JOSE M. MORAN-MIRABAL

Associate Professor, Department of Chemistry and Chemical Biology, McMaster University

1. PERSONAL INFORMATION

Name: Jose Manuel Moran-Mirabal Academic Field: Chemistry Languages: English, Spanish (Native), French, German (Conversational) Citizenship: Mexican

2. BUSINESS ADDRESS

Department of Chemistry and Chemical Biology Arthur N. Bourns Building (ABB) 233 1280 Main Street West Hamilton, ON L8S 4M1, Canada Tel.: +1.905.525.9140 ext. 24507 Email: <u>mirabj@mcmaster.ca</u>

3. ACADEMIC BACKGROUND

Applied Physics M.Sc., Ph.D. (2002-2007)

Cornell University, Ithaca, NY, USA. *Supervisor:* Prof. Harold G. Craighead *Thesis Title: "Biomembrane studies and applications through the use of micro- and nanostructured surfaces"*

Biotechnology M.Sc. (2000-2001)

Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), Monterrey, NL, México Supervisor: Prof. Rosamaría López-Franco Thesis Title: "Chromosomal transfer from citrus microprotoplasts to protoplasts through laser tweezers and scalpels"

Engineering Physics B.Sc., Minor Field: Biotechnology (1995-1999)

Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), Monterrey, NL, México

4. CURRENT STATUS AT MCMASTER

Associate Professor of Chemistry and Chemical Biology Tenure Appointment: July 2016

5. PROFESSIONAL ORGANIZATIONS

- Canadian Institute for Chemistry member
- Canadian Society for Chemistry member
- Microscopical Society of Canada member
- American Chemical Society member
- Biophysical Society member
- Nanotechnology Network of Ontario member
- Canadian Biomaterials Society member

6. EMPLOYMENT HISTORY

ACADEMIC

Associate Professor	July 2016-Present
Department of Chemistry and Chemical Biology	
McMaster University, Hamilton, ON, Canada	
Assistant Professor	July 2011-June 2016
Department of Chemistry and Chemical Biology	
McMaster University, Hamilton, ON, Canada	
Adjunct Assistant Professor	July 2011-July 2016
Department of Biological and Environmental Engineering	
Cornell University, Ithaca, NY, USA	
Research Associate	July 2009-June 2011
Department of Biological and Environmental Engineering	
Cornell University, Ithaca, NY, USA	
Post-Doctoral Research Associate	July 2007-June 2009
Research Supervisor: Prof. Larry P. Walker	

Department of Biological and Environmental Engineering Cornell University, Ithaca, NY, USA

Graduate Research Assistant	August 2002-June 2007
Research Supervisor: Prof. Harold Craighead	
School of Applied and Engineering Physics,	
Cornell University, Ithaca, NY, USA	
Technical Research Assistant	January 2002-July 2002

Research Supervisor: Haret Rosu IPICyT, San Luis Potosi, SLP, Mexico

Graduate Research Assistant Research Supervisor: Prof. Rosamaría López-Franco Biotechnology Center, ITESM, Monterrey, NL, Mexico

7. SCHOLARLY AND PROFESSIONAL ACTIVITIES

a) Editorial Boards

- *Industrial Biotechnology*, peer-reviewed bimonthly research journal focused on biobased industrial and environmental products and processes. (2011-present)
- Invited Guest Editor in Chief, Industrial Biotechnology, Special Issue: "Cellulose Nanotechnology: Fundamentals and Applications", February 2015.
- *ISRN Biophysics Journal*, peer-reviewed, open access journal that publishes original research articles as well as review articles in all areas of biophysics. (2011-2015)

b) Grant and Personnel Committees

- Aditi Foundation International Research Fund, (2015-2016) McMaster University Selection Committee.
- NSERC CREATE Grant, (2015-2016) McMaster University Internal Selection Committee.
- CRC Tier 2 in Bioinnovation 2016, Faculty of Engineering, McMaster University Internal Selection Committee.

c) Executive Positions

 Microscopical Society of Canada – Council Member – Council Member at Large – Funding Agency Liaison (2015-2018)

July 2000-December 2001

- Canadian Institute for Chemistry Hamilton Section, Member of the Executive, Treasurer (2015 Present).
- d) Journal Referee. Refereed over 100 articles for the journals:
 - ACS Nano
 - ACS Omega
 - ACS Sustainable Chemistry and Engineering
 - Advanced Functional Materials
 - Advanced Materials
 - Analyst
 - Analytical Chemistry
 - Applied Materials and Interfaces
 - Applied Optics Journal
 - Beilstein Journal of Nanotechnology
 - BioResource Technology
 - Biotechnology Advances
 - Biotechnology and Bioengineering
 - Canadian Journal of Chemistry
 - Epigenetics
 - Enzyme and Microbial Technology
 - Industrial Biotechnology

- ISRN Biophysics
- Journal of Industrial and Engineering Chemistry
- Journal of the American Chemical Society
- Materials Science and Engineering B
- Nano Letters
- Nano Research
- Nanotechnology
- Nucleic Acids Research
- Optics Express
- PLOS One
- Progress in Polymer Science
- Scientific Reports
- Sensors
- Soft Matter
- Trends in Analytical Chemistry

- e) External Grant Reviews (total)
 - Natural Sciences and Engineering Research Council, 2017 Collaborative Research Development Grant (1)
 - Natural Sciences and Engineering Research Council, 2016 Idea to Innovation Grant (1)
 - US-Israel Binational Science Foundation, 2016 BSF Grant (1)
 - Natural Sciences and Engineering Research Council, 2015 Discovery Grant Chemistry (1)
 - Human Frontier Science Program Organization, 2015 Research Grant Awards (1)

8. AREAS OF INTEREST

Research

My research group focuses on the study and application of micro- and nanoscale materials and

devices. As such, we focus on:

- Novel bench-top micro/nanofabrication approaches to pattern and structure materials.
- Developing novel approaches for the controlled patterning of biologically active molecules on surfaces.
- Exploring the application of micro- and nanostructured materials for use as integral components of biosensors, micro-analytical devices, and engineered cell microenvironments.
- Employing synthesis and characterization of surface-active molecules for the functionalization of nanomaterials and structured surfaces.
- Employing high-resolution fluorescence microscopy (i.e. Confocal, TIRF, Super-Resolution, and Single Molecule Tracking microscopy) for the elucidation of nanoscale biomolecular interactions.

Teaching

- Developing new application-based courses, where students learn chemical concepts through case studies.
- Implementing teaching methodologies for problem based learning.
- Developing educational multimedia in the form of websites, electronic documents, interactive learning software and educational videos to aid in content delivery.
- Developing new graduate courses that explore state-of-the-art technology and applications.
- Developing technical workshops that bring to McMaster University expert scientists from all over Canada and the world.

9. HONOURS

Tier 2 Canada Research Chair in Micro- and Nanostructured Materials Canada Research Chairs	2017
Early Researcher Award Ontario Ministry of Research and Innovation	2015
<i>Inaugural Speaker</i> Emerging Leaders of Applied Chemistry and Chemical Engineering Seminar, University of Toronto, Toronto, ON	2013

<i>Distinguished Alumnus Plenary Lecture</i> 30 th Anniversary IFI, ITESM, Monterrey, Mexico.	2010
Student Travel Award Biophysical Society Meeting, Baltimore MD.	2007
<i>Graduate Fellowship</i> CONACyT, Mexico.	2002-2007
<i>First Prize Award</i> Scanning Electron Microscopy Image Contest, Cornell Center for Materials Research, Cornell University, Ithaca, NY, USA.	2005
Best Poster Award Graduate Research Symposium, College of Engineering, Cornell University, Ithaca, NY, USA.	2004
<i>Graduate Excellence Academic Award</i> ITESM, Monterrey, NL, Mexico. (2001)	2001
Outstanding Academic Achievement Award for the Class of 1999 Colegio de Profesionistas de Nuevo Leon, Monterrey, NL, Mexico.	2000
<i>Excellence Graduate Scholarship</i> ITESM, Monterrey, NL, Mexico.	2000
Undergraduate Excellence Academic Award ITESM, Monterrey, NL, Mexico.	1999
Excellence Undergraduate Scholarship ITESM, Monterrey, NL, Mexico.	1995
Participant-Mexico, 26th International Physics Olympiad Canberra, Australia.	1995
10. COURSES TAUGHT (Past five years)	

a) Undergraduate

Curriculum Vitae – Moran-Mirabal J.M.

•	Chemical Biology 2AA3/2A03 – Introduction to Bioanalytical Chemistry (2011-2012 – co-taught (35%)	Fall 2011-2016
	with Dr. Phillip Britz-McKibbin)	
•	Chemistry 3AA3 – Instrumental Analysis Methods	Winter 2013-2016
•	Science 1A03 - Investigating Science-Opportunities and	Fall 2013-2016
	Experiences	
Gra	duate	
•	Chemistry 757 – Fabrication and Applications of Lab-on-a-	Winter 2014- Fall 2016
	Chip Devices.	

• Biomedical Engineering 706 – Biomedical Engineering Core 2. *Winter 2016*

c) Special Contributions to Teaching

b)

- Fall 2012 CHEMBIO 2AA3/2AO3 Restructured the laboratory practices for this course to enhance the student learning experience and ensure experimental success. Developed a uniform format for all practices, along with analyst report sheets for all practices to be used in future years.
- Winter 2013 CHEM 3AA3 Within the course material I developed an inquiry-based project titled "The miniaturization of analytical platforms", where teams of students pick a relevant analyte and propose a miniaturized platform for its quantitative detection in a complex matrix. This exercise makes students work from the conceptualization of an analytical technique, to how they implement it in a miniaturized format, to the testing and validation needed for its deployment as a commercial platform. This has been a very useful exercise, since it that has enabled students to go beyond learning how an analytical technique works and exposed them to areas of study (e.g. microfabrication) that they would have otherwise not explored. I have continued to run this inquiry-based project every year that I taught this course.
- Fall 2013 CHEMBIO 2AA3/2AO3 Designed, optimized and introduced two new laboratory experiments for this course. The experiments expose our Chemical Biology Undergraduates to Liquid and Gas Chromatography instrumentation and experimental use. The laboratories focused on the determination of caffeine content in energy drinks, in the context of their impact on our health. Both experiments have been successfully incorporated into the course. An optional component was offered to students to visualize the effect of caffeine in an aquatic organism using microscopy.
- 41st Southern Ontario Undergraduate Chemistry Conference, McMaster University, Hamilton, ON (March 30, 2013). SOUSCC is a unique conference, providing an opportunity for undergraduate chemistry students to present and discuss their research, meet other undergraduates from the province, and interact with academic

and industrial researchers. I participated as an organizer for this event and coordinated the website and program booklet design.

