

1 CV, publications and presentations

1.1 Curriculum vitae

Contact information

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Employment/Education

Jan. 2012 – Present – **Assistant Professor**
Department of Physics
McGill University

Mar. 2009 – Dec. 2011 – **Postdoctoral Researcher**
Group of Adam Cohen,
Department of Chemistry and Chemical Biology, Harvard University

Sept. 2002 – Dec. 2008 – **PhD in Optical and Atomic Physics**
Dept. of Physics, University of California at Berkeley (UCB),
Berkeley, California, USA ([PhD Thesis.pdf](#))

Advisor: Prof. Dan Stamper-Kurn

Sept. 1998 – Apr. 2002 – **BSc (Hon.) in Physics and Mathematics**
Dept. of Physics and Astronomy, University of British Columbia,
Vancouver, British Columbia, Canada

Synopsis: I was an undergraduate at the University of British Columbia where I won a number of awards including a Canada Scholar (top 3 graduating Canadian students), the CK Choi Presidential Award (top 5 graduating UBC students), as well as top prizes in Physics and Mathematics. I then performed my graduate studies and received my PhD in 2008, from the Physics Dept, UC Berkeley. I trained in experimental condensed matter and atomic physics, where I earned expertise in instrumentation, optics, imaging, and quantitative analysis. I worked on Dr. Stamper-Kurn's team dedicated to directly visualizing disorder-to-order transitions of cold atomic vapours, which we confined optically into thin sheets of light, provided by sculpted laser beams. My PhD experiments resulted in a productive set of studies published in top journals, including Nature, Phys Rev Letters and Phys Rev A. I then made a significant transition, from visualizing atoms in vacuum chambers, to visualizing biomolecules in liquids. Though I made a transition in subject matter, the technical and mathematical bases of my work at Harvard followed from what I had trained for at Berkeley. At Harvard I was a Mary Fieser Postdoctoral Fellow, where I invented and began developing my major technical accomplishment, *Convex Lens-induced Confinement (CLiC)* imaging. This elegant methodology has opened the door for my team and I to explore a wealth of biophysical problems in a new and unique way, with applications to biomedicine.

1.2 Publications

My interdisciplinary research is specialized in single-molecule biophysics, polymer physics, as well as innovations in microscopy instrumentation and nanoscale devices. The peer-reviewed work that I completed as a faculty member at McGill are dated after 2012. The names of students and postdocs I have supervised at McGill are underlined. Articles and research in my field are a team effort, and follow a convention of ordering authors such that the principal investigator is listed last, and the lead student or PDF is listed first. Names are labeled by stars in the case of “joint first-authors” and “joint last authors”, designating “equal contributions to the research” which are typically complementary, such as theory/experiment or sample/experiment.

1.2.1 Papers submitted to refereed journals

The following manuscript has been submitted to peer-reviewed journals and is in review.

- [1] Tyler Shendruck*, Dave Sean*, Daniel Berard*, Julian Wolf*, Justin Dragoman, Sophie Battat, Gary Slater, **Sabrina R. Leslie***.
Spin-induced Spooling of Macromolecules (SiMS).
Re-submitted to *Physical Review X* in February 2017.

1.2.2 Papers published in refereed journals

The following ten published/accepted, peer-reviewed manuscripts, are based on work at McGill.

- [2] **Sabrina R. Leslie***, Albert Kamanzi, Daniel Berard, Marjan Shayegan, Gilead Henkin, Jason Leith, Shane Scott, Francis Stable.
Biological Confinement Physics: Squeezing New Information out of Complex Macromolecules. Invited Review Article, Physics in Canada, Special Issue for June 2017.
- [3] Gilead Henkin, Daniel Berard, Francis Stable, Marjan Shayegan, Jason S. Leith, **Sabrina R. Leslie***.
Manipulating and visualizing molecular interactions in customized nanoscale spaces.
[Analytical Chemistry](#) **88**(22), 1110011107 (2016)
- [4] Jason S. Leith*, Albert Kamanzi*, Dave Sean, Daniel Berard, Andrew Guthrie, Christopher M.J. McFaul, Gary Slater, Hendrick de Haan*, **Sabrina R. Leslie***.
Free Energy of a Polymer in Slit-like Confinement from the Odijk Regime to the Bulk.
[Macromolecules](#) **49**(23), 92669271 (2016)
- [5] Bojing Jia, Tse-Luen Wee, Daniel J. Berard, Adiel Mallik, David Juncker, Claire M. Brown*, **Sabrina R. Leslie***.
Parallelized Cytoindentation Using Convex Micropatterned Surfaces.
[Biotechniques](#) **61**, No. 2, 73-82 (2016)
- [6] Daniel Berard*, Marjan Shayegan*, Francois Michaud, Gilead Henkin, Shane Scott, **Sabrina R. Leslie***.
Formatting and Ligating Biopolymers using Adjustable Nanotopographies.
[Applied Physics Letters](#) **109**, 033702-033706 (2016)

- [7] Jalal Ahamed, Sara Mahshid, Daniel Berard, Francois Michaud, Rob Sladek, Walter Reisner*, **Sabrina R. Leslie***.
Continuous Confinement Fluidics: Getting Lots of Molecules in Small Spaces.
[Macromolecules](#) **49**, (7) 2853-2859 (2016).
- [8] Sara Mahshid, Mohammed Jalal Ahamed, Daniel Berard, Susan Amin, Rob Sladek, **Sabrina R. Leslie***, Walter Reisner*
Development of a Platform for Single-Cell Genomics Using Convex Lens-Induced Confinement.
[Lab on a Chip](#) **15**, 3013-3020 (2015).
- [9] Adriel Arsenault, Jason Leith, Gil Henkin, Christopher McFaul, Matthew Tarling, R. Talbot, Daniel Berard, Francois Michaud, Shane Scott, **Sabrina Leslie***.
Open-frame System for Single-Molecule Microscopy.
[Rev. Sci. Instrum.](#) **86(3)**, 033701 (2015).
- [10] Daniel Berard, Francois Michaud, Sara Mahshid, Mohammed Jalal Ahamed, Christopher McFaul, Jason Leith, Pierre Berube, Rob Sladek, Walter Reisner*, **Sabrina R. Leslie***
Convex lens-induced nanoscale templating
[P.N.A.S.](#) **111**, 37 (2014).
Featured by PNAS Cover commentary, Genome Web, and other media.
- [11] Daniel Berard, Christopher McFaul, Jason Leith, Adriel Arsenault, François Michaud, **Sabrina Leslie***.
Precision Platform for Convex Lens-Induced Confinement Microscopy.
[Rev. Sci. Instrum.](#) **84**, 103704 (2013).
Featured as editor's pick on the front page of Rev. Sci. webpage.
- [12] Mary Williard Elting, **Sabrina R. Leslie**, L. Stirling Churchman, Jonas Korlach, Christopher McFaul, **Jason S. Leith**, Michael J. Levene, Adam E. Cohen, James A. Spudich
Single-molecule fluorescence imaging of processive myosin with enhanced background suppression using linear Zero Mode Waveguides (ZMW) and Convex Lens-induced Confinement (CLiC)
[Optics Express](#) **21** (1), 1189-1202 (2013).
- [13] **Sabrina R. Leslie**, Alexander P. Fields, Adam E. Cohen.
Convex Lens-induced Confinement for Imaging Single Molecules.
[Analytical Chemistry](#) **82** (14), 6224-6229 (2010).
Featured in Technology Review and C&E News.
- [14] **Adam E. Cohen**, Alexander P. Fields, Jennifer H. Hou, **Sabrina R. Leslie**, Min J. Shon.
In honor of W. E. Moerner: Confining molecules for single-molecule spectroscopy.
[Isreal Journal of Chemistry \(IJC\)](#) **49** (3-4), 275 (2010).
- [15] Jay D. Sau, **S.R. Leslie**, Marvin L. Cohen, D.M. Stamper-Kurn.
Spin squeezing of high-spin, spatially extended quantum fields.
[New J. Phys.](#) **12**, 085011 (2010).

