Michael F. Cunningham

Professor, Queen's University
P. Eng, FCIC, FCAE, FEIC

Department of Chemical Engineering (Cross appointed with Department of Chemistry),
Queen's University, 19 Division Street, Kingston,
Ontario, K7L 3N6, Canada. Telephone: 613-583-3994,
email: michael.cunningham@queensu.ca

Current position

2004 – present — Full Professor, Queen's University, Kingston, Ontario, Canada

Past Employment

April 1996 – May 2004 — Associate Professor, Queen's University, Kingston, Ontario, Canada

September 1990 – September 1996 — Member of Research Staff, Xerox Research Centre of Canada

Education

1987-1990
Ph.D. Chemical Engineering, University of Waterloo

1985-1987
M.Sc. Chemical Engineering, Queen's University

1981-1985
B.Sc. Engineering Chemistry with First Class Honours, Queen's University
(Graduated 1st in Engineering Chemistry)

Honours and Awards

- Macromolecular Science and Engineering Award, Chemical Institute of Canada, 2022
- Professional Engineers Ontario Research and Development Medal, 2021
- Queen's University Prize for Excellence in Research (highest form of excellence recognition from Queen's), 2020
- Fellow of the Canadian Academy of Engineering, 2020
- Fellow of the Engineering Institute of Canada, 2020
- 125th Anniversary Queen's Engineering Excellence Faculty Award Queen's, 2019
- Natural Sciences and Engineering Research Council of Canada (NSERC) Brockhouse Canada Prize for Interdisciplinary Research in Science and Engineering $250,000) (with colleagues Champagne, Jessop, Mabee), 2019
- Canadian Green Chemistry and Engineering Award, Chemical Institute of Canada, 2018
- Invited by Royal Society of Chemistry to co-author book on "Carbon Dioxide Switchable Materials"
- Fellow of the Chemical Institute of Canada, 2017
- Ontario Research Chair in Green Chemistry and Engineering, 2010 – 2015 ($1.25 M CDN)
- Visiting Professor, Global Centers of Excellence, Kyoto University, Japan, 2014
- Syncrude Canada Innovation Award, 2002. Presented by Canadian Society for Chemical

- Engineering (CSChE) (awarded to a resident of Canada who has made a distinguished contribution in the field of Chemical Engineering and is under 40 years).
- Premier's Research Excellence Award, 2001 ($100,000, awarded by the Premier of Ontario)
- Chancellor's Award for Research Excellence, Queen's University, 2002 ($50,000)

Professional Memberships

Professional Engineers of Ontario, Chemical Institute of Canada, Canadian Society for Chemical Engineering, American Chemical Society

Research Collaborations

Prof. Cunningham has had several international collaborations and visitors to his laboratory from the Netherlands, Switzerland, France, Germany, Japan, Mexico, Brazil, and Argentina. Collaborators include: Kyoto University (Japan), CNRS/University of Lyon I (France), Montpellier University (France), Swiss Federal Institute of Technology (ETH), Max Planck Institute for Colloids and Surfaces (Germany), Technical University of Eindhoven (Netherlands), Federal University of Rio de Janeiro (Brazil), BASF USA, BASF Germany, Ecosynthetix (Canada), Anomera Inc. (Canada), FPInnovations (Canada), Woodbridge Foam (Canada), Xerox Research Centre of Canada, University of Toronto, Arkema Group USA, Asahi-Kasei Chemical (Japan), Toagosei Chemical (Japan), Rhodia Operations/Solvay (France), Cabot Corporation (USA) and British Columbia Research Institute (BCRI) (Canada).

Citations and Impact Factors

- >230 publications in refereed journals; 32 patents or patent applications.
- Average number of citations for journal articles is 31 per article (Web of Science).
- Total citations >7700 (Web of Science); >10500 (Google Scholar).
- *h*-index (Hirsch index) from Web of Science is 42; from Google Scholar is 49.
- *i*-10 index is 186 (Google Scholar) (i.e. number of publications with at least 10 citations).
- 7 Featured Cover Articles

Publications

Manuscripts Accepted or Submitted for Publication

1. Abbasi, Raz; Jessop, Philip G.; Cunningham, Michael F. Crosslinking CO_2-Switchable Polymers for Paints and Coatings Applications, *RSC Applied Polymers* (2023), under revision.
2. Movafagh, Maryam; Meek, Kelly M.; Bayat, Parisa; Cranston, Emily D.; Cunningham, Michael F.; Champagne, Pascale; Morse, Timothy; Kiriakou, Michael; George, Sean; Dubé, Marc A. Improved Pressure-Sensitive Adhesive Performance Using Carboxylated Cellulose Nanocrystals via Blending, *Polymer Engineering and Science* (2023), under revision.
3. Ramezani, Maedeh; Ellis, Sarah; Riabtseva, Anna; Cunningham, Michael F.; Jessop, Philip G. CO_2-responsive Low Molecular Weight Polymer with High Osmotic pressure as a Draw Solute for Forward Osmosis, *ACS Omega* (2023) Manuscript ID: ao-2023-07644p, under revision.
4. Antoniw, Julia; Gabriel, Vida; Kiriakou, Michael; Dubé, Marc; Cunningham, Michael F.; Cranston, Emily, Influence of Cellulose Nanocrystal Surface Chemistry and Dispersion

Quality on Latex Nanocomposite Stability, Film Formation and Adhesive Properties, *RSC Applied Polymers* (2023), under review.

Manuscripts Published in Peer-reviewed Journals

239. Pirman, Tomaž; Sanders, Connor A.; Jasiukaitytė Grojzdek, Edita; Lazić, Valerija; Ocepek, Martin; Cunningham, Michael F.; Likozar, Blaž; Hutchinson, Robin A. Free-Radical Homopolymerization Kinetics of Biobased Dibutyl Itaconate, *ACS Applied Polymer Materials* (2023) https://doi.org/10.1021/acsapm.3c01708.
238. Cunningham, Michael F.; Jessop, Philip G. CO_2-Switchable colloids, *Chemical Communications* (2023) DOI: 10.1039/D3CC03929C. **[Invited Perspective]**
237. Zeinali, Elnaz; Marien, Yoshi W.; George, Sean R.; Cunningham, Michael F.; D'hooge, Dagmar R.; Van Steenberge, Paul H. M.; How phase transfer increases the number of kinetic regimes from three to seven in nitroxide mediated polymerization of n-butyl acrylate in aqueous miniemulsion, *Chemical Engineering Journal* (2023) 470, 144162. DOI10.1016/j.cej.2023.144162
236. Jansen-van Vuuren, Ross; Naficy, Sina; Ramezani, Maedeh; Cunningham, Michael; Jessop, Philip, CO_2-responsive gels, *Chemical Society Reviews* (2023) 52, 10, 3470-3542. DOI:10.1039/d2cs00053a
235. Ezenwajiaku, Ikenna H.; Sanders, Connor A.; George, Sean R.; Cunningham, Michael F.; Methacrylic acid-based amphiphilic block-random copolymer stabilizers for emulsion polymerization, *Canadian Journal of Chemical Engineering* (2023) 101, 5222-5230. DOI10.1002/cjce.24916 **[Invited manuscript for special issue in memory of Prof. A.E. Hamielec**]
234. Werner, Arthur; Sanders, Connor A.; Smeltzer, Sandra E.; George, Sean R.; Gernandt, Andreas; Reck, Bernd; Cunningham, Michael F.; Block-random copolymer stabilisers for semi-batch emulsion polymerisation, Polymer Chemistry (2023) 14, 15, 1781-1790. DOI:10.1039/d3py00085k
233. Smeltzer, Sandra E.; Sanders, Connor A.; Liu, Yang; George, Sean R.; Amiri, Crispin; Gernandt, Andreas; Reck, Bernd; Cunningham, Michael F.; Amphiphilic Block-Random Copolymers: Shedding Light on Aqueous Self-Assembly Behavior, *Macromolecules* (2023) 56, 4, 1601-1614. DOI:10.1021/acs.macromol.2c02286
232. Madden, McKenzie J.; Ellis, Sarah N.; Riabtseva, Anna; Wilson, Aaron D.; Cunningham, Michael F.; Jessop, Philip G.; Comparison of vapour pressure osmometry, freezing point osmometry and direct membrane osmometry for determining the osmotic pressure of concentrated solutions, *Desalination* (2023) 539, 115946. DOI:10.1016/j.desal.2022.115946
231. George, Sean R.; Sanders, Connor A.; Deeter, Gary A.; Campbell, J. David; Reck, Bernd; Cunningham, Michael F.; Amphiphilic Block-Random Copolymer Stabilizers: A "Seeded-Coagulative" Emulsion Polymerization Mechanism, *Macromolecules* (2022) 55, 13, 5279-5290. https://doi.org/10.1021/acs.macromol.2c00489
230. Cunningham, Michael F.; Jessop, Philip G. Carbon Dioxide Switchable Polymers – Recent Developments and Emerging Applications, Macromolecular Reaction Engineering (2022), 2200031. DOI: 1002/mren.202200031
229. Glasing, Joe; Cazotti, Jaime C.; Fritz, Alexander T.; Szych, Lilian S.; Fakim, Djalal; Smeets, M. B.; Cunningham, Michael F. Starch Nanoparticles as Pickering Emulsifiers in Miniemulsion Polymerization of Styrene, *Canadian Journal of Chemical Engineering*

(2022), 100, 752-766. DOI: 10.1002/cjce.24326 [**Invited manuscript, Special Issue in memory of Prof. K.F. O'Driscoll**]

228. Rigg, Amanda; Champagne, Pascale; Cunningham, Michael F. Polysaccharide Based Nanoparticles as Pickering Emulsifiers in Emulsion Formulations and Heterogeneous Polymerization Systems, *Macromolecular Rapid Communications* (2022) 43, 2100493. DOI: 10.1002/marc.202100493. [**Invited review**]
227. Gabriel, Vida A.; Champagne, Pascale; Cunningham, Michael F.; Dubé, Marc A. In-situ addition of carboxylated cellulose nanocrystals in seeded semi-batch emulsion polymerization, *Canadian Journal of Chemical Engineering* (2022), 100, 767-779. DOI: 10.1002/cjce.24299.
226. Gabriel, Vida A.; Tousignant, Mathieu N.; Wilson, Sean M. W.; Faure, Marie D. M.; Cranston, Emily D.; Cunningham, Michael F.; Lessard, Benoit H. Improving Latex Based Pressure-Sensitive Adhesive Properties Using Carboxylated Cellulose Nanocrystals, *Macromolecular Reaction Engineering* (2022), 2100051, DOI: 10.1002/mren.202100051
225. Jin, Haxia; Jessop, Philip G.; Cunningham, Michael F. CO_2-Switchable PMMA Latexes with Controllable Particle Size Prepared by Surfactant-Free Emulsion Polymerization, *Colloid and Polymer Science* (2022), 300, 375-385. DOI: 10.1007/s00396-022-04953-7.
224. Jiang, Yuhan; Fan, Weijia; Tosaka, Masatoshi; Cunningham, Michael F.; Yamago, Shigeru, Fabrication of Structurally Controlled Poly(n-Butyl Acrylate) Particles by ab-initio Emulsion Organotellurium-Mediated Radical Polymerization. Synthesis of High Molecular Weight Homo and Block Copolymers, *Macromolecules* (2021), 54, 10691-10699. DOI: 10.1021/acs.macromol.1c02037.
223. Torres-Rocha, Olga Lidia; Campbell, Sophie; Woodcock, Nicole; Pinaud, Julien; Lacroix-Desmazes; Champagne, Pascale; Cunningham, Michael F. Non-covalent polymer surface modification of cellulose nanocrystals using block copolymers, *Macromolecular Reaction Engineering* (2021), DOI: 10.1002/mren.202100046.
222. González-Blanco, Roberto; Cunningham, Michael F.; Saldivar-Guerra, Enrique. Copolymerization of Styrene with 2-Ethylhexyl Acrylate and 2-Ethylhexyl Methacrylate by Semibatch Emulsion Polymerization using BlocBuilder®MA as Macroinitiator, *Industrial and Engineering Chemistry* (2021), 60, 16919-16929. DOI: 10.1021/acs.iecr.1c03140.
221. Riabtseva, Anna; Ellis, Sarah N.; Champagne, Pascale; Jessop, Philip G.; Cunningham, Michael F. CO_2-responsive branched polymers for forward osmosis applications: the effect of branching on draw solute properties, *Industrial & Engineering Chemistry Research* (2021), 60, 9807-9816, DOI: 10.1021/acs.iecr.1c01335.
220. Cazotti, Jaime C.; Garcia-Valdez, Omar; Smeets, Niels M.B.; Dubé, Marc A.; Cunningham, Michael F. Grafting pH-responsive copolymers to cold water-soluble starch using nitroxide-mediated polymerization, *Macromolecular Reaction Engineering*, (2021), 15, 2100011, DOI: 10.1002/mren.202100011.
219. Garcia-Valdez, Omar; Champagne, Pascale; Cunningham, Michael F. Perspective on the controlled polymer-modification of chitosan and cellulose nanocrystals: Towards the design of functional materials, *Canadian Journal of Chemical Engineering* (2021), 99, 2087-2104, DOI: 10.1002/cjce.24156.
218. Ellis, Sarah N.; Cunningham, Michael F.; Jessop, Philip G. A forward osmosis hydrogel draw agent that responds to both heat and CO_2, *Desalination* (2021), 510, 115074, DOI: 10.1016/j.desal.2021.115074.
217. Gonzalez-Blanco, Roberto; Jimenez-Reyes, Nelson; Cunningham, Michael F.; Saldivar-

Guerra, Enrique. High Solids Hydroxy-TEMPO Mediated Radical Semibatch Emulsion Polymerization of Styrene, *Macromolecular Reaction Engineering* (2021), 15, 2000054, DOI: 10.1002/mren.202000054.