- Winter 2014 CHEM 799: Fabrication and Applications of Lab-on-a-chip devices Developed original course and lecture material for this graduate module. The graduate module explores fundamental techniques LoC device fabrication, the unit operations involved in on-chip analysis, and applications of LoC devices. As part of the course, the students develop a proposal where they apply a LoC device to an area of research. The course in its first offering drew in 5 registered and 5 auditing students as well as 2 faculty members. A request has been made to open the course to other departments.
- Fall 2014 CHEMBIO 2AA3/2AO3 Developed 5 instructional videos that introduce experiments that the students perform in this course. The videos were designed, recorded and edited in coordination with 3 Chemical Biology undergraduate students. These videos aid the students in their preparation for laboratory experiments and reduce the time needed to complete them successfully. The students have found the videos very helpful, as they reduced the stress of preparing for a laboratory. Some videos are also being used in experiments for the CHEM 2LA3 course.
- Winter 2015 CHEM 3AA3 I developed lecture podcasts where the slides and voiceover were recorded and made available online. This material allows students to review the lecture material at their own pace. Based on end-of-term evaluations, this was the learning aid that students found most efficient and would like to see retained.
- Fall 2014-2016 SCIENCE 1A03 "Investigating Science-Opportunities and Experiences" – Participated with Dr. Saravanamuttu in the development of a lecture that introduced first year undergraduates to what Chemistry is, what our Department has to offer in undergraduate programs, teaching laboratories and research, and how we teach Chemistry. My responsibilities were to coordinate the recording and editing of videos highlighting research in our department, structuring the presentation and synthesizing the information relevant to the areas of "Smart Materials" and "Energy and the Environment", and assembling together the presentation in Prezi, as a new and engaging format for the delivery of this information.
- Fall 2016 CHEMBIO 2AA3/2AO3 Developed 5 additional instructional videos that introduce experiments that the students perform in this course. These videos complete the collection so that every laboratory practice in the semester has an electronic resource to be viewed by the students. These videos aid the students in their preparation for laboratory experiments and reduce the time needed to complete them successfully. The students have found the videos very helpful, as they reduced the stress of preparing for a laboratory. Introduced online pre-lab quizzes to help students prepare for their lab experiment ahead of time.

11. SUPERVISORSHIP

a) Masters (MSc.)

- Helen Luu, Chemical Biology, co-supervised with Dr. Dawn Bowdish (September 2016

 Present). Project: Effect of structured surface on macrophage functionality.
- Christal Zhou, Chemical Biology, co-supervised with Dr. Harald Stöver (September 2016 – August 2017). Project: Electrospinning of ionic polymers for cell scaffolds. Awards/Recognitions: 2016 NSERC Canada Graduate Scholarship - Masters.
- Urooj Gill, Chemical Biology. (May 2015 July 2017). Project: Surface structuring and applications of cellulose nanocrystal films. Awards/Recognitions: 2nd Place Poster Presentation Award, 9th PolyMac Conference, Hamilton, ON (December 2016); 2016 Ontario Graduate Scholarship (September 2016).
- Jonathan West, Chemistry, Co-Supervised with Dr. Adam Hitchcock. (June 2014 July 2016). Project: Scanning Transmission X-Ray and Fluorescence Microscopy of Lipid Bilayers.
- 5. Saied Rahimi-Razin, Chemistry. (January 2013 February 2015). Project: Development of functional polymer coatings for biomaterial patterning.
- 6. Jacob C. Bolewski, Chemical Biology. (September 2012 withdrew from program September 2014). Project: Development of analysis methods for single molecule fluorescence microscopy (*cf.* Publication B21).

b) Doctoral (PhD.)

- Mouhanad Babi, Chemical Biology (May 2016 Present). Project: Super Resolution microscopy imaging of cellulose nanostructure. Awards/Recognitions: 2017 NSERC Canada Graduate Scholarship – Doctoral; 2016 NSERC Canada Graduate Scholarship – Masters; 2017 Biophysical Society Travel Award.
- Sokunthearath (Kevin) Saem, Chemistry. (May 2015 Present). Project: Development of nanostructured electrochemical sensors. <u>Awards/Recognitions:</u> 2017 Ontario Graduate Scholarship (September 2017); 1st Place Award, 2017 Graduate Research Colloquium, Department of Chemistry and Chemical Biology, McMaster University, Hamilton, ON (May 2017); 2nd Place Oral Presentation Award, 9th PolyMac Conference, Hamilton, ON (December 2016); 2nd Place 2-minute Thesis Presentation – Analytical Chemistry Division, 99th Canadian Chemistry Conference and Exhibition, Halifax, NS (June 2016); Best Poster, Materials Science – Materials Horizons, 98th Canadian Chemistry Conference and Exhibition, Ottawa, ON (June 2015). (cf. Publications B36, D8).
- *3. Xiuping Ding, Chemistry.* (May 2016 Present). Project: Development of Stretchable Solar Cell.

- 4. *Petr Nalivaika, Chemistry.* (September 2014 Present). Project: Integration of structured conductive probes into a novel mass spectrometry source (in collaboration with VBM Science Ltd., cf. Publication D7).
- 5. Sara Makaremi, Biomedical Engineering. (September 2014 Present). Project: Single molecule tracking of macrophage membrane receptors. <u>Awards/Recognitions</u>: Travel Award to attend the Laboratory for Fluorescence Dynamics workshop at the University of California at Irvine (October 2015); Canadian Foundation for the Development of Microscopy Travel Scholarship to attend the 60th Annual Biophysical Society Meeting in Los Angeles, California (January 2016); Appointed Student Councillor at Microscopical Society of Canada Term 2016-2018 (June 2016); Best Oral Presentation Award, 2017 BME Symposium, McMaster University (January 2017); Canadian Foundation for the Development of Microscopy and Cytometry Symposium in Montréal, Quebec (May 2017); 2017 Ontario Graduate Scholarship (September 2017).
- *Markus Rose, Physics,* co-Supervised with Dr. Cecile Fradin. (January 2014 Present).
 Project: Single molecule tracking of lipids and cellulases (*cf.* Publications B29, B34, B39).
- Ayodele Fatona, Chemistry, co-Supervised with Dr. Michael Brook. (September 2013 Present). Project: Development of functional silicones for microfluidic applications (cf. Publications B32, D5, E3). <u>Awards/Recognitions</u>: Best Poster Award – FIBREnetwork Industry Connect Meeting (April 2015); International Excellence Award, Faculty of Science, McMaster University (September 2016); Best Presentation – ACS Industrial and Engineering Chemistry Research, 253rd ACS National Meeting (April 2017).
- Yujie Zhu, Chemistry. (September 2011 December 2016). Project: Surface structuring and patterning at the micro- to nanoscale using bench-top approaches (cf. Publications B22, B33, B35, B37, B38, D4, D6).
- Jeremy S Luterbacher, Chemical Engineering, co-supervised with Dr. Larry Walker. (July 2010- July 2012). Project: Visualization of biomass depolymerization using fluorescence microscopy (cf. Publications B17, B20, B27, B28).

c) Post-Doctoral

1. Jaana Vapaavuori, Visiting Post-Doctoral Research Fellow, Department of Chemistry and Bioengineering, Tampere University of Technology, Finland

d) Supervisory Committees:

- 1. Honfeng Zhang, Chemical Engineering Ph.D. Student (2017-Present)
- 2. Lili Zhang, Physics Ph.D. Student (2017 Present).

- 3. Sheilan Sinjari, Chemistry Ph.D. Student (2017 Present).
- 4. James Bodnaryk, Chemistry Ph.D. Student (2017 Present).
- 5. Mengchen Liao, Chemistry Ph.D. Student (2017 Present).
- 6. *Kevin De France,* Chemical Engineering Ph.D. Student (2016 Present).
- 7. Eric Rozema, Chemical Engineering Ph.D. Student (2016).
- 8. Bryan Lee, Biomedical Engineering Ph.D. Student (2015 Present).
- 9. Darryl Fong, Chemistry Ph.D. Student (2015 Present).
- 10. Holly Bilton, Chemical Biology M.Sc. Student. (2014 Present).
- 11. Mai Yamamoto, Chemical Biology Ph.D. Student. (2014 Present).
- 12. Karen Lam, Chemical Biology Ph. D. Student (2014 Present).
- 13. Michael Reid, Chemical Engineering Ph.D. Student (2014 Present).
- 14. Michael Stolle, Physics Ph. D. Student (2014 Present).
- 15. Matthew Chan, Chemistry Ph.D. Student. (2013 Present).
- 16. Fei Xu, Chemical Engineering Ph.D. Student. (2013 Present).
- 17. Christy Hui, Chemical Biology Ph.D. Student. (2012 Present).
- 18. Alison Stewart, Chemistry Ph.D. Student. (2012 Present).
- *19. Nadine Wellington,* Chemistry Ph.D. Student. (2012 Present).
- 20. Sujan Fernando, Chemistry Ph.D. Student. (2012 2016).
- 21. Emilia Bakaic, Chemical Engineering Ph.D. Student. (2012 2017).
- 22. Farnaz H. Zadeh, Chemistry Ph.D. Student. (2011 2017).
- 23. Erica Forsberg, Chemical Biology Ph.D. Student (2011 2015).
- 24. Fei-Chi Yang, Physics M.Sc. Student. (2013 2014).
- 25. Ahmed Tawfic, Civil Engineering Ph.D. Student. (2013 2014).
- 26. Nehad Hirmiz, Physics M.Sc. Student. (2012-2014).
- 27. Naomi Kuehnbaum, Chemistry Ph.D. Student. (2011 2014).

e) Undergraduate Thesis Students

- 1. *Tyler Or,* Integrated Science 4A12: Senior Thesis in Integrated Science. (2017-2018). Project: Application of cellulose-based aerogel thin films.
- 2. Drew Hansen, Biochemistry 4T15: Senior Thesis in Biochemistry. (2016-2017). Project: Development of crosslinking approaches for the formation of CNC-based microparticles.
- *3.* Angelico Obille, Integrated Science 4A12: Senior Thesis in Integrated Science. (2016-2017). Project: Development of surface modification of cellulosic materials for functionalization through thiol-ene click chemistry.
- 4. Samuel Laskey, Chemical Biology 4GG9: Senior Thesis in Chemical Biology. (2016-2017). Project: Assessment of impact of expansins and swollenins on cellulose depolymerization.