- [16] M. Vengalattore, J. Guzman, **S. R. Leslie**, F. Serwane, and D. M. Stamper-Kurn.
Periodic spin textures in a degenerate $F=1$ ^{87}Rb spinor Bose gas.
[Physical Review A **81**, 053612 \(2010\).](#)
Featured in Science News: “Evidence mounts for an exotic supersolid”.
- [17] **S.R.Leslie**, J.Guzman, M.Vengalattore, J.D. Sau, M.L. Cohen, D.M. Stamper-Kurn.
Amplification of fluctuations in a spinor Bose Einstein condensate.
[Physical Review A **79**, 043631 \(2009\).](#)
Featured in PRA’s Kaleidoscope.
- [18] J.D. Sau, **S.R.Leslie**, D.M. Stamper-Kurn, M.L. Cohen.
Theory of domain formation in inhomogeneous ferromagnetic dipolar condensates
[Physical Review A **80**, 023622 \(2009\).](#)
Featured in PRA’s Kaleidoscope.
- [19] M.Vengalattore, **S.R.Leslie**, J.Guzman, D.M. Stamper-Kurn.
Spontaneously modulated spin textures in a dipolar spinor Bose-Einstein condensate.
[Physical Review Letters **100**, 170403 \(2008\).](#)
- [20] M. Vengalattore, J. M. Higbie, **S. R. Leslie**, J. Guzman, L. E. Sadler, D. M. Stamper-Kurn.
High-resolution magnetometry with a spinor Bose-Einstein condensate.
[Physical Review Letters **98**, 200801 \(2007\).](#)
Featured in Nature research highlights: “Best served chilled”.
- [21] L. E. Sadler, J. M. Higbie, **S. R. Leslie**, M. Vengalattore, D. M. Stamper-Kurn.
Coherence-enhanced imaging of a degenerate Bose gas.
[Physical Review Letters **98**, 110401 \(2007\).](#)
- [22] L. E. Sadler, J. M. Higbie, **S. R. Leslie**, M. Vengalattore, D. M. Stamper-Kurn.
Spontaneous symmetry breaking in a quenched ferromagnetic spinor Bose condensate.
[Nature **443**, 312 \(2006\).](#)
- [23] J. M. Higbie, L. E. Sadler, S. Inouye, A. P. Chikkatur, **S. R. Leslie**, K. L. Moore, V. Savalli, D. M. Stamper-Kurn.
Direct, non-destructive imaging of magnetization in a spin-1 Bose gas.
[Physical Review Letters **95**, 050401 \(2005\).](#)
- [24] K. L. Moore, T. P. Purdy, K. W. Murch, **S. Leslie**, S. Gupta, and D. M. Stamper-Kurn.
Collimated, single-pass atom source from a pulsed alkali metal dispenser for laser-cooling experiments.
[Rev. Sci. Instrum. **76**, 023106 \(2005\).](#)
- [25] **S. Leslie**, N. Shenvi, K. R. Brown, Dan M. Stamper-Kurn, and K. Birgitta Whaley.
Transmission spectrum of an optical cavity containing N atoms.
[Phys. Rev. A **69**, 043805 \(2004\).](#)

1.2.3 Non-refereed publications while at McGill

- [25] **Sabrina R. Leslie.**
CLiC to Enhance. Molecular imaging for the normal lab: a simple, cost-effective alternative.
[The Pathologist 0214 \(2014\).](#)
- [26] **Sabrina R. Leslie,** [Daniel Berard,](#) [Jason S. Leith,](#) [François Michaud.](#)
Using Tunable Nanoscale Confinement to Image and Manipulate DNA.
[OSA Conference Proceeding. Optical Sensors: Micro and Nano-Engineered Sensors, Barcelona, Spain. \(2014\).](#)
- [27] [Christopher M.J. McFaul,](#) [Jason S. Leith,](#) [Bojing Jia,](#) [François Michaud,](#) [Adriel Arsenault,](#) [Andrew Martin,](#) [Daniel Berard,](#) **Sabrina R. Leslie.** *Single-Molecule Microscopy Using Tunable Nanoscale Confinement.*
[SPIE Conference Proceeding, 8811 \(2013\).](#)

1.2.4 Papers in-preparation

- [28] [Shane Scott,](#) [Zhi Ming Xu,](#) [Fedor Kouzine,](#) [Daniel J. Berard,](#) [Barbara Gravel,](#) [Alexander Hofkirchner,](#) [Catherine LeRoux,](#) [Laura Saunders,](#) [Cynthia Shaheen,](#) [David Levens,](#) [Craig Benham,](#) **Sabrina R. Leslie.**
Single-molecule visualization of topology-mediated dynamics in supercoiled DNA.
In-preparation.
- [29] [Gilead Henkin,](#) [Francis Stabile,](#) [Daniel J. Berard,](#) [Felipe Guzman,](#) [William Glover,](#) **Sabrina R. Leslie.**
High-throughput, temporally controlled deposition of linearized DNA polymers onto removable substrates for high-resolution microscopy.
In-preparation.

1.3 Invited seminars, lectures and colloquia

I list my presentations and abstracts since arriving at McGill in January 2012, up to September 2016. Presentations are listed using the following format:

1. **Presentation date:** *Presentation title*
Conference and location.

1.3.1 Invited presentations at conferences and international schools

1. **20-24 June 2017:** *Single-molecule visualization of topology-mediated biomolecular interactions, using nanoconfinement microscopy.*
The Complexity of Dynamics and Kinetics from Single Molecules to Cells. Telluride, Colorado, USA.
2. **10 May 2017:** *Single-molecule visualization of topology-mediated biomolecular interactions, using nanoconfinement microscopy*
Canadian Microscopy and Cytometry Symposium on Micro/Nanofluidics for Optical Microscopy. Montreal, Quebec, Canada.