216. Jansen-van Vuuren, Ross D.; Drechsler Vilela, Guilherme; Ramezani, Maedeh; Gilbert, Peter H.; Watson, Danika; Mullins, Nathan; Lucas, Allen K.; Giacomin, Alan Jeffrey; Cunningham, Michael F.; Jessop, Philip G. CO_2-Responsive Superabsorbent Hydrogels Capable of >90% Dewatering When Immersed in Water, ACS Applied Polymer Materials (2021), 3, 2153-2165, DOI: 10.1021/acsapm.1c00136.
215. Cazotti, Jaime C.; Fritz, Alexander T.; Garcia-Valdez, Omar; Smeets, Niels M. B.; Dubé, Marc A.; Cunningham, Michael F. Graft Modification of Starch Nanoparticles Using Nitroxide-Mediated Polymerization and the “Grafting to” Approach, *Biomacromolecules* (2020), 11, 4492-4501, DOI: 10.1021/acs.biomac.0c00462.
214. Arredondo, Joaquin; Woodcock, Nicole M.; Garcia-Valdez, Omar; Jessop, Philip G.; Champagne, Pascale; Cunningham, Michael F. Surface modification of cellulose nanocrystals via RAFT polymerization of CO_2-responsive monomers – tuning hydrophobicity, *Langmuir* (2020), 36, 13989-13997, DOI: 10.1021/acs.langmuir.0c02509.
213. Cazotti, Jaime C.; Fritz, Alexander T.; Garcia-Valdez, Omar; Smeets, Niels M. B.; Dubé, Marc A.; Cunningham, Michael F. Graft modification of starch nanoparticles with pH-responsive polymers via nitroxide-mediated polymerization, *Journal of Polymer Science* (2020), 58, 2211-2220, DOI: 10.1002/pol.20200337.
212. Solimando, Xavier; Champagne, Pascale; Cunningham, Michael F. Synthesis of Biohybrid Particles by Modification of Chitosan Beads via RAFT Polymerization in Dispersed Media, *Macromolecular Reaction Engineering* (2020), 2000029, DOI: 10.1002/mren.202000029.
211. Cazotti, Jaime C.; Smeltzer, Sandra E.; Smeets, Niels M. B.; Dubé, Marc A.; Cunningham, Michael F. Starch nanoparticles modified with styrene oxide and their use as Pickering stabilizers, *Polymer Chemistry* (2020), 11, 2653-2665, DOI: 10.1039/d0py00036a.
210. Su, Xin; Jiang, Yuting; Jessop, Philip G.; Cunningham, Michael F.; Feng, Yujun. Photoinitiated TERP Emulsion Polymerization: A New Member of the Large Family of Preparation Approaches for CO_2-Switchable Latexes, *Macromolecules* (2020), 53, 6018-6023, DOI: 10.1021/acs.macromol.0c00616.
209. Salimando, Xavier; Kennedy, Emily; David, Ghislain; Champagne, Pascale; Cunningham, Michael F. Phosphorus-containing polymers synthesised via nitroxide-mediated polymerisation and their grafting on chitosan by *grafting to* and *grafting from* approaches, *Polymer Chemistry* (2020), 11, 4133-4142,

    DOI: https://doi.org/10.1039/D0PY00517G.
208. Fritz, Alexander T.; Cazotti, Jamie C.; Garcia-Valdez, Omar; Smeets, Niels M. B.; Dubé, Marc A.; Cunningham, Michael F. Graft modification of cold water-soluble starch via nitroxide-mediated polymerisation, *Polymer Chemistry* (2020), 11, 4180-4191, DOI: https://doi.org/10.1039/D0PY00239A.
207. Liu, Hanbin; Yuan, Xilong; Ho, Jaddie; Cunningham, Michael F.; Oleschuk, Richard D.; Jessop, Philip G. CO_2-Switchable Surface on Aluminium, *Applied Surface Science* (2020), 525, 146630, DOI: https://doi.org/10.1016/j.apsusc.2020.146630.
206. Glasing, Joe; Jessop, Philip G.; Champagne, Pascale, Hamad, Wadood Y.; Cunningham, Michael F. Microsuspension Polymerization of Styrene Using Cellulose Nanocrystals as

Pickering Emulsifiers: On the Evolution of Latex Particles, *Langmuir* (2020), 36 (3), 796-809, DOI: https://doi.org/10.1021/acs.langmuir.9b03583.

205. Cazotti, Jamie C.; Fritz, Alexander T.; Garcia-Valdez, Omar; Smeets, Niels M. B.; Dubé, Marc A.; Cunningham, Michael F. Graft Modification of Starch Nanoparticles using Nitroxide-Mediated Polymerization and the Grafting from Approach, *Carbohydrate Polymers* (2020), 115384, DOI: 10.1016/j.carbpol.2019.115384.
204. Lazar, Simone; Garcia-Valdez, Omar; Kennedy, Emily; Champagne, Pascale; Cunningham, Michael F.; Grunlan, Jaime C. Crosslinkable Chitosan Enabled Moisture-Resistant Multilayer Gas Barrier Thin Film, *Macromolecular Rapid Communications* (2019), 40, 6, 1800853, DOI: https://doi.org/10.1002/marc.201800853.
203. Cunningham, Michael F.; Jessop, Philip G. Carbon Dioxide-Switchable Polymers: Where Are the Future Opportunities?, *Macromolecules* (2019), 52, 6801-6816, DOI: https://doi.org/10.1021/acs.macromol.9b00914. **[Invited Perspective]**
202. Ellis, Sarah N.; Riabtseva, Anna; Dykeman, Ryan R.; Hargreaves, Sam; Robert, Tobias; Champagne, Pascale; Cunningham, Michael F.; Jessop, Philip G. Nitrogen Rich CO_2-Responsive Polymers as Forward Osmosis Draw Solutes, *Industrial & Engineering Chemistry Research* (2019), 58, 50, 22579-22586.
201. Su, Xin; Jessop, Philip G.; Cunningham, Michael F. Versatility of Organocatalyzed Atom Transfer Radical Polymerization and CO_2-Switching for Preparing Both Hydrophobic and Hydrophilic Polymers with the Recycling of a Photocatalyst, *Macromolecules* (2019), 52, 17, 6725-6733.
200. Cunningham, Michael F.; Campbell, J. David; Fu, Zhenwu; Bohling, James; Leroux, J. Gary; Mabee, Warren; Robert, Tobias. Future green chemistry and sustainability needs in polymeric coatings, *Green Chemistry* (2019), 21, 4919-4926. **[Invited Perspective]**
199. Zhang, Yujie, Cunningham, Michael F., Dubé, Marc A., Modification of Adhesive and Latex Properties for Starch Nanoparticle-Based Pressure Sensitive Adhesives, *Macromolecular Reaction Engineering* (2019), 1900023, DOI: 10.1002/mren.201900023
198. Torres-Rocha, Olga L.; Wu, Xiawei; Zhu, Chunyang; Crudden, Cathleen M.; Cunningham, Michael F. Synthesis of Diblock and Triblock Polymers from Cyclooctadiene and Norbornene Via ROMP in Miniemulsion, *Macromolecular Rapid Communications* (2019), 40, 1900087, DOI: 10.1002/marc.201900087
197. Sanders, Connor A.; George, Sean R.; Deeter, Gary A.; Campbell, J. D.; Reck, Bernd; Cunningham, Michael F. Amphiphilic Block-Random Copolymers: Self-Folding Behavior and Stabilizer in Emulsion Polymerization, *Macromolecules* (2019), 52, 4510-4519.
196. Arredondo, Joaquin; Champagne, Pascale; Cunningham, Michael F. RAFT-mediated polymerisation of dialkylaminoethyl methacrylates in tert-butanol, *Polymer Chemistry* (2019), 10, 1938-1946.
195. Giudici, Reinaldo; Espinola, Magda; Cunningham, Michael. Preparation of thermochromic films from latexes made by miniemulsion polymerization, *Macromolecular Reaction Engineering* (2019), 13, 1900009, DOI: 10.1002/mren.201900009.
194. Cazotti, Jaime C.; Fritz, Alexander T.; Garcia-Valdez, Omar; Smeets, Niels M. B.; Dube, Marc A.; Cunningham, Michael F. Grafting from Starch Nanoparticles with Synthetic Polymers via Nitroxide-mediated Polymerization, *Macromolecular Rapid Communications* (2019), 10, 1800834. [**Invited manuscript**]
193. Cummings, Shidan; Zhang, Yujie; Smeets, Niels; Cunningham, Michael; Dubé, Marc A. On the Use of Starch in Emulsion Polymerizations, *Processes* (2019), 7, 140, DOI:

10.3390/pr7030140.

192. Zhang, Yujie; Cunningham, Michael F.; Smeets, Niels M.B.; Dubé, Marc A. Increasing Starch Nanoparticle Content in Emulsion Polymer Latexes, *Industrial & Engineering Chemistry Research* (2019), DOI: 10.1021/acs.iecr.9b00332.

191. Hu, Jing; Sanders, Connor; Mekala, Shekar; Chen, Tzu-Yin; Cunningham, Michael F.; Gross, Richard A. A Zwitterionic Polymerizable Surfactant from omega-Hydroxyl Tetradecanoic Acid Provides Stimuli Responsive Behavior, *Macromolecules* (2019), 52, 1517 – 1525.

190. Bultz, Elijah; Ouchi, Makoto; Sawamoto, Mitsuo; Cunningham, Michael F. Smart catalysis with thermoresponsive ruthenium catalysts for miniemulsion living radical polymerization cocatalyzed by smart iron cocatalysts, *Journal of Polymer Science, Polymer Chemistry Edition (Part A),* (2019) 57, 305-312. [**Invited manuscript**]

189. Torres-Rocha, Olga Lidia; Wu, Xiaowei; Zhu, Chunyang; Crudden, Cathleen M.; Cunningham, Michael F. Polymerization-induced self-assembly (PISA) of 1,5-Cyclooctadiene Using Ring Opening Metathesis Polymerization, *Macromolecular Rapid Communications* (2019), 40, 1800326.

188. Zhu, Chunyang; Wu, Xiaowei; Zenkina, Olena; Zamora, Matthew T.; Moffat, Karen; Crudden, Cathleen M.; Cunningham, Michael F. Ring opening metathesis polymerization in miniemulsion using a TEGylated ruthenium-based metathesis catalyst, *Macromolecules* (2018), 51, 9088-9096.

187. Cummings, Shidan; Trevino, Esther; Zhang, Yujie; Cunningham, Michael; Dubé, Marc A. Incorporation of Modified Regenerated Starch Nanoparticles in Emulsion Polymer Latexes, *Starch* (2018), https://doi.org/10.1002/star.201800192

186. Su, Xin; Jessop, Philip G.; Cunningham, Michael F. ATRP Catalyst Removal and Ligand Recycling Using CO_2-Switchable Materials, *Macromolecules* (2018), 51, 8156-8164.

185. Darabi, Ali; Shirin-Abadi, Abbas Rezaee; Avar, Sajad; Jessop, Philip; Cunningham, Michael. Surfactant-Free Emulsion Copolymerization of Styrene and Methyl Methacrylate for Preparation of Water-Redispersible Polymeric Powders, *Journal of Polymer Science Part A: Polymer Chemistry* (2018), 56, 2376–2381.

184. Glasing Joe; Jessop, Philip G.; Champagne, Pascale; Cunningham, Michael F. Graft-modified cellulose nanocrystals as CO_2-switchable Pickering emulsifiers, *Polymer Chemistry* (2018), 9, 3864-3872.

183. Shirin-Abadi, Abbas Rezaee; Gorji, Mohsen; Rezaee, Saeid; Jessop, Philip G.; Cunningham, Michael F. CO_2-switchable-hydrophilicity membrane (CO_2-SHM) triggered by electric potential: faster switching time along with efficient oil/water separation, *Chemical Communications* (2018), 54, 8478-8481.

182. Yujie, Zhang; Cunningham, Michael F.; Smeets, Niels M. B.; Dube, Marc A. Starch nanoparticle incorporation in latex-based adhesives, *European Polymer Journal* (2018), 106, 128-138.

181. Cummings, Shidan; Cunningham, Michael; Dube, Marc A. The use of amylose-rich starch nanoparticles in emulsion polymerization, *Journal of Applied Polymer Science* (2018), 135, 46485.

180. Ho, Jaddie; Mudraboyina, Bhanu; Spence-Elder, Caroline; Resendes, Rui; Cunningham, Michael F.; Jessop, Philip G. Water-borne coatings that share the mechanism of action of oil-based coatings, *Green Chemistry* (2018), 20, 1899-1905.

179. Fan, Weijia; Tosake, Masatoshi; Yamago, Shigeru; Cunningham, Michael F. Living Ab

Initio Emulsion Polymerization of Methyl Methacrylate in Water Using a Water-Soluble Organotellurium Chain Transfer Agent under Thermal and Photochemical Conditions, *Angewandte Chemie – International Edition* (2018), 57, 962-966.