- 5. Daniel Levin, Chemical Biology 4GG9: Senior Thesis in Chemical Biology. (2016-2017). Project: Microfluidic assay for macrophage adhesion.
- *6. Tyler Or*, Integrated Science 3RP3, co-supervised with Dr. Emily Cranston. (September 2016 December 2016) Project: Patterning of CNC aerogels.
- Travis Sutherland, Chemical Biology 4GG9: Senior Thesis in Chemical Biology. (2015 2016). Project: Doping of hydrogels with CNCs for iontophoretic drug delivery.
- 8. Mouhanad Babi, Chemical Biology 4GG9: Senior Thesis in Chemical Biology. (2015 2016). Project: Super-Resolution Imaging of Cellulose Nanofibers.
- *9. Justin Boyle,* Biochemistry 4T12: Senior Thesis. (2015 2016). Project: Evaluation of macrophage response to structured glassy surfaces.
- Sanjay Sonney, Chemical Biology 4GG9: Senior Thesis in Chemical Biology. (2014 2015). Project: Development of microfluidic electrochemical sensor (*cf.* Publication B30)
- Baweleta Isho, Chemical Biology 4GG9: Senior Thesis in Chemical Biology. (2014 2015). Project: Development of structured conductive surface probes. (In collaboration with VBM Science Ltd)
- Urooj Gill, Chemical Biology 4GG9: Senior Thesis in Chemical Biology. (2014 2015).
 Project: Surface structuring of layer-by-layer biocomposite films.
- Sokunthearath (Kevin) Saem, Chemistry 4G09: Senior Thesis in Chemistry. (2014 2015). Project: Characterization of the electrical properties of polystyrene/SWNT composites (cf. Publication B31)
- 14. Justin Boyle, Biochemistry 3A03: Biochemical Research Practice. (September 2014 December 2014). Project: Macrophage growth on structured surfaces.
- Tomas Urlich, Chemistry 4G09: Senior Thesis in Chemistry. (2013 2014). Project: Derivatization of cellulose nanofibers and nanocrystals with fluorescent dyes for highresolution fluorescence microscopy.
- Rachel Prestayko, Chemistry 4G09: Senior Thesis in Chemistry, co-supervised with Dr. Alex Adronov. (2013 – 2014). Project: Characterization of the electrical properties of nanofibres and thin films (*cf.* Publication B31)
- Anthony Palermo, Chemical Biology 4GG9: Senior Thesis in Chemical Biology. (2012 2013). Project: Preparation of micro/nanoscale fluorescent cellulosic materials (*cf.* Publications B25, B34)
- Fahim Naeem, Chemical Biology 4GG9: Senior Thesis in Chemical Biology. (2012 2013). Project: Electrospinning of conductive SWNT/PEO nanofibres (*cf.* Publication B31)

f) Undergraduate Co-Operative Education Research Assistants

1. Daniel Levin, Chemical Biology. (May 2017 – December 2017). Project: Fabrication of

cellulose microparticles.

2. Baweleta Isho, Chemical Biology. (January 2014 – August 2014). Project: Fabrication of structured conductive probes.

g) Undergraduate Research Assistants

- 1. Osama Shahid, Chemistry. (May 2017 August 2017). Project: Membrane-based biosensors.
- 2. Thomas Gorski, Chemical Biology. (May 2017 August 2017). Project: Surface modification of cellulose for microanalytical devices.
- *3. Jaclyn Winitski,* Biomedical Engineering. (May 2017 August 2017). Project: Super-Resolution imaging of BMCC microfibrils.
- 4. Annie Wu, Life Sciences. (May 2016 August 2017) Project: Evaluation of macrophage phagocytic activity on structured surfaces.
- Tyler Or, NSERC-USRA, Integrated Science, co-supervised with Dr. Emily Cranston. (May 2016 – August 2017) Project: Development of CNC-based electrolyte absorbants.
- 6. Kajal Bhardwaj, Chemical Biology. (January 2016 May 2017) Project: Synthesis of cellulose based chemosensors.
- 7. Srimann Chari, NSERC-USRA, Chemical Biology. (January 2016 May 2017) Project: Development of PDMS-modifying printable inks.
- 8. Kaesevan Selvakumaran, Life Sciences. (May 2016 August 2016) Project: Characterization of macrophage adhesion to structured surfaces.
- *9. Julia Pantaleo*, Integrated Science. (May 2016 August 2016) Project: Single molecule imaging of cellulases on cellulose.
- 10. Angelico Obille, Integrated Science. (January 2016 August 2016) Project: Integration of CNCs into silicone elastomers.
- Dakota Binkley, NSERC-USRA, Integrated Sciences, co-Supervised with Dr. Kathryn Grandfield. (May 2015 – August 2016). Project: Electrospinning of poly-caprolactone nanofibers loaded with silver nanoparticles for biomineralization applications.
- Justin Boyle, NSERC-USRA, Biochemistry. (May 2013 August 2016). Projects: Fabrication of super-hydrophilic nanofluidic channels (2013) and Morphological evaluation of cell adhesion on structured surfaces (2014-2016, Co-Supervised with Dr. Dawn Bowdish).
- Christal Zhou, NSERC-USRA, Chemical Biology, co-Supervised with Dr. Harald Stöver. (May 2015 – August 2016). Project: Electrospinning of ionic polymers for cell scaffolding.
- 14. Mouhanad Babi, NSERC USRA, Chemical Biology. (May 2014 August 2015). Projects: Optimization of microfluidic interconnects and pressure testing (2014) and Super-

resolution reconstruction of cellulose nanostructures (2015, cf. Publication B29)

- *15. Travis Sutherland,* Chemical Biology. (May 2014 August 2015). Project: Shrink induced structuring of cellulose biocomposites.
- *16. Henry Fan,* NSERC-USRA, Chemical Biology. (May 2015 August 2015). Project: Fluorescence labeling of cellulose using triazinyl derivatives.
- 17. Julian Gilmore, Chemical Biology. (May 2015 August 2015). Project: Bench-top fabrication of a water-in-oil droplet microfluidic device.
- *18. Daniel Levin,* Chemical Biology. (May 2015 August 2015). Project: Purification of fluorescently labeled proteins through anion exchange FPLC.
- *19. Mohammed Muneeb Shoaib,* Chemical Biology. (May 2014 August 2014). Project: Scale up of amino-Parylene synthesis.
- 20. Sokunthearath Saem, Chemical Biology. (May 2014 August 2014). Project: Determination of percolation threshold for PEO/SWNT composites. (*cf.* Publication B31)
- *21. Urooj Gill,* Chemical Biology. (May 2014 August 2014). Project: Structuring of PDMS surfaces through plasma oxidation.
- 22. Daniel D'Souza, Biochemistry. (May 2014 August 2014). Project: Electrospinning of polystyrene/PDMS composites.
- 23. Sanjay Sonney, NSERC USRA, Chemical Biology. (May 2013 August 2014). Projects: Bonding of PDMS to polystyrene substrates (2013), Fabrication of microfluidic devices for electrochemical sensing (2014, *cf.* Publication B30)
- 24. Ahmed Negmi, Biochemistry. (May 2013 August 2014). Project: Patterning of lipid bilayer stacks (*cf.* Publication B33).
- 25. Akanksha Nayak, Biochemistry. (May 2013 August 2014). Projects: Purification of crystalline cellulose from Nata de Coco (2013), Reducing-end labeling of cellulose nanofibrils and nanocrystals (2014).
- *26. Katija Bonin,* Arts and Sciences. (May 2012 August 2013). Project: Characterization of crumpled glassy films for biological applications.
- 27. Katie Huyhn, NSERC USRA, Chemical Biology. (May 2013 August 2013). Project: Integration of glassy crumpled structures within microfluidic devices.
- 28. Aren Armenian, Biochemistry. (May 2013 August 2013). Project: Fabrication of crumpled surfaces for SERS applications.
- *29. Shyamal Pansuriya,* Honours Biology. (May 2012 August 2013). Project: Coding of single molecule tracking algorithms.
- Oriana Vanderfleet, NSERC USRA, Chemical Engineering, co-Supervised with Dr. Leyla Soleymani (May 2012 – August 2013). Projects: Miniaturized electrospinning setup (2012, *cf.* Publication B26), Electrochemical cell based on crumple-structured electrodes (2013).

- *Avinash Ramkissoon,* NSERC USRA, Chemical Biology. (May 2012 August 2012). Project: Characterization of conductive polymer films.
- *32. Norman Shek,* Chemical Biology. (May 2012 August 2012). Project: Bench-top fabrication of microfluidic devices (*cf.* Publication B30).
- *33. Roman Malekzai,* Chemical Biology. (May 2012 August 2012). Project: Electrospinning of polystyrene nanofibres.
- *34. Jonathan Satar,* Chemical Biology. (May 2012 August 2012). Project: Modeling of single molecule imaging.

h) Other (visiting researchers)

- Ahmed Saad, Visiting MSc. Researcher, Université de Besancon Université de Franche Comte. (January – April 2017). Project: Optimization of membrane deposition on structured electrodes.
- Juan Francisco Luna Muñoz, Visiting BSc. Researcher, Biotechnology Engineering Universidad Politécnica de Sinaloa. (September – December 2016). Project: Development of a reducing-end assay to assess the effect of expansin on cellulosic materials.
- 3. Paul Astiasarain, Visiting MSc Researcher, Chemistry École Nationale Superiéure de Chimie de Clermont-Ferrand. (May August 2015). Project: Characterization of the mechanical properties of PDMS-CNC composites.
- Miguel Olarte Lozano, Visiting PhD Student Researcher, Biotechnology UNAM, Mexico. (November 2014 – December 2014). Project: Isolation and functionalization of bacterial cellulose.
- Lauren Nowicki, Visiting Undergraduate Researcher, Physics Gettysburg College. (May 2013 – August 2013). Project: Electrical characterization of conductive nanofibres (*cf.* Publication B31).