3. **10 November 2016:** *Squeezing new information out of DNA using tunable nanotopographies.*
Nano Ontario Conference, Guelph, Ontario.
4. **9 September 2016:** 1.) *Getting into that room at the bottom: formatting DNA using tunable nanoscale confinement.* 2.) *How DNA do the twist: visualizing supercoil-induced site-unwinding and site-invasion in DNA loops.*
13th Greta Pifat International School of Biophysics 2016, Croatia.
5. **1 June 2016:** *Squeezing new information out of DNA using tunable nanotopographies.*
Canadian Biophysics Society, University of Manitoba, MB, Canada.
6. **26 May 2016:** *Squeezing new information out of DNA using tunable nanotopographies.*
Next Generation Sequencing GTC Bio Meeting, Boston, MA, USA.
7. **18 June 2015:** *Getting into that Room at the Bottom of DNA analysis using tunable nanoscale confinement.*
CAP Congress, University of Alberta, AB, Canada.
8. **16 June 2015:** *Getting into that Room at the Bottom of DNA analysis using tunable nanoscale confinement.*
Symposium on Advances in Biological Imaging and Spectroscopy, Canadian Chemistry Conference, Ottawa, Canada.
9. **29 May 2015:** *Getting into that Room at the Bottom of DNA Analysis using tunable nanoscale confinement.*
Symposium on Fluorescence Microscopy at the Nanoscale, Canadian Microscopy Conference, McMaster University, Canada.
10. **25 August 2013:** *Single-molecule microscopy using tunable nanoscale confinement*
SPIE OP106 2013 - Physical Chemistry of Interfaces and Nanomaterials XII Conference, San Diego, USA.
11. **31 May 2013:** *Precision spectroscopy of DNA under physiologically compelling conditions*
CAP Congress, Montreal, Canada.

1.3.2 Contributed presentations at conferences

1. **13 March 2017:** *Formatting biopolymers using adjustable nanoconfinement*
APS March Meeting, New Orleans. March 2017. Contributed talk.
2. **13 March 2017:** *Manipulating and Visualizing Molecular Interactions in Customized Nanoscale Spaces*
APS March Meeting, New Orleans. March 2017. Contributed talk.
3. **12 May 2016:** *Squeezing new information out of DNA using tunable nanotopographies*
Biology of Genomes Meeting, Cold Spring Harbor, New York, USA. Contributed poster.

4. **4 July 2016:** *Squeezing new information out of DNA using tunable nanotopographies* Single-molecule approaches to Biology, Gordon Research Conference, Hong Kong, China. Contributed poster.
5. **29 July 2014:** *Manipulating and imaging DNA using tunable nanoscale confinement* OSA Symposium on Optical Sensors: Micro and Nano-Engineered Sensors. Barcelona, Spain. Selected contributed talk.
6. **15 July 2014:** *Convex Lens-induced Nanochannel Templating* Gordon Research Conference on Single-Molecule Approaches to Biology, Italy. Contributed poster.
7. **10 January 2013:** *Nano-scale confinement enables precision spectroscopy of DNA under physiologically compelling conditions.* Aspen Center for Physics, Single-Molecule Biophysics Meeting. Organizer Tom Perkins. Selected contributed talk.
8. **23 April 2012:** *Shedding new light Into weak and slow molecular Interactions* Bellairs Research Institute, Quantitative Biology Initiative of McGill University, Barbados. Contributed talk.

1.3.3 Conference abstracts by my group (national/international)

A star indicates the person who gave the following presentations.

1. Shane Scott*, Mack Xu, Daniel Berard, Fedor Kouzine, Alex Hofkirchner, Catherine LeRoux, Barbara Gravel, Laura Saunders, Cynthia Shaheen, David Levens, Craig Benham, **Sabrina Leslie**. *Topology-mediated dynamics in DNA visualized using nanoconfinement microscopy* American Biophysical Society Meeting, New Orleans, USA. February 2017 (Contributed talk).
2. Shane Scott*, Mack Xu, Daniel Berard, Fedor Kouzine, Alex Hofkirchner, Catherine LeRoux, Barbara Gravel, Laura Saunders, Cynthia Shaheen, David Levens, Craig Benham, **Sabrina Leslie**. *Seeing single DNA molecules do the twist: topology-mediated DNA dynamics.* Canadian Biophysical Society Meeting, Winnipeg, Canada. June 2016 (Contributed poster).
3. Daniel Berard*, Marjan Shayegan, Francois Michaud, Gilead Henkin, Shane Scott, **Sabrina Leslie**. *Trapping and ligating biopolymers in linear and circular nanogrooves with single-fluorophore visualization sensitivity.* APS March Meeting, Baltimore. March 2016 (Contributed talk).
4. Gilead Henkin*, Daniel Berard, Frank Stabile, **Sabrina Leslie**. *Visualizing and controlling biomolecular reactions in adjustable nanoscale environments.* APS March Meeting, Baltimore. March 2016 (Contributed talk).
5. Albert Kamanzi*, Jason Leith, David Sean, Daniel Berard, Gary Slater, Hendrick de Haan, **Sabrina Leslie**. *Free energy of confinement of polymers in a slit-like geometry over a continuum of applied confinement, from nanoscale to bulk.* APS March Meeting, Baltimore. March 2016 (Contributed talk).

6. Frank Stabile*, Daniel Berard, Gilead Henkin, Shane Scott, **Sabrina Leslie**. *CLiC platform for high-throughput linearization and visualization of DNA configurations, dynamics and interactions for long-read sequencing applications*. APS March Meeting, Baltimore. March 2016 (Contributed poster).
7. Adriel Arsenault*, Jason Leith, Daniel Berard, **Sabrina Leslie**. *Custom, home-built single-molecule microscopy platform*. Biophysical Society Meeting, San Francisco. February 2016 (Contributed poster).
8. Adriel Arsenault*, Jason Leith, Daniel Berard, **Sabrina Leslie**. *Custom, home-built single-molecule microscopy platform*. CAP Meeting, Edmonton. June 2015 (Contributed poster).
9. Marjan Shayegan*, Daniel Berard, **Sabrina Leslie**. *CLiC platform for high-throughput linearization and visualization of DNA configurations, dynamics and interactions*. CAP Meeting, Edmonton. June 2015 (Contributed poster).
10. Albert Kamanzi*, Jason Leith, David Sean, Daniel Berard, Gary Slater, Hendrick de Haan, **Sabrina Leslie**. *Free energy of confinement of polymers in a slit-like geometry over a continuum of applied confinement, from nanoscale to bulk*. CSC Meeting, Ottawa. June 2015 (Contributed talk).
11. Gilead Henkin*, Daniel Berard, **Sabrina Leslie**. *Visualizing biomolecular reactions in adjustable nanoscale environments*. CSC Meeting, Ottawa. June 2015 (Contributed talk).
12. Francois Michaud*, Daniel Berard, **Sabrina Leslie**. *CLiC platform for high-throughput DNA linearization for long-read sequencing applications*. CSC Meeting, Ottawa. June 2015 (Contributed talk).
13. Daniel Berard*, Marjan Shayegan, Francois Michaud, **Sabrina Leslie**. *Trapping and linearizing DNA in nanogrooves with single-fluorophore visualization sensitivity*. CSC Meeting, Ottawa. June 2015 (Contributed talk).
14. Daniel Berard*, François Michaud, Sara Mahshid, Jalal Ahamed, Rob Sladek, Walter Reisner, **Sabrina Leslie**. *How to get into that “room at the bottom” of DNA analysis*. APS March Meeting, Texas. March 2015 (Contributed talk).
15. Shane Scott*, Jason Leith, Hugo Brandao, Simon Reyshak, Daniel Berard, Paul Wiseman, **Sabrina Leslie**. *Toward Enhanced Image Correlation Spectroscopy of DNA Interactions Using Tunable Nanoscale Confinement*. APS March Meeting, Texas. March 2015 (Contributed talk).
16. Jason Leith*, Hugo Brandao, Simon Reyshak, Daniel Berard, Shane Scott, Paul Wiseman, **Sabrina Leslie**. *Toward Enhanced Image Correlation Spectroscopy of DNA Interactions Using Tunable Nanoscale Confinement*. Canadian Chemical Biophysics Symposium, Toronto, Canada. May 2015 (Contributed talk).
17. Daniel Berard*, François Michaud, Christopher McFaul, Sara Mahshid, Walter Reisner, **Sabrina Leslie**. *Convex Lens-Induced Nanochannel Templating*. APS March Meeting, Denver, Colorado. March 6 2014. (Contributed talk).

