Hanadi Sleiman

EDUCATION AND POSTDOCTORAL EXPERIENCE

1993-1995 Université Louis Pasteur, Strasbourg, France
CNRS Postdoctoral Fellow in Supramolecular Chemistry
Research Supervisor: Professor Jean-Marie Lehn

1985-1990 Stanford University, *Stanford, California*
Ph.D. Degree in Organic Chemistry
Research Supervisor: Professor Lisa McElwee-White

1982-1985 American University of Beirut, *Beirut, Lebanon*
B.S. Degree in Chemistry with High Distinction
Dean's Honor List each term

WORK EXPERIENCE

2011-present ***Professor and Canada Research Chair in DNA Nanoscience, Tier I,*** Department of Chemistry, McGill University, Montreal, Canada

2005-2011 ***Associate Professor and William Dawson Scholar***, Department of Chemistry McGill University, Montreal, Canada

1998-2005 ***Assistant Professor***, Department of Chemistry
McGill University, Montreal, Canada

AWARDS AND DISTINCTIONS

Awards.

2023 **Fellow of the Royal Society (London),** granted to individuals who have made a "substantial contribution to the improvement of natural knowledge, including mathematics, engineering science, and medical science".

2021 **NSERC John C. Polanyi Award 2021**. One of the two highest awards given by NSERC for Science and Engineering in Canada; $250,000 in research funding. NSERC is the Natural Science and Engineering Research Council in Canada.

2020 **Cottrell STAR Award** Research Corporation, USA. "The Cottrell STAR Award is designed to recognize the outstanding research and educational accomplishments of members of the community of Cottrell Scholars."

2018 **Killam Research Fellowship**, Canada Council for the Arts. "The Killam Research Fellowships provide support to scholars of exceptional ability by granting them time to pursue research projects of broad significance and widespread interest within the disciplines of the humanities, social sciences, natural sciences, health sciences, engineering, or studies linking any of these disciplines." This award

provided me with $140K for two years of teaching and administration release, to pursue research. (2018-2020)

2018 **Albus Award**, Grifols Corporation, Barcelona, Spain. "The Albus Program is an annual international award focused on innovative ideas related to albumin and its role as a therapeutic product"; $70K in research funding.

2018 **R. U. Lemieux Award in Organic Chemistry**, Canadian Society for Chemistry "Presented to an organic chemist who has made a distinguished contribution to any area of organic chemistry and who is currently working in Canada"

2017 **Netherlands Scholar Award** in Supramolecular Chemistry. This award aims to "recognize and reward outstanding scientists working in supramolecular chemistry and encourage excellence in the field".

2016 **Fellow of the Royal Society of Canada**. "They are 2000 Canadian scholars, artists, and scientists, peer-elected as the best in their field. The fellowship of the RSC comprises distinguished men and women from all branches of learning who have made remarkable contributions in the arts, the humanities and the sciences, as well as in Canadian public life."

2016 **Izatt-Christensen Award** in Supramolecular and Macrocyclic Chemistry. Highest international award in the field of Supramolecular Chemistry.

2016 **Member, Editorial Advisory Board**, *J. Am. Chem. Soc.*, *Chem (CellPress), J. Org. Chem., Nanoscale Horizons, Bioconj. Chem., ChemBioChem*

2012 **Canada Research Chair in DNA Nanoscience,** Tier I. "The Canada Research Chairs Program invests up to $311 million per year to attract and retain some of the world's most accomplished and promising minds. Chairholders aim to achieve research excellence in engineering and the natural sciences, health sciences, humanities, and social sciences." (2012-2019, renewed 2019-2026).

2009 **Strem Award for Pure or Applied Inorganic Chemistry**, Canadian Society for Chemistry. "Presented to a Canadian who has made an outstanding contribution to inorganic chemistry, demonstrating exceptional promise, while working in Canada.

2009 **Fellow**, Canadian Institute of Advanced Research, Nanoelectronics Program.

2008 **NSERC Discovery Accelerator Supplement.** "The Discovery Accelerator Supplements program provides substantial and timely additional resources to accelerate progress and maximize the impact of established, superior research programs." $120,000.

2005 **Leo Yaffe Award** for excellence in teaching, McGill University, Faculty of Science.

2004 **William Dawson Scholar Award** for excellence in Research and Teaching McGill University (2004-2014).

2003 **Principal's Prize for Excellence in Teaching,** McGill University, (Assistant Professor Category).

2002 **Cottrell Scholar Award**, Research Corporation. "The Cottrell Scholar program honors and helps to develop outstanding teacher-scholars who are recognized by their scientific communities for the quality and innovation of their research programs and their potential for academic leadership. (U.S.A. and Canada-wide award in Chemistry, Physics and Astronomy).

1993-94 **Postdoctoral Fellowship**, Centre National de la Recherche Scientifique, France.

Lectureships.

2023 **Ayer Lectureship**, U. Alberta, Canada

2023 **Hirschmann Lectureship**, University of Wisconsin-Madison, USA

2023 **BP Sustainability Lectureship**, University of Cambridge, UK

2022 **Bristol-Myers-Squibb Lectureship**, Columbia University, New York, USA

2016 **Bristol-Myers-Squibb Lectureship**, Massachusetts Institute of Technology

2013 **Swiss Chemical Society Lectureship,** Fall 2013, *U. Genève, EPFL, U. Neuchâtel, U. Fribourg, U. Basel*

2012 **E. Gordon Young Lectureship**, Chemical Institute of Canada

RESEARCH PUBLICATIONS

Our group consistently publishes in the top scientific journals. In the last 10 years, our work appeared in Nat. Chem. (7 papers, impact factor IF=24.3), J. Am. Chem. Soc. (15 papers, IF=16.4), Chem (3, IF=22.8), Angew. Chem. (7, IF=16.8), Chem. Sci. (5, IF=9.97), ACS Nano (5, IF=18), Adv. Sci. (1 paper, IF= 17.5), Nat. Commun. (4, IF=17.7) Nat. Mater. (1, IF=47.7) and ACS Central Sci. (1, IF=21.4). Our breakthroughs were highlighted in the journals Nature (which called our DNA cages "Gene Boxes"), Science, Nat. Mat., ACS Nano, Mat. Today, with features in scientific and popular media around the world. They were selected by the Faculty of 1000 Biology, top 2% for online attention in Nat. Chem. They led to an invitation from the journal Science to write a review on DNA nanotechnology (1108 citations, IF=63.7). I was also invited, along with N. Seeman, the inventor of the field of DNA nanotechnology, to write a review of the field in Nat. Rev. Mat. (2017, 1237 citations, IF=76.7).

Publications.

1. P. Pichetti, S. Volpi, M. Rossetti, M. D. Dore, T. Trinh, F. Biedermann, M. Neri, A. Bertucci, A. Porchetta, R. Corradini, H. Sleiman, L. De Cola, Responsive Nucleic Acid-Based Organosilica Nanoparticles, **J. Am. Chem. Soc**., 2023, accepted.
2. P. Pichetti, S. Volpi, M. Sancho-Albero, M. Rossetti, M. D. Dore, T. Trinh, F. Biedermann, M. Neri, A. Bertucci, A. Porchetta, R. Corradini, H. Sleiman, L. De Cola, Supramolecular Nucleic Acid-Based Organosilica Nanoparticles Responsive to Physical and Biological Inputs, **J. Am. Chem. Soc**., 2023, accepted.
3. X. Luo, D. Saliba, T. Yang, S. Gentile, K. Mori, P. Isla Garcia, T. Das, N. Bagheri, A. Porchetta, A. Guarne, G. Cosa, H. Sleiman, Robust DNA nanotubes assembled from four strands: tunable geometry, size, chirality, and dynamics; ***Angew. Chem.***, 2023, 62, accepted.
4. M. G. Rafique, J. M. Remington, F. Clark, V. Toader, D. F. Perepichka, J. Li, H. F. Sleiman, Two-Dimensional Supramolecular Polymerization of DNA Amphiphiles is Driven by Sequence-Dependent DNA-Chromophore Interactions, ***Angew. Chem***. 2023, 62, e202217814. (IF=16.82)
5. C. Lachance-Brais, M. Rammal, J. Asohan, A. Katolik, X. Luo, D. Saliba, A. Jonderian, M.J. Damha, M. Harrington, H.F. Sleiman, Small Molecule-Templated DNA Hydrogel with Record Stiffness Integrates and Releases DNA Nanostructures and Gene Silencing Nucleic Acids. ***Adv. Sci.*** 2023, 2205713. (IF=17.5)
6. T. M. Brown, H. H. Fakih, D. Saliba, J. Asohan, H. F. Sleiman, Stabilization of Functional DNA Structures with Mild Photochemical Methods, **J. Am. Chem. Soc**., 2023, 145, 2142–2151 (IF=16.4)