12. RESEARCH LEAVES

Research Sabbatical Stay – Egineering in Life Sciences Applications Team, Laboratory for the Architecture and Analysis of Systems, Centre National de la Recherche Scientifique. Toulouse, France. Project: "Micro- and Nanoscale Structuring of Cellulosic Materials through Capillary Patterning and Photo-Initiated Crosslinking for Tissue Engineering and 3D Printing Applications" 2017-2018

13. RESEARCH FUNDING (since joining McMaster University)

Tier 2 Canada Research Chair in Micro- and Nanostructured Materials – Canada Research Chairs (CRC), \$500,000.	2018-2023
New Collaborations Initiative – France-Canada Research Fund (FCRF), \$15,000. "Micro- and Nanoscale Structuring of Cellulosic Materials through Capillary Patterning and Photo-Initiated Crosslinking for Tissue Engineering and 3D Printing Applications"	2017-2019
Globalink France (Sokunthearath Saem) – MITACS, \$7,000. "Development of Novel Cellulose Bioprinting Materials Using Thilo-ene Click Chemistry for Application in 3D Printing/Structuring"	2017-2018
Research Tools and Instrumentation-1 – Natural Sciences and Engineering Research Council (NSERC), \$150,000, (1 of 10 co-applicants). "Thermo- gravimetric Analysis Instrument"	2017-2018
Idea to Innovation (Market Assessment) – Natural Sciences and Engineering Research Council (NSERC), \$20,000, (1 of 2 co-aplicants). "Smart nanotech sensors using human red blood cells for fast blood testing"	2017
Voucher for Innovation and Productivity – Ontario Centers of Excellence (OCE), \$45,000. "Functional Conductive Structured Surfaces for Primary Ion Mass Spectrometry Source (FSCS-PIMSS)"	2016
Early Researcher Award – Ontario Ministry of Research and Innovation (OMRI), \$150,000. "Simple and Inexpensive Fabrication of Micro- and Nanostructured Surfaces for Sensors, Flexible Electronics, and Tissue Engineering Applications"	2015-2020
Interdisciplinary Research initiative – McMaster University, Faculty of Science, \$74,000. "Nanoscale Investigation of the Molecular Mechanisms Behind Infection and Disease"	2015-2018
Interaction Grant – Natural Sciences and Engineering Research Council (NSERC), \$2,704. "Visit to IOGEN to discuss potential collaborative projects"	2015
Engage Grant – Natural Sciences and Engineering Research Council (NSERC),	2015

*\$25,000. "*Assesment of a One-Step Method for the Chemical Functionalization of Cellulose Nanocrystals"

Interaction Grant – Natural Sciences and Engineering Research Council (NSERC),2014-2015\$1,282. "Meeting with CelluForce to Evaluate a Collaborative Project for theOne-Step Functionalization of Cellulose Nanocrystals"

Research Tools and Instrumentation-1 – Natural Sciences and Engineering2014-2015Research Council (NSERC), \$68,000, (1 of 7 co-applicants). "633 nm Laser forRaman Instrument"

Voucher for Innovation and Productivity – Ontario Centers of Excellence (OCE),2014\$45,000. "Conductive Structured Surfaces for Primary Ion Mass SpectrometrySource (SCS-PIMSS)"

Discovery Grant – Natural Sciences and Engineering Research Council (NSERC),2013 – 2019\$138,000. "Development and Application of Micro-Engineered Surfaces forBiomaterial Micropatterning and the Study of Biomolecular Interactions"

Research Tools and Instrumentation-1 – Natural Sciences and Engineering2013-2014Research Council (NSERC), \$33,800. "Microscope Upgrade for theCharacterization of Micro and Nanostructured Materials through Fluorescenceand Polarization"

Leaders Opportunity Fund – Ontario Research Fund, \$225,000. "Laboratory for2012-2017the Study of Biomolecular Interactions through Micropatterning and HighResolution Fluorescence Microscopy" (Funds Released in 2013)

Leaders Opportunity Fund – Canada Foundation for Innovation, \$225,000.2012-2017"Laboratory for the Study of Biomolecular Interactions through Micropatterning
and High Resolution Fluorescence Microscopy" (Funds Released in 2013)2012-2017

Research Tools and Instrumentation-1 – Natural Sciences and Engineering2012-2013Research Council (NSERC), \$84,300, (1 of 6 co-applicants). "Multiple WavelengthSurface Plasmon Resonance Spectrometer for Optical Characterization andAdsorption Studies of Biomaterials and Nanocomposites"Adsorption Studies of Biomaterials and Nanocomposites

Science and Engineering Research Board – McMaster University, \$20,000. 2012-2013

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"Development of functional micro- and nanostructured surfaces for the study of biomolecular interactions"

CREATE Grant – Natural Sciences and Engineering Research Council (NSERC),2011-2017\$1,650,000 (\$25,500/yr to JM Moran-Mirabal for graduate and undergraduatestudent support). "Integrated Development of Extracellular Matrices"

CREATE Grant – Natural Sciences and Engineering Research Council (NSERC),2011-2017\$1,600,000 (\$10,500/yr to JM Moran-Mirabal for graduate student support)."BioInterfaces Training Program"

14. LIFETIME PUBLICATIONS (H-index = 19, i10-index = 28, Total citations = 1462, Google Scholar Metrics, retrieved October 2017)

Note: Graduate students supervised in boldface, undergraduate students supervised underlined, corresponding author denoted with asterisk. Students supervised at Cornell University follow the same nomenclature but have been italicized to denote this distinction from HQP trained at McMaster University.

PEER REVIEWED

a) Contributions to books

- A4. Moran-Mirabal JM* (2013) "Advanced-microscopy techniques for the characterization of cellulose structure and cellulose-cellulase interactions" in T. van de Ven and L. Godbout (Eds.) *Cellulose Fundamental Aspects.* In-Tech Press. ISBN: 978-953-51-1183-2.
- A3. Moran-Mirabal JM*, Craighead HG, and Walker LP (2012) "Single molecule fluorescence techniques for biomedical applications" in J.M.K. Irudayaraj (Ed.). *Biomedical Nanosensors*. Pan Stanford Press. 400pp.
- A2. Moran-Mirabal JM*, Andresen K, and McMullen JD (2007) "History of Nobel laureates in physics" in Fundamentals of Physics, from *Encyclopedia of Life Support Systems (EOLSS),* Developed under the Auspices of the UNESCO, EoLSS Publishers, Oxford ,UK, [http://www.eolss.net] [Retrieved May, 2015]
- A1. Orth RN*, Foquet M, Moran-Mirabal JM, Craighead HG, and Hajjar DP (2006)
 "Nanotechnology: tools microbiologists use to refine their research and become nanobiologists." Cosmetic Science and Technology Series. 31: 271-294.

b) Journal Articles

- B45. Rambarran T, Gonzaga F, Fatona A, Coulson M, Saem S, Moran-Mirabal JM, and Brook MA* (2017) "Thermal Bonding of Silicones for Functional Microfluidics Using Huisgen Cyclization." Journal of Polymer Science Part A. Accepted. (Funding NSERC Discovery, Early Researcher Award)
- B44. Gilbert T, Alsop R, Babi M, Moran-Mirabal JM, Rheinstadter MC, Hoare T* (2017)
 "Nanostructure of Fully Injectable Hydrazone-Thiosuccinimide Interpenetrating Polymer Network Hydrogels Assessed by Small-Angle Neutron Scattering and dSTORM Single-Molecule Fluorescence Microscopy." *Applied Materials and Interfaces.* In Press. DOI: 10.1021/acsami.7b11637 (Funding NSERC Discovery, Early Researcher Award)
- B43. Khondker A, Alsop R, Dhaliwal A, Saem S, Moran-Mirabal JM, and Rheinstadter MC* (2017) "Membrane Cholesterol Reduces Polymyxin B Nephrotoxicity in Renal Membrane Analogues." *Biophysical Journal.* 113: 1-13. (Funding: NSERC Discovery Grant, Early Researcher Award)
- B42. West J, Zhu Y, Saem S, Moran-Mirabal JM*, and Hitchcock AP* (2017) "X-ray absorption spectroscopy and spectromicroscopy of supported lipid bilayers." *Journal* of Physical Chemistry C. 121: 4492–4501. (Funding: NSERC Discovery Grant)
- B41. Gill U, <u>Sutherland T</u>, Himbert S, Zhu Y, Rheinstädter MC, Cranston ED and Moran-Mirabal JM* (2017) "Beyond Buckling: Humidity-Independent Measurement of the Mechanical Properties of Green Nanocomposite Films." *Nanoscale.* 9: 7781-7790. (Funding: NSERC Discovery Grant, Early Researcher Award)
- B40. Saem S, Zhu Y, Luu H, and Moran-Mirabal JM* (2017) "Bench-top fabrication of an all-PDMS microfluidic electrochemical biosensor integrating micro/nanostructured electrodes." Sensors. 12: 732. (Funding: NSERC Discovery Grant, Early Researcher Award)
- B39. Himbert S, Alsop RJ, Rose M, Hertz L, Dhaliwal A, Moran-Mirabal JM, Verschoor CP, Bowdish DME, Kaestner L, Wagner C, Rheinstädter MC* (2017) "The Molecular Structure of Human Red Blood Cell Membranes from Highly Oriented, Solid Supported Multi-Lamellar Membranes." *Scientific Reports* 7: 39661. (Funding: NSERC Discovery Grant, McMaster University Faculty of Science Interdisciplinary Research Initiative)
- B38. **Zhu Y** and Moran-Mirabal JM* (2016) "Micropatterning of phase-segregated supported lipid bilayers and binary lipid phases through polymer stencil lift-off." *Langmuir.* **32:** 11021-11028. (Funding: NSERC Discovery Grant)
- B37. Yamamoto M, Ly R, Gill B, Zhu Y, Moran-Mirabal JM, Britz-McKibbin P* (2016) "A Robust and High Throughput Method for Anionic Metabolite Profiling: Preventing Polyimide Aminolysis and Capillary Breakages under Alkaline Conditions in CE-MS." Analytical Chemistry. 88: 10710-10719 (Funding: NSERC Discovery Grant)

- B36. Fong D, Bodnaryk WJ, Rice N, Saem S, Moran-Mirabal JM, Adronov A* (2016)
 "Influence of polymer electronics on selective dispersion of single walled carbon nanotubes." *Chemistry-A European Journal.* 22: 14560-14566. (Funding: NSERC Discovery Grant)
- B35. Zhu Y and Moran-Mirabal JM* (2016) "Fabrication of highly flexible and stretchable electrodes through compressive stress microstructuring." Advanced Electronic Materials. 2: 1500345. (Funding: NSERC Discovery Grant, Early Researcher Award)
- B34. Rose M, Hirmiz N, Moran-Mirabal JM*, Fradin C* (2015) Lipid diffusion in supported lipid bilayers: a comparison between line-scanning fluorescence correlation spectroscopy and single particle tracking. *Membranes*. 5: 702-721. (Funding: NSERC Discovery Grant, McMaster University Faculty of Science Interdisciplinary Research Initiative)
- B33. Zhu Y, <u>Negmi A</u> and Moran-Mirabal JM* (2015) Multi-Stacked Supported Lipid Bilayer Micropatterning through Polymer Stencil Lift-Off. *Membranes*. 5: 385-398. (Funding: McMaster University Science and Engineering Research Board, NSERC Discovery Grant)
- B32. Fatona A, Chen Y, Reid M, Brook MA, Moran-Mirabal JM* (2015) "One-step in-mould modification of PDMS surfaces and its application in the fabrication of self-driven microfluidic channels." *Lab-on-a-Chip.* 15: 4322-4330. (Funding: NSERC Discovery Grant, Early Researcher Award)
- B31. <u>Naeem F, Prestayko R</u>, Saem S, <u>Nowicki L</u>, Imit M, Adronov A, and Moran-Mirabal JM* (2015) "Fabrication of conductive polymer nanofibers through SWNT supramolecular functionalization and aqueous solution processing." *Nanotechnology*. 26: 395301 (Funding: McMaster University Start-up Funds, Science and Engineering Research Board, NSERC Discovery Grant)
- B30. <u>Sonney S</u>, <u>Shek N</u>, and Moran-Mirabal JM* (2015) "Rapid bench-top fabrication of PDMS/polystyrene microfluidic devices incorporating high-surface-area sensing electrodes." *Biomicrofluidics*. **9**: 026501. (Funding: NSERC Discovery Grant)
- B29. Rose M, <u>Babi M</u>, and Moran-Mirabal JM* (2015) "The study of cellulose structure and depolymerization through single-molecule methods." *Industrial Biotechnology*. 11: 1-9. (Featured in cover) (Funding: NSERC Discovery Grant)
- B28. Luterbacher JS, Moran-Mirabal JM*, Burkholder E, and Walker LP* (2015) "Modeling enzymatic hydrolysis of lignocellulosic substrates using confocal fluorescence microscopy I: filter paper cellulose." *Biotechnology and Bioengineering*. 112: 21-31. (Funding: DOE Grant GO18084, McMaster University Start-up Funds).
- B27. *Luterbacher JS*, Moran-Mirabal JM*, Burkholder E, and Walker LP* (2015) "Modeling enzymatic hydrolysis of lignocellulosic substrates using confocal fluorescence

microscopy II: pretreated biomass." *Biotechnology and Bioengineering*. **112**: 32-42. (Funding: DOE Grant GO18084, McMaster University Start-up Funds)

