- **Bioorthogonal Catalysis: A General Method To Evaluate Metal Catalyzed Reactions in Real Time in Living Systems Using a Cellular Luciferase Reporter System** *BIOCONJUGATE CHEMISTRY*  
Hsu, H., Trantow, B. M., Waymouth, R. M., Wender, P. A.  
2016; 27 (2): 376-382
- **Electrooxidation of Alcohols with Electrode-Supported Transfer Hydrogenation Catalysts** *ACS CATALYSIS*  
Buonaiuto, M., De Crisci, A. G., Jaramillo, T. F., Waymouth, R. M.  
2015; 5 (12): 7343-7349
- **A Simple and Facile Approach to Aliphatic N-Substituted Functional Eight-Membered Cyclic Carbonates and Their Organocatalytic Polymerization** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Venkataraman, S., Ng, V. W., Coady, D. J., Horn, H. W., Jones, G. O., Fung, T. S., Sardon, H., Waymouth, R. M., Hedrick, J. L., Yang, Y. Y.

2015; 137 (43): 13851-13860

- **Catalytic Role of Multinuclear Palladium-Oxygen Intermediates in Aerobic Oxidation Followed by Hydrogen Peroxide Disproportionation** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Ingram, A. J., Walker, K. L., Zare, R. N., Waymouth, R. M.  
2015; 137 (42): 13632-13646
- **Catalytic Dimerization of Crotonates** *ACS CATALYSIS*  
Flanagan, J. C., Kang, E. J., Strong, N. I., Waymouth, R. M.  
2015; 5 (9): 5328-5332
- **Cyclopropanimine Superbases: Competitive Initiation Processes in Lactide Polymerization** *ACS MACRO LETTERS*  
Stukenbroeker, T. S., Bandar, J. S., Zhang, X., Lambert, T. H., Waymouth, R. M.  
2015; 4 (8): 853-856
- **Structurally Dynamic Hydrogels Derived from 1,2-Dithiolanes** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Barcan, G. A., Zhang, X., Waymouth, R. M.  
2015; 137 (17): 5650-5653
- **N-Heterocyclic Carbene-Catalyzed Ring Opening Polymerization of  $\epsilon$ -Caprolactone with and without Alcohol Initiators: Insights from Theory and Experiment.** *journal of physical chemistry. B*  
Jones, G. O., Chang, Y. A., Horn, H. W., Acharya, A. K., Rice, J. E., Hedrick, J. L., Waymouth, R. M.  
2015; 119 (17): 5728-5737
- **Organocatalytic Ring-Opening Polymerization of Trimethylene Carbonate To Yield a Biodegradable Polycarbonate** *JOURNAL OF CHEMICAL EDUCATION*  
Chan, J. M., Zhang, X., Brennan, M. K., Sardon, H., Engler, A. C., Fox, C. H., Frank, C. W., Waymouth, R. M., Hedrick, J. L.  
2015; 92 (4): 708-713
- **Ion pairing effects in the zwitterionic ring opening polymerization of delta-valerolactone** *POLYMER CHEMISTRY*  
Chang, Y. A., Waymouth, R. M.  
2015; 6 (29): 5212-5218
- **Synthesis and Topological Trapping of Cyclic Poly(alkylene phosphates)** *MACROMOLECULES*  
Stukenbroeker, T. S., Solis-Ibarra, D., Waymouth, R. M.  
2014; 47 (23): 8224-8230
- **Disassembly and reassembly of polyhydroxyalkanoates: Recycling through abiotic depolymerization and biotic repolymerization** *BIORESOURCE TECHNOLOGY*  
Myung, J., Strong, N. I., Galega, W. M., Sundstrom, E. R., Flanagan, J. C., Woo, S., Waymouth, R. M., Criddle, C. S.  
2014; 170: 167-174
- **Zwitterionic Ring Opening Polymerization with Isothioureas** *ACS MACRO LETTERS*  
Zhang, X., Waymouth, R. M.  
2014; 3 (10): 1024-1028
- **Organocatalytic Ring-Opening Polymerization of Morpholinones: New Strategies to Functionalized Polyesters** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Blake, T. R., Waymouth, R. M.  
2014; 136 (26): 9252-9255
- **Experimental and Computational Studies on the Mechanism of Zwitterionic Ring-Opening Polymerization of delta-Valerolactone with N-Heterocyclic Carbenes** *JOURNAL OF PHYSICAL CHEMISTRY B*  
Acharya, A. K., Chang, Y. A., Jones, G. O., Rice, J. E., Hedrick, J. L., Horn, H. W., Waymouth, R. M.  
2014; 118 (24): 6553-6560
- **Trinuclear  $pd_3 o_2$  intermediate in aerobic oxidation catalysis.** *Angewandte Chemie (International ed. in English)*  
Ingram, A. J., Solis-Ibarra, D., Zare, R. N., Waymouth, R. M.  
2014; 53 (22): 5648-5652
- **Zwitterionic Ring-Opening Polymerization: Models for Kinetics of Cyclic Poly(caprolactone) Synthesis** *MACROMOLECULES*