7. D. de Rochambeau, M. Barlog, F. Rizzuto, Q. Laurent, X. Luo, K. Lau, H. Bazzi, H. Sleiman, A single monomer difference can impact the nanostructure output of precision oligo(phosphodiesters), **Polym. Chem**. 2023, *14*, 3971 - 3977. (IF=4.6)
8. S. Kaviani, H. H. Fakih, A. Katolik, J. Asohan, M.J. Damha, H. F. Sleiman, Sequence-Controlled Spherical Nucleic Acids: Effect of Hydrophobic Monomer Structure and Sequence on Gene Silencing, Encapsulation and Cellular Uptake, **Nucl. Acids Ther,** 2023, *33*, 265-276. (IF=4.24)
9. D. Saliba, X. Luo, F. Rizzuto, H. F. Sleiman, "Programming rigidity into size-defined wireframe DNA nanotubes", **Nanoscale** (invited), 2023, *15*, 5403-5413 (IF=8.3)
10. F. Rizzuto, M. Dore, M. G. Rafique, X. Luo, H. Sleiman. DNA Sequence and Length Dictate the Assembly of Nucleic Acid Block Copolymers, ***J. Am. Chem. Soc.***, 2022, 144, 12272–12279. (IF=16.38)
11. D. Saliba, T. Trinh, C. Lachance-Brais, A. L. Prinzen, F. J. Rizzuto, D. de Rochambeau, H. F. Sleiman, Asymmetric patterning drives the folding of a tripodal DNA nanotweezer, ***Chem. Sci.*** 2022, 13, 74-80. (IF=9.97) (Featured in the 2021 Chemical Science HOT Article Collection)
12. C. Hennecker, C. Lachance-Brais, H. Sleiman, A. Mittermaier, Using Transient Equilibria to Measure the Dynamics of Slowly Assembling Supramolecular Systems, ***Science Adv.,*** 2022, 8, eabm8455. (IF=14.14)
13. C. Lachance-Brais, C. Hennecker, A. Alenaizan, X. Luo, V. Toader, M. Taing, C. D. Sherrill, A. Mittermaier, H. F. Sleiman, "Tuning DNA Supramolecular Polymers by Addition of Small, Functionalized Nucleobase Mimics", ***J. Am. Chem. Soc.*** 2021, 143, 19824–19833. (*Highlighted in Nature Reviews Chemistry*) (IF=16.38)
14. M. Dore, T. Trinh, D. de Rochambeau, P. Xu, J.Li, H. F. Sleiman, "Thermosetting supramolecular polymerization of compartmentalized DNA fibers with stereo sequence and length control", ***Chem.,*** 2021, 7, 2395-2414. (IF=22.8)
15. F. Rizzuto, C. Platnich, X. Luo, M. Dore, C. Lachance-Brais, G. Cosa, H. Sleiman, A dissipative pathway for the structural evolution of DNA fibers, ***Nat. Chem.***, 2021, 13, 843–849. (*Editor's Choice in Nature Chemistry, "Dissipative DNA Fibres")* (IF=24.3)
16. A Lacroix, H. F. Sleiman, DNA Nanostructures: Current Challenges and Opportunities for Cellular Delivery, ***ACS Nano***, 2021, 15, 3631–3645. (IF=18.03)
17. H. Fakih, A. Katolik, E. Malek-Adamian, J. J Fakhoury, S. Kaviani, M. J Damha, H. F Sleiman, Design and enhanced gene silencing activity of spherical 2′-fluoroarabinose nucleic acids (FANA-SNAs), ***Chem. Sci.,*** 2021, 12, 2993-3003. (IF=9.97)
18. A. Prinzen, D. Saliba, C. Hennecker, T. Trinh, A. Mittermaier, H. F. Sleiman, Amplified Self-Immolative Release of Functional Molecules Through the Hybridization Chain Reaction, ***Angew. Chem.*** 2020, 59, 12900-12908. (*"Hot Paper")* (IF=16.82)
19. W. Ren, P.J. Huang, D. de Rochambeau, W.J. Moon, J. Zhang, M. Lyu, S. Wang, H. Sleiman, J. Liu Selection of a metal-ligand modified DNAzyme for detecting Ni2+, ***Biosensors and Bioelectronics,*** 2020, 165, 112285. (IF= 12.54)
20. F.J. Rizzuto, T. Trinh, H.F. Sleiman, Molecular Printing with DNA Nanotechnology, ***Chem***, 2020, 6, 1560-1574. (IF=22.8)
21. A Lacroix, H. H. Fakih, H. F. Sleiman, Detailed cellular assessment of albumin-bound oligonucleotides: Increased stability and lower non-specific cell uptake, ***J. Contr. Release***, 2020, 324, 34-46. (IF= 11.47)
22. C. M. Platnich, F. J. Rizzuto, G. Cosa, H. F Sleiman, Single-molecule methods in structural DNA nanotechnology, ***Chem. Soc. Rev***. 2020, 49, 4220-4233. (IF=54.56)
23. Q. Li, J. Zhao, L. Liu, S. Jonchhe, F. J. Rizzuto, S. Mandal, H. He, S. Wei, H. F. Sleiman, H. Mao, C. Mao, A poly(thymine)–melamine duplex for the assembly of DNA nanomaterials, ***Nat. Mat.*** 2020, 19, 19, 1012–1018. (IF=47.7)
24. X. Luo, C. Lachance-Brais, A. Bantle, H. F. Sleiman, The Assemble, Grow and Lift-Off (AGLO) Strategy to Construct Complex, Pre-Designed Gold Nanostructures, ***Chem. Sci***. 2020, 11, 4911-4921. (IF=9.97)
25. A. Rousina-Webb, C. Lachance-Brais, F. J. Rizzuto, M. Askari, H. F. Sleiman, Transition Metal-Functionalized DNA Double-Crossover Tiles: Enhanced Stability and Chirality Transfer to Metal Centers, ***Angew. Chem***., 2020, 59, 4091-4098. (IF=16.82)

26. P.-J. J. Huang, D. de Rochambeau, H. F. Sleiman, J. Liu, Target Self-Enhanced Selectivity in Metal-Specific DNAzymes, ***Angew. Chem.*** 2020, 59, 3573 –3577. (IF=16.82)
27. M. Dore, H. Sleiman, Sequence-defined DNA-amphiphiles for drug delivery: synthesis and self-assembly, Invited contribution to an edition on " Nucleic Acid Detection and Structural Investigations: Methods and Protocols " in ***Methods in Molecular Biology***, Springer Nature, 2020, *2063*, pp. 87-100
28. A.S. Danis, K.L. Metera, N.A. Payne, H.F. Sleiman, J. Mauzeroll, Bottom-Up Characterization and Self-Assembly of Electrogenerated Chemiluminescence Active Ruthenium Nanospheres, ***ChemElectroChem***, 2019, 6, 3499-3506. (IF= 4.78)
29. C. Platnich, A. Hariri, H. F. Sleiman, G. Cosa, Advancing Wireframe DNA Nanostructures Using Single-Molecule Fluorescence Microscopy Techniques, ***Accts. Chem. Res.*** 2019, *52*, 3199-3210. (IF=22.38)
30. A. Lacroix, E. Vengut-Climent, D. de Rochambeau, H. Sleiman, "Uptake and Fate of Fluorescently Labelled DNA Nanostructures in Cellular Environments - A Cautionary Tale", ***ACS Central Sci.***, 2019, 5, 882-891. (IF=21.4); 95 citations.
31. M. S. Askari, C. Lachance-Brais, F. Rizzuto, H. Sleiman, Remote control of charge transport and chiral induction along a DNA-metallohelicate, ***Nanoscale***, 2019,11, 11879-11884 (IF= 8.3)
32. H. Fakih, D. Bousmail, H. Sleiman, Minimalist Design of a Stimuli-Responsive Spherical Nucleic Acid for Conditional Delivery of Oligonucleotide Therapeutics, ***ACS Appl. Mat. Interfaces***, 2019, 11, 13912-13920. (IF= 10.38)
33. P. Chidchob, D. Offenbartl-Stiegert, D. McCarthy, X. Luo, J. Li, S. Howorka, and H. F. Sleiman, "Spatial Presentation of Cholesterol Units on a DNA Cube as a Determinant of Membrane Protein-Mimicking Functions", ***J. Am. Chem. Soc.*** 2019, 141, 1100-1108. (IF=16.38)
34. T. Trinh, D. Saliba, C. Liao, D. de Rochambeau, A. L. Prinzen, J. Li, H. Sleiman, "Printing" DNA Strand Patterns on Small Molecules with Control of Valency, Directionality and Sequence, ***Angew. Chem.***, 2019, *58*, 3042-3047. (IF=16.82)
35. K. E. Bujold, H. H. Fakih and H. F. Sleiman, Design Strategy to Access siRNA-Encapsulating DNA "Nanosuitcases" that can Conditionally Release their Cargo. Invited contribution to issue on "RNA interference and cancer therapy" in ***Methods in Molecular Biology***, Springer Nature, 2019, 1974, Chapter 6, 69-81.
36. T. Trinh, C. Liao, V. Toader, M. Barłóg, H. S. Bazzi, J. Li, H. F. Sleiman, "DNA-Imprinted Polymer Nanoparticles with Monodispersity and Prescribed DNA-Strand Patterns" ***Nat. Chem.*** 2018, *10,* 184–192. Generated press in a number of media outlets. (IF=24.3)
37. C. M. Platnich, A. A. Hariri, J. F. Rahbani, J. B. Gordon, H. F. Sleiman, G. Cosa, Kinetics of Strand Displacement and Hybridization on Wireframe DNA Nanostructures: Dissecting the Roles of Size, Morphology, and Rigidity, ***ACS Nano***, 2018, *12*, 12836-12846. (IF=18.03)
38. M. Dore, J. Fakhoury and H. F. Sleiman, Templated synthesis of spherical RNA nanoparticles with enhanced gene silencing activity, ***ChemComm.***, 2018, 54, 11296-11299. (IF=6.06)
39. R. Harkness, N. Avakyan, H. Sleiman, A. Mittermaier, Mapping the energy landscapes of supramolecular assembly by thermal hysteresis, ***Nat. Commun.***, 2018, 9, 3152. Editor's Choice. (IF=17.7)
40. D. Bousmail, P. Chidchob, H. F. Sleiman, Cyanine-mediated DNA Nanofiber Growth with Living Character and Controlled Dimensionality. ***J. Am. Chem. Soc.***, 2018, 140, 9518-9530. (IF=16.38)
41. D. de Rochambeau, Y. Sun, M. Barłog, H. S. Bazzi, H. F. Sleiman, Modular Strategy to Expand the Chemical Diversity of DNA and Sequence-Controlled Polymers, ***J. Org. Chem.***, 2018, 83, 9774–9786. (IF= 4.35)
42. J. Rahbani, P. Chidchob, T. Trinh, G. Cosa, H. Sleiman, DNA Nanotubes with Hydrophobic Environments: Toward New Platforms for Guest Encapsulation and Cellular Delivery, ***Adv. Healthcare Mater.,*** 2018, 7, 1701049. (IF=11.09)
43. K. Bujold, A. Lacroix, H. Sleiman, DNA Nanostructures at the Interface with Biology, ***Chem***, 2018, 4, 495-521. (IF=22.8); 117 citations.

44. P. Chidchob and H. F. Sleiman, Recent Advances in DNA Nanotechnology, ***Curr. Opin. Chem. Biol.*** (invited), 2018, *46*, 63-70. (IF=8.97); 92 citations.
45. X. Luo, H. F. Sleiman, Encapsulation of gold nanoparticles into DNA minimal nanocages for complex anisotropic functionalization and assembly, ***Small***, 2018, 14, 1702660. (IF= 15.15)
46. N. Seeman, H. Sleiman, "DNA Nanotechnology", ***Nature Reviews Materials*** (invited), 2017, 17068. (IF= 76.68); cited 965 times.
47. A. Garci, K. Castor, J. Fakhoury, J.-L. Do, J. DiTrani, R. S. Stein, A. Mittermaier, T. Friščić and H. Sleiman, "Efficient and Rapid Mechanochemical Assembly of Platinum(II) Squares for Guanine Quadruplex Targeting", ***J. Am. Chem. Soc.***, 2017, 139, 16913-16922. (IF=16.38)
48. N. Avakyan, J. Conway, H. Sleiman, Long-range ordering of blunt-ended DNA tiles on supported lipid bilayers, ***J. Am. Chem. Soc.***, 2017, *139*, 12027–12034. (IF=16.38)
49. D. Bousmail, L. Amrein, J. J. Fakhoury, H. H. Fakih, J. C.C. Hsu, L. Panasci, H. F. Sleiman, "Precision Spherical Nucleic Acids for Delivery of Anticancer Drugs", ***Chem. Sci.*** 2017, 8, 6218-6229. (IF=9.97)
50. A. Lacroix, T. G. W. Edwardson, M. D. Dore, M. A. Hancock, H. F. Sleiman, "Development of DNA nanostructures for high-affinity binding to human serum albumin", ***J. Am. Chem. Soc.*** 2017, 139, 7355-7373. (IF=16.38); 105 citations.
51. A. Hariri, G. Hamblin, J. Harwick, R. Godin, J.-F. Desjardins, P. Wiseman, H. Sleiman, G. Cosa, Stoichiometry and Dispersity of DNA Nanostructures Using Photobleaching Pair Correlation Analysis, ***Bioconj. Chem.*** 2017, 2017, 28, 2340-2349. (IF=4.77)
52. A. Danis, W. Odette, S. C. Perry, S. Canesi, H. Sleiman, J. Mauzeroll, Cuvette-Based Electrogenerated Chemiluminescence Detection System for the Assessment of Polymerizable Ruthenium Luminophores, ***ChemElectroChem***, 2017, 4, 1736-1743. (IF=4.78)
53. K. E. Bujold, J. C. C. Hsu and H. F. Sleiman; Optimized DNA "Nanosuitcases" for Encapsulation and Conditional Release of siRNA***, J. Am. Chem. Soc.*** 2016, 138, 14030–14038. **JACS Research Spotlight**. (IF=16.38); 154 citations.
54. T. Trinh, P. Chidchob, H. S. Bazzi, H. F. Sleiman, DNA micelles as nanoreactors: efficient DNA functionalization with hydrophobic organic molecules, ***Chem. Commun.***, 2016, 52, 10914-10917 (IF=6.06)
55. D. de Rochambeau, M. Barłóg, T. G. W. Edwardson, J. J. Fakhoury, R. S. Stein, H. S. Bazzi, H. F. Sleiman, "DNA–Teflon" sequence-controlled polymers, ***Polym. Chem.***, 2016, 7, 4998-5003 **Journal Cover Image.** (IF= 4.6)
56. K. L. Lau and H. F. Sleiman, Minimalist Approach to Complexity: Templating the Assembly of DNA Tile Structures with Sequentially Grown Input Strands, ***ACS Nano***, 2016, 10, 6542–6551. (IF=18.03)
57. P. Chidchob, T. G. W. Edwardson, C. J. Serpell, H. F. Sleiman, Synergy of Two Assembly Languages in DNA Nanostructures: Self-Assembly of Sequence-Defined Polymers on DNA Cages, ***J. Am. Chem. Soc.*** 2016, 138, 4416–4425. (IF=16.38); 90 citations.
58. N. Avakyan, A. A. Greschner, F. Aldaye, C. J. Serpell, A. Petitjean, H. F. Sleiman, 'Reprogramming the assembly of unmodified DNA with a small molecule', ***Nat. Chem.***, 2016, 8, 368-376. (highlighted in numerous scientific media) (IF=24.3); 115 citations.
59. T. Edwardson, H. F. Sleiman, 'Transfer of molecular recognition information from DNA nanostructures to gold nanoparticles', ***Nat. Chem.*** 2016, 8, 162-170. (highlighted in numerous scientific media) (IF=24.3)
60. Mancini J, Rousseau P, Castor KJ, Sleiman HF, Autexier C, Platinum(II) phenanthroimidazole G-Quadruplex ligand induces selective Telomere shortening in A549 cancer cells, ***Biochimie,*** 2016, 121, 287-297. (IF=4.08)
61. J. J. Fakhoury, T. W. Edwardson, J. W. Conway, F. Khan, M. Barlog, H. S. Bazzi, H. F. Sleiman, 'Antisense precision polymer micelles require less poly(ethylenimine) for efficient gene knockdown', ***Nanoscale***, 2015, **7**, 20625-20634. (IF=8.3)