- B26. <u>Vanderfleet OM</u>, Gabardo CM, <u>Naeem F</u>, Moran-Mirabal JM*, and Soleymani L*
 (2014) "Rapid prototyping of a miniaturized electrospinning setup for the production of polymer nanofibers." *Journal of Applied Polymer Science*. **131:** 40629. (Funding: McMaster University, Science and Engineering Research Board).
- B25. Abitbol T*, <u>Palermo AF</u>, Moran-Mirabal JM, and Cranston ED (2013) "Fluorescent labeling and characterization of cellulose nanocrystals with varying charge contents." *Biomacromolecules.* 14: 3278-3284. (Funding: McMaster University, Science and Engineering Research Board).
- B24. Moran-Mirabal JM* (2013) "The study of cellulose structure and cellulose-cellulase interactions through fluorescence microscopy." *Cellulose*. **20**: 2291-2309. (Funding: NSERC Discovery Grant).
- B23. Yang D, Moran-Mirabal JM, Parlange JY, and Walker LP* (2013) "Investigation of the porous structure of cellulosic substrates through confocal laser scanning microscopy." *Biotechnology and Bioengineering*. **110**: 2836-2845. (Funding: DOE Grant GO18084).
- B22. Gabardo CM, Zhu Y, Soleymani L*, and Moran-Mirabal JM* (2013) "Benchtop fabrication of hierarchically structured high surface area electrodes." Advanced Functional Materials. 23: 3030-3039. (Featured in cover). (Funding: McMaster University, Science and Engineering Research Board).
- B21. Moran-Mirabal JM*, Bolewski JC, and Walker LP* (2013) "Cellulases exhibit limited surface diffusion on bacterial microcrystalline cellulose." *Biotechnology and Bioengineering*. 110: 47-56. (Featured in Research Spotlight). (Funding: DOE Grant GO18084, McMaster University Start-up Funds).
- B20. Luterbacher JS, Walker LP, Moran-Mirabal JM* (2013) "Observing and modeling BMCC degradation by commercial cellulase cocktails with fluorescently labeled Trichoderma reseii Cel7A through confocal microscopy." Biotechnology and Bioengineering. 110: 108-117. (Funding: DOE Grant 18084, McMaster University Start-up Funds).
- B19. Kostylev M, Moran-Mirabal JM, Walker LP, and Wilson DW* (2012) "Determination of the molecular states of the processive endocellulase Thermobifida fusca Cel9A during crystalline cellulose depolymerization." *Biotechnology and Bioengineering*. **109:** 295-299.
- B18. Moran-Mirabal JM*, <u>Bolewski JC</u>, and Walker LP (2011) "Reversibility and binding kinetics of *Thermobifida fusca* cellulases studied through fluorescence recovery after photobleaching microscopy." *Biophysical Chemistry*. **155**: 20-28. (Funding: DOE Grant 18084).

- B17. Zhu P, Moran-Mirabal JM, *Luterbacher JS*, Walker LP, and Craighead HG* (2011)
 "Observing *Thermobifida fusca* cellulase binding to pretreated wood particles using time-lapse confocal laser scanning microscopy." *Cellulose*. 18: 749-758.
- B16. Moran-Mirabal JM, Corgie SC, <u>Bolewski JC</u>, <u>Smith HM</u>, Cipriany BR, Craighead HG, Walker LP* (2009) "Labeling and purification of cellulose-binding proteins for highresolution fluorescence applications." Analytical Chemistry. **81:** 7981-7987.
- B15. Moran-Mirabal JM and Craighead HG* (2008) "Zero-mode waveguides: subwavelength nanostructures for single molecule studies at high concentrations." *Methods*. 46: 11-17.
- B14. Moran-Mirabal JM, Santhanam N, Corgie SC, Craighead HG, and Walker LP* (2008)
 "Immobilization of cellulose fibrils on solid substrates for cellulase binding studies through quantitative fluorescence microscopy." *Biotechnology and Bioengineering*.
 101: 1129 1141. (Featured in cover).
- B13. Slinker JD, DeFranco JA, Jaquith MJ, Silveira WR, Zhong YW, Moran-Mirabal JM, Craighead HG, Abruña H, Marohn JA, and Malliaras GG* (2007) "Direct measurement of the electric-field distribution in a light-emitting electrochemical cell." *Nature Materials*. 6: 894-899.
- B12. Moran-Mirabal JM, <u>Aubrecht DM</u>, and Craighead HG* (2007) "Phase separation and fractal domain formation in phospholipid/diacetylene supported lipid bilayers." *Langmuir*. 23: 10661-10671.
- B11. Moran-Mirabal JM, Torres AJ, Samiee KT, Baird BA, Craighead HG* (2007) "Cell investigation of nanostructures: Zero-Mode Waveguides for plasma membrane studies with single molecule resolution." *Nanotechnology*. 18: 195101. (Featured in cover).
- B10. Zhou X, Moran-Mirabal JM, Craighead HG, and McEuen P* (2007) "Supported lipid bilayer/carbon nanotube hybrids." *Nature Nanotechnology*. **2:** 185-190.
- B9. Moran-Mirabal JM*, Slinker JD, DeFranco JA, Verbridge SS, Ilic R, Flores-Torres S, Abruña H, Malliaras GG, and Craighead HG (2007) "Electrospun light-emitting nanofibers." *Nano Letters.* 7: 458-463. (Featured in Biophotonics Journal, and Nanotechweb).
- B8. Moran-Mirabal JM, Tan C, Orth RN, Williams EO, Craighead HG, and Lin DM* (2007)
 "Controlling microarray spot morphology with polymer lift-off arrays." Analytical Chemistry. Analytical Chemistry 79: 1109-1114.
- B7. Bellan LM, Cross JD, Strychalski EA, Moran-Mirabal JM, and Craighead HG* (2006)
 "Individually resolved DNA molecules stretched and embedded in electrospun polymer nanofibers." Nano Letters. 6: 2526-2530.

- B6. Samiee KT, Moran-Mirabal JM, <u>Cheung YK</u>, and Craighead HG.* (2006) "Zero Mode Waveguides for single molecule spectroscopy on lipid membranes." *Biophysical Journal*. **90:** 3288-3299.
- B5. Meyer GD, Moran-Mirabal JM, Branch DW, and Craighead HG.* (2006) "Non-specific binding removal from protein microarrays using thickness shear mode resonators." *IEEE Sensors Journal.* 6: 254-261.
- B4. Moran-Mirabal JM, Edel JB, Meyer GD, Throckmorton D, Singh AK, and Craighead HG* (2005) "Micrometer-sized supported lipid bilayer arrays for bacterial toxin binding studies through total internal reflection fluorescence microscopy." *Biophysical Journal*. 89: 296-305.
- B3. Verbridge SS, Edel JB, Stavis SM, Moran-Mirabal JM, Mathers R, Coates G, and Craighead HG* (2005) "Suspended glass nanochannels coupled with silicon microstructures for single molecule detection." *Journal of Applied Physics*. 97: 124317-1:12437-4.
- B2. Rosu HC,* Moran-Mirabal JM, Cornejo O (2003) "One-parameter nonrelativistic supersymmetry for microtubules." *Physics Letters A*. **310:** 353-356.
- B1. Louzada ES,* del Rio HS, Xia D, and Moran-Mirabal JM (2002) "Preparation and fusion of *Citrus sp.* microprotoplasts." *Journal of the American Horticultural Society*. 127: 484-488.

c) Editorial

C1. Moran-Mirabal JM* and Cranston ED (2015) "Cellulose nanotechnology on the rise." *Industrial Biotechnology*. **11:** 14-15.

d) Patents

- D8. Rheinstädter MC, Himbert S, Alsop RJ, Moran-Mirabal JM, Saem S, Bowdish DME (2016) "Biological Membrane-Based Sensor", United States Provisional Patent Application No. 62/413,652, McMaster University, October 2016.
- D7. Moran-Mirabal JM, Vuckovic D, Nalivaika P (2016) "Structured Conductive Probes for Mass Spectrometry." United States Provisional Patent Application No. 62/347,294, McMaster University, June 2016.
- D6. Moran-Mirabal JM, Bowdish D, Zhu Y, Boyle JP (2016) "Structured Glassy Surfaces for Use as Substrates for Immune Cell Assays." United States Provisional Patent Application No. 62/338,091, McMaster University, May 2016.
- D5. Moran-Mirabal JM, Brook MA, **Fatona AT** (2014) "One Step fabrication of functional structured surfaces for microfluidic applications." *United States Provisional Patent Application No. 62/033,159*, McMaster University, August 2014.