178. Garcia-Valdez, Omar; Champagne, Pascale; Cunningham, Michael F. Graft modification of natural polysaccharides via reversible deactivation radical polymerization, *Progress in Polymer Science* (2018), 76, 151-173.178. **[Invited manuscript]**
177. Krasznai, Daniel; Champagne Hartley, Rachel; Roy, Hanna M.; Champagne, Pascale; Cunningham, Michael F. Compositional analysis of lignocellulosic biomass: conventional methodologies and future outlook, *Critical Reviews in Biotechnology* (2018), 38, 199-217.
176. Yuan, Xilong; Jessop, Philip; Cunningham, Michael; Oleschuk, Richard. Carbonated water for the separation of carboxylic compounds: a chromatography approach, *Green Chemistry* (2017), 20, 440-448.
175. Madill, Evan; Garcia-Valdez, Omar; Champagne, Pascale; Cunningham, Michael F. CO_2-Responsive Graft Modified Chitosan for Heavy Metal (Nickel) Recovery, *Polymers* (2017), 9, 394.
174. Glasing, Joe; Bouchard, Jean; Jessop, Philip G.; Champagne, Pascale; Cunningham, Michael F. Grafting well-defined CO_2-responsive polymers to cellulose nanocrystals via nitroxide-mediated polymerisation: effect of graft density and molecular weight on dispersion behaviour, *Polymer Chemistry* (2017), 8, 6000-6012.
173. Cano-Valdez, Andrés; Saldívar-Guerra, Enrique; González-Blanco, Roberto; Cunningham, Michael F.; Herrera-Ordóñez, Jorge. Nitroxide Mediated Radical Emulsion Polymerization: Mathematical Modeling, *Macromolecular Symposia* (2017) 374, 1600150
172. Arredondo, Joaquin; Jessop, Philip G.; Champagne, Pascale; Bouchard, Jean; Cunningham, Michael F. Synthesis of CO_2-responsive cellulose nanocrystals by surface-initiated Cu(0)-mediated polymerization, *Green Chemistry* (2017) 19, 4141 – 4152.
171. Garcia-Valdez, Omar; Brescacin, Tiziana; Arredondo, Joaquin; Bouchard, Jean; Jessop, Philip G.; Champagne, Pascale; Cunningham, Michael F. Grafting CO_2-responsive polymers from cellulose nanocrystals *via* nitroxide-mediated polymerization, *Polymer Chemistry* (2017) 8, 4124-4131.
170. Su, Xin; Jessop, Philip G.; Cunningham, Michael F. Preparing Artificial Latexes Using a Switchable Hydrophilicity Solvent, *Green Chemistry* (2017), 19, 1889-1894.
169. Cunningham, Michael F.; Jessop, Philip G.; Darabi, Ali. Stimuli-Responsive Latexes Stabilized by Carbon Dioxide Switchable Groups, *Advances in Polymer Science* (2017), 1-17, Springer, Berlin, Heidelberg, DOI: 10.1007/12_2017_6. **[Invited manuscript]**
168. Tsai, Bryan; Garcia-Valdez, Omar; Champagne, Pascale; Cunningham, Michael F. Poly(Poly(Ethylene Glycol) Methyl Ether Methacrylate) Grafted Chitosan for Dye Removal from Water, *Processes* (2017), 5, 12. **[Invited manuscript]**
167. Darabi, Ali; Cunningham, Michael F. Preparation of Poly(poly(ethylene glycol) methyl ether methacrylate-co-styrene)-b-poly(2-(diethylamino)ethyl methacrylate-co-acrylonitrile) by Nitroxide-Mediated Polymerization in Water, *Polymer* (2017), 115, 255-260.
166. Yuan, Xilong; Kim, E. G.; Sanders, Colin A.; Richter, Bruce E.; Cunningham, Michael F.; Jessop, Philip G.; Oleschuk, Richard D. CO_2-modified Solvents for Chromatographic Separation, *Green Chemistry* (2017), 19, 1757-1765.
165. Darabi, Ali; Glasing, Joe; Jessop, Philip G.; Cunningham, Michael F. Preparation of CO_2-Switchable Latexes Using N-[3-(Dimethylamino)propyl]methacrylamide (DMAPMAm),

Journal of Polymer Science, Part A Polymer Chemistry (2017), 55*,* 1059-1066.

164. George, Sean R.; Champagne-Hartley, Rachel; Deeter, Gary A.; Campbell, J. D.; Reck, Bernd; Urban, Dieter; Cunningham, Michael F. Amphiphilic Block Copolymers as Stabilizers in Emulsion Polymerization: Effects of the Anchoring Block Molecular Weight Dispersity on Stabilization Performance, *Macromolecules* (2017), 50 (1), 315–323.
163. Shirin-Abadi, Abbas Rezaee; Jessop, Philip G.; Cunningham, Michael F. In situ use of aqueous RAFT prepared poly (2-(diethylamino)ethyl methacrylate) as a stabilizer for preparation of CO_2 switchable latexes, *Macromolecular Reaction Engineering* (2016), 11, 1600035.
162. Cunningham, M. F. Editorial for special issue: Controlled radical polymerization in dispersed media. *Polymer* (2016), 106, 159-160.
161. Cunningham, Michael F.; Jessop, Philip G.; Darabi, Ali; Su, Xin. Carbon Dioxide Switchable Polymers and Processes in Polymer Reaction Engineering, *Macromolecular Symposia* (2016), 370, 92-98.
160. Roeder, Ryan D.; Garcia-Valdez, Omar; Whitney, Ralph A.; Champagne, Pascale; Cunningham, Michael F. Graft modification of cellulose nanocrystals via nitroxide-mediated polymerization, *Polymer Chemistry* (2016), 7, 6383-6390.
159. Shibaeva, Oxana; Champagne, Pascale; Cunningham, Michael F. Greener Solvent Systems for Copper Wire Mediated Living Radical Polymerization, *Green Materials* (2016), 4, 104-114.
158. Bultz, Elijah; Ouchi, Makoto; Fujimura, Kojiro; Sawamoto, Mitsuo; Cunningham, Michael F. Ferrocene cocatalysis for ruthenium-catalyzed radical miniemulsion polymerization, *Polymer* (2016), 106, 313-319.
157. Shirin-Abadi, Abbas Rezaee; Darabi, Ali; Jessop, Philip G.; Cunningham, Michael F. Tuning the aggregation and redispersion behavior of CO_2-switchable latexes by a combination of DMAEMA and PDMAEMA-b-PMMA as stabilizing moieties, *Polymer* (2016), 106, 303-312.
156. Su, Xin; Nishizawa, Keita; Bultz, Elijah; Sawamoto, Mitsuo; Ouchi, Makoto; Jessop, Philip G.; Cunningham, Michael F. Living CO_2 Switchable Latexes Prepared Via Emulsion ATRP and AGET Miniemulsion ATRP, *Macromolecules* (2016), 49(17), 6251-6259.
155. Glasing, Joe; Champagne, Pascale; Cunningham, Michael. Graft modification of chitosan, cellulose and alginate using reversible deactivation radical polymerization (RDRP), *Current Opinion in Green and Sustainable Chemistry* (2016), 2, 15-21. **[Invited]**
154. Khakzad, Fahimeh; Mahdavian, Ali Reza; Salimi-Mobarakeh, Hamed; Shirin-Abadi, Abbas Rezaei; Cunningham, Michael F. Redispersible PMMA latex nanoparticles containing spiropyran with photo-, pH- and CO_2- responsivity, *Polymer* (2016), 101, 274-283.
153. Ge, Shijian; Champagne, Pascale; Wang, Hai-Dong; Jessop, Philip G.; Cunningham, Michael F. Microalgae Recovery from Water for Biofuel Production Using CO_2-Switchable Crystalline Nanocellulose, *Environmental Science & Technology* (2016), 50, 7896-7903.
152. Darabi, Ali; Jessop, Philip G.; Cunningham, Michael F. CO_2-responsive polymeric materials: synthesis, self-assembly, and functional applications, *Chemical Society Reviews* (2016), 45, 4391-4436.
151. Cunningham, Michael F.; Jessop, Philip G. An introduction to the principles and fundamentals of CO_2-switchable polymers and polymer colloids, *European Polymer Journal* (2016), 76, 208 – 215. **[Invited manuscript]**

150. Payne, Kevin A.; Debling, Jon; Nesvadba, Peter; Cunningham, Michael F.; Hutchinson, Robin A. NMP of styrene in batch and CSTR at elevated temperatures: Modeling experimental trends, *European Polymer Journal* (2016), 80, 186-199.
149. González-Blanco, Roberto; Cunningham, Michael F.; Saldívar-Guerra, Enrique. High Solids TEMPO Mediated Semibatch Emulsion Polymerization of Styrene, *Journal of Polymer Science: Part A Polymer Chemistry* (2016), 54, 49-62.
148. Kapishon, Vitaliy; Allison, Stephanie; Whitney, Ralph A.; Cunningham, Michael F.; Szewczuk, Myron R; Neufeld, Ronald J. Oseltamivir-conjugated polymeric micelles prepared by RAFT living radical polymerization as a new active tumor targeting drug delivery platform, *Journal of Biomaterials Science Polymer Edition* (2016), 5, 511-521.
147. Boniface, Kyle J.; Wang, Hong-Bo; Dykeman, Ryan R.; Cormier, Alex; Mercer, Sean. M.; Liu, Guojun; Cunningham, Michael F.; Jessop, Philip G. CO_2 switchable drying agents, *Green Chemistry* (2016), 18, 208-213.
146. Darabi, Ali; García-Valdez, Omar; Champagne, Pascale; Cunningham, Michael F. PEGylation of Chitosan Via Nitroxide-Mediated Polymerization in Aqueous Media, *Macromolecular Reaction Engineering* (2016), 10, 82-89.
145. George, Sean; Champagne-Hartley, Rachel; Deeter, Gary; Campbell, Dave; Reck, Bernd; Urban, Dieter; Cunningham, Michael F. Amphiphilic Block Copolymers as Stabilizers in Emulsion Polymerization: Effects of the Stabilizing Block Molecular Weight Dispersity on Stabilization Performance, *Macromolecules* (2015), 48(24), 8913-8920.
144. Zhang, Mingmin; Cunningham, Michael F.; Hutchinson, Robin. Aqueous Copper(0) Mediated Reversible Deactivation Radical Polymerization of 2-Hydroxyethyl Acrylate, *Polymer Chemistry* (2015), 6, 6509-6518.
143. Kapishon, Vitaliy; Cunningham, Michael F.; Whitney, Ralph A.; Champagne, Pascale; Neufeld, Ronald. Polymerization induced self-assembly of alginate based amphiphilic graft copolymers synthesized by single electron transfer living radical polymerization, *Biomacromolecules* (2015), 16, 2040–2048.
142. Wang, Hai-Dong; Bouchard, Jean; Jessop, Philip G.; Champagne, Pascale; Cunningham, Michael F. Cellulose Nanocrystals with CO_2-Switchable Aggregation and Redispersion Properties, *Cellulose* (2015), 22, 3105-3116.
141. Wang, Hai-Dong; Roeder, Ryan; Whitney, Ralph A.; Champagne, Pascale; Cunningham, Michael F. Graft modification of crystalline nanocellulose by Cu(0)-mediated SET living radical polymerization, *Journal of Polymer Science: Part A Polymer Chemistry* (2015), 53, 2800-2808.
140. Bultz, Elijah; Ouchi, Makoto; Nishizawa, Keita; Cunningham, Michael F.; Sawamoto, M. Shuttling Catalyst for Living Radical Miniemulsion Polymerization: Thermoresponsive Ligand for Efficient Catalysis and Removal, *ACS Macro Letters* (2015), 4, 628-631.
139. García-Valdez, Omar; George, Sean; Champagne-Hartley, Rachel; Saldívar-Guerra Enrique; Champagne, Pascale; Cunningham, Michal F. Chitosan Modification via Nitroxide-Mediated Polymerization and grafting to Approach in Homogeneous Media, *Polymer* (2015), 67, 139-147.
138. Darabi, Ali; Jessop, Philip G.; Cunningham, Michael F. One-Pot Synthesis of Poly((diethylamino)ethyl methacrylate-co-styrene)-b-poly(methyl methacrylate-co-styrene) Nanoparticles via Nitroxide-Mediated Polymerization, *Macromolecules* (2015), 48, 1952-1958.
137. Payne, Kevin A.; Nesvadba, Peter; Debling, Jon; Cunningham, Michael F.; Hutchinson,

Robin A. Nitroxide-Mediated Polymerization at Elevated Temperatures, *ACS Macro Letters* (2015), 4, 280–283.

136. Shirin-Abadi, Abbas Rezaee; Darabi, Ali; Jessop Philip G.; Cunningham, Michael F. Preparation of redispersible polymer latexes using cationic stabilizers based on 2-dimethylaminoethyl methacrylate hydrochloride and 2,2'-azobis[2-(2-imidazolin-2-yl)propane]dihydrochloride, *Polymer* (2015), 60, 1-8.
135. García-Valdez, Omar; Champagne-Hartley, Rachel; Saldívar-Guerra, Enrique; Champagne, Pascale; Cunningham, Michael F. Modification of chitosan with polystyrene and poly(n-butyl acrylate) via nitroxide-mediated polymerization and grafting from approach in homogeneous media, *Polymer Chemistry* (2015), 6, 2827-2836.
134. Cunningham, Michael F.; Jessop, Philip G. CO_2-Switchable Materials, *Green Materials* (2014), 2, 53. **[Invited manuscript]**
133. Darabi, Ali; Rezaee Shirin-Abadi, Abbas; Jessop, Philip G.; Cunningham, Michael F. Nitroxide-Mediated Polymerization of 2-(Diethyl)aminoethyl Methacrylate (DEAEMA) in Water, *Macromolecules* (2014), 48, 72-80.
132. Van Steenberge, Paul H. M.; D'hooge, Dagmar R.; Reyniers, Marie-Françoise; Marin, Guy B.; Cunningham, Michael F. 4-Dimensional modeling strategy for an improved understanding of miniemulsion NMP of acrylates initiated by SG1-macroinitiator, *Macromolecules* (2014), 47, 7732-7741.
131. Darabi, Ali; Rezaee Shirin-Abadi, Abbas; Pinaud, Julien; Jessop, Philip G.; Cunningham, Michael F. Nitroxide-mediated surfactant-free emulsion copolymerization of methyl methacrylate and styrene using poly(2-(diethyl)aminoethyl methacrylate-co-styrene) as a stimuli-responsive macroalkoxyamine, *Polymer Chemistry* (2014), 5, 6163-6170.
130. Li, Jennifer; Cunningham, Michael F. Nitroxide-Mediated Microemulsion Polymerization of n-Butyl Acrylate: Decoupling of Target Molecular Weight and Particle Size, *Polymer Chemistry* (2014), 5, 3804 – 3816.
129. Payne, Kevin; Van Steenberge, Paul; D'hooge, Dagmar; Reyniers, Marie-Francoise; Marin, Guy; Hutchinson, Robin; Cunningham, Michael F. Controlled synthesis of poly[(butyl methacrylate)-co-(butyl acrylate)] via activator regenerated by electron transfer atom transfer radical polymerization: insights and improvement, *Polymer International* (2014), 2, 848-857. [Invited Paper for Special Issue]
128. Su, Xin; Jessop, Philip G.; Cunningham, Michael F. Switchable surfactants at the polystyrene-water interface: effect of molecular structure, *Green Materials* (2014), 2, 69-81.
127. Hu, Jing; Jin, Zhennan; Chen, Tzu-Yin; Polley, Jennifer D.; Cunningham, Michael F.; Gross, Richard A. Anionic Polymerizable Surfactants from Biobased omega-Hydroxy Fatty Acids, *Macromolecules* (2014), 47(1), 113–120.
126. Su, Xin; Cunningham, Michael F.; Jessop, Philip G. Use of a Switchable Hydrophobic Associative Polymer to Create an Aqueous Solution of CO_2-switchable viscosity, *Polymer Chemistry* (2014), 5, 940-944.
125. Su, Xin; Fowler, Candace; O'Neill, Catherine; Pinaud, Julien; Kowal, Erica; Jessop, Philip; Cunningham, Michael. Emulsion Polymerization Using Switchable Surfactants: A Route Towards Water Redispersible Latexes, *Macromolecular Symposia* (2013) 333, 93–101.
124. Payne, Kevin A.; D'hooge, Dagmar R.; Van Steenberge, Paul H. M.; Reyniers, Marie-Françoise; Cunningham, Michael F.; Hutchinson, Robin A.; Marin, Guy B. ARGET ATRP of Butyl Methacrylate: Utilizing Kinetic Modeling to Understand Experimental Trends,

Macromolecules (2013), 46(10), 3828−3840.