62. J. Rahbani, A. Hariri, Gonzalo Cosa and Hanadi Sleiman, Dynamic DNA Nanotubes: Reversible Switching between Single and Double-Stranded Forms, and Effect of Base Deletions, ***ACS Nano*** 2015, 9, 11898–11908. (IF=18.03)
63. K. J. Castor, U. M. Tefashe, K. L. Metera, C. J. Serpell, J. Mauzeroll, H. F. Sleiman, Cyclometallated iridium(III) phenanthroimidazole complexes as luminescent and electrochemiluminescent G-quadruplex DNA binders, ***Inorg. Chem.*** 2015, *54*, 6958-67. (IF=5.44); 154 citations.
64. G. Hamblin, J. Rahbani, H. Sleiman, Sequential growth of long DNA strands with user-defined patterns for nanostructures and scaffolds, ***Nat. Commun.***, 2015, *6*, 7065. (IF=17.69)
65. A. Hariri, G. D. Hamblin, H. F. Sleiman and G. Cosa, Stepwise growth of surface-grafted DNA nanotubes visualized at the single molecule level, ***Nat. Chem.*** 2015, *7*, 295-300. Cover Page. (IF=24.3)
66. P. Dauphin-Ducharme , F. Rosati , A. Greschner , A. D. De Bruijn , D. Salvatore, V. Toader , K. Lau, J. Mauzeroll, H. Sleiman, Modulation of Charge Transport Across Double-Stranded DNA by the Site-Specific Incorporation of Copper Bis-Phenanthroline Complexes, ***Langmuir***, 2015, 31, 1850–1854. (IF=4.33)
67. C. J. Serpell, T. Edwardson, P. Chidchob, K. Carneiro, H. Sleiman, Precision Polymers and 3D DNA Nanostructures: Emergent Assemblies from New Parameter Space, ***J. Am. Chem. Soc.*** 2014, 136, 15767-15774, selected as *JACS Spotlight*. (IF=16.38); 98 citations.
68. J. W. Conway, C. Madwar, T. G. Edwardson, C. K. McLaughlin, J. Fahkoury, R. B. Lennox, and H. F. Sleiman, Dynamic Behavior of DNA Cages Anchored on Spherically Supported Lipid Bilayers, ***J. Am. Chem. Soc.*** 2014, *136*, 12987-12997. (IF=16.38)
69. A. Greschner, K. E. Bujold, H. F. Sleiman, Controlled Growth of DNA Structures from Repeating Units Using the Vernier Mechanism**,** ***Biomacromolecules*** 2014, *15*, 3002-3008. (IF=6.99)
70. K. E. Bujold, J. Fakhoury, T. G. W. Edwardson, K. M. M. Carneiro, J. N. Briard, A. G. Godin, L. Amrein, G. D. Hamblin, L. C. Panasci, P. W. Wiseman, H. Sleiman, Sequence-Responsive Unzipping DNA Cubes with Tunable Cellular Uptake Profiles, ***Chem. Sci.***, 2014, 5, 2449-2455. Highlighted in *Chemistry World* (Royal Society for Chemistry), 'DNA cube programmed for an exclusive reveal', April 2014. (IF=9.97)
71. Huang, Y. C., Castor, K. J., Sleiman, H. F., Sen, D. Mechatronic DNA devices driven by a Gquadruplex-binding platinum ligand. ***Bioorg. Med. Chem.*** 2014, *22,* 4376-83 (IF= 3.64)
72. T. G.W. Edwardson, K. M.M. Carneiro, C. J. Serpell, H. F. Sleiman, "An Efficient and Modular Route to Sequence-Defined Polymers Appended to DNA", ***Angew. Chem.***, 2014, 'Very Important Paper', Journal Cover Page, *53*, 4567-71. (IF=16.82); 135 citations.
73. C. J. Serpell, M. Barłóg, K. Basu, J. F. Fakhoury, H. S. Bazzi, H. F. Sleiman, "Nucleobase Peptide Amphiphiles", ***Mater. Horiz.*** *(RSC),* 2014, **1**, 348-354. (IF= 13.27)
74. J. J. Fakhoury, C. K. McLaughlin, T. W. Edwardson, J. W. Conway, H. F. Sleiman, "Development and Characterization of Gene Silencing DNA Cages", ***Biomacromolecules***, 2014, 15, 276-282. (IF=6.99)
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<u>Manuscripts in Revision.</u>

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147. H. H. Fakih, Q. Tang, D. Echeverria, D. A. Cooper, A. Lacroix, A. Khvorova and H. F. Sleiman, Dendritic Amphiphilic siRNA: Selective Albumin Binding, *In Vivo* Efficacy and Low Toxicity, ***Mol. Ther. – Nucl. Acids***, revisions requested.

Submitted Manuscripts.

- J. Asohan, H. H. Fakih, J. G. Mungia-Lopez, J. M. Kinsella, H. F. Sleiman, Control of the Assembly and Disassembly of Spherical Nucleic Acids is Critical for Enhanced Gene Silencing, submitted to **ACS Nano**.
- C. Platnich, Y. Gidi, R. Karimi, P. Islas, L. Ginot, H. F. Sleiman, G. Cosa, "Automated synthesis of wireframe DNA nanotubes", submitted to **???**
- F. Zhao, M. Frandsen, S. Capodaglio, H. Sleiman, "DNA-Mediated Peptide Assembly into Mini-Proteins", submitted to ***J. Am. Chem. Soc.***

Book Chapters.

148. J. Rahbani, H. Sleiman, Toward the Assembly of Dynamic and Complex DNA Nanostructures, in ***"Advanced Materials"***, In Theodorus van de Ven, Armand Soldera (Eds.), Advanced Materials, 2020, (pp. 183–208). Berlin, Boston: De Gruyter J. (invited)
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151. J. Rahbani, K. Metera, H. F. Sleiman 'DNA-based metallosupramolecular materials', in ***Functional Metallosupramolecular Materials***, RSC, 2015, p. 32-69.
152. A. Greschner, F. Rosati, H. F. Sleiman 'Synthetic Molecules as Guides for DNA Nanostructure Formation,' in ***DNA in Supramolecular Chemistry and Nanotechnology***, Wiley, 2015, p. 353-369.
153. K. Carneiro, H. F. Sleiman; "Self-Assembly of Nucleic Acids", invited review in: **"Supramolecular Chemistry: From Molecules to Materials"**, Wiley, March 2012.

2. Patents and Translational Work.

Our group actively pursues translational research, with multiple patents and collaborations with companies. For example, we collaborated with L'Oreal to use DNA structures for the delivery of active ingredients to the skin (patent 2015), with Grifols (Spain) to develop albumin-binding DNA nanostructures (2018), with Quantum Si to use DNA nanostructures to increase the sensitivity of DNA sequencing and with N-plex Bioscience to develop antibody-DNA conjugates for diagnostics. We are currently working with Galenvs Bioscience to develop a DNA aptamer technology that significantly extends their chemical space (patent application, licensed to Galenvs)

1. US Provisional patent application: BIOPOLYMER PROTECTED OLIGONUCLEOTIDES FOR DRUG DELIVERY; application no. 63/482,407; Jan. 2023
2. International (PCT) Patent Application No. PCT/CA2021/050899: DNA-ENCODED FUNCTIONALIZED APTAMERS; licensed to Galenvs, Montreal, Canada; granted US20230220381A1
3. US Provisional Patent Application, Dendritic conjugates for the brain delivery of therapeutic oligonucleotides, in collaboration with UMass Medical School, filed by UMass, with Hassan Fakih and Hanadi Sleiman as co-inventors from McGill.
4. US Provisional Patent Application, Dendritic conjugates for the skin delivery of therapeutic oligonucleotides, in collaboration with UMass Medical School, filed by UMass, with Hassan Fakih and Hanadi Sleiman as co-inventors from McGill).
5. US Provisional Patent Application, Dendritic conjugates for the brain delivery of therapeutic oligonucleotides, in collaboration with UMass Medical School, filed by UMass, with Hassan Fakih and Hanadi Sleiman as co-inventors from McGill).
6. US Patent granted, Reagents Based on a Tertiary Amine Backbone to Introduce Functionality in Nucleic Acids and Sequence Controlled Polymers, US-2021-0163422-A1, published 06/03/2021
7. PCT application, DNA-Encoded Functionalized Aptamers, PCT/CA2021/050899, filed June 30, 2021: this invention is now licensed to Galenvs Biosciences, Montreal, QC.
8. Provisional Patent Application, Ultrabright DNA Nanostructures for Biosensing, No. 63/270,019, Filed by the company Quantum Si, USA, and based on a contract with the company, with Hassan Fakih and Hanadi Sleiman as co-inventors from McGill.
9. US Patent Application, Polynucleotide-poly(diol) conjugates, process of preparation and uses thereof, Publication number: 20190060324, Application Filed: November 7, 2018, Publication date: February 28, 2019, Patent App. 16/182,956
10. US Provisional Patent Application, Nucleotide modular assemblies and their use as delivery devices, US 61 672 057) (2013)
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REVIEWS AND MEDIA COVERAGE OF OUR WORK

2021 Article in JACS, ***highlighted by Nat. Rev. Chem***. ("Fabricating Functionalized Fibres", https://www.nature.com/articles/s41570-021-00357-3)

2021 Article in Nat. Chem. 2021, ***featured in Nat. Chem. "News and Views"*** (Dissipative DNA Fibres), and other science media (Lighting the way to improved materials)

2021 ***Interview*** at BEaTS Research Radio (Lessons learnt from the career journey of a chemist)

2020 Article in Nat. Mat. 2020, featured in Chem&Eng News (Melamine mediates formation of polythymine duplexes)

2020 Article in Angew. Chem, selected as "***Hot Paper***".

2019 ***Interview*** at KAUST, Saudi Arabia (https://youtu.be/uAOduExo8ro). Recorded talk at the WEP meeting: https://www.youtube.com/watch?v=TqpUlvxwt6I

2019 Article in ACS Central Science, 2019, generated press (DNA nanostructures designed for drug delivery remain a technical challenge) and ***top 5% i***n altmetric score.