- D4. Moran-Mirabal JM, Soleymani L, Gabardo CM, **Zhu Y** (2013) "Benchtop fabrication of hierarchically structured high surface area materials." *United States Provisional Patent Application No. 61/788443*, McMaster University, February 2013.
- D3. Moran-Mirabal JM, Slinker JD, Abruña HD, Malliaras GG, Craighead HG (2013) "Electrospun Light-emitting Fibers." USPTO Patent No. 8,541,940.
- D2. Moran-Mirabal JM, Slinker JD, Abruña HD, Malliaras GG, Craighead HG (2012) "Electrospun Light-emitting nanoFibers." USPTO Patent No. 8,106,580.
- D1. Chang YF, Clark TG, Craighead HG, Lin DM, Moran-Mirabal JM, Orth RN (2010) "Protective Coating for array material deposition." *USPTO Patent No. 7,781,378.*

e) Other, including Proceedings of Meetings

- E3. Fatona A, Chen Y, Brook MA, Moran-Mirabal JM* (2015) "One-step in-mould modification of PDMS surfaces and its application in the fabrication of self-driven microfluidic channels." μTAS The 19th International Conference on Miniaturized Systems for Chemistry and Life Science, October 2015. Gyeongju, Korea.
- E2. Moran-Mirabal JM, Throckmorton D, Singh AK, Craighead HG* (2003)
 "Micropatterning of functional lipid domains for toxin detection." *Materials Research* Society Meeting, Fall 2003 Proceedings. Boston, Massachusetts.
- E1. Rosu HC*, Moran-Mirabal JM, Planat M (2003) "Milne phase for the Coulomb quantum problem related to Riemann's hypothesis." *Group 24: Physical and mathematical aspects of Symmetries Institute of Physics Conference Series* **173:** 695-697.

SUBMITTED FOR PUBLICATION

Journal Articles

- B46. Amirdehi MA,[†] Saem S,[†] Zarabadi MP, Moran-Mirabal JM,^{*} and Greener J^{*} (2017)
 "Impact of anode microstructure on direct electron transfer biofilms in microbial fuel cells." *Energy and Environmental Science*. Under Review.
 [†]Equally contributing authors.
- B47. <u>Fatona A</u>, Berry R, Brook M, Moran-Mirabal JM (2017) "One-Step Surface Modification of Cellulose Fibres and Cellulose Nanocrystals through Modular Triazinyl Chemistry." *Journal of the American Chemical Society*. Under Review.
- B48. Zhu Y, Boyle JP, Bonin K, Chowdhury T, Bowdish DME and Moran-Mirabal JM* (2017) "Micro/nanostructured SiO₂ and TiO₂ films fabricated through polymer shrinking as tunable topography substrates to control cell morphology and function." Integrative Biology. Under Review.

NON-PEER REVIEWED

Journal Articles

1. **Zhu Y** and Moran-Mirabal JM* (2012) "Micro and nanostructured materials for the study and monitoring of biomolecular interactions." *Laboratory Focus.* **16**: 13-15.

15. INVITED TALKS AT UNIVERSITIES, INDUSTRY, ETC.

- "Patterned Micro/Nanostructured Surfaces through Shape-Memory Polymer Shrinking", Guest Seminar Biosciences and Biomaterials Division, Research Institutes of Sweden, Stockholm, Sweden, November 2017.
- 2. "Micro and Nanostructured Materials: On Patterning, Wrinkling, Surface Chemistry and Super-Resolution", *Seminar Department of Bioproducts and Biosystems, Aalto University*, Helsinki, Finland, October 2017.
- 3. "Designer Molecules for One-Step Modification of Polysaccharides (Cellulose)", *Guest Lunch Seminar, Mirexus Biotechnologies Inc.,* Guelph, ON, June 2017.
- 4. "Structured Electrodes for Passive Sampling and On-Chip Sensing." *Symposium Annuel du Reséau de Recherche en Microfluidique, Université Laval*, Quebec City, QC, June 2017.
- 5. "Patterned Micro/Nanostructured Surfaces through Shape-Memory Polymer Shrinking." Engineering for Life Sciences Applications Guest Lecture, Laboratory for the Architecture and Analysis of Systems, CNRS, Toulouse, France, October 2016.
- 6. "Bench-top fabrication of patterned micro- and nanostructured surfaces and their applications in sensing, stretchable electronics, and tissue engineering". *Analytical Chemistry Seminar Series, Department of Chemistry, University of Toronto,* September 2016.
- 7. "High Resolution Fluorescence Microscopy for the Study of the Biochemical Depolymerization of Cellulosic Materials". *IOGEN Corporation*, Ottawa, ON, June 2015.
- 8. "Bench-top Fabrication Patterned Micro/Nanostructured Surfaces". *XRCC Seminar, Xerox Research Centre of Canada*, Mississauga, ON, January 2015.
- 9. "One-Step Functionalization of Cellulose Nano-Crystals". *Guest Seminar, CelluForce*, Montreal, QC, November 2014.
- "Bench-top Fabrication Patterned Micro/Nanostructured Surfaces". Guest Seminar Series, Department of Chemistry and Biochemistry, University of Windsor, Windsor, ON, October 2014.
- "Microscopía de Alta Resolución para el Estudio de Interacciones Celulasa-Celulosa". Cátedra Institucional, Instituto de Biotecnología, UNAM, Cuernavaca, Morelos, Mexico, September 2014.
- 12. "Fabricación de Superficies Micro/Nanoestructuradas por Técnicas No-Convencionales". *Seminario Institucional, Facultad de Química, UNAM*, Mexico City, Mexico, August 2014.

- 13. "Biomolecular Interactions Dissected by Single Molecule and Super-Resolution Fluorescence Microscopy". *Department of Physics Seminar, University of Guelph*, Guelph, ON, February 2014.
- "Biomolecular Interactions Dissected by Single Molecule and Super-Resolution
 Fluorescence Microscopy". *Department of Biochemistry Seminar, McMaster University,* Hamilton, ON, January 2014.
- 15. "The Study of Cellulase-Cellulose Interactions and Cellulose Structure through Fluorescence Microscopy Techniques". *Guest Seminar Series, Novozymes A/S,* Bagsvaerd, Denmark, November, 2013.
- 16. "Study of Cellulase-Cellulose Interactions through Single Molecule Fluorescence Microscopy Techniques". *Emerging Leaders of Applied Chemistry and Chemical Engineering Seminar, University of Toronto*, Toronto, ON, October 2013.
- "The simplicity of bench top fabrication of hierarchically structured materials". *Chemistry Departmental Seminar, University of Waterloo,* Waterloo, ON, November 2012.
- 18. "The Study of Cellulase-Cellulose Interactions through High-Resolution Fluorescence Microscopy Techniques". *The Science and Engineering Challenges to the Development of Sustainable Biobased Industries, Cornell University,* Ithaca, NY, October 2011.

16. PRESENTATIONS AT MEETINGS

a) Invited

- 1. "Designer Molecules for One-Step Modification of Cellulosic Materials." *International Conference on Nanotechnology for Renewable Materials, TAPPI,* Montreal, QC, June 2017.
- "Characterization of Cellulose Nanostructure through Super-Resolution Fluorescence Microscopy." 61st International Conference on Analytical Sciences and Spectroscopy, Quebec City, QC, June 2017.
- 3. "Assembly and Characterization of Nanocellulose-based Biocomposite Materials." 100th Canadian Chemistry Conference and Exhibition, Toronto, ON, June 2017.
- "Study of Cellulose Structure and Cellulase-Cellulose Interactions through Single Molecule Methods." 3rd Annual Meeting, Biophysical Society of Canada, Montreal, QC, May 2017.
- 5. "Characterization of Cellulose Nanostructure through Super-Resolution Fluorescence Microscopy." *Canadian Microscopy and Cytometry Symposium,* Montreal, QC, May 2017.
- 6. "Microfluidic Devices with Integrated Structured Electrodes for On-chip Sensing." 99th

Canadian Chemistry Conference and Exhibition, Halifax, NS, June 2016.

- "The structural underpinnings of bacterial microcrystalline cellulose acid hydrolysis". 98th Canadian Chemistry Conference and Exhibition, Ottawa, ON, June 2015.
- 8. "Compressive Stress Micro/Nanostructuring of CNC-XG Composite Films. Symposium on Sustainable Nanomaterials". *Canadian Society for Chemical Engineering Conference*, Niagara Falls, ON, October 2014.
- "Bench-top Fabrication of Patterned Micro/Nanostructured Surfaces and Applications".
 97th Canadian Chemistry Conference and Exhibition, Vancouver, BC, June 2014.
- "High Resolution Fluorescence Microscopy for the Characterization of Cellulosic Materials". 96th Canadian Chemistry Conference and Exhibition, Quebec City, QC, May 2013.
- 11. "The Study of Cellulase-Cellulose Interactions through Fluorescence Microscopy". *American Chemical Society Spring Meeting,* New Orleans, LA, April 2013.
- 12. "Polymers as structural materials in micro and nanofabrication". *PolyMac Conference, McMaster University*, Hamilton, ON, December 2012.
- 13. "The study of cellulase-cellulose interactions through fluorescence-based techniques: from macromolecular structures to individual molecules". 2011 Gordon-Keenan Research Symposium: Cellulosomes, Cellulases & Other Carbohydrate Modifying Enzymes, Stonehill College, Easton, MA, July 2011.
- 14. "Use of High Resolution Optical Methods and Micro/Nanofabrication for the Study of Cellulase-Cellulose Interactions at the nanoscale". 2008 Pacific Rim Summit on Industrial Biotechnology and Bioenergy, Vancouver, BC, September 2008.
- 15. "Zero-Mode Waveguides: Subwavelength Optical Apertures for Single-Molecule Studies at High Molecular Concentrations". *IEEE-LEOS*, Orlando, FL, October 2007.
- "Zero Mode Waveguides for Nanoscale Observation of Membrane Processes". 7th Annual Nanobiotechnology Symposium, Cornell University, Ithaca, NY, October 2006. Available as Academy eBriefing at: <u>http://www.nyas.org/nbtc2006</u>

b) Contributed (presenter underlined)

- <u>Gill U</u>, Sutherland T, Himbert S, Zhu Y, Rheinstadter MC, Cranston ED, Moran-Mirabal JM "Beyond Buckling: Humidity-Independent Measurement of the Mechanical Properties of Green Nanocomposite Films." *International Conference on Nanotechnology for Renewable Materials, TAPPI,* Montreal, QC, June 2017. (Contributed Talk)
- <u>Saem S</u>, Zhu Y, Moran-Mirabal JM "Bench-top fabrication of all-PDMS microfluidic electrochemical sensors integrating micro/nanostructured electrodes" 100th Canadian Chemistry Conference and Exhibition, Toronto, ON, June 2017. (Contributed Talk)
- 3. <u>Nalivaika P</u>, Isho B, Vuckovic D, Moran-Mirabal JM "Structured Conductive Probes for Mass Spectrometry: Novel Ambient Ionization Technique" *100th Canadian Chemistry*

Conference and Exhibition, Toronto, ON, June 2017. (Contributed Poster)