- Brown, H. A., Xiong, S., Medvedev, G. A., Chang, Y. A., Abu-Omar, M. M., Caruthers, J. M., Waymouth, R. M.  
2014; 47 (9): 2955-2963
- **Titanium Bis(amidates) Bearing Electron Donating Pendant Arms as Catalysts for Stereospecific Polymerization of Propylene** *ORGANOMETALLICS*  
Elkin, T., Botoshansky, M., Waymouth, R. M., Eisen, M. S.  
2014; 33 (4): 840-843
  - **Zwitterionic Polymerization to Generate High Molecular Weight Cyclic Poly(Carbosiloxane)s** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Brown, H. A., Chang, Y. A., Waymouth, R. M.  
2013; 135 (50): 18738-18741
  - **Zwitterionic Ring-Opening Polymerization for the Synthesis of High Molecular Weight Cyclic Polymers** *ACCOUNTS OF CHEMICAL RESEARCH*  
Brown, H. A., Waymouth, R. M.  
2013; 46 (11): 2585-2596
  - **A Renewable Lignin-Lactide Copolymer and Application in Biobased Composites** *ACS SUSTAINABLE CHEMISTRY & ENGINEERING*  
Chung, Y., Olsson, J. V., Li, R. J., Frank, C. W., Waymouth, R. M., Billington, S. L., Sattely, E. S.  
2013; 1 (10): 1231-1238
  - **Electrooxidation of alcohols catalyzed by amino alcohol ligated ruthenium complexes.** *Journal of the American Chemical Society*  
Brownell, K. R., McCrory, C. C., Chidsey, C. E., Perry, R. H., Zare, R. N., Waymouth, R. M.  
2013; 135 (38): 14299-14305
  - **Chemoselective Pd-catalyzed oxidation of polyols: synthetic scope and mechanistic studies.** *Journal of the American Chemical Society*  
Chung, K., Banik, S. M., De Crisci, A. G., Pearson, D. M., Blake, T. R., Olsson, J. V., Ingram, A. J., Zare, R. N., Waymouth, R. M.  
2013; 135 (20): 7593-7602
  - **Octahedral Group IV Bis(phenolate) Catalysts for 1-Hexene Homopolymerization and Ethylene/1-Hexene Copolymerization** *MACROMOLECULES*  
Kiesewetter, E. T., Waymouth, R. M.  
2013; 46 (7): 2569-2575
  - **Chemoselective Oxidation of Polyols with Chiral Palladium Catalysts** *ORGANOMETALLICS*  
De Crisci, A. G., Chung, K., Oliver, A. G., Solis-Ibarra, D., Waymouth, R. M.  
2013; 32 (7): 2257-2266
  - **Polymerizing Base Sensitive Cyclic Carbonates Using Acid Catalysis** *ACS MACRO LETTERS*  
Coady, D. J., Horn, H. W., Jones, G. O., Sardon, H., Engler, A. C., Waymouth, R. M., Rice, J. E., Yang, Y. Y., Hedrick, J. L.  
2013; 2 (4): 306-312
  - **Semicrystalline Dihydroxyacetone Copolymers Derived from Glycerol** *MACROMOLECULES*  
Simon, J., Olsson, J. V., Kim, H., Tenney, I. F., Waymouth, R. M.  
2012; 45 (23): 9275-9281
  - **Amidine-Mediated Zwitterionic Polymerization of Lactide** *ACS MACRO LETTERS*  
Brown, H. A., De Crisci, A. G., Hedrick, J. L., Waymouth, R. M.  
2012; 1 (9): 1113-1115
  - **Designed guanidinium-rich amphipathic oligocarbonate molecular transporters complex, deliver and release siRNA in cells** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Geihe, E. I., Cooley, C. B., Simon, J. R., Kiesewetter, M. K., Edward, J. A., Hickerson, R. P., Kaspar, R. L., Hedrick, J. L., Waymouth, R. M., Wender, P. A.  
2012; 109 (33): 13171-13176
  - **Organocatalytic Synthesis of Quinine-Functionalized Poly(carbonate)s** *BIOMACROMOLECULES*  
Edward, J. A., Kiesewetter, M. K., Kim, H., Flanagan, J. C., Hedrick, J. L., Waymouth, R. M.  
2012; 13 (8): 2483-2489
  - **Facile Synthesis of Functionalized Lactones and Organocatalytic Ring-Opening Polymerization** *ACS MACRO LETTERS*  
Kim, H., Olsson, J. V., Hedrick, J. L., Waymouth, R. M.  
2012; 1 (7): 845-847



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## **PRESENTATIONS**

- IBM Smarter Planet Blog: Meet Robert Waymouth - IBM (December 12, 2012)
- GCEP Symposium, Synthetic Fuels Technical Talk: Molecular Designs for Electrocatalysis - Stanford Percourt Institute for Energy (October 14, 2014)