2019 ***Interview*** for the magazine BioLab Business, 35th Anniversary Issue, "2018 Killam Research Fellowship Winner"

2018 ***Interview*** for Mike FM; Montreal Times; and CJAD Radio, Montreal

2018 Article in Nat. Comm. 2018, ***Editor's Choice***.

2017 Article in Nature Chemistry 2016 generated press in multiple news outlets, see McGill coverage (**Using DNA strands to design new polymer materials**)

2016 Article in Nature Chemistry 2016, ***top 2%*** on the altmetric score; see McGill coverage (**From backyard pool chemical to nanomaterial**)

2016 Article in Nature Chemistry, ***top 2%*** on the altmetric score; see McGill coverage (**A 'printing press' for nanoparticles**)

2016 Article in ***Nature Communications***, 2015, generated media coverage; see McGill coverage (**A better way to build DNA scaffolds**)

2015 Article in Nature Chemistry 2015, was selected as the Journal Cover, and generated media coverage; see McGill coverage (**Building tailor-made DNA nanotubes step by step**)

2014 Manuscript in ***J. Am. Chem. Soc.*** 2014, selected as a JACS Research Spotlight.

2014 Manuscript in ***Angewandte Chemie***, 2014, selected as 'Very Important Paper' and Journal Cover Page

2014 Highlight of our research in ***Chemistry World*** (Royal Society for Chemistry), 'DNA cube programmed for an exclusive reveal', April 2014

2013 Manuscript published in ***Nature Chemistry***, 2013, top 10 in Altmetric Score, and generated press in a number of scientific media (McGill, Wired, Guardian, Canadian Chemical News ACCN, Revue Decouverte)

2013 Article on our research in "***Al-Hayat***"

2013 Manuscript published in ***J. Am. Chem. Soc.*** 2013, was nominated for the Faculty of 1000 Biology

2012 Highlight of our research in ***Chemistry World*** (Royal Society for Chemistry), 'DNA Motors On', Jan. 2012

2012 TV Documentary about our DNA research on ***TeleQuebec*** (Code Chastenay, Ep. #100, Feb 7, 2012)

2011 Interview and Article on our research for ***Canadian Chemical News*** (ACCN) in celebration of the International Year of Chemistry 2011

2010 Manuscript published in ***Nature Chemistry***, 2010, 2, 319, was selected for ***Faculty of 1000 Biology***, and received **research highlights** in *Chemistry World* (Royal Society for Chemistry), *Nano Today* (Elsevier), *Quebec Science*, and popular media (Rutherford radio show, Asharq Awsat newspaper and various web science media).

2010 Articles on our research in Asharq El Awsat
http://archive.aawsat.com/details.asp?section=15&article=561906&issueno=11436 - .WNBZDo61vVp
http://archive.aawsat.com/details.asp?issueno=11700&article=564414 - .WNBZpI61tsM

2010 ***Editor's Choice in Science Magazine,*** "Stringing DNA Along", 2010, 327 (Febr. 12 issue)

2009 Manuscript "Templated Ligand Environments for the Selective Incorporation of Different Metals into DNA" selected for the *cover page of the journal "**Angewandte Chemie**"*

2009 ***Research Highlight*** in *Nature Chemistry* "Form Leading to Function" 2009, *1*, 524.

2009 ***"News and Views"*** article on our work in *Nature Chemistry*, "Coordinating Corners", 2009, *1*, 339.

2009 ***Editor's Choice*** *in SYNFACTS* for article in *J. Am. Chem. Soc.*, 2009, *131*, 4182 (written by Tim Swager)

2009 ***Editor's Choice*** in the journal "***Nature Chemistry***", "Conjugated Polymers: Template Trickery"

2009 Manuscript published in ***Nature Nanotechnology***, 2009, *4*, 349-352, generated press coverage in a number of scientific and popular media (McGill, Biofutur, NextBio, NextBigFuture, Foresight Institute, etc.)

2009 ***Interviews*** in the magazine "The Scientist" and the web magazine "Wired"

2008 ***Research Highlight*** in "Materials Today", "Molecular Architectures Using DNA" (Nov. 2008)

2008 Manuscript selected for the *cover page of the journal "**Angewandte Chemie**"*

2008 ***Research Highlight*** in the journal *"Nature Materials"*, "Unnatural Life" (Feb. 2008)

2007 ***Editor's Choice*** in the journal *"Nature"*, "Gene Boxes" (Dec. 2007)

2007 ***Research Highlight*** in the journal *"ACS NANO"*, "Inspiration and Perspiration from Biology" (Dec. 2007)

2007 ***Editor's Choice*** in the journal *"Nature Nanotechnology"*: "Gold Nanoparticles: DNA Builds Bridges" (Nov. 2007)

2006 Manuscript selected by ***Angewandte Chemie*** *as "Hot Paper"* and for cover page

INVITED LECTURES

1. **Gordon Research Conference Biointerface Science,** Italy, June 16-21, 2024
2. **Suprachem 2024,** U. Ulm, Germany, February 25-27, 2024 (Keynote)
3. **International Symposium on Supramolecular and Macrocyclic Chemistry,** Reykjavik, Iceland, June 2023
4. **U. Alberta, Ayer Lecture,** May 2023
5. **U. Wisconsin-Madison, Hirschmann Lecture**, March 2023
6. **Cambridge University, BP Sustainability Lecture,** January 2023
7. **New York University,** December 9, 2022, "Symposium in Honor of Prof. Nadrian Seeman"
8. **American University of Beirut**, Makhlouf Haddadin Symposium, Oct. 6-7, 2022 **(**Plenary)
9. **Pietr Cullis Invitational Lecture, Nanomedicines Innovation Network,** Sept. 20th, 2022 (online)
10. **Columbia U., Bristol-Myers-Squibb Lecture,** September 8, 2022
11. **Plenary, EuchemS Chemistry Congress**, Aug. 28-Sept. 1, 2022, Lisbon, Portugal
12. **Plenary, 2nd International Conference on Noncovalent Interactions**, Strasbourg, July 19-23, 2022
13. **Plenary, 18th Symposium on Chemistry of Nucleic Acid Components** - June 5-10, 2022, Cesky Krumlov (Czech Republic).
14. **American Chemical Society Conference, Doha**, Qatar, May 9-11, 2022 (Keynote)
15. **Plenary, Swiss Chemical Society Meeting**, April 21-22, 2022, Geneva, Switzerland
16. **Foundations of Nanoscience (FNANO) Meeting,** April 11-14, 2022 (virtual)
17. **Pacifichem 2021,** December 16 - 21, 2021 | Honolulu, Hawaii (virtual)
18. **Keynote, Sigma-Aldrich Symposium (McMaster U. and U. Alberta),** Dec. 9, 2021 (virtual)

19. **Nature Conference: Bioinspired Materials**, Nov. 15-17, 2021, Seoul, Korea (virtual)
20. **MIT Department of Biological Engineering**, Fall 2021
21. **U. British Columbia**, Department of Chemistry, Feb. 4, 2020
22. **Keynote, King Abdullah University of Science and Technology**, Jan. 2020, Saudi Arabia
23. **Oligonucleotide Therapeutics Society Annual Meeting**, Oct. 13 –16, 2019, Munich, Germany
24. **14th International Symposium on Supramolecular and Macrocyclic Chemistry**, June 2-6, 2019, Lecce, Italy.
25. **Gordon Research Conference in RNA Nanotechnology,** Ventura, CA, Jan. 2019
26. **Grifols Albus Award Ceremony,** Awardee Lecture, Barcelona, Spain, October 2018
27. **Keynote, 9th Annual NanoOntario Conference,** Nano-enabled Materials: Fundamentals to Applications, Nov. 23, 2018, Ottawa.
28. **U. Victoria,** Dept of Chemistry, Jan. 2019
29. **Plenary, Bordeaux Symposium on Foldamers**, Bordeaux, France September 24-26, 2018
30. **Functional DNA Nanotechnology Workshop**, Rome, Italy, June 6-8, 2018
31. **Canadian Society for Chemistry Meeting**, Edmonton, May 27-31 2018, 3 invited lectures including R. U. Lemieux Award Lecture
32. **Netherlands Supramolecular Award Tour**, Leiden U., Eindhoven U., Nijmegen U., Groningen U., Twente U., January 29- Feb. 2, 2018 (5 lectures)
33. **U. Chicago,** Chemistry Department, January 2018
34. **Georgia Institute of Technology,** Chemistry Department, Sept. 2017
35. **7th Cambridge Symposium on Nucleic Acids Chemistry and Biology,** Cambridge, UK, 3-6 September 2017
36. **Gordon Research Conference on "Self-Assembly & Supramolecular Chemistry",** May 21–26 2017, Les Diablerets, Switzerland
37. **International Symposium on Visionary Trends in Molecular Science**, 24th - 26th of February 2017, Tianjin University, China
38. **Arizona State University**, Department of Chemistry, January 2017
39. **Purdue University**, Department of Chemistry, November 2016
40. **Keynote, U. Vermont, Humphrey Symposium,** October 14-15 2016
41. **MIT, 2016-2017 Bristol-Myers Squibb Lecturer in Organic Chemistry**, September 22, 2016
42. **UC Berkeley,** September 13, 2016
43. **Plenary, XXII International Roundtable on Nucleosides, Nucleotides and Nucleic Acids** (IRT 2016), Paris, July 18-22, 2016.
44. **Izatt-Christensen Award Lecture**, **International Symposium in Supramolecular and Macrocyclic Chemistry**, Seoul, South Korea, July 2016;
45. **Pacifichem 2015 (ACS),** Honolulu, Hawaii, (2 invited), December 2015
46. **Plenary, International Institute for Nanotechnology (IIN) Symposium**, Northwestern University, Oct. 2015.
47. **International Symposium in Supramolecular and Macrocyclic Chemistry**, Strasbourg, June 28th - July 2nd, 2015
48. **Plenary, 12th International Conference on Materials Chemistry**, 20-23 July 2015, University of York, UK.
49. **Oligonucleotide Therapeutics Society Conference**, Oct. 14, 2014, 9:30am, San Diego, USA.
50. **Plenary, 7th International Conference on Molecular Electronics, Strasbourg, France**, Aug. 2014
51. **2014 Gordon Research Conference on Bioinspired Materials** June 2014, Maine, USA.
52. **16th Symposium on Chemistry of Nucleic Acid Components**, Czech Republic, June 2014
53. **2014 Canadian Society for Chemistry Meeting**, May 2014, Vancouver, BC.
54. **American Chemical Society Meeting**, ("Inorganic Supramolecular Chemistry" symposium), March 2014, Dallas.
55. **Université de Montreal**, Chemistry Dept., Jan. 22, 2014