- 4. <u>Luu H</u>, Makaremi S, Boyle J, Levin D, Bowdish DME, Moran-Mirabal JM "The Effect of Glassy Film Topography on Macrophage Function and Adhesion" *100th Canadian Chemistry Conference and Exhibition*, Toronto, ON, June 2017. (Contributed Poster)
- 5. <u>Zhou C</u>, Moran-Mirabal JM, Stöver HDH "Self-crosslinking p(APM-co-AA) nanofibrous scaffolds and microstructured films as biomimetic scaffolds" *100th Canadian Chemistry Conference and Exhibition,* Toronto, ON, June 2017. (Contributed Poster)
- <u>Fatona A</u>, Bhardwaj K, Brook MA, Moran-Mirabal JM "A New Colorimetric and Fluorescent Cellulose Chemosensor for Selective Detection of Copper (II) and Mercury (II) in Water" *100th Canadian Chemistry Conference and Exhibition,* Toronto, ON, June 2017. (Contributed Poster)
- <u>Gill U</u>, Sutherland T, Himbert S, Zhu Y, Rheinstadter MC, Cranston ED, Moran-Mirabal JM "Beyond Buckling: Humidity-Independent Measurement of the Mechanical Properties of Cellulose Nanocrystal- Based Films" *100th Canadian Chemistry Conference and Exhibition*, Toronto, ON, June 2017. (Contributed Poster)
- <u>Babi M</u>, Fatona A, Moran-Mirabal JM "Super-Resolution Imaging of Native Cellulose Nanostructure." 3rd Annual Meeting, Biophysical Society of Canada, Montreal, QC, May 2017. (Contributed Poster)
- 9. <u>Makaremi S</u>, Luu H, Ranjit S, Digman MA, Gratton E, Bowdish DME, Moran-Mirabal JM "Raster Image Correlation Spectroscopy for Measuring Diffusion of Receptors on Macrophage Membranes" *Canadian Microscopy and Cytometry Symposium*, Montreal, QC, May 2017. (Contributed Poster)
- <u>Fatona A</u>, Brook MA, Moran-Mirabal JM "Designer molecules for one-step modification of cellulosic materials in aqueous and organic media through triazine chemistry" 253rd *American Chemical Society National Meeting and Exposition*, San Francisco, CA, April 2017. (Contributed Talk)
- <u>Babi M</u>, Moran-Mirabal JM "The Characterization of Cellulose Nanostructure Using Super-Resolution Fluorescence Microscopy" 61st Biophysical Society Meeting, New Orleans, LA, USA, February 2017. (Contributed Poster)
- <u>Saem S</u>, Fong D, Adronov A, Moran-Mirabal JM "Single-Walled Carbon Nanotube:PDMS Devices - A Promising Avenue in Flexible Electronics" 9th Annual PolyMac Conference, Hamilton, ON, December 2016. (Contributed Talk)
- <u>Gill U</u>, Sutherland T, Himbert S, Rheinstädter MC, Cranston ED, Moran-Mirabal JM.
 (2016) "Beyond Buckling: Humidity-Independent Measurement of the Mechanical Properties of Green Nanocomposite Films." 9th Annual PolyMAC Conference, McMaster University, Hamilton, ON, December 2016. (Contributed Poster)
- 14. Babi M, Moran-Mirabal JM "Super-resolution imaging of cellulose." *9*th Annual PolyMac Conference, McMaster University, Hamilton, ON, December 2016. (Contributed Poster)

- 15. <u>Zhou C</u>, Stöver HDH, Moran-Mirabal JM. "Self-crosslinking structured p(APM-co-AA) films and nanofibers for use as biomimetic scaffolds." 9th Annual *PolyMAC Conference*, Hamilton, ON, December 2016. (Contributed Poster)
- 16. <u>Gill U,</u> Sutherland T, Himbert S, Wojcik J, Rheinstädter MC, Cranston ED, Moran-Mirabal JM "Beyond Buckling: Humidity-Independent Measurement of the Mechanical Properties of Green Nanocomposite Films." 7th Annual Nano Ontario Conference, Guelph, ON, November 2016. (Contributed Poster)
- <u>Saem S,</u> Fong D, Adronov A, Moran-Mirabal JM "Single-Walled Carbon Nanotubes:PDMS Devices - A Promising Avenue in Flexible Electronics." 99th Canadian Chemistry Conference and Exhibition, Halifax, NS, June 2016. (Contributed Talk)
- <u>Nalivaika P</u>, Vuckovic D, Moran-Mirabal JM "Structured Conductive Probes for Mass Spectrometry." 99th Canadian Chemistry Conference and Exhibition, Halifax, NS, June 2016. (Contributed Talk)
- Makaremi S, Ranjit S, Bowdish DME, Digman MA, Gratton E, Moran-Mirabal JM "Investigating Diffusion of Receptors on Macrophage Membranes Using Raster Image Correlation Spectroscopy" 43rd Microscopical Society of Canada Annual Meeting, Edmonton, AB, June 2016. (Contributed Talk)
- <u>Makaremi S</u>, Boyle JP, Zhu Y, Bowdish D, Moran-Mirabal JM "Phagocytic ability of macrophages cultured on nano-structured glassy films." 10th World Biomaterials Congress, Montreal, QC, May 2016. (Contributed Poster)
- <u>Gill U,</u> Sutherland T, Himbert S, Wojcik J, Mascher P, Rheistädter M, Cranston ED, Moran-Mirabal JM "Stable, irreversible and tuneable micro/nanostructuring of cellulose nanocrystal biocomposite films." 10th World Biomaterials Congress, Montreal, QC, May 2016. (Contributed Poster)
- <u>Zhu Y</u>, Boyle JP, Moran-Mirabal JM "Effect of glassy film micro/nanostructured Topography on Cell Morphology." 10th World Biomaterials Congress, Montreal, QC, May 2016. (Contributed Talk)
- 23. <u>Fatona AT</u>, Chen Y, Brook MA, Moran-Mirabal JM "Structuring and in-mould modification of PDMS surfaces for self-driven microfluidic devices." *10th World Biomaterials Congress*, Montreal, QC, May 2016. (Contributed Talk)
- 24. <u>Babi M</u>, Moran-Mirabal JM "Super-resolution imaging of cellulose." *Chemical Biophysics Symposium, University of Toronto,* Toronto, ON, May 2016. (Contributed Poster)
- 25. <u>Makaremi S</u>, Novakowski K, Rose M, Bowdish DME, Moran-Mirabal JM, "Investigating Diffusion of Receptors on Macrophage Membranes Using Single Molecule Tracking" 60th Biophysical Society Meeting, Los Angeles, CA, USA, February 2016. (Contributed Poster)
- 26. <u>Zhu Y</u>, Moran-Mirabal JM "Bench top fabrication of transferrable micro/nanostructured gold electrodes for stretchable sensors and electronics." *The International Chemical Congress on Pacific Basin Societies 2015*, December 2015. Hawaii, USA. (Contributed

Talk)

- 27. <u>Fatona A</u>, Chen Y, Brook MA, Moran-Mirabal JM "One-step in-mould modification of PDMS surfaces and its application in the fabrication of self-driven microfluidic channels." *The International Chemical Congress on Pacific Basin Societies 2015*, December 2015. Hawaii, USA. (Contributed Talk)
- Fatona A, Chen Y, Brook MA, <u>Moran-Mirabal JM</u> "One-step in-mould modification of PDMS surfaces and its application in the fabrication of self-driven microfluidic channels." μTAS – The 19th International Conference on Miniaturized Systems for Chemistry and Life Science, October 2015. Gyeongju, Korea. (Contributed Poster)
- <u>Fatona AT</u>, Chen Y, Brook MA, Moran-Mirabal JM. "Fabrication of Amphiphilic PDMS Arrays Using Facile One-step Method and Its Application in Self-driven Microfluidic Device". *98th Canadian Chemistry Conference and Exhibition*, Ottawa, ON, June 2015. (Contributed Talk)
- 30. <u>Gill U,</u> Sutherland T, Moran-Mirabal JM. "Structuring of Cellulose Nanocrystal Composite Films on Shape Memory Polymers". *98th Canadian Chemistry Conference and Exhibition,* Ottawa, ON, June 2015. (Contributed Talk)
- 31. <u>Zhu Y,</u> Moran-Mirabal JM. "Bench Top Fabrication of Stretchable Micro/nanostructured Gold Electrodes for Sensors and Electronics". *98th Canadian Chemistry Conference and Exhibition,* Ottawa, ON, June 2015. (Contributed Talk)
- <u>Rahimi-Razin S</u>, Moran-Mirabal JM. "Synthesis of Amine-Functionalized Parylene for Biomaterial Patterning Applications". *98th Canadian Chemistry Conference and Exhibition*, Ottawa, ON, June 2015. (Contributed Talk)
- Saem S, Rice N, Adronov A, Moran-Mirabal JM. "Effect of Thermal Treatment on the Conductivity of Single-Walled Carbon Nanotube-Polymer Composite Films". 98th Canadian Chemistry Conference and Exhibition, Ottawa, ON, June 2015. (Contributed Poster)
- 34. <u>West J,</u> Moran-Mirabal JM, Hitchcock A. "Development of a Flow Cell for Scanning Transmission X-Ray Microscopy (STXM) for the Study of Lipid-Anti-Microbial Peptide Interactions". *98th Canadian Chemistry Conference and Exhibition,* Ottawa, ON, June 2015. (Contributed Poster)
- 35. <u>Boyle J,</u> Zhu Y, Moran-Mirabal JM. "The Effect of Glassy Film Topography on Murine Fibroblast Morphology". *32nd Annual Meeting of the Canadian Biomaterials Society.* Toronto, ON, May 2015. (Contributed Poster)
- 36. <u>Makaremi S</u>, Novakowski K, Rose M, Bowdish DME, Moran-Mirabal JM. "Investigating the Diffusion of Receptors on Macrophage Membranes Using Single Molecule Tracking". *MSC Annual Meeting.* Hamilton, ON, May 2015. (Contributed Poster)
- 37. <u>Rose M</u>, Fradin C, Moran-Mirabal JM. "Single Molecule Fluorescence Microscopy and Tracking of Lipids in Mitochondrial-Like Supported Lipid Bilayers". *MSC Annual Meeting*.