123. Su, Xin; Cunningham, Michael F.; Jessop, Philip G. Switchable Viscosity Triggered by CO_2 Using Smart Worm-like Micelles, *Chemical Communications* (2013), 49, 2655–2657.
122. Chan, Nicky; Meuldijk, Jan; Cunningham, Michael F.; Hutchinson, Robin A. Continuous ARGET ATRP of Methyl Methacrylate and Butyl Acrylate in a Stirred Tank Reactor, *Industrial & Engineering Chemistry Research* (2013) 52, 11931−11942.
121. Pohn, Jordan; Cunningham, Michael F.; McKenna, Timothy F. L. Scale-Up of Emulsion Polymerization Reactors Part II – Simulations and Interpretations, *Macromolecular Reaction Engineering* (2013) 7, 393–408.
120. Pohn, Jordan; Cunningham, Michael F.; McKenna, Timothy F. L. Scale-Up of Emulsion Polymerization Reactors Part I – Development of a Model Framework, *Macromolecular Reaction Engineering* (2013) 7, 380–392.
119. O'Neill, Catherine; Fowler, Candace; Jessop, Philip G.; Cunningham, Michael F. Redispersing Aggregated Latexes Made with Switchable Surfactants, *Green Materials* (2013) 1, 27–35.
118. Chan, Nick; Cunningham, Michael F.; Hutchinson, Robin A. Copper-mediated controlled radical polymerization in continuous flow processes: Synergy between polymer reaction engineering and innovative chemistry. *Journal of Polymer Science, Part A: Polymer Chemistry* (2013) 51(15), 3081–3096. **[Invited manuscript]**
117. Thomson, Mary E.; Ness, Jason S.; Schmidt, Scott C.; Macy, Noah; McKenna, Timothy F.; Cunningham, Michael F. Particle Nucleation in High Solids Nitroxide Mediated Emulsion Polymerization of n-Butyl Acrylate with a Difunctional Alkoxyamine Initiator, *Polymer Chemistry* (2013), 4, 1803-1814.
116. Su, Xin; Robert, Tobias; Mercer, Sean M.; Humphries, Christine; Cunningham, Michael F.; Jessop, Philip G. A Conventional Surfactant Becomes CO_2 -Responsive in the Presence of Switchable Water Additives, *Chemistry - A European Journal* (2013), 19, 5595-5601.
115. Chan, Nicky; Cunningham, Michael F.; Hutchinson, Robin A. Copper mediated controlled radical polymerization of methyl acrylate in the presence of ascorbic acid in a continuous tubular reactor, *Polymer Chemistry* (2012), 3(5), 1322-1333.
114. FitzPatrick, Michael; Champagne, Pascale; Cunningham, Michael F.; Falkenburger, Charlene. Application of optical microscopy as a screening technique for cellulose and lignin solvent systems, *Canadian Journal of Chemical Engineering* (2012), 90(5), 1142-1152.
113. Pinaud, Julien; Kowal, Erica; Cunningham, Michael F.; Jessop, Philip G. 2-(Diethyl)aminoethyl Methacrylate as a CO_2-Switchable Comonomer for the Preparation of Readily Coagulated and Redispersed Polymer Latexes, *ACS Macro Letters* (2012), 1(9), 1103-1107.
112. Monteiro, Michael J.; Cunningham, Michael F. Polymer Nanoparticles via Living Radical Polymerization in Aqueous Dispersions: Design and Applications, *Macromolecules* (2012), 45(12), 4939-4957. [**Invited Perspective**]
111. Robert, Tobias; Mercer, Sean M.; Clark, Timothy J.; Mariampillai, Brian E.; Champagne, Pascale; Cunningham, Michael F.; Jessop, Philip G. Nitrogen-Containing Polymers as Potent Additives for Aqueous Solutions of Switchable Ionic Strength: Application to Separation of Organic Liquids and Clay Particles from Water. *Green Chemistry* (2012), 14(11), 3053-3062.

110. Fowler, Candace I.; Jessop, Philip G.; Cunningham, Michael F. Aryl Amidine and Tertiary Amine Switchable Surfactants and their Application in the Emulsion Polymerization of Methyl Methacrylate, *Macromolecules* (2012), 45(7), 2955-2962.
109. Su, Xin; Jessop, Philip G.; Cunningham, Michael F. Surfactant-Free Polymerization Forming Switchable Latexes That Can Be Aggregated and Redispersed by CO_2 Removal and then Re-addition, *Macromolecules* (2012), 45(2), 666-670.
108. Payne, K.; Hutchinson, Robin A.; Cunningham, Michael F. ARGET ATRP of BMA and BA: Exploring Limitations at Low Copper Levels, *ACS Symposium Series* (2012), 183-202.
107. Krasznai, Daniel; Champagne, Pascale; Cunningham, Michael F. Quantitative Characterization of Lignocellulosic Biomass Using Surrogate Mixtures and Multivariate Techniques, *Bioresource Technology* (2012), 110, 652-661.
106. Krasznai, Daniel J.; McKenna, Timothy F. L.; Cunningham, Michael F.; Champagne, Pascale; Smeets, Niels M. B. Polysaccharide-stabilized core cross-linked polymer micelle analogues, *Polymer Chemistry* (2012), 3(4), 992-1001.
105. Chan, Nick; Cunningham, Michael F.; Hutchinson, Robin A. Continuous controlled radical polymerization of methyl acrylate with copper wire in a CSTR, *Polymer Chemistry* (2012), 3, 486-497.
104. FitzPatrick, Michael; Champagne, Pascale; Cunningham, Michael F. Quantitative Determination of Cellulose Dissolved in 1-Ethyl-3-Methylimidazolium Acetate Using Partial Least Squares Regression on FT-IR Spectra, *Carbohydrate Polymers* (2012), 87 (2), 1124-1130.
103. FitzPatrick, Michael; Champagne, Pascale; Cunningham, Michael F. The Effect of Sub-Critical Carbon Dioxide on the Dissolution of Cellulose in the Ionic Liquid 1-Ethyl-3 methylimidazolium Acetate, *Cellulose* (2012), 19(1), 37-44.
102. Mihara, Masatoshi; Jessop, Philip; Cunningham, Michael F. Redispersible Polymer Colloids Using Carbon Dioxide as an External Trigger, *Macromolecules* (2011), 44(10), 3688–3693.
101. Thomson, Mary E.; Ness, Jason S.; Schmidt, Scott C.; Cunningham, Michael F. High Solids Nitroxide-Mediated Microemulsion Polymerization of MMA with a Small Amount of Styrene and Synthesis of (MMA-*co*-St)-*block*-(BMA-*co*-St) Polymers, *Macromolecules (2011), 44(6), 1460–1470.*
100. Fowler, Candace I.; Muchemu, Christine M.; Miller, Ricarda E.; Phan, Lam; O'Neill, Catherine, Jessop, Philip G.; Cunningham, Michael F. Emulsion Polymerization of Styrene and Methyl Methacrylate using Cationic Switchable Surfactants, *Macromolecules* (2011), 44(8), 2501–2509.
99. Munro, Andrew; Cunningham, Michael F.; Jerkiewicz, Gregory. Spectral and Physical Properties of Electrochemically Formed Colored Layers on Titanium Covered with Clearcoats, *ACS Applied Materials & Interfaces* (2011), 3(4), 1195–1203.
98. Chan, Nicky; Cunningham, Michael F.; Hutchinson, Robin A. Continuous controlled radical polymerization of methyl acrylate in a copper tubular reactor, *Macromolecular Rapid Communications* (2011), 32(7), 604–609.
97. Pohn, Jordan; Heniche, Mourad; Fradette, Louis; Cunningham, Michael F.; McKenna, Timothy. Computational Analysis of Mixing and Scale-Up in Emulsion Polymerization Reactors, *Macromolecular Symposia* (2011), 302(1), 133–141.
96. Enright, Thomas E.; Keoshkerian, Barkev; Cunningham, Michael F. Residence Time

Distribution Study of a Living/Controlled Radical Miniemulsion Polymerization System in a Continuous Tubular Reactor, *Macromolecular Reaction Engineering* (2011), 5, 431-442. **[Invited manuscript]**

95. El-Jaby, Ula; Cunningham, Michael F.; McKenna, Timothy F.L. Continuous production of miniemulsions using in-line SMX elements, *AIChE J* (2011), 57(6), 1585–1594.
94. Thomson, Mary E.; Manley, Anna-Marie; Ness, Jason S.; Schmidt, Scott C.; Cunningham, Michael F. Nitroxide-Mediated Surfactant-Free Emulsion Polymerization of n-Butyl Methacrylate with a Small Amount of Styrene, *Macromolecules* (2010), 43(19), 7958-7963.
93. FitzPatrick, Michael; Champagne, Pascale; Cunningham, Michael F.; Whitney, Ralph A. A biorefinery processing perspective: Treatment of lignocellulosic materials for the production of value-added products, *Bioresource Technology* (2010), 101, 8915-8922.
92. Chan, Nicky; Cunningham, Michael F.; Hutchinson, Robin A. Reducing ATRP catalyst concentration in batch, semibatch and continuous reactors, *Macromolecular Reaction Engineering* (2010), 4, 369-380.
91. El-Jaby, Ula; Cunningham, Michael F.; McKenna, Timothy F. L. Miniemulsions via in situ Surfactant Generation, *Macromolecular Chemistry and Physics* (2010), 211, 1377-1386.
90. Thomson, Mary E.; Smeets, Niels M. B.; Heuts, Johan P. A.; Meuldijk, Jan; Cunningham, Michael F. Catalytic Chain Transfer Mediated Emulsion Polymerization: Compartmentalization and Its Effects on the Molecular Weight Distribution, *Macromolecules* (2010), 43, 5647-5658.
89. El-Jaby, Ula; Cunningham, Michael F.; McKenna, Timothy F. L. The advantages of in situ surfactant generation for miniemulsions, *Macromolecular Rapid Communications* (2010), 31, 558-562.
88. Enright, Thomas E.; Cunningham, Michael F.; Keoshkerian, Barkev. Nitroxide-mediated bulk and miniemulsion polymerization in a continuous tubular reactor: synthesis of homo-, di- and triblock copolymers, *Macromolecular Reaction Engineering* (2010), 4, 186-196.
87. Munro, Andrew; Cunningham, Michael F.; Jerkiewicz, Gregory. Influence of Clearcoats on the Spectral and Physical Properties of Electrochemically Formed Colored Passive Layers on Zirconium, *ACS Applied Materials & Interfaces* (2010), 2, 854-862.
86. Thomson, Mary E.; Cunningham, Michael F. Compartmentalization Effects on the Rate of Polymerization and the Degree of Control in ATRP Aqueous Dispersed Phase Polymerization, *Macromolecules* (2010), 43, 2772-2779.
85. Pohn, Jordon; Heniche, Mourad; Fradette, Louis; Cunningham, Michael F.; McKenna, Tim. Development of a Computational Framework to Model the Scale-up of High-Solid-Content Polymer Latex Reactors, *Chemical Engineering & Technology* (2010), 33, 1917-1930.
84. Smeets, Niels M.B.; Heuts, Johan P.A.; Meuldijk, Jan; Cunningham, Michael F.; van Herk, Alex M. The Effect of Co(II) Mediated Catalytic Chain Transfer on the Emulsion Polymerization Kinetics of Methyl Methacrylate, *Journal of Polymer Science Part A: Polymer Chemistry* (2009), 47, 5078-5089.
83. Chan, Nicky; Boutti, Salima; Cunningham, Michael F.; Hutchinson, Robin A. Continuous atom transfer radical polymerization with low catalyst concentration in a tubular reactor, *Macromolecular Reaction Engineering* (2009), 3,5, 222-231. **[Featured Cover Article]**
82. El-Jaby, Ula; Farzi, Ghomali; Bourgeat-Lami, Elodie; Cunningham, Michael F.; McKenna, Timothy F.L. Emulsification for Latex Production using Static Mixers, *Macromolecular*

Symposia (2009), 281, 77-84.