18. Sara Mahshid*, Daniel Berard, Rob Sladek , **Sabrina Leslie**, Walter Reisner. *Nanofluidic laboratory-on-chip device for mapping of single molecule DNA extracted from single cells*. APS March Meeting. Denver, Colorado. March 4 2014. (Contributed talk).

1.3.4 Invited seminars and colloquia

1. **14 November 2016:** *How DNA do the twist: visualizing supercoil-induced site-unwinding and site-invasion in DNA loops*.
U.C. Davis, CA, USA.
2. **21 October 2016:** *Squeezing new information out of DNA using tunable nanotopographies*.
Oxford University, Oxford, England.
3. **20 October 2016:** *Squeezing new information out of DNA using tunable nanotopographies*.
Marie Curie Institute, Paris, France.
4. **19 October 2016:** *How DNA do the twist: visualizing supercoil-induced site-unwinding and site-invasion in DNA loops*.
Université Paris Diderot, Paris, France.
5. **18 October 2016:** *Squeezing new information out of DNA using tunable nanotopographies*.
Université d'Évry val d'Essonne, France.
6. **27 May 2016:** *Squeezing new information out of DNA using tunable nanotopographies*
NorthEastern University, Department of Physics, Massachusetts, USA.
7. **19 April 2016:** *Squeezing new information out of DNA using tunable nanotopographies*
University of Rochester, Department of Biomedical Engineering and Optics, New York, USA.
8. **29 January 2016:** *Squeezing new information out of DNA using tunable nanotopographies*
Queens University, Department of Physics, Ontario, Canada.
9. **26 January 2016:** *Squeezing new information out of DNA using tunable nanotopographies*
McGill University, Department of Chemistry, Quebec, Canada.
10. **21 January 2016:** *Squeezing new information out of DNA using tunable nanotopographies*
McGill University, Department of Physiology (CAMBAM Series), Quebec, Canada.
11. **19 June 2015:** *Getting into that Room at the Bottom of DNA analysis using tunable nanoscale confinement*
Micralyne Foundry, Alberta, Canada.

12. **13 May 2015:** *Nanoengineering approaches to visualizing tunable and transient molecular processes*
University of California at San Diego (UCSD), Department of Bio Nano Engineering, USA.
13. **4 November 2014:** *Getting into that Room at the Bottom of DNA analysis using tunable nanoscale confinement*
Washington State University, WA, USA.
14. **31 October 2014:** *Getting into that Room at the Bottom of DNA analysis using tunable nanoscale confinement*
Simon Fraser University, British Columbia, Canada.
15. **30 October 2014:** *Getting into that Room at the Bottom of DNA analysis using tunable nanoscale confinement*
University of British Columbia, British Columbia, Canada.
16. **29 October 2014:** *Getting into that Room at the Bottom of DNA analysis using tunable nanoscale confinement*
University of Victoria, British Columbia, Canada.
17. **24 November 2014:** *Manipulating single-molecule dynamics with tunable nanoscale confinement*
Washington University in St Louis, Department of Physics, Missouri, USA.
18. **5 February 2014:** *Visualizing and controlling DNA using tunable nanoscale confinement*
McMaster University, Department of Physics, Ontario, Canada.
19. **23 January 2014:** *Visualizing and controlling DNA using tunable nanoscale confinement*
Queen's University, Department of Physics, Ontario, Canada.
20. **7 November 2013:** *Visualizing and controlling DNA using tunable nanoscale confinement*
University of Ottawa, Department of Physics, Ontario, Canada.
21. **11 September 2013:** *Convex Lens-induced Confinement (CLiC) Microscopy for simultaneously deforming and visualizing thin materials*
Rolls Royce Research and Development, Quebec, Canada.
22. **27 March 2013:** *Nano-scale confinement enables precision spectroscopy of DNA under physiologically compelling conditions*
Concordia University, Quebec, Canada.
23. **19 November 2012:** *Nano-scale confinement enables new kinds of biophysical measurements*
University of Montreal, Department of Physics, Quebec, Canada.
24. **5 April 2012:** *Nano-scale confinement enables new kinds of biophysical measurements*
Dalhousie University, Department of Physics, Nova Scotia, Canada.

25. **29 October 2012:** *Nano-scale confinement enables new kinds of biophysical measurements*
Simon Fraser University, Department of Physics, British Columbia, Canada.

1.3.5 Selected presentations as a post-doctoral research fellow

1. **January 2011:** *Enabling new biophysical measurements under previously inaccessible conditions with Convex Lens-induced Confinement (CLiC) microscopy*
Invited talk at Rowland Institute at Harvard University, MA, USA.
2. **February 2011:** *Enabling new biophysical measurements under previously inaccessible conditions with Convex Lens-induced Confinement (CLiC) microscopy*
Invited talk at McGill University, Department of Physics, Quebec, Canada.
3. **May 2011:** *Enabling new biophysical measurements under previously inaccessible conditions with Convex Lens-induced Confinement (CLiC) microscopy*
Invited talk at Quantitative Biology Initiative Meeting, McGill University's Bellairs Research Institute, Barbados.
4. **March 2011:** *Enabling new biophysical measurements under previously inaccessible conditions with Convex Lens-induced Confinement (CLiC) microscopy*
Invited talk at University of British Columbia, Department of Physics Seminar, British Columbia, Canada.
5. **July 2010:** *Applying CLIC microscopy to study how myosin VI motor protein procession and ATP uptake are coupled*
Invited talk at Stanford University, Bio-X Institute Seminar, CA, USA.
6. **July 2010:** *Convex Lens-induced Confinement (CLiC) for Imaging Single Molecules*
Poster at Single-molecule Approaches to Biology Gordon Research Conference Poster, Italy.
7. **March 2010:** *Under the Looking Glass: Convex Lens-induced Confinement (CLiC) for Imaging Single Molecules.*
Invited talk at Harvard University, Medical School and Department of Chemistry and Chemical Biology's Single-Molecule Seminar Series, MA, USA.