Hamilton, ON, May 2015. (Contributed Talk)

- <u>Zhu Y</u>, Moran-Mirabal JM. "Polymer Stencil Lift-Off for Simple and Direct Patterning of Stacked Lipid Bilayers." *Chemical Biophysics Symposium*. Toronto, ON, April 2015. (Contributed Poster).
- <u>Zhu Y</u>, Moran-Mirabal JM. "Polymer Stencil Lift-Off for Simple and Direct Patterning of Stacked Lipid Bilayers." 7th Annual PolyMac Conference, McMaster University, Hamilton, ON, December 2014. (Contributed Poster)
- <u>Rahimi-Razin S</u>, Moran-Mirabal JM. "Synthesis of Amino-Functionalized Parylene for Biomaterials Applications." 7th Annual PolyMac Conference, McMaster University, Hamilton, ON, December 2014. (Contributed Talk)
- <u>Zhu Y</u>, Moran-Mirabal JM. "Bench Top Fabrication of Transferrable and Stretchable Micro and Nanostructured Thin Film Electrodes." 5th Annual NanoOntario Conference, Windsor, ON, November 2014. (Contributed Poster)
- Saem S, Prestayko R, Naeem F, Nowicki L, Imit M, Adronov A, Moran-Mirabal JM.
 "Conductive Polymer-Single Walled Carbon Nanotube Composite Nanofibers Through Supramolecular Functionalization and Aqueous Solution Processing." 5th Annual NanoOntario Conference, Windsor, ON, November 2014. (Contributed Poster)
- 43. <u>Fatona AT</u>, Brook MA, Moran-Mirabal JM. "Fabrication of Hydrophilic PDMS Microarrays: Mild and Simple Surface Immobilization via Soft Lithography." *The* 17th *International Symposium on Silicon Chemistry*, Berlin, Germany, July 2014. (Contributed Poster)
- Moran-Mirabal JM. "Optical Nanoscopy with Real-time Stabilization to Study Cellulose Structure." 97th Canadian Chemistry Conference and Exhibition, Vancouver, BC, June 2014. (Contributed Talk)
- 45. <u>Zhu Y</u>, Negmi A, and Moran-Mirabal JM. "Polymer Stencil Lift-off: Simple and Rapid Patterning Arrays of Single or Stacked Phase-Segregated Lipid Bilayers." *97th Canadian Chemistry Conference and Exhibition*, Vancouver, BC, June 2014. (Contributed Talk)
- 46. <u>Sonney S</u>, Shek N, and Moran-Mirabal JM. "Integration of Micro- and Nanostructured Surfaces within PDMS microfluidics." *97th Canadian Chemistry Conference and Exhibition*, Vancouver, BC, June 2014. (Contributed Talk)
- 47. <u>Zhu Y</u>, Moran-Mirabal JM. "Polymer Stencil Lift-Off: a Simple and Rapid Method for Patterning Arrays of Single or Stacked Lipid Bilayers Containing Phase-Segregated Domains." *Chemical Biophysics Symposium*. Toronto, ON, May 2014. (Contributed Poster)
- <u>Zhu Y</u>, Moran-Mirabal JM. "Bench Top Fabrication of Micro and Nanostructured Surfaces for Sensing and Tissue Engineering Applications." 6th Annual PolyMac Conference, McMaster University, Hamilton, ON, December 2013. (Contributed Talk)

- 49. <u>Moran-Mirabal JM</u>. "High resolution fluorescence microscopy for the study of cellulosecellulose interactions." 2013 Gordon Research Conference on Cellulases, Cellulosomes and Other Carbohydrate Modifying Enzymes, Proctor Academy, Andover, NH, August 2013. (Contributed Poster)
- 50. <u>Bolewski JC</u> and Moran-Mirabal JM. "dSTORM imaging of cellulose nanofibrils." 2013 Gordon Research Conference on Cellulases, Cellulosomes and Other Carbohydrate Modifying Enzymes, Proctor Academy, Andover, NH, July 2013. (Contributed Poster)
- <u>Moran-Mirabal JM</u>. "Benchtop fabrication of hierarchically structured high surface area electrodes." 96th Canadian Chemistry Conference and Exhibition, Quebec City, QC, May 2013. (Contributed Talk)
- 52. <u>Zhu Y</u> and Moran-Mirabal JM. "Supported Lipid Bilayer Patterning through Polymer Stencil Lift-Off." *96th Canadian Chemistry Conference and Exhibition,* Quebec City, QC, May 2013. (Contributed Talk).
- 53. <u>Moran-Mirabal JM</u>. "The study of cellulose-cellulase interactions through high resolution fluorescence microscopy." *96th Canadian Chemistry Conference and Exhibition,* Quebec City, QC, May 2013. (Contributed Talk).
- 54. <u>Zhu Y</u> and Moran-Mirabal JM. "Supported Lipid Bilayer Patterning." *SUNY Buffalo Chemistry Graduate Student Symposium*, SUNY, Buffalo NY, 2012 (Contributed Talk).
- 55. <u>Moran-Mirabal JM</u>, Bolewski JC, Walker LP. "Do Cellulases Exhibit Diffusion Along Cellulose Surfaces? FRAP and Single Molecule Evidence." 2011 Biophysical Society *Meeting*, Baltimore, MA, USA, March 2011. (Contributed Poster)
- 56. Moran-Mirabal JM, <u>Bolewski JC</u> and Walker LP. "Surface diffusion of cellulases on cellulose fibrils studied through fluorescence spectroscopy." 2010 Biophysical Society *Meeting*, San Francisco, CA, USA, February 2010. (Contributed Poster)
- 57. <u>Moran-Mirabal JM</u>. "Elucidation of cellulase-cellulose interaction at the nanoscale with high-resolution fluorescence microscopy." 2009 Pacific Rim Summit on Industrial Biotechnology and Bioenergy, Honolulu, HI, USA, November 2009. (Contributed Talk)
- Moran-Mirabal JM. "Fluorescence labeling and purification of cellulases for single molecule spectroscopy." 2009 Biophysical Society Meeting, Boston, MA, USA, March 2009. (Contributed Poster)
- 59. <u>Moran-Mirabal JM</u>. "Electrospun Light-Emitting Nanofibers." *Materials Research Society, Fall Meeting*, Boston, MA, USA, November 2007. (Contributed Talk)
- 60. <u>Moran-Mirabal JM</u>, Torres AJ, Samiee KT, Baird BA, and Craighead HG. "Cell investigation of nanostructures: Zero Mode Waveguides for Cell Membrane Studies with Single Molecule Resolution." *2007 Biophysical Society Meeting*, Baltimore, MD, USA, March 2007. (Contributed Poster)

- 61. <u>Moran-Mirabal JM</u>, Samiee KT, Cheung YK, and Craighead HG. "Zero Mode Waveguides for Single Molecule Spectroscopy on Lipid Membranes", *2006 Biophysical Society Meeting*, Salt Lake City, UT, USA, February 2006. (Contributed Talk)
- 62. <u>Moran-Mirabal JM</u>, Flaminio MJBF, and Craighead HG. "Induction of immune response and differentiation in equine cells using micropatterned monolayers of bacterial-LPS." *International Congress on Biological Physics*, Gothenburg, Sweden, August 2004. (Contributed Talk)
- 63. <u>Moran-Mirabal JM</u>, Throckmorton D, Singh AK, and Craighead HG. "Micropatterning of Functional Lipid Domains for Toxin Detection." *Materials Research Society, Fall Meeting*, Boston, Massachusetts, USA, November 2003. (Contributed Poster)
- 64. <u>Moran-Mirabal JM</u>, Orth RN, Smith AE, and Craighead HG. "Micrometer Scale Lipid and Protein Patterns Inside Microfluidic Channels for Biomolecular Sorting." *Experimental Biology Meeting*, San Diego, California, USA, April 2003. (Contributed Poster)
- 65. <u>Moran-Mirabal JM</u>, Lopez-Franco R, and Bracker CE. "Cell polarity, a memory system?" *International Congress on Biological Physics*, Kyoto, Japan, August 2002. (Contributed Poster)

17. ADMINISTRATIVE RESPONSIBILITIES

a) Department 2nd • Research Space Grant – SIF Committee, Floor 2016 – present Representative 2016 – present Chemistry Department Undergraduate Mentorship Circle 2015 – present • Departmental Website Redevelopment and Social Media 2014 – present • Recruiting, In-reach and Outreach 2012 – present • Graduate Colloquium Organizer (Chemistry). • Level 2 Chemical Biology Instruction Committee. 2012 – present • Level 3 Chemistry Instruction Committee. 2012 – present • Level 3 Chemical Biology Instruction Committee. 2012 – present • Bay Area Science Fair Merit Judge – Chemistry Department 2014 – present Representative • Science 1A03 "Engaging Lecture" Committee 2014 – present 2013 - 2014 • Undergraduate Curriculum Committee. (Chemistry) 2012 - 2014• Faculty Advisor to the McMaster Undergraduate Society for the Chemical Sciences. • Representative to the Chemical Institute of Canada Local 2012 - 2014 Section

	Laboratory Safety Inspection Committee	2011 – 2013
b)	Faculty	
	 Faculty of Science Scholarships and Awards Committee 	2015 – present
	 CGS Scholarship Ranking Committee – Representative from Chemical Biology Program 	2014 – present
	Physics 1A03, Ad-hoc Development Committee	2014
	Ontario Universities' Fair, Faculty of Science Representative	2014 – 2015
c)	University	
	Ad-hoc Committee for Central Microscopy Facility	2016 – present
	 Ad-hoc Committee for BioMaker Laboratory Design 	2016 – present
	CRC in Bioinnovation Committee	2016
	BIMR Seminar Committee	2015 – 2016
	NSERC CREATE University Internal Selection Committee	2015 – 2016
	 Aditi Foundation International Research Fund, Selection Committee. 	2015 – 2016

18. OTHER RESPONSIBILITIES

- Executive Council Councillor-at-Large Microscopical Society of Canada. (May 2015 Present).
- Executive Committee Member Treasurer Canada Institute of Chemistry, Hamilton Section. (January 2015 present).
- External Reviewer Discovery Grant, Analytical Chemistry Division NSERC (December 2015 January 2016)

19. OTHER ACTIVITIES

- Presenter The Magic of Molecules Show, (McMaster, 2013 present).
- Symposium Organizer: "Light Microscopy: Micro/Nanofluidic Platforms for In-Situ Microscopy", 2017 Microscopical Society of Canada Annual Meeting. (2016-2017)
- Session Chair 2016 NanoOntario Conference. Focus on NanoBio and Sustainability. (2016)
- Symposium Organizer: "Microfluidic Platforms for Bioanalytical Applications", 99th Canadian Chemistry Conference and Exhibition (2015-2016)

- Organizer Interdisciplinary Workshop: "Tools for the Investigation of Molecular Mechanisms of Infection & Disease", McMaster University. (2016)
- Organizer RSC Roadshow at McMaster University (2015).
- Annual Meeting Organizer and Scientific Program Committee 2015 Microscopical Society of Canada Annual Meeting. (2014-2015)
- Faculty Judge Bay Area Science and Engineering Fair (2014-2015)
- Faculty Judge Undergraduate Monsaroff Student Paper Night (2013 2014)
- **Organizer –** 41st Southern Ontario Undergraduate Student Chemistry Conference (McMaster, 2013).
- **Faculty Judge** Present Around the World Competition, The Institution of Engineering and Technology. Hamilton Section. March 23rd 2013.
- Faculty Judge Women in Science and Engineering Symposium (McMaster, 2012)
- Keynote Speaker PolyMac (McMaster, 2012).
- **Organizer –** 40th International Physics Olympiad 2009, Merida, Yucatan, Mexico. (2009)