81. Smeets, Niels M.B.; Heuts, Johan P.A.; Meuldijk, Jan; Cunningham, Michael F.; van Herk, Alex M. Mass Transport Limitations and their Effect on the Control of the Molecular Weight Distribution in Catalytic Chain Transfer Mediated Emulsion Polymerization, *Macromolecules* (2009), 42, 6422–6428.
80. Smeets, Niels M.B.; Heuts, Johan P.A.; Meuldijk, Jan; Cunningham, Michael F.; van Herk, Alex M. Evidence of Compartmentalization in Catalytic Chain Transfer Mediated Emulsion Polymerization of Methyl Methacrylate, *Macromolecules* (2009), 42, 7332-7341.
79. El-Jaby, Ula; Cunningham, Michael; McKenna, Timothy F.L. Comparison of Emulsification Devices for the Production of Miniemulsions, *Industrial and Engineering Chemistry Research* (2009), 48, 10147-10151.
78. Chan, Nicky; Cunningham, Michael F.; Hutchinson, Robin A. ARGET ATRP of methacrylates and acrylates with stoichiometric ratios of ligand to copper, *Macromolecular Chemistry and Physics* (2008), 209, 1797-1805.
77. Simms, Ryan W.; Cunningham, Michael F. Compartmentalization of Reverse Atom Transfer Radical Polymerization in Miniemulsion, *Macromolecules* (2008) 41, 5148-5155.
76. Cunningham, Michael F. Controlled/Living Radical Polymerization in Aqueous Dispersed Systems, *Progress in Polymer Science* (2008), 33, 365-398. **[Invited review]**
75. El-Jaby, U; Cunningham, Michael F.; Enright, Tom; McKenna, Timothy F. L. Polymerisable Miniemulsions Using Rotor-Stator Homogenisers, *Macromolecular Reaction Engineering* (2008), 2, 350-360.
74. Asteasuain, Mariano; Soares, Matheus; Lenzi, Marcelo K.; Hutchinson, Robin A.; Cunningham, Michael F.; Brandolin, Adriana; Pinto, Jose C.; Sarmoria, Claudia. Living Radical Polymerization in Tubular Reactors, 2 - Process Optimization for Tailor-Made Molecular Weight Distributions, *Macromolecular Reaction Engineering* (2008), 2, 414-421.
73. Simms, Ryan W.; Cunningham, Michael F. High Molecular Weight Poly (butyl methacrylate) via ATRP Miniemulsions, *Macromolecular Symposia* (2008), 261, 32-35.
72. Mueller, Matthias; Cunningham, Michael F.; Hutchinson, Robin A. Continuous Atom Transfer Radical Polymerization in a Tubular Reactor, *Macromolecular Reaction Engineering* (2008), 2, 1, 31-36.
71. Maehata, Hideo; Liu, Xinzhi; Cunningham, Michael F.; Keoshkerian, Barkev. TEMPO-Mediated Emulsion Polymerization, *Macromolecular Rapid Communications* (2008), 29, 479-484.
70. Simms, Ryan W.; Hoidas, Mark D.; Cunningham, Michael F. Nitroxide-Mediated Styrene Surfactant-Free Emulsion Polymerization, *Macromolecules* (2008), 41, 1076-1079.
69. Pohn, Jordan; Buragina, Catherine; Georges, Michael K.; Keoshkerian, Barkev; Cunningham, Michael F. Stable Free Radical Polymerization in Emulsion: Modelling the Thermodynamics of Monomer Transfer Between Droplets and Particles, *Macromolecular Theory and Simulations* (2008), 17, 73-85.
68. Maehata, Hideo; Buragina, Catherine; Cunningham, Michael F. Compartmentalization in TEMPO-Mediated Styrene Miniemulsion Polymerization, *Macromolecules* (2007), 40, 7126-7131.
67. Asteasuain, Mariano; Soares, Matheus; Lenzi, Marcelo K.; Cunningham, Michael F.; Sarmoria, Claudia; Pinto, Jose Carlos; Brandolin, Adriana. Living free radical polymerization in tubular reactors. I. Modeling of the complete molecular weight

distribution using probability generating functions, *Macromolecular Reaction Engineering* (2007), 1(6), 622-634.

66. Schaffer, Mark A.; McAuley, Kim B.; Marchildon, E. Keith; Cunningham, Michael F. Thermal degradation kinetics of nylon 66: experimental study and comparison with model predictions, *Macromolecular Reaction Engineering* (2007), 1(5), 563-577.
65. Fu, Yao; Mirzaei, Ahmad; Cunningham, Michael F.; Hutchinson, Robin A. Atom-transfer radical batch and semibatch polymerization of styrene, *Macromolecular Reaction Engineering* (2007), 1(4), 425-439.
64. El-Jaby, Ula; McKenna, Timothy F. L.; Cunningham, Michael F. Miniemulsification: An Analysis of the Use of Rotor Stators as Emulsification Devices, *Macromolecular Symposia* (2007), 259, 1-9.
63. Fu, Y.; Cunningham, M.F.; Hutchinson, R.A. Semibatch Atom Transfer Radical Copolymerization of Styrene and Butyl Acrylate, *Macromolecular Symposia* (2007), 259, 151-163.
62. Simms, R.W.; Cunningham, Michael F. High Molecular Weight Poly (Butyl Methacrylate) by Reverse Atom Transfer Radical Polymerization in Miniemulsion Initiated by a Redox System, *Macromolecules* (2007), 40(4), 860-866.
61. Fu, Yao; Cunningham, Michael F.; Hutchinson, Robin A. Modeling of nitroxide-mediated semibatch radical polymerization, *Macromolecular Reaction Engineering* (2007), 1(2), 243-252.
60. Osti, Martina; Cunningham, Michael F.; Whitney, R.A.; Keoshkerian, B.; Enright T. Miniemulsion Polymerization Initiated by L-Ascorbic Acid and Sulfonate/Sulfate Surfactants, *Journal of Polymer Science, Part A: Polymer Chemistry* (2007), 45, 69-80.
59. Lin, Marcus; Hsu, James C.C.; Cunningham, Michael F. Role of Sodium Dodecylbenzenesulfonate in 2,2,6,6-Tetramethyl-1-piperidinyloxy-Mediated Styrene Miniemulsion Polymerization, *Journal of Polymer Science, Part A: Polymer Chemistry* (2006), 44, 5974-5986.
58. Liu, Yingxin; Jessop, Philip G.; Cunningham, Michael F.; Eckert, Charles A.; Liotta, Charles L. Switchable Surfactants, *Science* (Washington, DC, United States) (2006), 313(5789), 958-960.
57. Bian, Kejian; Cunningham, Michael F. Surface-initiated nitroxide-mediated radical polymerization of 2-(dimethylamino)ethyl acrylate on polymeric microspheres, *Polymer* (2006), 47(16), 5744-5753.
56. Simms, Ryan W.; Cunningham, Michael F. Reverse atom transfer radical polymerization of butyl methacrylate in a miniemulsion stabilized with a cationic surfactant, *Journal of Polymer Science, Part A: Polymer Chemistry* (2006), 44(5), 1628-1634.
55. Cunningham, Michael F.; Ng, David C. T.; Milton, Sarah G.; Keoshkerian, Barkev. Low temperature TEMPO-mediated styrene polymerization in miniemulsion, *Journal of Polymer Science, Part A: Polymer Chemistry* (2006), 44(1), 232-242.
54. Bian, Kejian; Cunningham, Michael F. Nitroxide-Mediated Radical Polymerization of 2-(Dimethylamino)ethyl Acrylate and its Sequential Block Copolymerization with Styrene and n-Butyl Acrylate, *Journal of Polymer Science, Part A: Polymer Chemistry* (2006), 44(1), 414-426.
53. Cunningham, Michael F.; Chatterton, Matthew; Puskas, Judit E. Thymine-functionalized polystyrenes for applications in biotechnology. III. Increasing the thymine loading via a

new synthetic pathway, *Journal of Polymer Science, Part A: Polymer Chemistry* (2005), 43(22), 5545-5553.

52. Bian, Kejian; Cunningham, Michael F. Synthesis of polymeric microspheres from a Merrifield resin by surface-initiated nitroxide-mediated radical polymerization, *Journal of Polymer Science, Part A: Polymer Chemistry* (2005), 43(10), 2145-2154.
51. Simms, Ryan W.; Davis, Thomas P.; Cunningham, Michael F. Xanthate-mediated living radical polymerization of vinyl acetate in miniemulsion, *Macromolecular Rapid Communications* (2005), 26 (8) 592-596.
50. Abdallah, D.; Ghani, M. A. A.; Cunningham, M. F.; Kazmaier, P. M.; Keoshkerian, B.; Buncel, E. Multi-armed, TEMPO-functionalized unimolecular initiators for starburst dendrimer synthesis via stable free radical polymerization. 1. Tri azofunctionalized unimer, *Canadian Journal of Chemistry* (2004), 82 (9), 1393-1402.
49. Enright, T.E.; Keoshkerian, B.; Cunningham, Michael F. Nitroxide-Mediated Miniemulsion Polymerization of Styrene in a Continuous Tubular Reactor, *Macromolecular Rapid Communications* (2005), 26, 221-225.
48. Bian, Kejian; Cunningham, Michael F. Nitroxide-Mediated Living Radical Polymerization of 2-Hydroxyethyl Acrylate and the Synthesis of Amphiphilic Block Copolymers, *Macromolecules* (2005), 38, 695-701.
47. Wang, Y.; Hutchinson, R.A.; Cunningham, Michael F. A Semi-Batch Process for Nitroxide Mediated Radical Polymerization, *Macromolecular Materials and Engineering* (2005), 290, 230-241.
46. Cunningham, Michael F. Visions on trends and new paths: A view from academia. *DECHEMA Monographien, 38 (8th International Workshop on Polymer Reaction Engineering)* (2004), 3-8.
45. Fu, Y.; Cunningham, Michael F.; Hutchinson, Robin A. Controlled radical semibatch polymerization for the production of solvent-borne coating resins. *DECHEMA Monographien, 138 (8th International Workshop on Polymer Reaction Engineering)* (2004), 467-471.
44. Lenzi, Marcelo K.; Cunningham, Michael F.; Lima, Enrique L.; Pinto, Jose C. Producing bimodal molecular weight distribution polymer resins using living and conventional free-radical polymerization, *Industrial and Engineering Chemistry Research* (2005), 44 (8), 2568-2578.
43. Cunningham, M.F.; Buragina, C.; Milton, S.; Ng, D.; Keoshkerian, B. Maximizing Polymer Livingness in Nitroxide-Mediated Miniemulsion Polymerizations, *Polymer* (2005), 46, 1025-1032.
42. Lenzi, Marcelo K.; Cunningham, Michael F.; Lima, Enrique L.; Pinto, Jose C. Modeling of Semibatch Styrene Suspension Polymerization Processes, *Journal of Applied Polymer Science* (2005), 96(5), 1950-1967.
41. Lenzi, Marcelo K.; Silva, Fabricio M.; Lima, Enrique, L.; Cunningham, Michael F. Low-cost Thermocouple Signal Conditioning Module, *Journal of Chemical Education* (2005), 82, 122-123.
40. Lin, Marcus; Cunningham, Michael F.; Keoshkerian, Barkev. Achieving High Conversions in Nitroxide-Mediated Living Styrene Miniemulsion Polymerization, *Macromolecular Symposia* (2004), 206, 263-274.
39. Puskas, Judit E.; Dahman, Yaser; Margaritis, Argyrios; Cunningham, Michael F. Novel Thymine – Functionalized Polystyrene for Applications in Biotechnology. II. Adsorption of

Model proteins, *Biomacromolecules* (2004), 5 (4), 1412-1421.

38. Cunningham, Michael F.; Lin, Marcus; Smith, Jodi-Anne; Ma, John; McAuley, Kim; Georges, Michael G.; Keoshkerian, Barkev. Nitroxide Mediated Living Radical Polymerization in Dispersed Systems, *Progress in Colloid and Polymer Science* (2004), 124, 88-93.
37. Cunningham, M.F.; Lin, M.; Keoshkerian, B. Optimizing Nitroxide-Mediated Miniemulsion Polymerization Processes, *Journal of Coatings Technology Research* (2004), 1, 33-39.
36. Cunningham, M.F. Recent Progress in Nitroxide Mediated Polymerizations in Miniemulsions, *Comptes rendu Chimie Academie des sciences* (2003), 6, 1351-1374. **[Invited review]**
35. Cunningham, M.F.; Witty, T. Diffusion Limited Chain Transfer in Styrene Emulsion Polymerization: Use of n-Dodecanethiol to Regulate Molecular Weight, *Polymer Reaction Engineering* (2003), 11, 519-540.
34. Schaffer, M. A.; McAuley, K.B.; Cunningham, M.F.; Marchildon, E.K. Experimental Study and Modeling of Nylon Polycondensation in the Melt Phase, *Ind. Eng. Chem. Res.* (2003), 42, 2946-2959.
33. Wang, Y.; Naulet, F.; Cunningham, M.F.; Hutchinson, R.A. Nitroxide-Mediated Semibatch Polymerization for the Production of Low-Molecular Weight Solvent-Borne Coatings Resins, *Advances in Controlled/Living Radical Polymerization* (ACS Symposium Series) (2003), 854, 466-480.
32. Dahman, Y.; Puskas, J.E.; Margaritis, A.; Merali, Z.; Cunningham, M. Synthesis and Characterization of Novel Functionalized Polystyrene for Drug Delivery Applications, *Macromolecules* (2003), 36, 2198-2205.
31. Schaffer, M. A.; McAuley, K.B.; Cunningham, M.F.; Marchildon, E.K. Prediction of Water Solubility in Nylon Melts Based on Flory-Huggins Theory, *Polym. Eng. Sci.* (2003), 43, 639-646.
30. Ma, J.W.; Smith, J.-A.; Cunningham, M.F.; McAuley, K; Georges, M.K.; Keoshkerian, B. Model Studies of Nitroxide-Mediated Styrene Miniemulsion Polymerization – Opportunities for Process Improvement, *Macromolecular Theory and Simulations* (2003), 12, 72-85.
29. Ma, J.W.; Smith, J.-A.; Cunningham, M.F.; McAuley, K; Georges, M.K.; Keoshkerian, B. Interfacial Mass Transfer in Nitroxide-Mediated Miniemulsion Polymerization, *Macromolecular Theory and Simulations* (2002), 11, 953-960.
28. Ma, J.W.; Smith, J.-A.; Cunningham, M.F.; McAuley, K; Georges, M.K.; Keoshkerian, B. Living Radical Polymerization of Styrene in Miniemulsion. Part 1: Model Studies of Alkoxyamine Initiated Systems, *Chemical Engineering Science* (2003), 58, 1163-1176.
27. Ma, J.W.; Smith, J.-A.; Cunningham, M.F.; McAuley, K; Georges, M.K.; Keoshkerian, B. Living Radical Polymerization of Styrene in Miniemulsion. Part 2: Model Studies of Persulfate Initiated Systems, *Chemical Engineering Science* (2003), 58, 1177-1190.
26. Scott, M.E.; Parent, J.S.; Hennigar, S.L.; Whitney, R.A.; Cunningham, M.F. Determination of Alkoxyamine Concentration in Nitroxyl-Mediated Styrene Polymerization Products, *Macromolecules* (2002), 35, 7628-7633.
25. Cunningham, M.F.; Tortosa, K.; Lin, M.; Keoshkerian, B.; Georges, M.K. Influence of Camphorsulfonic Acid in Nitroxide-Mediated Styrene Miniemulsion Polymerization, *Journal of Polymer Science (Polymer Chemistry Edition)* (2002), 40, 2828-2841.
24. Cunningham, M.F. Living/Controlled Radical Polymerizations in Dispersed Phase