1.4 Intellectual property

1.4.1 Patents

1. **Nanoscale Surface-embedded Topography (SeT) Based Loading and Confinement Methods and Systems:** *Canada US Prov. Patent Appl. 62/364359, filed on 20 July 2016*
Sabrina R. Leslie, Daniel Berard, Gilead Henkin, Albert Kamanzi, Francois Michaud, Francis Stabile.
2. **Convex Lens-Induced Confinement (CLIC):** *US Appl. #13/521,425, CDN Appl CA2787242A1, filed on 15 Jan 2010*
Sabrina R. Leslie, Adam Cohen.

1.4.2 Disclosures

I have submitted 5 disclosures to the McGill technology transfer office which are under active consideration and review.

1.5 Prizes and awards

My prizes and awards, received throughout my career, are listed here. They demonstrate my longstanding commitment to, and sincere interest in scientific inquiry.

1. *Clark Science Executive Leadership Fellowship (SELF)*, 09/2016-12/2016, \$5000 for an “executive mini MBA”, to support scientists with relevant training in management.
2. *McGill Dobson Cup Innovation Competition*, 05/2015, Fourth prize (\$5000).
3. *Integrative Biology Poster Prize (Top Prize)*, Gordon Research Conference on Single Molecule Approaches to Biology, Il Ciocco, Italy, 7/2010.
4. *Mary Fieser Postdoctoral Fellowship*, Department of Chemistry and Chemical Biology, Harvard University, 3/2009—3/2010.
5. *Natural Sciences and Engineering Research Council of Canada (NSERC) Postgraduate Scholarship D, International*, 8/2004—8/2006, and *Postgraduate Scholarship A, International*, 8/2002—8/2004.
6. *Department of Physics Fellowship, UC Berkeley*, 8/2002—8/2004.
7. *Canadian Scholarship Trust Foundation Graduate Award*. (Awarded yearly to 5 graduating undergraduates in Canada), 5/02.
8. *C.K. Choi Scholarship*. (1 of 5 UBC Presidential Awards to graduating undergraduates), and designation as *Wesbrook Scholar*, 11/2001.
9. *Dorothy Gladys Studer Memorial Scholarship*. (Top marks in Physics), 8/2001.
10. *International Undergraduate Summer School in Particle Physics and Astronomy* (1 undergraduate in Canada selected to attend, awarded full stipend). Cavendish Astrophysics Group, Cambridge, England, 7/2001.
11. *WH MacInnes Scholarship in Physics and Mathematics*. (Top marks in Physics), 3/2001.
12. *National Research Council Women in Engineering and Science Program Award* (2 summer internships, held at NRC’s Steacie Institute for Molecular Sciences in the Ultrafast Science Group with Dr. David Rayner and Paul Corkum), 1/2000–5/2002.
13. *Natural Sciences and Engineering Research Council of Canada (NSERC) Undergraduate Research Award* (Held in Mary Anne White’s Materials Science Group at Dalhousie University, Halifax, Canada), 5/1999–8/1999.
14. *Science Scholar Designation and Dean’s Honour List*, 5/1999–5/2002.
15. *Undergraduate Scholars Program* (Entrance scholarship to UBC), 9/1998–5/2002.

16. *Governor General's Award* (National award to top student per high school), 6/1998.
17. *BC Science Council Award* (Provincial award to top science student per high school), 6/1998.

1.6 Research funding record summary

Funds granted for research in my laboratory, under my management, total \$2,457,330 to date. While the grants themselves total \$3,179,226, a portion has been directed to collaborators and overhead on industry contributions (as agency contributions are already corrected for overhead). Of my research funds, \$1,268,000 has been directed to equipment and renovations (\$980k CFI + \$40k of FRQNT+ \$248k of RTI grants) and the remainder (\$1,189,330) has been directed to operational expenses such as salaries, consumables, materials and repairs, which is further complemented by fellowships. I outline acronyms for funding agencies below and list the grants in Table 1.1.

Definition of acronyms for granting agencies and programs

CIHR: Canadian Institute for Health Research (Canada)

NSERC: Natural Sciences and Engineering Research Council (Canada)

FRQNT: *Fonds de recherche du Québec - Nature et technologie*

Quebec research fund - Nature and technology (Québec)

CFI: Canadian Foundation for Innovation (Canada)

RTI: Research, Tools, and Instruments

CRD Collaborative Research and Development

CHRP: Collaborative Health Research Progrant

LOF: Leaders Opportunity Fund

IOF: Infrastructure Operating Fund

CREATE: Collaborate Research And Training Experience

1.7 International collaborations

- **Jim McGrath (07/2014 - present).** Bioengineering Dept. University of Rochester, USA.
- **Ralf Jungmann (07/2014 - present).** Max Planck Institute of Biochemistry, Munich, Germany.
- **Andrea Tao (04/014 - present).** Nanoengineering Dept. UC San Diego, USA.
- **David Levens and Craig Benham (03/2012 - present).** NIH Cancer Center and UC Davis Genome Center.
- **Jim Spudich (06/2010-01/2013).** Biochemistry Dept, Stanford University, USA.

Number	Year	Agency	Grant	Type
1	2017-2018	NSERC	Idea to Innov.	Individual Title: <i>Nanoscale toolset for formatting and visualizing single molecules</i>
2	2017-2018	ZSG	SRA	Individual Title: <i>Massively parallel linearization and chemical treatment of DNA molecules in arrays using tunable nanoscale confinement, Part 3, for Academic Associate Stipend</i>
3	2017-2018	NSERC	CRD	Individual Title: <i>Massively parallel linearization and chemical treatment of DNA molecules in arrays using tunable nanoscale confinement, Part 2 for Second Year</i>
4	2016-2018	NSERC	CRD	Team (Co) Title: <i>Identify and quantitate biomarkers using nanopores fabricated by controlled breakdown</i>
5	2016-2017	NSERC	CRD	Individual Title: <i>Massively parallel linearization and chemical treatment of DNA molecules in arrays using tunable nanoscale confinement</i>
6	2014-2015	ZSGenetics	Contract	Individual Title: <i>CLiC confinement and visualization of polymer complexes</i>
7	2015-2016	NSERC	Idea to Innov.	Individual Title: <i>Market assessment of molecular manipulation and nanoscopy platform</i>
8	2015-2018	FRQNT	Team	Team (Pr) Title: <i>Microscopie de connement l'chelle nanometrique pour l'observation de la dynamique et des interactions de l'ADN et des proteins</i>
9	2015	NSERC	RTI	Team (Pr) Title: <i>Visualizing and directing dynamic DNA nanostructure assembly with single-molecule resolution</i>
10	2015	NSERC	Engage	Individual Title: <i>Single-DNA manipulation above a suspended membrane using tunable nanoscale confinement</i>
11	2014	NSERC	Engage	Individual Title: <i>Imaging patterned materials under strain</i>
12	2013-2016	NSERC	CHRP	Team (Co) Title: <i>Nanoconfinement based single-cell cytogenetic platform for pre-/post-implantation genetic diagnosis</i>
13	2013	NSERC	Engage	Individual Title: <i>A custom inexpensive versatile microscope</i>
14	2013-2017	CFI	IOF	Individual Title: <i>Single-molecule investigations of fast biomolecular search processes</i>
15	2013-2017	CFI	LOF	Individual Title: <i>Single-molecule investigations of fast biomolecular search processes</i>
16	2012	NSERC	Engage	Individual Title: <i>Dramatically improved single-molecule imaging of thin molecular films</i>
17	2012	NSERC	RTI	Individual Title: <i>Force and fluorescence microscopy of DNA Repair</i>
18	2012-2017	NSERC	Discovery	Individual Title: <i>Single-molecule investigations of fast biomolecular search processes</i>
19	2012-2017	McGill	Startup	Individual
Cumulative	All	All	All	All