56. **Swiss Chemical Society Lecture Tour,** U. Genève, EPFL (Lausanne), U. Neuchâtel, U. Fribourg, U. Basel, October 2013.
57. **19th International Conference on DNA Computing and Molecular Programming**, Sept. 2013, Tempe, Arizona.
58. **American Chemical Society Meeting**, Sept. 2013, Indianapolis, USA.
59. **Keynote, National Organic Symposium,** Seattle, June 2013
60. **Canadian Society for Chemistry Meeting,** Quebec City, May 2013
61. **American Association for the Advancement of Science Meeting,** Boston, February 2013
62. **1st Herrenhauser Conference, "Downscaling Science",** Hanover, Germany, December 2012
63. **New York University,** Chem. Dept, Nov. 2012
64. **E. Young Award Lectureship Tour,** U. Toronto, Ryerson U. and Public Lecture, Oct. 2012
65. **AVS 59th Annual International Symposium,** Tampa, Florida, October 2012
66. **4th European Chemical Societies (EuCheMS) Congress**, Prague (Czech Republic), August 2012
67. **Controlled Release Society Meeting,** Quebec City, 2012
68. **12th Eurasia Conference on Chemical Sciences** (EuAsC2S-12), Corfu, Greece, April 2012 (2 invited talks)
69. **ACS Meeting**, San Diego, March 2012.
70. Keynote, **International Symposium in Supramolecular Chemistry ISMSC**, New Zealand, Jan. 2012
71. **IUPAC Meeting, Polymers in Organic Chemistry**, Doha, Qatar, Jan. 2012.
72. **Plenary, 6th International Symposium on Advancing the Chemical Sciences on Challenges in Organic Materials and Supramolecular Chemistry** (ISACS, Organized by the Royal Society of Chemistry, Sept. 2-5, 2011, Peking U., Beijing, China)
73. **Keynote, International Symposium in Supramolecular Chemistry ISMSC**, Brighton, England, July 2011
74. **46th EUCHEM Burgenstock Conference**, Switzerland, May 2011
75. **U. Pennsylvania**, Chem. Dept., April 2011
76. **Invited Talk at the company BioRad**, San Francisco, April 2011
77. **Foundations of Nanoscience (FNANO) Conference**, Special Symposium in Honor of Nadrian Seeman, April 2011, Snowbird, Utah.
78. **ACS Meeting**, Anaheim, CA, March 2011
79. **Pacifichem 2010**, Hawaii, December 2010 (2 invited lectures)
80. **U. California, San Diego**, Chem. Dept., February 2011.
81. **Northwestern University**, Chemistry Department, Nov. 2-4, 2010
82. **ETH Zurich**, Chemistry Department, September 27, 2010.
83. **Brookhaven National Lab**, New York, Fall 2010.
84. **Gordon Research Conference on Nanostructure Fabrication**, Tilton, NH, July 2010
85. **Canadian Society for Chemistry Conference**, Toronto ON, May 2010
86. **University of California, Santa Barbara**, California Nanosystems Institute, May 14, 2010
87. **McMaster University**, Chemistry Department, March 2010
88. **U. Houston**, Chemistry Department, February 2010
89. **University of California Los Angeles**, Chemistry Department, 2010
90. **QAFCO-TAMUQ Chemistry Conference**, Doha, Qatar, Jan. 2010
91. **Sherbrooke University**, Chemistry Department, Dec. 2009
92. **Yale University**, Chemistry Department, October 1, 2009
93. **13th IUPAC Conference on Polymers and Organic Chemistry (POC'09**), Montreal, July 2009
94. **International Symposium in Supramolecular Chemistry ISMSC**, Maastricht, Netherlands, June 2009
95. **Albany: the Conversation on Nucleic Acids**, U. Albany, NY, June 2009
96. **Canadian Society for Chemistry Conference**, Strem Award Lecture, Hamilton ON, May 2009
97. **DNA-based Nanotechnology Conference**, Dresden, Germany, May 2009
98. **Dartmouth College**, Chemistry Dept, Apr. 2009
99. **14th Int. Symp. on Recent Advances in Drug Delivery Systems**, Salt Lake City, UT, Feb. 2009

100. **University of Colorado**, Boulder, Chemistry Dept, Jan. 2009
101. **QAFCO-TAMUQ Chemistry Conference**, Doha, Qatar, Jan. 2009
102. **Queens University**, Chemistry Dept, Kingston, Nov. 2008
103. **Universite de Quebec a Montreal**, Chemistry Dept, Oct. 2008
104. **Center for Nanoscience CenS Conference**, Venice, Italy, Sept. 2008
105. **Indiana University**, Bloomington, Sept. 2008
106. **Telluride Workshop on Nucleic Acids**, August 2008
107. **Tetrahedron Symposium**, July 2008, Berkeley, California
108. **Junior Nanotechnology Network**, June 2008, McGill Physics Department
109. **University of Illinois Urbana-Champaign**, Chemistry Dept, May 2008
110. **Center for Self-Assembled Chemical Structures Annual Conference**, May 2008, Montreal
111. **Foundations of Nanoscience**, Keynote Lecture, April 2008, Snowbird, Utah.
112. **University of Ottawa**, Chemistry Department, March 2008
113. **California Institute of Technology**, Dept of Chemistry, February 2008
114. **University of Tokyo**, Japan, December 2007
115. **Int. Symposium of Chemistry of Coordination Space** (ISCCS2007), Awaji, Japan, Dec. 2007
116. **Materials Research Society** (MRS) Meeting, Boston, Nov. 2007
117. **U. Texas at Austin**, Chemistry Dept, Sept. 2007
118. **American Chemical Society Meeting**, Boston, Aug. 2007
119. **SPIE Conference**, San Diego, Aug. 2007
120. **Canadian Society for Chemistry Meeting**, Winnipeg, May 2007 (two invited talks)
121. **Canadian Institute of Advanced Research**, Oct. 2006
122. **American Chemical Society Meeting**, San Francisco, Sept. 2006
123. **International Symposium in Supramolecular Chemistry ISMSC**, Victoria, BC, June 2006
124. **Canadian Society for Chemistry Meeting**, Halifax, May 2006 (two invited talks)
125. **Xerox Research Center**, February 2006
126. **Rensselear Polytechnic Institute**, Materials Science Dept, Dec. 2005
127. **Simon Fraser U.**, Chemistry Dept, Nov. 2005
128. **U. of Victoria**, Chemistry Dept, Nov. 2005
129. **University of British Columbia**, Dept Chemistry, Nov. 2005
130. **U. Toronto**, Dept Chemistry, Oct. 2005
131. **Canadian High Polymer Forum**, August 2005
132. **Canadian Society for Chemistry Meeting**, Saskatoon, May 2005
133. **Keynote Address, Int.Conf. Research Trends in Science and Techn.**, Beirut, Lebanon, March 2005
134. **Canadian Institute of Advanced Research**, Vancouver, Nov. 2004
135. **ACFAS Meeting**, Montreal, May 2004
136. **Organic and Bioorganic Workshop for Leading, Young Canadian Chemists**, London, ON, May 2004
137. **U. of Alberta**, Chemistry Dept, March 2004
138. **Carleton U.,** Chemistry Dept, Apr. 2003
139. **Massachusetts Institute of Technology**, Chemistry Dept, Feb. 2003
140. **U. South Florida**, Chemistry Dept, Jan. 2003
141. **U. Montreal**, Chemistry Dept., Dec. 2002
142. **U. Laval**, Chemistry Dept, Sept 2002
143. **Galileo Genomics**, Montreal, QC, April 2002
144. **U. New Brunswick**, Chemistry Dept, Feb. 2002
145. **Dalhousie U.**, Chemistry Dept, Feb. 2002
146. **State U. of New York at Albany**, Chemistry Dept, Jan. 2002
147. **Keynote Address, Int. Conf on Research Trends in Science and Techn**, March 2002, Beirut, Lebanon
148. **American Chemical Society Meeting, Pacifichem 2000**, Honolulu, Hawai, December 2000

LEADERSHIP (selected roles, please refer to Administration section in the CV for full list)

Institutional. (selected)

- **Chair, Equity, Diversity, and Inclusion Committee**, Department of Chemistry (2021-present)
Equity, Diversity, and Inclusion (EDI) are core strategies in academic institutions, and discrimination against minorities is still of great concern. I am Chair of a newly established departmental Equity, Diversity, and Inclusion (EDI) committee for students, faculty and staff. Our initiatives include a wellness survey to assess the department's support for underrepresented minorities; invited talks by minority graduate students in the Freshman Chemistry courses, where they discuss their research experience. Freshman Chemistry has been shown to be an exit point for minorities; this initiative will give students role models within their community and illustrate the interdisciplinary nature of chemical research; EDI training modules for department members, more diverse seminar speakers, and fundraising for graduate scholarships for under-represented minorities. This will foster inclusion and a sense of belonging for minority members of the University community and will address their concerns on discrimination and microaggressions.

- **Lead PI** on two large grant applications for McGill University for a National Center of Excellence in RNA Therapeutics (Lead co-PI, Canada First Excellence Research Fund, $165 million, approved) and Research Infrastructure (Lead PI, Canada Foundation for Innovation, $10 million) -2022

- **Provost's Delegate** on the Senate Committee for Teaching and Learning. Represented McGill's Provost on the Committee to implement teaching strategies in the University (2007-2009)

National. (selected)

- **Director, NSERC CREATE** Graduate Training program in Nucleic Acids (2019-2025).
I led an initiative for establishing a national graduate training program in nucleic acid chemistry and obtained $1.65 M funding from NSERC to support this endeavor. The program, named PROMOTE: "Programmed Molecules for Therapeutics, Sensing and Diagnostics" brings together 11 laboratories from 6 universities across Canada, and 52 industrial and international collaborators. Underlying this initiative is the realization that graduates require important complementary skills to be workplace-ready: entrepreneurial thinking, team management, multi-disciplinary collaboration and excellent communication skills. Unfortunately, this training is not currently integrated into graduate programs. The PROMOTE program aims to train a generation of nucleic acid scientists who are well-prepared for careers in industry, academia, entrepreneurship, policy, intellectual property, and who are able to translate their fundamental discoveries into commercial technologies. It is composed of 6 training axes: I. Collaborative Training; II. Industrial and International Mobility; III. Training in Management and Entrepreneurship. IV. Enriched Academic Training in nucleic acids chemistry and biology. V. Leadership and Professional Skills Workshops. VI. A Women in Science initiative, to support women throughout their graduate studies with mentoring and networking. This ambitious and innovative team is working together to provide a strong, multidisciplinary and integrative preparation for 85 trainees to enter the workforce, start new companies and contribute effectively to society and the economy.

International. (selected)

- **Associate Editor**, Journal of the American Chemical Society (2018-present). This is the premier and most cited journal in Chemistry.

- **President**, International Society for Nanoscale Science, Computation and Engineering (ISNSCE). This is the major DNA Nanotechnology Society worldwide. I was Vice-President (2017-19), President (2019-21) and I am now on the Board of Directors.

RESEARCH SUPPORT

Research Operating Grants:

2023-2029: **Canada First Excellence Research Fund**, "DNA to RNA (D2R)", $165 Million, Lead co-PI, McGill, 50 researchers.

2021-2023: ***NSERC John Polanyi Award***, $250,000 total in research funding. (100%)

2021-2023: ***McGill Faculty Retention Grant***, $70,000/year.