Systems, *Progress in Polymer Science* (2002), 27 (6), 1039-1067. **[Invited review]**

23. Cunningham, M.F.; Tortosa, K.; Ma, J.W.; McAuley, K.B.; Georges, M.K.; Keoshkerian, B. Nitroxide Mediated Styrene Polymerization in Miniemulsion, *Macromolecular Symposia* (2002), 182, 273-282.
22. Cunningham, M.F.; Xie, M.; McAuley, K.B.; Georges, M.K.; Keoshkerian, B. Nitroxide Mediated Styrene Miniemulsion Polymerization, *Macromolecules* (2002), 35, 59-66.
21. Krywko, W.; McAuley K; Cunningham, M.F. Modelling Morphology Development in Emulsion Polymerization, *Polymer Reaction Engineering* (2002), 10, 135-162.
20. P.J. Bates; J. Kendall; D. Taylor; M. Cunningham. Pressure Build-up during Melt Impregnation, *Composites Science and Technology* (2002), 62, 379-384.
19. Tortosa, K.; Smith, J.-A.; Cunningham, M.F. Synthesis of Polystyrene-block-Poly(butyl acrylate) Block Copolymers Using Nitroxide-Mediated Living Radical Polymerization in Miniemulsion, *Macromolecular Rapid Communications* (2001), 22, 957-961.
18. Ma, J.W.; McAuley, K.B.; Cunningham, M.F.; Georges, M.K.; Keoshkerian, B. Nitroxide Partitioning Between Styrene and Water, *Journal of Polymer Science (Polymer Chemistry Edition)* (2001), 39, 1081-1089.
17. Schaffer, M.A; Marchildon, E.K.; McAuley, K.B.; Cunningham, M.F. Assessment of Mixing Performance and Power Consumption of a Novel Polymerization Reactor System, *Chemical Engineering & Technology* (2001), 24 (4), 401-408.
16. Bates, P.J.; Taylor, D.J.; Cunningham, M.F. Compaction and Transverse Permeability of Glass Rovings, *Applied Composite Materials* (2001), 8 (6), 163-178.
15. Cunningham, M.F.; Geramita, K.; Ma, J.W. Measuring the Effects of Dissolved Oxygen in Styrene Emulsion Polymerization, *Polymer* (2000), 41, 5385-5392.
14. Cunningham, M.F.; Mahabadi, H.K.; Wright, H.M. Supermicron Polymer Particles with Core-Shell Type Morphologies, *Journal of Polymer Science (Polymer Chemistry Edition)* (2000), 38 (2), 345-351.
13. Cunningham, M.F.; Ma, J.W. Calculating Molecular Weight Distributions in Emulsion Polymerization Under Conditions of Diffusion Limited Chain Transfer, *Journal of Applied Polymer Science* (2000), 78, 217-227.
12. Schaffer, M.A.; Marchildon, E.K.; McAuley, K.B.; Cunningham, M.F. Thermal Non-Oxidative Degradation of Nylon 6,6, *Journal of Macromolecular Science; Reviews* (2000), 40 (4), 233-272.
11. Ma, J.W.; Cunningham, M.F. Predicting the Effectiveness of n-Dodecanethiol Chain Transfer Agent in Styrene Emulsion Polymerization, *Macromolecular Symposia* (Polymers in Dispersed Media I) (2000), 150, 85-93.
10. Bates, P.J.; Taylor, D.J.; Cunningham, M.F.; Transverse Permeability of Direct Glass Rovings, *The Journal of Reinforced Plastics and Composites* (2000), 19, 1217-1226.
9. Cunningham, M.F. Microsuspension Polymerization of Methyl Methacrylate, *Polymer Reaction Engineering* (1999), 7 (2), 231-258.
8. Li Pi Shan, C.; Baker, W.E.; Cunningham, M.F.; Baird, M.C. Conversion Studies in a Novel Reaction Injection Moulding Process for Syndiotactic Polystyrene, *Journal of Applied Polymer Science* (1998), 70, 2679-2693.
7. Cunningham, M.F.; Mahabadi, H.K. Kinetics of High-Conversion Free-Radical Polymerization. 1. Understanding Kinetics through Study of Pseudoinstantaneous Molecular Weight Distributions, *Macromolecules* (1996), 29 (3), 835-841.

6. Cunningham, M.F. Reactor Operating Strategies for Minimizing Diffusion of Additives During In-Situ Suspension Polymerization, *AIChE J.* (1996), 42 (10), 2948-2959.
5. Cunningham, M.F.; O'Driscoll, K.F.; Mahabadi, H.K. Bulk Polymerization of Methyl Methacrylate in a Tubular Reactor III: Modelling Fouling Behaviour, *Polymer Reaction Engineering* (1993), 1 (2), 245-288.
4. Cunningham, M.F.; O'Driscoll, K.F.; Mahabadi, H.K. Bulk Polymerization of Methyl Methacrylate in a Tubular Reactor II: Production of Low Molecular Weight PMMA, *Polymer Reaction Engineering* (1993), 1 (2), 229-244.
3. Cunningham, M.F.; O'Driscoll, K.F.; Mahabadi, H.K. Bulk Polymerization of Methyl Methacrylate in a Tubular Reactor I: Experimental Observations on Fouling, *Canadian Journal of Chemical Engineering* (1991), 69 (3), 630-638.
2. Hsu, C.C.; Dusseault, J.J.A.; Cunningham, M.F. Evaluation and Analysis of a Multisite Kinetic Model for Polymerization Initiated with Supported Ziegler-Natta Catalysts, Computer Applications, *Applied Polymer Science II* (ACS Symposium Series 404) (1989), 404, 403-415.
1. Cunningham, M.F.; Dusseault, J.J.A.; Dumas, C.; Hsu, C.C. Kinetics of Propylene Polymerization over Magnesium Chloride Supported Catalysts in a Slurry Reactor, *Transition Metal Catalyzed Polymerizations*, R.P. Quirk (ed.) (1988), 136-150.

Patents

32. George, S. R., Cunningham M. F., Deeter, G. A., Campbell, J. D. Sanders, C., Reck, B. Hydrophobic block–random block copolymer emulsion polymer stabilizers. (2022) US Patent Appl. No. 17/851,601.
31. Campbell, J. D., George, S. R., Deeter,G. A., Reck, B., Cunningham, M. F., Sanders, C. Hydrophobic block—random block copolymer emulsion polymer stabilizers. (2022) US Patent 11,396,573.
30. Resendes, R., Jessop, P. G., Cunningham, M. F., Mudraboyina, B. P., Ozvald, A. M., Clark, T. J., Mariampillai, B., Yang, Y., Holland, A. M., Honeyman, C. H. Switchable water-based paint or coating compositions. (2022) US Patent 11,236,250.
29. Jessop, P. G., Cunningham, M. F., Champagne, P., Ellis, S., Dykeman, R., Honeyman, C. H., Holland, A. M., Robert, T., Mudraboyina, B. P. Forming a treated switchable polymer and use thereof in a forward osmosis system. (2021) US Patent Appl. No. 17/271,069.
28. Resendes, R., Jessop P. G., Cunningham M. F., Mudraboyina, B. P., Ozvald, A. M., Clark, T. J., Mariampillai, B., Yang, Y., Holland, A. M., Honeyman, C. H. (2018) Switchable water-based paint or coating compositions. US Patent 11,236,250. International patent application PCT/CA2016/050644.
27. Jessop, P. G., Mercer, S., Robert, T., Boniface, K., and M. Cunningham. Switchable Materials, Methods and Uses Thereof. US Patent 10,294,321. CA Patent 2,924,633.
26. Mahabadi, H.K.; Cunningham, M.F.; Wright, H.M. (2001), Polyblend Polymeric Composite and Microcapsule Toners, and a Process for Producing the Same, US Patent 6,322,946.
25. Cunningham, M.F.; Veregin, R.P.N.; Tripp, C.P., Enright, T.E.; McDougall, M.V.; Creatura, J.A. (2001), Carrier Particles with Halosilanated Pigments, US Patent 6,268,100.
24. Cunningham; M.F., Veregin; R.P.N., Tripp; C.P., Enright, T.E., McDougall; M.V., Creatura, J.A. (2001), Carrier Particles with Halosilanated Pigments, US Patent 6,180,311.

23. Cunningham, M.F. and Mahabadi, H.K. (2000), Supercritical Polymerization Processes, US Patent 6,057,409.
22. Cunningham, M.F., Liebermann, G., Mahabadi, H.K., McNeil, D.M., Hawkins, M.S., Enright, T.E. and Cogswell, A.J. (1999), Conductive Polymers, U. Patent 5,958,302.
21. Gerroir, P.J., Listigovers, N.A., Cunningham, M.F., Enright, T.E. and Creatura, J.A. (1999), Conductive Particles Containing Carbon Black and Processes for the Preparation Thereof, US Patent 5,883,176.
20. Cunningham, M.F., Liebermann, G., Mahabadi, H.K., McNeil, D.M., Hawkins, M.S., Enright, T.E. and Cogswell, A.J. (1998), Conductive Polymers, US Patent 5,807,506.
19. Gerroir, P.J., Listigovers, N.L., Cunningham, M.F., Enright, T.E. and Creatura, J.A. (1998), Conductive Particles Containing Carbon Black and Processes for the Preparation Thereof, US Patent 5,747,577.
18. Creatura, J.A., McKnight, C.A., Duggan, M.J., Cogswell, A.J., Cunningham, M.F. and Dombroski, T.C. (1998), Conductive Developer Compositions with Coated Carrier Particles, US Patent 5,595,851.
17. Cunningham, M.F. and Mahabadi, H.K. (1996), Supercritical Polymerization Processes, US Patent 5,514,512.
16. Cunningham, M.F. and Mahabadi, H.K. (1996), Carrier Powder Supercritical Polymers, US Patent 5,514,513.
15. Cunningham, M.F. and Mahabadi, H.K. (1996), Carrier Coatings and Processes, US Patent 5,514,514.
14. Cunningham, M.F. and Mahabadi, H.K. (1996), Method of Making Carriers Having Coatings with Fillers, US Patent 5,516,618.
13. Cunningham, M.F., Enright, T.E. and Mahabadi, H.K. (1996), Coated Carrier Particles and Processes Thereof, US Patent 5,529,719.
12. Mahabadi, H.K., Wright, D.Y., Cunningham, M.F. and Creatura, J.A. (1996), Processes for the Preparation of Conductive Polymeric Particles with Linear and Crosslinked Portions, US Patent 5,575,954.
11. Cunningham, M.F. and Mahabadi, H.K., Smith, T.W. and Creatura, J.A. (1996), Conductive Composite Particles and Processes for the Preparation Thereof, US Patent 5,516,619.
10. Cunningham, M.F., Mahabadi, H.K., Smith, T.W. and Creatura, J.A., (1996), Conductive Composite Particles and Processes for the Preparation Thereof, US Patent 5,484,681.
9. Tripp, C.P., Veregin, R.P., Cunningham, M.F., Enright, T.E. and McDougall, M.V. (1996), Toner Compositions with Halosilanated Pigments, US Patent 5,484,675.
8. Mahabadi, H.K., Wright, D.Y., Cunningham, M.F. and Creatura, J.A. (1996), Processes for the Preparation of Conductive Polymeric Particles with Linear and Crosslinked Portions, US Patent 5,487,847.
7. Van Dusen, J.G., Cunningham, M.F. and Kelly, B.A. (1996), Conductive Contrast Carrier for Xerographic Coating, US Patent 5,496,675.
6. Creatura, J.A., McKnight, C.A., Duggan, M.J. Dombroski, T.C., Kelly, B.A., Mahabadi, H.K. and Cunningham, M.F. (1996), Coated Carrier Particles and Processes Thereof, US Patent 5,567,562.

5. Creatura, J.A., McKnight, C.A., Duggan, M.J. Dombroski, T.C., Kelly, B.A., Mahabadi, H.K. and Cunningham, M.F. (1996), Coated Carrier Particles and Processes Thereof, US Patent 5,518,855.
4. Cunningham, M.F., Enright, T.E., Mahabadi, H.K. and Van Dusen, J.G. (1995), Conductive Powder Coating Materials and Process for Preparation, US Patent 5,447,791.
3. Cunningham, M.F. and Mahabadi, H.K. (1994), Suspension Polymerized Toner Treated by Starved Feed Monomer Addition Process, US Patent 5,306,593.
2. Mahabadi, H.K., Cunningham, M.F. and Wright, D.Y. (1994), Processes for the Preparation of Polymers, US Patent 5,288,585.
1. Mahabadi, H.K., Cunningham, M.F., Wright, H.M. and Gardner, S.J. (1993), Processes for the Preparation of Toners, US Patent 5,264,31.