Table 1.1: Grants awarded while at McGill⁴, using established acronyms for agencies and programs. For team grants, which include multiple investigators, “Pr” vs. “Co” indicates whether I am the Principal (Pr) or a Co-applicant (Co).

1.8 Supervision and courses: summary

1.8.1 Undergraduate student supervision

I have supervised thirty-five undergraduates in research projects over the past five years at McGill (Tables 1.2 and 1.3), who have been enrolled in degree programs in Physics, Quantitative Biology, Biology and Computer Science, Mathematics and Biology, Cell Anatomy and Molecular Biology, Physics and Physiology, and Computer Science. Currently, six undergraduate researchers, formatted in bold, are active members of my group. The projects are listed in chronological order based on start time. The “Dates” column indicates the time-frame for group membership and active research. The “Type(s) of project(s) (& funding)” column indicates the type of position(s), which includes “research assistant” for extended contributions to my group’s research projects, as well as course numbers for projects contributing toward graduation requirements, described in the table captions. Course numbers with stars indicate included theses. Table 1.6 lists the titles of the projects which culminated in theses, submitted for graduation from the degree programs. Fellowship awards for and prizes received by undergraduate students’ research in my group are described in Table 1.8 and Table 1.9 respectively.

1.8.2 Graduate student and postdoc supervision

My graduate student and PDF supervision is the cornerstone of my research program at McGill, as well as my development as a mentor and teacher (Tables 1.4 and 1.5). My trainees are listed in alphabetical order below with **current members in bold**. Over the past five years of setting up a new laboratory, I have supervised five MSc students (two of whom have completed theses), four PhD students, and four PDFs.

1.8.3 Theses submitted by research students

Table 1.6 includes theses submitted by my research students. Among the undergraduate students whom I have supervised, fourteen have submitted theses which are key components of their degree programs. In addition, two M.Sc. students have submitted final theses.

1.8.4 Competitive awards won by graduate students and PDFs

Graduate students and PDFs have won competitive fellowships and awards, with my support for their proposals which fit within my program; these are listed in Table 1.7.

1.8.5 Competitive awards won by undergraduate students

Furthermore, the talented undergraduate researchers in my group have won a series of fellowship awards to support their research.

1.8.6 Prizes won by undergraduate students for research talks

At conferences and workshops, my undergraduate students have won prizes for their results and presentations.

1.8.7 Undergraduate and graduate courses taught

A summary list of courses taught prior to Fall 2016 along with level, enrolment numbers, format, and duration of lectures is presented in Table 1.10.

Number	Name	Dates	Degree	Type(s) of project
1	Ranya Virk Patel	06/2016 – present	Quantitative Biology	Research assistant BIOL 468*
2	Laura Saunders	05/2016 – present	Honours Physics	Research assistant PHYS 459*
2	Barbara Gravel	01/2016 – present	Biology and Mathematics	Research assistant BIOL 468*
4	Yash Patel	01/2016 – present	Computer Science and Biology	Research assistant
5	Alvin Haoran Liao	01/2016 – present	Honours Mathematics and Physics	Research assistant
6	Christopher Cayen-Cyr	09/2015 – 05/2016	Honours Physics	PHYS 459*
7	Catherine Leroux	05/2015 – 05/2016	Honours Physics	Research assistant PHYS 459*
8	Julian Wolf	08/2015 – 06/2016	Majors Physics	PHYS 459*
9	Zhi (Mack) Zhu	01/2015 – present	Computer Science and Biology	Research assistant COMP 401*
10	Sophie Battat	05/2015 – 08/2015	CEGEP student	Research assistant
11	Illana Naveen	05/2015 – 08/2015	CEGEP student	Research assistant
12	Alexandra Valdescault	05/2014 – 08/2014	Roll's Royce Intern	Research assistant
13	Philippe Aubin	05/2014 – 08/2014	Roll's Royce Intern	Research assistant
14	Patricia Angkiriwang	05/2014 – 08/2014	Honours Biophysics, UBC	Research assistant
15	Justin Dragoman	05/2014 – 05/2015	Honours Mathematics and Physics	Research assistant
16	Andrew Caleb Guthrie	01/2014 – 05/2016	Honours Computer Science	COMP 396 Research assistant PHYS 459*
17	Alexander Hofkirchner	01/2014 – 07/2015	Quantitative Biology	Research assistant BIOL 459*
18	Alexander Verge	01/2014 – 08/2014	Computer Science	COMP 396 Research assistant
19	Jill Laurin	09/2013 – 05/2016	Honours Anatomy and Cell Biology	Research assistant PHYS 396
20	Yang Zhou	09/2013 – 12/2013	Comp. Sci. and Biol.	PHYS 396
21	Andrew Martin	05/2013 – 01/2014	Comp. Sci.	Research assistant PHYS 396

Table 1.2: Undergraduates supervised in research projects while at McGill, Part 1.

PHYS 449, 479: one-semester honours project or majors thesis course

PHYS 459, BIOL 459, PHGY 461 D1/D2*: two-semester thesis courses

BIOL 468: one-semester honours thesis course

PHYS / BIOL 396: one-semester project course

Number	Name	Dates	Degree	Type(s) of project
22	François Michaud	05/2013 – 07/2015	Honours Physics	Research assistant PHYS 396 PHYS 449 PHYS 459*
23	Alec Silver	05/2013 – 05/2014	Quantitative Biology	Research assistant BIOL 459*
24	Christopher King	05/2013 – 12/2013	Physics	Research assistant PHYS 449
25	Jessica Dakkak	05/2013 – 08/2013	CEGEP student	Research assistant
26	Laurel Stothers	05/2013 – 08/2013	Physics	PHYS 396
27	Max Krogius	01/2013 – 05/2013 01/2014 – 05/2015	Honours Physics	PHYS 396 PHYS 479 PHYS 459*
28	Amédée d’Aboville	01/2013 – 05/2013	Honours Software Engineering	PHYS 396
29	Clarence Leung	09/2012 – 05/2013	Computer Science and Biology	BIOL 468*
30	Alex Sylvester	09/2012 – 12/2012	Honours Physics	PHYS 396
31	Matthew Tarling	05/2012 – 05/2013	Physics	PHYS 479* PHYS 396 BIOL 396
32	Marc Rousseau	01/2012 – 08/2012	Physics	Research assistant
33	Bojing Jia ¹	05/2012 – 05/2015	Quantitative Biology	BIOL 468* Research assistant Exchange with Quorum Technologies
34	Chris McFaul	01/2012 – 06/2014	Physics and Physiology	Research assistant PHYS 396 PHGY 461 D1/D2*
35	Daniel Berard	01/2012 – 12/2013	Honours Physics	Research assistant PHYS 459* PHYS 449

Table 1.3: Undergraduates supervised in research projects while at McGill, Part 2.