2018- 2023: ***NSERC Discovery Grant***, $138,000/year, (100%) PI: H. Sleiman; Supramolecular DNA Structures: From Design to Function

2020- 2027: ***Canada Research Chair, Tier I*** (Renewal) $40,000/year PI: H. Sleiman; DNA Nanoscience (100%)

2021-2022: ***NFRF New Frontiers in Research Fund – Exploration***, $100,000/year; Toward automated synthesis of DNA nanomaterials, G. Cosa (50%) and H. Sleiman (50%)

2020-2022: Research Corporation, ***Cottrell SEED award***, $66,950; DNA Hydrogels Promoted by Small Molecules: Highly Scalable Synthesis and Stimuli-Responsive Applications in Tissue Regeneration. (100%)

2020-2022: ***I+P Partnership Program***, $100,000; project with Nplex Biosciences, Development of Mono-functionalized DNA-Antibody Conjugates for Multiplexed Protein Assays. (100%)

2020-2023: ***FRQNT Team Grant***, $60,000/year, (33%), PI: D. Perepichka; co-PIs: H. Sleiman, G. Cosa; Autoassemblage biologique et fonction des fils moleculaires ADA-DAD. (100%)

2019- 2025 ***NSERC CREATE,*** $1,650,000 *PI and Director:* H. Sleiman (9%), co-PIs: M. Damha, M. McKeague, N. Moitessier, G. Cosa, Y. Li (McMaster), S. Kelley (U. Toronto), M. Shoichet (U. Toronto), C. Wilds (Concordia U.), M. de Rosa (Carleton U.), Alexis Vallee-Belisle (U. Montreal); Programmed Molecules for Therapeutics, Sensing and Diagnostics (PROMOTE)

2017- 2023, ***FRQNT Regroupement Strategique***, $412,500/year, PI: L. Reven, co-PI: H. Sleiman (3%) Centre Quebecois sur les Materiaux Avances (CQMF / QCAM)

2019- 2023, ***FRQS Structural Biology Centre***, $600,000/year, PI: M. Schmeing, co-PI: H. Sleiman (3.5%); McGill University Centre for Structural Biology

2017-2022: ***Horizon 2020***: Marie Skłodowska-Curie Actions (MSCA) - Research and Innovation Staff Exchange (RISE) (H2020-MSCA-RISE-2017): PI: L. De Cola (U. Strasbourg); co-PIs: H. Sleiman (Direct funding only to European partners), Partner universities: University of Strasbourg (France), McGill University (Canada), University of Tor Vergata (Italy), Universita Degli Studi de Parma (Italy), UCLA (USA), University of Havana (Cuba) and Nanomol Technologies (Spain). Title: Nano-OligoMed: Hybrid Nanostructured Oligonucleotide Platforms for Biomedical Applications

Recently Completed Grants:

2019- 2020: ***FRQ Audace,*** $120,000, *(50%)* PI: H. Sleiman, co-PI: Christopher Rudd (U. Montreal); Nanoparticle conjugates for targeted Cancer Immunotherapy

2017-2019 ***Cancer Research Society***, Operating Grant, $60,000/year, PI: H. Sleiman (50%), co-PI: L. Panasci (Montreal Jewish General Hospital, Lady Davis Institute); Synergistic chemosensitization of HER2-positive breast cancer cells by a three-pronged strategy integrated within DNA nano-cages

2017- 2020, ***FRQNT Team Grant,*** $54,000/year PI: G. Cosa, co-PIs: H. Sleiman (33%), D. Perepichka; Interfacing with Cells Using Transmembrane Block Copolymers Bearing Conjugated Units

2018-2019: ***Albus Award, Grifols Corporation,*** Barcelona Spain, $75,000, (100%) PI: H. Sleiman; Albumin as a passive targeting agent: effect of the protein binding on stability, biodistribution and therapeutic outcome of oligonucleotides and DNA nanoparticles.

2019-2020: ***Research Contract with Quantum Si,*** Boston, USA, $60,000 (100%) PI: H. Sleiman; DNA Nanostructures to Increase the Brightness and Incorporation Rate in Single Molecule DNA Sequencing

2017-2018: ***NSERC ENGAGE with IntelGenX,*** 2017, Sleiman, 100%, "DNA-Based Nanoparticles (DNP) for the Targeted Delivery of Therapeutics to Cancer Cells", $25,000

2015-2017: ***L'Oreal Research Contract,*** "DNA Cages for Skin Targeting", $156,800, 100%

2013-2015: ***Prostate Cancer Canada, Movember Grant,*** "Conditional siRNA delivery to prostate cancer cells using DNA cages", (100%), $100,000/year

2012-2015: ***CIHR/NSERC Collaborative Health Research Grant (CHRP)*** , (Sleiman, PI (50%), Panasci) "DNA Cages as a Platform for Efficient and Selective Delivery of Therapeutics into Tumor Cells ", $200,000/year

QNRF National Priorities Research Project, 2012-2015, H. Sleiman (co-PI, 40%), H. Bazzi,"Interfacing DNA Cages with Synthetic Polymers for Biological and Materials Applications", $305,000/year

2013-2016 : ***FQRNT Team Grant,*** (Sleiman, PI, 33%, Perepichka, Cosa) « Conjugated nucleobase-containing polymers for organic electronics », $45,000/year

2013-2016: ***FQRNT Team Grant,*** (Mauzeroll, PI, Sleiman 33%, Canesi), « Biomarker detection with high amplification using electrochemiluminescent Nanospheres », $50,000/year

2013-2016 : ***FQRNT Team Grant,*** (Grutter, PI, Sleiman 50%)"DNA guided templation of discrete nanoparticle assemblies for fundamental nano-electronic studies", $43,000/year

2011-2018: ***NSERC CREATE Program in Bionanomachines***, , Gehring, K. (PI), H. Sleiman (4.5%), 22 researchers from McGill, Concordia, U. Calgary, Laval U., U. Montreal, U. Saskatchewan, UQAM, $1,650,000 total

2010-2012: ***CFI Infrastructure Operating Fund***, "DNA Nanochemistry Facility", $70,000/year (100%)

2010-2017*:* ***CIHR Drug Development Training Program,*** Pappadopoulos, V. (PI), H. Sleiman (2.5%), 39 researchers), $1,500,000 total

QNRF National Priorities Reseach Project 2009-2012**,** H. Sleiman (co-PI, 40%), H. Bazzi, "Nucleic Acid-Templated Access to Fully Synthetic, DNA-Mimetic Polymers", $305,000/year

2008-2012: ***CIHR Operating Grant,*** H. Sleiman, PI (40%) N. Moitessier and C. Autexier, "Supramolecular Complexes as G-Quadruplex Binders: Towards Effective telomerase Inhibition", $103,673/year

2009-2013: ***William Dawson Scholar Award,*** McGill University, H. Sleiman, PI, 100%, "Nanostructures using DNA", $15,000/year

2008-2012: ***FQRNT Team Grant*** , T. Szkopek, H. Sleiman (33%) and P. Grutter, "DNA-Mediated Construction of Nanoparticle Assemblies - Chemistry and Physics", $54,000/year

2008-2012: ***CIHR/NSERC Collaborative Health Research Grant (CHRP)***, H. Sleiman, PI (33%), Juncker, Siegel, Park) "Microfluidic Detection System for Profiling Multiple Cancer Biomarkers with Ultrahigh Sensitivity and Specificity", $184,400/year

2005-2012: ***Canadian Institute of Advanced Research***, Project Grant "Using DNA for Patterning Nanoelectronic Components", $25,000/year

2009-2010: ***CIFAR Junior Fellow Grant*** , H. Sleiman (PI, 33%), P. Grutter, T. Szkopek. "Gold Nanoparticle Assemblies Using DNA", $50,000/year

2008-2011: ***QNRF National Priorities Reseach Project ,*** H. Sleiman (co-PI, 44%), H. Bazzi (PI), "Novel Biodetection Methods", $170,000/year

2008-2011: ***Xerox Corporation UAC Program Grant***, H. Sleiman (PI, 100%) "DNA-Mimetic Polymers", $20,000/year

2006-2009: ***FQRNT Team Grant*** , Sleiman, PI (67%), Ritcey (U. Laval) "Molecular recognition at Interfaces", $57,782/year

Research Equipment and Infrastructure:

CFI JELF Nucleic Acids Infrastructure, 2022, Sleiman, $595,483, 100%

NSERC Research Tools and Instrument Grant, 2022, Sleiman, $112,000, 100%, HPLC

FQRNT Team Equipment Grant, 2013, Sleiman, 33%, Perepichka, Cosa, Upgrades to the AFM/STM/fluorescence microscopy facilities, $44,000,

FQRNT Team Equipment Grant, 2013, Sleiman, 100%, Grutter (PI), HPLC instrument, $44,050

NSERC Research Tools and Instruments Grant (2013)
Sleiman, "DNA and Protein Imaging Unit", $49,000
NSERC Research Tools and Instruments Grant (2011)
Perepichka, PI, Sleiman, Rosei, Barrett "Scanning probe microscope to study molecular, biomolecular and polymer self-assembly"
NSERC Research Tools and Instruments Grant (2011)
Andrews, PI, Sleiman, Kambhampati, Hilke "Integrated Spectroscopy System", $107,000
Canada Foundation for Innovation, Leaders Opportunity Fund (2009-2012)
Sleiman, 100%, "DNA Nanochemistry Facility" (equipment and renovations), $998,989
NSERC Research Tools and Instruments Grant (2009)
Sleiman, 100%, "Automated DNA Synthesizer", $90,112
FQRNT, Regroupement Strategique, (2002-2013)
(L. Reven, PI, H. Sleiman and 26 researchers from McGill, U. Montreal, U. Sherbrooke, Concordia) "Centre for Self-Assembled Chemical Structures", $412,500/year

SUPERVISION OF RESEARCH TRAINEES

Our graduate students and post-doctoral fellows have been recognized for the quality and impact of their research by major national and international awards, including NSERC, Banting, Vanier, IUPAC, MSED and FRQNT Doctoral Prizes, Governor General Gold Medal, Swiss Chemical Society, and numerous best papers / best conference presentation awards. Our graduates are welcomed as postdoctoral fellows in many prestigious labs (Harvard, Northwestern, Stanford, MIT, ETH, Caltech), many have themselves become professors in excellent universities, e.g., U. Toronto, McMaster U., UBC, U. Kent, U. Hong Kong, Texas A&M, Max Planck, UNSW or work

at excellent companies, e.g., Moderna, Xerox, IntelGenX, Grifols, Atalanta, Pharmascience, SixFold, GE, Goodyear, L'Oreal, Cascades, Nova.

Current Graduate Students.

1. **Jathavan Asohan**, Ph.D. candidate, (2018-present, CIHR PGSM, Dept Major Award) "Drug Delivery with DNA cages"
2. **Ghufran Rafique,** PhD candidate, (2019-pres., Vanier), "DNA-Programmed Conjugated Materials", (co-supervised with Prof. D. Perepichka).
3. **Tyler Brown,** PhD candidate (2019-pres., NSERC CREATE and FRQS CRBS), "Immuno-oncology with DNA Nanostructures"
4. **Sepideh Kaviani,** PhD candidate (2019-pres., FRQS CRBS), "Gene Silencing with DNA Amphiphiles"
5. **Fangzhou Zhao,** PhD candidate (2019-pres., FRQS CRBS), "DNA templates for the formation of mini-proteins"
6. **Son Bui,** MSc candidate (2020-pres.), "DNA-Encoded Aptamer Libraries" (co-supervised with M. McKeague)
7. **Paty Isla Garcia**, PhD candidate (2020-pres.), "Automated synthesis of DNA nanostructures" (co-supervised with G. Cosa)
8. **Sinan Faiad**, PhD candidate (2021-pres, NSERC CREATE), "Stimuli-responsive DNA nanostructures"
9. **Abdelrahman Elmanzalawy**, PhD candidate (2021-pres. MITACS), "DNA-Encoded Aptamers on Magnetic Beads"
10. **Trishalina Das**, PhD candidate (2022, pres., McGill Major Award), "DNA nanostructures in cells and in vivo"
11. **Jessica Bennett,** PhD candidate (2022-pres., McGill Major and CREATE), Reprogramming DNA Base-Pairing with a Small Molecule "
12. **Yihao Wu,** PhD student (2022-pres.), DNA cages for gene silencing"
13. **Shiyuan Liu,** visiting joint PhD student from Hunan University (2020-2023), "Hybridization Chain Reaction"
14. **Sally Yao**
15. **Christopher Saab**

Current Postdoctoral Fellows.