Book

Jessop, P.G., Cunningham, M.F.; **CO_2-Switchable Materials**, The Royal Society of Chemistry, 2020

Special Issues

Cunningham, M.F., Monteiro, M.J., co-editors of Special Issue of *Biomacromolecules* (Polymer Colloids: Synthesis Fundamentals to Applications), 2020

Book Chapters

Sundberg, Donald C. and Cunningham, Michael F. Emulsion Polymerization, *Kirk-Othmer Encyclopedia of Chemical Technology*, 2020

Sanders, Connor A. and Cunningham, Michael F. Polymerizations in Aqueous Dispersed Media. *Macromolecular Engineering: From Precise Synthesis to Macroscopic Materials and* Applications. *2nd Edition.* Editors Yves Gnanou, Nikos Hadjichristidis, Krzysztof Matyjaszewski, Murugappan Muthukumar, Sergei Sheik, 2020.

Cunningham, M., Save, M., Billon, L. Surface Initiated Nitroxide Mediated Polymerization, in *Handbook of Nitroxide Mediated Polymerization*, Editor Didier Gigmes (Royal Society of Chemistry, publisher), 2015.

Charleux, B., Cunningham, M.F., Leiza, J.R., "Vinyl polymerization in heterogeneous systems", 463-499, in *"Comprehensive Polymer Science" (2nd Edition),* Editors K. Matyjaszewski and M. Möller, Section: Volume 3 - Chain Vinyl Polymerization, Volume Editors: Geoffrey W. Coates and Mitsuo Sawamoto, 2012.

Cunningham, M.F. and Hutchinson, R.A., Industrial Applications and Processes, 333-360, in *Handbook of Radical Polymerization*, Editors T.P. Davis and K. Matyjaszewski, Wiley-Interscience, New York, 2002.

Invited Lectures (2002-2023)

- PPC18 The 18th Pacific Polymer Conference, Peurto Vallarta, Mexico (December 2023) **[Plenary]**
- ACS Controlled Radical Polymerization, Charleston South Carolina (November 2023)
- Canadian Chemical Engineering Conference CSChE, Calgary, Canada (October 2023)
- 14th International Workshop on Polymer Reaction Engineering PRE, Potsdam, Germany (September 2023)

- Canadian Paints and Coatings Conference, Niagara on the Lake, Canada (May 2023) **[Plenary]**
- PPC17 The 17th Pacific Polymer Conference, Brisbane, Australia (December 2022)
- Canadian Chemical Engineering Conference CCEC, Vancouver, Canada (October 2022)
- Sustainable Materials Research Summit (SMART Conference), Vancouver, Canada (August 2022)
- Frontiers of Polymer Colloids, Prague, Czech Republic (July 2022)
- The 49th World Polymer Congress IUPAC-MACRO 2022, Winnipeg, Canada (July 2022)
- Pacifichem 2021: A Creative Vision for the Future, Virtual (December 2021)
- 5th MacroMex Symposium: Advances in Polymer Science, Riviera Maya, Mexico (November 2021) **[Plenary]**
- World Polymer Congress IUPAC-MACRO 2020+, Virtual (May 2021)
- Hangzhou International Polymer Forum, Hangzhou, China (October 2020) **[Plenary]**
- Canadian Society for Chemical Engineering Conference, Ottawa, Canada (October 2020)
- Pacific Polymer Conference, Singapore (December 2019)
- XXXII National Meeting of The Mexican Polymer Society, Veracruz, Mexico (October 2019) **[Plenary]**
- 2019 International Latex Conference, Akron, OH, United States (June 2019) **[Plenary]**
- International Conference on Advanced Polymers via Macromolecular Engineering, Stellenbosch South Africa (April 2019)
- 13th International Workshop on Polymer Reaction Engineering, Hamburg, Germany (May 2019)
- Paperweek 2019, Montreal Canada (February 2019)
- Canadian Society for Chemical Engineering Conference, Toronto, Canada (October 2018) **[Keynote, Award Lecture]**
- 14th International Symposium on Bioplastics, Biocomposites, and Biorefining, Guelph, Canada (July 2018) **[Keynote]**
- Symposium in Honor of Mohamed El-Aasser, Bethlehem, PA, USA (June 2018)
- Canadian Paints and Coatings Conference, Toronto, Canada (May 2018) **[Keynote]**
- Polymer Reaction Engineering X, Punta Cana, Dominican Republic (May 2018) **[Keynote]**
- 4th MacroMex Symposium: Advances in Polymer Science, Los Cabos, Mexico (December 2017)
- Frontiers in Green Materials Conference, London, UK (December 2017)
- World Congress of Chemical Engineering, Barcelona, Spain (October 2017) **[Keynote]**
- Canadian Chemical Engineering Conference, Edmonton, Canada (October 2017)
- American Chemical Society 8th Symposium on "Controlled/Living Radical Polymerization, Washington DC, USA (August 2017)
- Hangzhou International Polymer Forum, Hangzhou, China (May 2017) **[Plenary]**
- 1st Canadian Nitroxide Mediated Polymerization Symposium, Ottawa (February 2017) **[Keynote]**
- AIChE Annual Meeting, San Francisco, CA, USA (November 2016) **[Plenary]**
- Canadian Chemical Engineering Conference, Quebec City, Canada (October 2016)
- 12th International Workshop on Polymer Reaction Engineering, Hamburg, Germany (May 2016) **[Keynote]**
- 14th International Symposium on Bioplastics, Biocomposites and Biorefining, Guelph, Canada (May 2016) **[Keynote]**
- International Chemical Congress of the Pacific Basin Societies, Honolulu, Hawaii (December

2015)
- Pacific Polymer Conference 14, Kauai, Hawaii (December 2015)
- Canadian Chemical Engineering (CSChE) Annual Conference, Calgary, Canada (October 2015)
- 4th Symposium of Applied Chemical and Biochemical Engineering, Saltillo, Coahuila, México (October 2015) **[Plenary]**
- International Polymer Colloids Group Conference, New Hampshire, USA (June 2015) **[Plenary]**
- Canadian Society for Chemistry Annual Conference, Ottawa, Canada (June 2015)
- Polymer Reaction Engineering Conference, Cancun, Mexico (May 2015)
- Macromex 2014, Nuevo Vallarta, Mexico (December 2014)
- 2nd WACKER-RSC International Symposium on Smart Materials for Smart Applications - Emulsion Polymers and Silicones, Shanghai, China (November 2014)
- Canadian Chemical Engineering (CSChE) Annual Conference, Niagara Falls, Canada (October 2014)
- ACS 7th Symposium on "Controlled/Living Radical Polymerization, San Francisco, USA (August 2014)
- Frontiers of Polymer Colloids: from Synthesis to Macro-Scale and Nano-Scale Applications, Prague, Czech Republic (July 2014) **[Keynote]**
- Pacific Polymer Conference, Taiwan (November 2013)
- IUPAC International Symposium on Ionic Polymerizations, Kyoto, Japan (September 2013)
- International Polymer Colloids Group Conference, Shanghai, China (July 2013)
- Canadian Society for Chemistry Annual Conference, Quebec, Quebec (May 2013) **[Keynote]**
- 11th International Workshop on Polymer Reaction Engineering, Hamburg, Germany (May 2013) **[Keynote]**
- Canadian Society for Chemistry Annual Conference, Calgary, Canada (May 2012) **[Keynote]**
- Polymer Reaction Engineering VIII, Cancun, Mexico (May 2012)
- International Conference on Polymers in Dispersed Media, Lyon France (April 2012) **[Keynote]**
- MacroMex 2011: 2nd US-Mexico Meeting on Advances in Polymer Science and 14th SPM National Congress, Cancun, Mexico (December 2011)
- Canadian Society for Chemical Engineering Conference, London, Canada (October 2011) **[Keynote]**
- 6th Symposium on "Controlled/Living Radical Polymerization", (National Meeting of the American Chemical Society), Denver, CO, USA (August 2011)
- IUPAC International Symposium on Ionic Polymerizations, Akron, OH, USA (July 2011)
- International Latex Conference, Akron, OH, USA (July 2011)
- 15th Green Chemistry & Engineering Conference, American Chemical Society, Washington DC, USA (June 2011)
- Symposium on Waterborne Coatings Conference, New Orleans, USA (March 2011) **[Plenary]**
- IUPAC World Polymer Congress, Glasgow, Scotland (July 2010) **[Keynote]**
- 2 lectures at the 2nd Sino-Canadian Scientific Exchange Conference on Advanced Materials, Suzhou, China (May 2010)
- Pacific Polymer Conference, Cairns, Australia (December 2009)

- International Symposium on Polymer Colloids, Italy (July 2009)
- International Symposium on Polymer Microspheres, Japan (November 2008) **[Keynote]**
- American Chemical Society Meeting, Philadelphia (August 2008)
- International Symposium on Polymer Colloids, Prague (July 2008)
- International Polymer Colloids Symposium, Coventry, United Kingdom (September 2007)
- Hangzhou International Polymer Forum, Hangzhou, China (June 2007)
- IUPAC World Polymer Congress, Brazil (July 2006)
- 9th Meeting of Pacific Polymer Federation Conference, Hawaii, USA (December 2005)
- 2nd International Symposium on Polymeric Microspheres, Japan (May 2005)
- International Congress on Polymer Reaction Engineering, Berlin, Germany (October 2004)
- Polymers in Dispersed Media, Lyon, France (April 2004)
- Canadian Chemical Engineering Conference, Hamilton ON (October 2003)
- IUPAC Congress/Canadian Society for Chemistry Meeting, Ottawa ON (August 2003)
- Engineering Foundation Conference on Polymer Reaction Engineering, Québec (May 2003)
- Canadian Chemical Engineering Conference, Vancouver (October 2002)
- American Chemical Society Meeting, Boston (August 2002)

Invited University, Industry, and Government Seminars (2002-2023)

- Synthomer, Virtual (March 2021)
- IDEXX Corporation, Westbrook, ME, USA (March 2020)
- Solvay USA Inc., Bristol PA USA (June 2019)
- Dow Chemical Company, Collegeville PA, USA (February 2019)
- Montpellier University, Montpellier France (January 2019)
- IDEXX Corporation, Westbrook, ME, USA (January 2019)
- Drexel University, Philadelphia, PA, USA (November 2016)
- Arkema Inc., King of Prussia, PA, USA (November 2016)
- Ontario Research Chairs Symposium, Toronto, Canada (April 2015)
- Kyoto University, Osaka, Japan (April 2015)
- Cabot Corporation, Billerica, MA, USA (September 2014)
- RCI Science Dinner of the Year, Toronto, Canada (April 2014)
- Ontario's Toxics Reduction Program, Toronto, Canada (March 2014)
- University of Southern Mississippi, Mississippi, USA (February 2013)
- Ministry of Environment, Symposium on Green Chemistry and Engineering (November 2012)
- Kobe University, Kobe, Japan (October 2012)
- CIQA (Centro de Investigación en Química Aplciada) Research Centre, Saltillo, Mexico (March 2012)
- Department of Chemistry and Biochemistry, Concordia University (February 2012)
- Workshop on Advances in Emulsion Technology and Nanoparticles for Biomedical and Related Applications, Shanghai, China (October 2011)
- Fuji-Xerox Company, Odawara, Japan (October 2011)
- ToaGosei Chemical Company, Nagoya, Japan (October 2011)
- 2 lectures at Kyoto University, Kyoto, Japan (October 2011)
- UNH Materials Science Seminar, University of New Hampshire (March 2010)
- Leading Edge Seminar Series, University of Toronto (February 2010)
- Synthomer, Essex, UK (July 2009)

- Eindhoven University, Netherlands (July 2009)
- Arkema Inc., King of Prussia, PA, USA (June 2009)
- Canadian Special Operations Forces Command (Canadian Joint Incident Response Unit – Chemical, Biological, Radiological and Nuclear), Kingston, Canada (May 2009)
- Keio University, Minato, Japan (November 2008)
- BASF - The Chemical Company, Ludwigshafen, Germany (July 2008)
- Rensselaer Polytechnical Institute, Troy, NY, USA (June 2007)
- DuPont Dow Elastomers, USA (June 2005)
- Arkema Inc., USA (April 2005)
- Air Products, Allentown, PA (June 2002)

Organization of Conferences and Symposia

- Local Organizer: IPCG (International Polymer Colloid Group) Conference (June 2023)
- Symposium Organizer (2 symposia) for 2020 Pacifichem Conference (December 2020, postponed to December 2021)
- Symposium Organizer: Pacifichem (Sustainable Polymerization Processes), Hawaii, USA (December 2015)
- Member of Organizing Committee: Nano-Ontario Conference, Kingston, Canada (November 2013)
- Member of Organizing Committee & Session Chair: Engineering Foundation Conference on Polymer Reaction Engineering (Sustainable Polymer Reaction Engineering), Cancun, Mexico (May 2012)
- Member of Organizing Committee & Session Moderator: Sustainability Summit, Kingston, Canada (September 2011)
- Chair: International Polymer Colloid Group Conference, New Hampshire, USA (June 2011)
- Symposium Organizer: Pacifichem (Controlled Radical Polymerization in Dispersed Systems), Hawaii, USA (December 2010)
- Symposium Organizer: Canadian Society for Chemistry Conference (Green Engineering), Toronto, Canada (June 2010)
- Co-Chair: International Polymer Colloids Group Conference, Tuscany, Italy (July 2009)
- Organizer: Symposium on Emulsion Polymerization for the American Chemical Society Meeting, Philadelphia (August 2008)
- International Advisory Committee Member for numerous major international conferences, including:
    - International Symposium on Polymer Colloids, Prague, Czech Republic (July 2020)
    - 49th World Polymer Congress – MACRO 2022, Winnipeg.
    - International Workshop on Polymer Reaction Engineering, Hamburg, Germany (June 2019)
    - International Symposium on Polymer Colloids, Prague, Czech Republic (July 2020)
    - International Polymer Colloids Group Meeting, Singapore (June 2019)
    - Engineering Foundation Conference on Polymer Reaction Engineering, Punta Cana (May 2018)
    - Hangzhou International Polymer Forum, Hangzhou, China (May 2017)
    - International Polymer Colloids Group Meeting, Bilbao, Spain (June 2017)
    - World Chemical Engineering Congress, Barcelona, Spain (October 2017)
    - 4th MacroMex Symposium:Advances in Polymer Science, Los Cabos, Mexico (December 2017)