¹Co-supervised with Claire Brown

PHYS 449, 479: one-semester honours project or majors thesis course

PHYS 459, BIOL 459, PHGY 461 D1/D2*: two-semester thesis courses

BIOL 468: one-semester honours thesis course

PHYS / BIOL 396: one-semester project course

Number	Name	Dates	Current Status
1	Dr. M. Jalal Ahamed [†]	11/2013 – 06/2015	Assistant Professor, University of Windsor
2	Dr. Jason Leith	04/2012 – 06/2016	Applying for “big data” consultant/analyst positions
3	Dr. Sara Mahshid [†]	06/2013 – 04/2015	Post-doctoral fellow University of Toronto
4	Dr. Marjan Shayegan	03/2015 – present	Post-doctoral fellow McGill University

Table 1.4: Post-doctoral fellows supervised while at McGill.

[†]Co-supervised with Reisner (Physics) and Sladek (Genome Center)

Number	Name	Level	Dates	Current status
1	Adriel Arsenault [†]	M.Sc. R.A.	09/2012 – 08/2015 08/2015 – 05/2016	Enrolled in “big data” program (NYC)
2	Daniel Berard	M.Sc. Ph.D.	01/2014 – 01/2015 01/2015 – present	Ph.D., McGill Physics
3	Gilead Henkin	M.Sc.	05/2013 – 08/2016	Scientific writer at Nature Scientific Reports
4	Albert Kamanzi	Trainee Ph.D.	07/2014 – 09/2014 09/2014 – present	Ph.D., McGill Physics
5	John Ross*	Trainee M.Sc.	07/2015 – 09/2015 09/2015 – present	M.Sc., McGill Physics
6	Shane Scott	Trainee Ph.D.	10/2012 – 01/2013 01/2013 – present	Ph.D., McGill Physics
7	Cynthia Shaheen	Trainee M.Sc.	05/2016 – 09/2016 09/2016 – present	M.Sc., McGill Physics
8	Frank Stabile	Trainee Ph.D.	08/2015 – 09/2015 09/2015 – present	Ph.D., McGill Physics
9	Zhiyue Zhuang	Trainee M.Sc.	07/2016 – 09/2016 09/2016 – present	M.Sc., McGill Physics

Table 1.5: Graduate students/RAs supervised while at McGill.

[†] Medical leave during 10/14-05/15. Served as R.A. 06/15-04/16

* Co-supervised with Paul Wiseman and Mark Sutton

Number	Name(s)	Title of Submitted Thesis	Date
1	Gilead Henkin [†]	<i>Manipulating and visualizing molecular interactions in customized nanoscale spaces</i>	08/2016
2	Julian Wolf	<i>SCREW-DNA: Sequential Compaction via Rotation-induced Elongation and Wrapping of DNA</i>	04/2016
3	Christopher Cayen-Cyr & Catherine Leroux	<i>Oligo invasion of plasmids</i>	04/2016
4	Andrew Caleb Guthrie	<i>Finding persistence lengths of DNA nanotubes nanostructures using DNA PAINT imaging</i>	04/2016
5	Adriel Arsenault [†]	<i>Single-molecule fluorescence imaging instrumentation design and development</i>	08/2015
6	Alexander Hofkirchner	<i>Towards visualizing topology-driven DNA unwinding</i>	04/2015
7	François Michaud	<i>Towards visualizing protein-DNA interactions: chambers for biophysical studies</i>	04/2015
8	Bojing Jia	<i>Mechanical deformation of cells with convex lens-induced confinement</i>	04/2015
9	Max Krogius	<i>On sensing applied strain to deformed thin films using imaging</i>	04/2015
10	Alec Silver	<i>Unwinding dynamics in plasmid pUC19 as a function of plasmid topology</i>	04/2014
11	Christopher McFaul	<i>Toward a CLiC implementation of imaging correlation spectroscopy of reactions in thin aqueous films</i>	04/2014
12	Daniel Berard	<i>Convex lens-induced nanoscale templating for biophysical Studies</i>	04/2013
13	Matthew Tarling	<i>A custom single-molecule fluorescence microscopy system</i>	04/2013
14	Clarence Leung	<i>A computer control system for convex lens-induced confinement microscopy</i>	04/2013

Table 1.6: Submitted theses.

[†]M. Sc. theses

Number	Recipient	Fellowship Proposal	Fellowship	Date
1	Zhiyue Zhuang	<i>Using adjustable nanoconfinement to unravel and guide DNA polymers into and through nanopore sensors</i>	NSERC Bionanomachines graduate fellowship	09/2016 – 12/2016
2	Cynthia Shaheen	<i>Toward single-molecule microscopy of genome regulation mechanisms using in-vitro DNA constructs</i>	NSERC Bionanomachines graduate fellowship	09/2016 – 12/2016
3	Albert Kamanzi	<i>Partitioning DNA polymers under applied nanoconfinement using an adjustable nanofluidic device</i>	NSERC Bionanomachines graduate fellowship	09/2016 – 12/2016
4	John Ross ¹	<i>Wide-field correlation spectroscopy of weak and slow interactions using CLiC kICS methodology</i>	NSERC Bionanomachines graduate fellowship	09/2015 – 03/2017
5	Frank Stabile	<i>Next-generation sequencing using tunable nanoscale confinement</i>	NSERC Bionanomachines graduate fellowship	09/2015 - 03/2017
6	Marjan Shayegan	<i>Toward CLiC imaging of regulatory protein-DNA interactions</i>	NSERC CDMC PDF fellowship	03/2015 - 03/2016
7	Daniel Berard	<i>Toward mapping genomes with CLiC microscopy and nanolithography</i>	NSERC CGS D fellowship	09/2015 - 08/2018
8	Daniel Berard	<i>Toward mapping genomes with CLiC microscopy and nanolithography</i>	NSERC Bionanomachines MSc fellowship	09/2014 - 08/2015
9	Gilead Henkin	<i>Toward single-molecule biomarker diagnostics</i>	NSERC Bionanomachines MSc fellowship	05/2014 - 05/2016
10	Jason Leith	<i>Partitioning DNA polymers and nanostructures using CLiC microscopy</i>	NSERC Bionanomachines PDF fellowship	03/2014 - 03/2015
11	Adriel Arsenaault ²	<i>Toward single-molecule microscopy of DNA repair</i>	NSERC CDMC graduate fellowship	09/2012 - 08/2015
12	Shane Scott	<i>Visualizing superhelicity-driven transcriptional dynamics</i>	FRQNT graduate fellowship	09/2015 - 01/2016
13	Shane Scott	<i>Visualizing superhelicity-driven transcriptional dynamics</i>	NSERC CDMC graduate fellowship	01/2013 - 09/2015
14	Jason Leith	<i>Visualizing DNA dynamics using CLiC microscopy</i>	NSERC CDMC PDF fellowship	03/2012 - 03/2014

Table 1.7: Graduate students/postdocs having received competitive awards.