16. **Quentin Laurent,** Swiss National Society postdoctoral fellow, "Oligonucleotide nanostructures for gene silencing"
17. **Daniel Saliba,** MITACS Postdoctoral Fellow, joint between the Sleiman lab and the company Galenvs Biosciences.
18. **Christopher Lachance Brais**, Ph.D. candidate (2017-pres., Vanier Scholar), "Reprogramming DNA Base-Pairing with a Small Molecule"

Current Undergraduates.

19. **Brenna Bordeniuk**, "Sequence-controlled DNA-polymers"

Former Graduate Students.

1. **Christopher Lachance Brais**, Ph.D. (2017-2022., Vanier Scholar), "Reprogramming DNA Base-Pairing with a Small Molecule", will join an NSERC postdoctoral position with Ben Feringa (U. Groningen, Nobel laureate 2016)
2. **Daniel Saliba,** Ph.D. (2016-2022), "Minimalist Strategies for Large DNA Nanostructures: Nanotweezers and Nanotubes", currently MITACS Postdoctoral Fellow, joint between the Sleiman lab and the company Galenvs Biosciences.
3. **Sean Laxton**, M.Sc., (2018-2022, NSERC CREATE), "DNA Nanostructures as Printing Presses for DNA-Polymer Hybrid Materials", will start an MBA degree in 2022.

4. **Hassan Fakih**, Ph.D. (2016-2022, McGill Majors Fellowship, NSERC CREATE), "Biomedical Applications of Nucleic Acid-based Nanoparticles: Gene Regulation and Biosensing", currently a postdoctoral fellow at UMass Amherst (with Prof. A. Khvorova)
5. **Shaun Anderson,** MSc (2019-2021, NSERC CGSM), "Aptamer Discovery with DNA-Encoded Sequence Controlled Polymers", currently pursuing an education degree to teach in college.
6. **Xin Luo**, **Ph. D. candidate,** (2015-2021), "DNA Gold Nanoparticle Assembly", currently postdoctoral fellow, MIT (with Prof. Mark Bathe)
7. **Alexander Prinzen,** Ph.D. candidate**,** (2015-2021, NSERC PGSD) "Oligonucleotide Conjugates in DNA Nanotechnology: Applications in Drug Delivery and Gene Silencing", currently, Senior Scientist II, Atalanta Pharmaceuticals, Boston.
8. **Michael Dore,** Ph.D. candidate (2015-2021), "Self-Assembly of Sequence-Defined DNA Polymers: Hierarchy and Compartmentalization"; *Current Position:* Postdoctoral Fellow, Northwestern U. (with Prof. Samuel Stupp)
9. **Casey Platnich,** Ph.D. candidate, (2015-2021, NSERC CGSD) **"**Single-Molecule Fluorescence Studies of DNA Nanotubes" (co-supervised with Prof. G. Cosa); *Current Position:* Hershel Smith Postdoctoral Fellow, Cambridge University (with Prof. Ulrich Keyser)
10. **Aurelie Lacroix,** Ph.D., (2014-2019) "Receptors for Cellular Uptake of DNA Cages"; *Current Position:* Senior Scientist II, Sixfold biosciences, London, UK
11. **Tuan Trinh**, PhD (2015-2019), "DNA Nanostructures as Platforms for Chemical Transformations"; *Current Position*: Postdoctoral Fellow, Stanford University (with Prof. Tom Soh).
12. **Donatien de Rochambeau**, PhD (2014-2019), "Expanding the Scope of Sequence-Defined Oligo(Phosphodiester)s with Novel Building Blocks" *First Position:* Professor of Chemistry, College de Brebeuf, Montreal, Canada. *Current Position*: Operations Executive, SNCF, France.
13. **John Hsu**, M.Sc. (2016-2018), "in vivo Studies of DNA Nanostructures", *Current Position*: Medical School, McGill University.
14. **Danny Bousmail,** Ph.D. (2013-2018) "DNA micelles for drug delivery in chronic lymphocytic leukemia"; *Current position:* Research Scientist, Pharmascience, Montreal, Canada
15. **Nicole Avakyan,** Ph.D., (2011-2018), "Guest Mediated Transformation of the DNA Watson-Crick code"; then Postdoctoral Fellow, University of California, San Diego (with Prof. A. Tezcan), 2019-2022*; Current Position*: Research Scientist, Illumina, San Diego, CA, USA.
16. **Pongphak Chidchob,** Ph.D. (2013-2018) "DNA nanostructure-polymer conjugates"; *Current position:* Postdoctoral fellow, Eindhoven University, Netherlands (with Prof. E. W. (Bert) Meijer)
17. **Janane Rahbani,** Ph. D. (2012-2017), "Towards the assembly of higher-order DNA nanostructures: DNA nanotube dynamics and railroad tracks for DNA 'super-origami"; *Current position:* Postdoctoral fellow, Department of Biochemistry, McGill University (with Prof. Lawrence Kazak).
18. **Katherine Bujold,** Ph.D., (2011-2017), "Development of Optimized DNA Nanostructure Designs towards Biological Applications"; then Banting Postdoctoral fellow, Northwestern University, USA (with Prof Chad Mirkin), 2018-2020; Current Position: Assistant Professor, McMaster University, ON, Canada
19. **Kai Lin Lau,** Ph.D. (2010-2017) "Gold-Nanoparticle DNA Assemblies"; *Current position:* Postdoctoral fellow, Nanyang Technological University, Singapore (with Prof. Nam Joon Cho).
20. **Alex Rousina-Webb,** M.Sc. (2014-2016 "Metal-DNA Structures"; *Current position:* Scientist at Xerox Research Center, Canada
21. **Amani Hariri,** Ph. D. (2010-2016) "Advancing DNA nanotechnology using single molecule fluorescence methodologies' (joint with Prof. Gonzalo Cosa); *Current position:* Assistant Professor, U. British Columbia, Chemistry; *former position*: Postdoctoral Fellow at Stanford University, USA (with Prof. Tom Soh)
22. **Justin Conway,** Ph.D. (2009-2015) "Interfacing DNA Nanotechnology with Biological Systems: Increasing Stability, Bilayer Interactions, and Therapeutic Applications", *Current position:* VP Research and New Product Development, Great White North Growers, QC, Canada

23. **Thomas Edwardson,** Ph.D. (2010-2015) "DNA Cages and Sequence-Controlled Polymers", then postdoctoral fellow ETH, Zurich, Switzerland (Donald Hilvert); current position: Senior Scientist, Cavea Biotech, Zurich, Switzerland.
24. **Alan Blayney,** M. Sc. (2010-2012), "DNA-Mimetic Conjugated Polymers", co-supervised with Prof. D. Perepichka, *Current position:* MD/PhD student at SUNY, Syracuse, USA
25. **Graham Hamblin**, Ph.D. (2008-2014): "Practical designs for DNA nanostructures: balancing minimal design and structural complexity", Vanier scholar, NSERC PGSD, Tomlinson fellow. Ambridge and Winkler awardee. *Current Position*: Principal Scientist, Grifols USA, formerly NSERC postdoctoral fellow in California Institute of Technology, USA (with D. Tirrell)
26. **Katherine Castor**, Ph.D. (2008-2014) "Design and Synthesis of G-Quadruplex Binders". *Current Position:* Staff Chemist at California Department of Toxic Substances Control, USA
27. **Andrea Greshner,** Ph. D. **(**2008-2014): "Effect of Synthetic Molecules on DNA Assembly" *Current Position:* Research Associate at INRS Varennes with Prof. M. A. Gauthier, Canada
28. **Karina Carneiro**, Ph.D. (2006-2012): ""DNA-macromolecule conjugates: Synthesis and hierarchical self-assembly" *Current Position*: Associate Professor at University of Toronto, Faculty of Dentistry, Canada, 2016-pres. Previously NSERC postdoctoral fellow at University of California, San Francisco with Prof. S. Habelitz.
29. **Christopher McLaughlin**, Ph.D. (2006-2012), Assembly of 3D DNA Architectures: Towards Minimal Design and Maximal Function". *Current Position*: Senior Scientist at Moderna Therapeutics, Boston, USA; previously NSERC postdoctoral fellow with Prof. Molly Shoichet at U. Toronto, Canada
30. **Peggy Lo**, Ph.D. (2006-2010) "Supramolecular DNA Chemistry: Assembly of DNA Nanotubes and Templated Synthesis of DNA-Mimetic Polymers"; *Current Position:* Associate Professor, City University of Hong Kong (formerly a Postdoctoral Fellow at Harvard University, USA (with Prof. Hongkun Park))
31. **Hua Yang**, Ph. D. (2003-2009), "Template synthesis of metal-modified DNA complexes and applications in the construction of two-and three-dimensional metal-DNA nanostructures"; *Current Position:* Laboratory Manager and R&D Support Chemist at TRIUMF (Canada's National Lab for Particle and Nuclear Physics)
32. **Roxanne Kieltyka**, Ph. D. (2003-2009), "Platinum Complexes for G-Quadruplex Recognition and Nanomaterials Organization"; *Current Position:* Associate Professor, University of Leiden, Netherlands (2013) (Formely: Postdoctoral Fellow, Eindhoven University, Netherlands, (with Prof. E. W. Meijer))
33. **Faisal Aldaye**, Ph. D. (2002-2008), "Supramolecular DNA Nanotechnology: Discrete Nanoparticle Organization, Three-Dimensional DNA Construction and Molecule-Templated DNA Assembly"; *Current Position:* Doctor at Liverpool Hospital, Sydney, Australia. *Formerly:* NSERC Postdoctoral Fellow, Harvard Medical School, USA (with Prof. Pamela Silver.
34. **Kim Metera**, Ph. D. (2002-2008), "Self-Assembly, Luminescence Properties and Excited State Interactions of Metal Block Copolymers" *Current position:* Academic Associate, McGill University.
35. **Mohamed Slim**, Ph. D. (2001-2008, has defended and needs to submit thesis corrections), "Ruthenium Bipyridine Complexes for Protein Binding and DNA Nanotechnology" *First position:* Postdoctoral Fellow, Montreal Jewish Hospital (with Prof. E. Schirrmacher).
36. **Rachel Nassif**, M. Sc. (2005-2008) "Design and Optimization of Polymer Nanostructures for Signal Amplification of Biomolecule Detection". *First position:* Scientist at l'Oreal, Montreal, Canada.
37. **Yoshihiro Ishihara**, M. Sc. (2005-2007) "DNA-Inspired Materials for 'Bottom-Up' Nanotechnology". *Current position:* Research Scientist II at Vertex Pharmaceuticals, San Diego, USA; formerly Ph.D. student with Prof. Phil Baran (Scripps), USA
38. **Debbie Mitra**, Ph. D. (2001-2007, co-supervised with M. Damha) "Branched Oligonucleotides for Biological and Nanotechnology Applications". *Current Position:* Assistant Professor of Research, Eye Institute, University of Ottawa, formerly postdoctoral associate, University of Ottawa (with Prof. Deryn Fogg)
39. **Alison Palmer**, M.Sc. (2004-2006) "Novel Nucleoside Analogs with Supramolecular and Biological Applications". *Current position:* Lead Impact Science Writer, Brain Canada Foundation.