- International Workshop on Polymer Reaction Engineering, Hamburg, Germany (May 2016)
- International Polymer Colloids Group Meeting, New Hampshire, USA (June 2015)
- Engineering Foundation Conference on Polymer Reaction Engineering, Mexico (May 2015)
- International Conference on Polymer Colloids, Prague (July 2014)
- Hangzhou International Polymer Forum, Hangzhou, China (May 2014)
- Sustainability Summit, Montreal (June 2013)
- International Polymer Colloids Group Meeting, Shanghai, China (June 2013)
- International Workshop on Polymer Reaction Engineering, Hamburg, Germany (May 2013)
- International Conference on Polymers in Dispersed Media, Lyon, France (April 2012)
- 2nd MacroMex Symposium: Advances in Polymer Science, Cancun, Mexico (December 2011)
- International Workshop on Polymer Reaction Engineering, Hamburg, Germany (October 2010)
- 7th Engineering Foundation Meeting on Polymer Reaction Engineering, Canada (May 2009)
- International Symposium on Advanced Particles, Yokohama, Japan (April 2009)
- International Symposium on Polymer Colloids, Prague, Czech Republic (July 2008)
- International Workshop on Polymer Reaction Engineering, Hamburg, Germany (October 2007)

Editorial, Board and Panel Positions

- Chair, International Polymer Colloids Group (2010-current)
- President, Canadian Society for Chemical Engineering, 2022-2023
- Vice-President, Canadian Society for Chemical Engineering, 2021-2022
- Chair, Engineering Conferences International (Polymer Reaction Engineering) Steering Committee (2015 – current)
- Chair, National Research Council of Canada major program review: Bio-based Specialty Chemicals Program (2018-2019)
- NSERC Discovery Program Evaluation Panel (2021-2024)
- Member of Editorial Board, *Biomacromolecules* (2022 – 2024)
- Member of Editorial Board, *Green Materials* (2013 – 2021)
- Member of Editorial Board, *Macromolecular Reaction Engineering* (2006 – current)
- Invited Speaker, Ontario Research Chairs Symposium, Toronto (2015)
- Invited Speaker, “Research Matters” Symposium, Toronto (2015)
- Ontario and Canada Research Chairs Panels, Sustainable Economies (2015)
- Ontario Toxic Reductions Program Planners’ Workshop (2014)
- COU Sustainability Symposium on Green Chemistry (2013)
- Member of Organizing Committee for Sustainable Chemistry Summit, Montreal, Canada (2013)
- Member of Editorial Board, *Macromolecules* (2007 – 2012).
- Ministry of the Environment, Green Chemistry Symposium (2012)
- Member of Organizing Committee for Sustainable Chemistry Summit, Kingston, Canada (2011) (Sponsored by MOE)
- Reviewed Safer Alternatives Legislation for Ontario Ministry of the Environment (2010)

- CSChE (Canadian Society for Chemical Engineering) Board of Directors (2006 – 2010)
- Chemical Institute of Canada Division Executive Member, MSED (1999 – 2006)

Industrial Courses Taught

- Scaleup of Emulsion Polymerization Processes (2012 – 2023), USA
- Advances in Emulsion Polymerization & Latex Technology, Davos, Switzerland (2004 – 2019, 2022, 2023)
- Advances in Emulsion Polymerization & Latex Technology, Lehigh University, USA (2002 – 2019, 2021-2023)

Grants and Awards in Support of Research (2010-2023)

2022-2023	MITACS Accelerate with BCRI	$60,000
2021-2023	Alliance Grant (with University of Ottawa, Anomera), Queen's portion	$50,000
2021	Rhodia Operations (Solvay)	$14,000
2021-2022	MITACS Accelerate with BCRI	$55,000
2020	Queen's University Prize for Excellence in Research	$20,000
2020-2021	MITACS Accelerate with Anomera	$15,000
2020-2025	NSERC Discovery Grant	$64,000 p.a.
2019-2023	NSERC CRD with BASF	$320,000
2019-2023	BASF Ludwigshafen, Germany	$200,000
2016-2021	NSERC strategic projects grant, Jessop (PI), Champagne	$552,740
2018-2020	MITACS grant with Forward Water Technology (with Jessop)	$135,000
2015-2020	NSERC Discovery Grant	$54,000 p.a.
2019	NSERC Engage Grant with CelluForce	$25,000
2017-2019	NSERC Ontario Centres of Excellence OCE, Tam (PI)	$360,000
2015-2019	NSERC CRD with EcoSynthetix Inc, Dube (PI)	$334,644
2017-2019	Queen's University Internal Research Fund	$20,000
2017-2018	NSERC RTI	$150,000
2017-2018	Queen's University Dean's Research Fund, Champagne, Fam, MacDougall, Ramsay	$99,720
2013-2017	NSERC strategic projects grant, Jessop (PI), Oleschuk	$130,080
2016-2017	NSERC RTI, Jessop	$103,695
2016-2017	NSERC Engage with Bluegoose Biorefineries	$25,000
2012-2016	BASF Canada Inc	$200,000
2013-2016	NSERC strategic projects grant, Champagne, Jessop	$350,000
2012-2016	NSERC strategic projects grant, Crudden	$329,820
2016	Ontario Centres of Excellence OCE with EcoSynthetix Inc, Smeets	$15,000
2015-2016	NSERC RTI, Champagne (PI), Jessop	$144,739
2013-2015	BASF USA	$120,000
2010-2015	Ontario Research Chair in Green Chemistry and Engineering	$250,000 p.a.
2010-2015	NSERC Discovery Grant	$54,000 p.a.
2010-2014	NSERC CREATE, Crudden (PI) with 9 others	$1,376,400
2014	NSERC Engage Plus with EcoSynthetix Inc	$25,000
2011-2013	AboraNano NCE, Champagne, Whitney	$445,400
2013	NSERC Engage with EcoSynthetix Inc	$25,000

2011-2013	Ministry of Environment, Best in Science Program	$50,000
2010-2013	NSERC Discovery Accelerator Supplement	$40,000 p.a.
2008-2012	NSERC Strategic grant, Jessop	$331,920
2011	BASF Canada Inc	$20,000
2008-2010	Arkema France	$50,000
2010	NSERC RTI, Champagne (PI)	$82,418

Five Most Significant Research Contributions

1. *Preparation of Nanoparticles via Living Polymerization in Aqueous Dispersions*

An extensive investigation into living radical polymerization (LRP) to make "living" nanoparticles has been a central focus of my research program. Adaptation of LRP chemistry to aqueous dispersions is challenging but enables the precision synthesis of polymers in nanoparticle form, including control of molecular weight distribution, copolymer composition and morphology. Precision control of nanoparticle design is important for applications including: large volume commercial products such advanced coatings, dispersants and adhesives; sensing and sensors; and diagnostic/biomedical materials. This work further also provides a much more sustainable approach to synthesizing polymers than traditional processes that used hazardous organic solvents. We have examined both practical and fundamental aspects, and collaborated with several companies including Xerox, Fuji Xerox (Japan), Arkema (USA), BASF (Germany/USA), Asahi Kasei (Japan), Toagosei (Japan), and Pidilite (India). The emphasis of the investigation has been not only the fundamentals (kinetics, transport effects in a multi-phase system including phase equilibrium) but on practical aspects such as making high solids latexes. We recently expanded the work to include Ring Opening Metathesis Polymerization (ROMP). My group has played a pioneering role in this new field, with other leading groups now adopting our approaches and methodologies. Our results have generated extensive interest in North America, Europe and Japan, and have led to numerous invited lectures (many at major international meetings) and publications, and several international collaborations.

2. Carbon Dioxide Responsive Polymers and Colloids

We were the first to report the preparation of CO_2 responsive polymer colloids (Liu et al., *Science* (2006) 313, 958). This work is a collaboration with Prof. Jessop (Chemistry). (Prof. Jessop provides expertise on CO_2 switching, while I provide expertise on polymers and colloids.) Using surfactants containing amidine or tertiary amine groups, we were the first to demonstrate the preparation of nanoparticle dispersions that could be aggregated or redispersed simply by bubbling air or CO_2 through the latex, due to a change in the surface properties of the surfactant on the particle surface. Since we published these papers, interest in this area has exploded, with several other groups now actively pursuing related and new materials that can be made with this approach that we introduced, and a rapidly increasing number of related publications in recent years. I have been invited to lecture on this subject at numerous international conferences, as well as universities and corporate research groups.

We have expanded our initial work on CO_2 responsive latexes that used preformed switchable surfactants to more sophisticated methods that do not require the surfactants to be made prior to reaction; rather the stabilizing species for the particles are synthesized *in situ* during the reaction. This gives a simpler, less expensive and more industrially appealing process, as well as providing critical property advantages to the latexes. Conventional (preformed) surfactants, while effective, are only adsorbed on the particle surface, and can therefore desorb in use. The latex can become unstable in storage, or the desorbed surfactants can diffuse into the environment if in use (and most are toxic). Our new approach gives particles where the stabilizing groups are chemically bound to the particles and therefore cannot desorb. This is the

newer generation of CO_2 responsive latexes, and one that most companies are now interested in pursuing. Most academic researchers are also pursuing this approach, designing particles with chemically bound stabilizing groups to avoid using added surfactants. Most recently we have designed a new type of coating that uses water as the solvent and could replace oil-based coatings.

Prof. Jessop and I were invited by the Royal Society of Chemistry (UK) to write a book on this subject (published 2020).

3. Hybrid Composites by Graft Modification of Natural Polymers via Living Radical Polymerization

Living radical polymerization (LRP) has been used to create new hybrid composite materials consisting of natural polymers (bio-sourced, biodegradeable) that have synthetic polymers grafted onto their backbone, thereby enabling a highly flexible design, and a reduced carbon footprint. The objective of this research is to design new materials with a bio-sourced component to replace currently used petroleum-based products. This work is a collaboration with Prof. Champagne (Civil Engineering), who provides expertise on natural polymers, while I provide expertise on polymers and nanoparticles. (Profs. Neufeld, Whitney and Jessop have also been coauthors on some papers.) We have used chitosan, cellulose nanocrystals, alginate and more recently starch as natural polymers. We graft synthetic polymer chains onto the backbone of the natural polymers. The type, molecular weight and amount of synthetic polymers can be readily modified, allowing facile tailoring of properties. With alginate, we showed nanoparticles formed through a self-assembly process, giving materials with possible drug delivery applications. Modified chitosan has been used for water treatment. The work has generated extensive interest within the polymer community, including several invited talks. I was invited by the editor-in-chief of *Progress in Polymer Science* to write a review on this subject.

4. Carbon Dioxide Responsive Polymers and Processes Using Living Radical Polymerization (LRP)

Polymers with CO_2 switchable groups were synthesized via LRP chemistry. Further, they are designed so they can self-assemble when desired to bestow unique properties as desired for a given application. Atom Transfer Radical Polymerization (ATRP) was used to make a four-armed associative polymer designed so that in the presence of CO_2 the amines are charged, and the star-shaped polymers are fully soluble, giving a low viscosity solution. However, when air is bubbled through solution, the polymer chains become more hydrophobic (amines are neutral) and self-assemble to give high viscosity solutions with an accompanying 10,000x increase in viscosity. Switchable viscosity materials are of high interest for applications such as enhanced oil recovery and pipeline cleaning. We also used an *in situ* approach in which self-assembly of polymer chains containing CO_2 switchable groups leads to the formation of polymer particles through a process known as PISA (Polymerization Induced Self-Assembly). This is some of the first work combining the concepts of CO_2 switchability and LRP for the purpose of self-assembly, and although only recently published has already garnered considerable attention from other academic researchers. Self-assembly dramatically expands the scope of properties than can be designed into nanoparticles. I was invited to write a Perspective for *Macromolecules* based on this work.

5. Amphiphilic Block Copolymers as Stabilizers in Emulsion Polymerization

It was previously believed that block copolymers (segments or “blocks” of two different polymers coupled to each other) needed to have narrow molecular weight distributions (MWDs) to function effectively in applications such as emulsion polymerization stabilizers, although this view had

not been rigorously investigated. Besides being of fundamental importance, this is a critically important practical question for industry; narrow MWDs are expensive to prepare and therefore impractical for most applications. However, if a less expensive process yielding broader MWDs could be used, block copolymers could become cost effective for several applications. We conducted a fundamental study in collaboration with industry partner BASF to answer the question: are narrow MWDs necessary for stabilizers in emulsion polymerization? Our results revealed that, contrary to the commonly held view, narrow MWDs were not required. We established that while the dispersity of each block did influence the number and size of latex particles, there were not significant negative effects on stability or particle size. These results were initially quite startling to those in the field, have overturned an incorrect perception that has hampered the commercial use of block polymers, and will facilitate their industrial acceptance. We further discovered during this work that if one of the blocks is an amphiphilic random copolymer, then the block copolymer molecule can undergo self-folding to give single chain nanoparticles, similar to proteins, a remarkable discovery that may enable new applications for block copolymers such as nanocatalyst carriers. The work has resulted in 8 invited lecture invitations, and an NSERC CRD with BASF (4 years, $550k). I was invited to write a Perspective for *Green Chemistry* based on these activities.