CDMC: Cellular Dynamics of Macromolecular Complexes

¹Co-supervised by Paul Wiseman and collaborative with Mark Sutton

²Listed fellowship and research time reduced by medical leave, 10/2013 – 04/2014

Number	Recipient	Fellowship Proposal	Fellowship	Date
1	Alvin Haoran Liao	<i>DNA "PAINT and CLiC"</i>	SURA	05/2016 - 08/2016
2	Yash Patel	<i>DNA "PAINT and CLiC"</i>	Bionano Fellowship	05/2016 - 08/2016
3	Laura Saunders	<i>Seeing single DNA do the twist</i>	NSERC USRA	05/2016 - 08/2016
4	Catherine Leroux	<i>CLiC visualization of molecular reactions and complexes</i>	NSERC USRA	05/2015 - 08/2015
5	Boijing Jia	<i>Squeezing cellular dynamics into focus</i>	Industrial Undergraduate NSERC Award	05/2014 - 08/2014
6	Alexander Hofkirchner	<i>Topology and Transcription</i>	NSERC CREATE Bionanomachines	05/2014 - 08/2014
7	Patricia Angkiriwang	<i>Partitioning DNA nanostructures using CLiC</i>	NSERC USRA	05/2014 - 08/2014
8	Justin Dragoman	<i>Manipulating DNA with tunable nanoscale confinement</i>	NSERC USRA+CREATE Bionanomachines	05/2014 - 08/2014
9	Alexander Verge	<i>CLiC Wide-Field Fluorescence Cross Correlation Spectroscopy</i>	SURA	05/2014 - 08/2014
10	Daniel Berard	<i>Convex Lens-Induced Nanoscale Templating</i>	SURA	05/2013 - 08/2013
11	Chris McFaul	<i>Confinement spectroscopy of DNA molecules</i>	NSERC CREATE Bionanomachines	05/2013 - 08/2013
12	Alec Silver	<i>Creating a model molecular system for visualizing superhelicity-driven conformation transitions of DNA plasmids</i>	NSERC CREATE Bionanomachines	05/2013 - 08/2013
13	Chris McFaul	<i>Fluorescence microscopy of thin molecular films using flow-cell CLiC microscopy</i>	NSERC CREATE CDMC	05/2012 - 08/2012
14	Daniel Berard	<i>Precision platform for Convex Lens-Induced Confinement (CLiC)</i>	NSERC CREATE Bionanomachines	05/2012 - 08/2012

Table 1.8: Undergraduate research fellowships

Bionanomachines: name of a CREATE

CDMC: Cellular Dynamics of Macromolecular Complexes (name of a CREATE)

CREATE: Collaborative Research and Training Experience (an NSERC Program)

IUSRA: Industrial Undergraduate Student Research Award (an NSERC Program)

USRA: Undergraduate Student Research Award (an NSERC Program)

SURA: Faculty of Science Undergraduate Research Award (internal McGill Program)

Number	Name	Prize	Event	Date
1	François Michaud	<i>First prize (oral presentation)</i>	Biological/Medicinal Division of Canadian Chemistry Society Conference	06/2015
2	Bojing Jia	<i>Reginald Fessenden Prize in Innovation</i>	Competition (Written Submission)	12/2014
3	Alexander Verge	<i>First prize (poster and talk)</i>	Bionanomachines Summer Symposium	08/2014
4	Alexander Hofkirchner	<i>Second prize (poster and talk)</i>	Bionanomachines Summer Symposium	08/2014
5	Jill Laurin	<i>Top prize (poster and talk)</i>	Molecular Biology Summer Symposium	08/2014
6	Justin Dragoman	<i>Fourth prize (poster)</i>	Physics Department Poster Fair	08/2014
7	Bojing Jia	<i>Selected and funded to attend and present a poster</i>	National Research Collegiate Conference, Harvard University	01/25/2014
8	Bojing Jia	<i>Top poster prize</i>	Faculty of Science Poster Fair, Cellular and Organismal Biological Sciences Division	10/2013
9	Daniel Berard	<i>Top poster prize</i>	Faculty of Science Poster Fair, Physical Sciences Division	10/2013
10	Daniel Berard	<i>Top poster prize</i>	Physics Department Poster Fair	09/2013
11	Daniel Berard	<i>Top oral presentation prize</i>	CUPC and CAP, Biological and Medical Physics Division	10/2012
12	Daniel Berard & Chris McFaul	<i>Top poster prize</i>	Physics Department Poster Fair	09/2012

Table 1.9: Undergraduate research prizes

Semester	Course	Level	Enrolment	Format	Duration
W17	PHYS 333	Undergrad	51	Classroom	Full Semester
W17	Phys 489	Undergrad	18	Classroom	Full Semester
W17	Phys 479	Undergrad	3	Classroom	Full Semester
W17	Phys 459	Undergrad	9	Classroom	Full Semester
W17	Phys 634	Grad	8	Classroom	Full Semester (Coteaching)
W16	BIOL PHYS 319	Undergrad	15	Classroom	Full Semester
W16	BIOL PHYS 333	Undergrad	41	Classroom	Full Semester
W16	PHYS 607	Grad	6	Reading/Presentation	Full Semester
W16	PHYS 659	Grad	14	Classroom	1 Week + 1 Project
W15	BIOL PHYS 319	Undergrad	22	Classroom	Full Semester
W15	BIOL PHYS 333	Undergrad	38	Classroom	Full Semester
W15	PHYS 659	Grad	16	Classroom	1 Week
F15	PHYS 634	Grad	5	Classroom	1/4 Semester + Coordinator
W14	BIOL PHYS 319	Undergrad	13	Classroom	Full Semester
W14	BIOL PHYS 333	Undergrad	49	Classroom	Full Semester
W14	PHYS 659	Grad	16	Classroom	1 Week
W13	BIOL PHYS 319	Undergrad	24	Classroom	Full Semester
F13	PHYS 634	Grad	8	Classroom	1/4 Semester
F12	PHYS 607	Grad	1	Reading	Full Semester
W12	BIOL 413	Undergrad	1	Reading	Full Semester
W12	BIOL PHYS 319	Undergrad	17	Classroom	Full Semester

Table 1.10: Courses taught at McGill since appointment in January 2012. Under ‘Format’, the word ‘Classroom’ indicates that lectures were delivered in a traditional classroom setting, in contrast with, e.g. ‘Project’ or ‘Reading/Presentation’ where lectures were not given every week. The semester code indicates the semester and year in which a course was taught, e.g., W12 indicates a course taught in the winter semester of 2012.