40. Hassan Bazzi, Ph.D. (1998-2003) "Synthesis and Self-Assembly of Conjugated and Biomimetic Polymers and Block Copoplymers via Ring-Opening Metathesis Polymerization"; *Current Position:* Professor and Associate Dean, Texas A&M University, Qatar.
41. Felaniaina Rakotondradany, Ph.D. (1998-2003, co –supervised with Prof. M. A. Whitehead) *First Position:* Postdoctoral Fellow, Prof. Murray Gray at the University of Alberta. *Current Position*: Science writer and editor, ON, Canada. "Theoretical and Experimental Investigations of Photoresponsive and Biomimetic Supramolecular Materials"
42. Jake Dalphond, M. Sc. (2000-2002) *Current Position:* Research Scientist at Camoplast Solideal, QC, Canada. "Synthesis and Self-Assembly of Polymers Containing Dicarboximide Groups by Living Ring-Opening Metathesis Polymerization"
43. Michel Paradis, M. Sc. (1998-2000) *First Position:* Specialist, Quality and Compliance, Quality Assurance Cambrex, Montreal, Canada. "Platinum Complexes as DNA Intercalators"

<u>Former Visiting Graduate Students and Postdoctoral Fellows:</u>

1. **Beatrice**
2. **Martin Frandsen**, visiting PhD student from Aarhus University (Jan.-Apr. 2023), "DNA-templated mini-proteins"
3. Serena Gentile, visiting PhD student from University of Rome, Italy, "Dissipative control of nanotube construction"; part of the Horizon 2020 student exchange program.
4. Sabrina Capodaglio, visiting PhD student from University of Parma, Italy, "DNA templates for the formation of mini-proteins"; part of the Horizon 2020 student exchange program.
5. Jakob Hartmann, visiting MSc student from LMU, Munich, Germany, "DNA nanostructures in cells and in vivo"
6. Keita Mori (Visiting PhD student from U. Tokyo- Prof. Shionoya group) "DNA nanotubes with hydrophobic and metallic groups", 2022
7. Stefano Volpi (Visiting PDF from Universita di Parma, Italy); Co-supervised (Prof. Roberto Corradini), 2022; part of the Horizon 2020 student exchange program.
8. Pierre Picchetti (Visiting PhD student from Prof. Luisa De Cola's group at U. Strasbourg) "Mesoporous silica-DNA particles", part of the Horizon 2020 student exchange program.
9. Irene Ponzo: visiting MSc student from University of Rome (MSc student with Prof. Francesco Ricci), part of the Horizon 2020 exchange program.
10. Sonia Romero: visiting PhD student from Universidad Autonoma de Madrid (PhD student with Prof. David Gonzalez-Rodriguez), "Sequence-controlled electroactive polymers", June 5-Sept. 11 2017.
11. Klaudia Englert: visiting PhD student from the University of Birmingham, (PhD student with Prof. James Tucker), "Anthracene-DNA tiles", 2017.
12. Albert Daubry, visiting MSc student from EPFL (Sept 2016-Apr 2017).
13. Simon Arsene, M.Sc. exchange student from Ecole Polytechnique Palaiseau, France, 2014-2015, "DNA nanotubes for Chronic Lymphocytic Leukemia treatment", currently finishing his M.Sc. in France.
14. Donatien de Rochambeau, visiting M.Sc. student from Ecole Nationale Superieure in Paris, 2013-2014, "Polymer-DNA conjugates", currently Operations Executive, SNCF, France.
15. Ryo Ohtani, visiting Ph.D. student from Kyoto University (working with Prof. S. Kitagawa), June-July 2012; currently: Assistant Professor, Kumamoto University, Japan.
16. Dowine De Bruijn, visiting graduate student from Groningen University, Netherlands (July -December 2010) "Metal-DNA Nanostructures" (6 month internship, currently PhD student, Groningen U.); currently: Project Manager, PRA Health Sciences, Netherlands.
17. Petra Bouten, visiting graduate student from Nijmejen University, Netherlands (Feb -Aug. 2010) "Protein-Coated DNA Cages" – Currently professor at Gymnasium Beekvliet,, Netherlands
18. Florian Altvater, visiting graduate student from U. Freiburg (March 2009-March 2010) "Metal-DNA Construction"- Currently, PhD student UC Berkeley.

19. Jing Wang, visiting graduate student from Yale University, USA, "Vesicle Budding with DNA Cages" (2009-2010, collaboration with Prof. James Rothman at Yale University)

Former Postdoctoral Fellows

1. Felix Rizzuto (Banting Postdoctoral Fellow (2018-2021) "DNA Supramolecular Structures out of Equilibrium" *Current Position:* Discovery Early Career Research Award (DECRA) Fellow and group leader at University of New South Wales in Australia.
2. Johans Fakhoury (2010-2018), Senior Research Associate. *Current Position:* Director, Strategic Planning and Operations at McGill University Department of Biomedical Engineering, Montreal, Canada
3. Empar Vengut Climent (2016-2017) (Fundación Martín Escudero), "Cellular Uptake Mechanisms of DNA Structures", Researcher, @ScienceFlows group at University of València, Spain.
4. Amine Garci (2016-2017) (Swiss National Science Foundation), "Platinum complexes for targeting G-quadruplexes in cancer"
   Current position: Postdoctoral fellow with Prof. Fraser Stoddart, Northwestern University
5. Mohammad Askari (2015-2017) (NSERC postdoctoral fellowship), "Metal-DNA Nanostructures",
   Current Position: Scientist at NUCHEM Sciences, Montreal.
6. Christopher Serpell (2011 –2014): "Interfacing DNA Nanostructures with Synthetic Polymers for Biological and Materials Applications" (Banting Postdoctoral Fellow) *Currently:* Assistant Professor, University of Kent, UK.
7. Ilton Daltro (2011 –2013): "DNA-Mimetic Polymers" (postdoctoral Fellowship, Brazil) *Current position:* Group leader at the Max Planck Intitute für Kohlenforschung in Mulheim.
8. Anita Leitgeb (2012-2013): "Interfacing DNA Nanostructures with Hydrophobic Polymers" (postdoctoral fellowship, Austrian Chemical Society), *Current Position*: Scientist at Mayr Melnhof Karton GmbH, Austria
9. Manoj Nayak (2009-2011) visiting joint postdoctoral fellow from Texas A&M University in Qatar (2 months/year) *Current position*: Assistant Professor and Senior Scientist at the CSIR-Chandigarh.
10. Fiora Rosati (Sept. 2011-2013): "Metal-DNA Nanostructures" (Canadian Government Fellowship), *Current position*: Project manager (oncology) Menarini Ricerche pharmaceuticals (Florence).
11. Kevin Haenni (May 2010-2012): "Biologically enabled ROMP polymers" (postdoctoral fellow, Swiss National Foundation) *Current Position:* College Lecturer, Morges, Switzerland
12. Andrzej Rys (2007-2010): Ruthenium bipyridine block copolymer micelles for biomolecule detection. *Current position*: Analytical Chemist, Clarovita Nutrition, Montreal
13. Yongqiang Wen (2008-2009) Gold nanoparticle DNA assemblies *Current Position:* Associate Professor, Chinese Academy of Sciences, Beijing China
14. N. Sankaran, Postdoctoral fellow (2006-2007): "DNA Detection Using Luminescent Polymers" *Current Position*: Senior Scientist, General Electric, Bangalore, India
15. Bingzhi Chen, Postdoctoral Fellow (2003-2005): "Functional ROMP Polymers" *Current Position:* Senior Staff Scientist, Nalco Water, New York
16. Nicolas Di Cesare, Postdoctoral Fellow (2002-2003) "Self-Assembly of DNA Nanostructures" *Current Position:* Scientist, Research and Development Center, Cascades Inc., Quebec
17. Ignacio Vargas-Baca, Postdoctoral Fellow (1998-2000): "Transition Metal-Linked Oligonucleotides" *Current Position:* Associate Professor, McMaster University, Hamilton, Ontario

Former Undergraduate Research Students:

1. Isa Benitez (1999): then PhD student U. Florida
2. Jessamine Ng (1999): Finished Ph. D. with Whitesides (Harvard) and is a patent lawyer (New York)
3. Sylvie Asselin (1999, NSERC USRA): then Ph. D. student, U. Pennsylvania
4. Ghislaine Bailey (1999, NSERC USRA): Finished PhD with Swager (MIT), scientist at Nova Chemicals
5. Kenza Kahrim (2000, NSERC USRA): Art Restoration, Metropolitan Museum of Art, New York

6. **Philippe Violette** (2000,2001), NSERC USRA: Medical degree, McGill University (Urologist)
7. **Jay Banerjee** (2001): then Medical student, University of Western Ontario
8. **Emily Rochette** (2001, NSERC USRA)
9. **Jean Bouffard** (2002): finished Ph. D. at MIT; currently Professor, EWHA Womans University, S. Korea
10. **Hisham Khalil** (2002, NSERC USRA): currently Medical student, University of Western Ontario
11. **Vincent Lemieux** (2003, NSERC USRA): Ph. D. student, Simon Fraser University, postdoc Nijmejen, currently R&D Chemist at St Jean Photochemicals, Montreal.
12. **Anne Wawrezinieck** (2004) currently postdoctoral fellow, U. Nijmejen, Netherlands
13. **Francois Godin** (2003, NSERC USRA, currently PhD student, IRCM Montreal
14. **Yoshi Ishihara** (2004), NSERC USRA, currently Senior scientist at Scripps Institute, San Diego, CA
15. **Alexander Wong** (2005), CSACS scholarship, currently medical student UBC
16. **Lucas Lecours** (2006), NSERC USRA, currently PhD student U. Toronto
17. **Tanit Haddad** (2006), NSERC USRA, currently student at Ecole Polytechnique Montreal
18. **Marie-Christine Dorais** (2007), CSACS student, currently undergraduate at U. Laval
19. **Helen Huang-Hobbs** (2008), currently PhD student UBC
20. **Cheen Euong Ang**, (2009) SURA and CSACS scholarships, summer Honor's research project in collaboration with Prof. C. Barrett, "Photoresponsive DNA nanostructures", currently graduate student Stanford U.
21. **Nicole Avakyan**, "G-Quadruplex Binders as Antitumor Therapeutics", Summers 2010 and 2011 (NSERC USRA fellowships), currently graduate student, McGill (Sleiman)
22. **Katherine Bujold**, "DNA Nanotubes with Moving Parts", Summers 2010 and 2011 (McGill SURA, CSACS and NSERC USRA fellowships), currently graduate student McGill (Sleiman)
23. **Janet Belliveau,** "Encapsulation of Enzymes in DNA Nanotubes", Summer 2010 (CSACS fellowship), currently graduate student, McGill.
24. **Alan Blayney**, "DNA-Mimetic Conjugated Polymers", Summer 2011 (joint with D. Perepichka), currently M.Sc. student McGill (Sleiman/Perepichka)
25. **Janet McMillan**, "Hydrophobic Dendrons on DNA Nanotubes and SERS of Gold Nanoparticle Dimers", Summers 2013 and 2014, NSERC USRA, currently graduate student, Northwestern U.
26. **Adrienne Gallant Lanctot**, Honors pharmacology, (2013-2014 research project), "DNA cages for BCL2 and Ku86 gene silencing", currently graduate student, UK.
27. **John Hsu**, "Dynamic DNA cages and DNA-polymer self-assembly), Summer 2014, CREATE Bionanomachines fellowship.
28. **Yingqian (Kitty) Chen,** Honors Chemistry, co-supervised with J. Mauzeroll, "Charge Transport of Metal-DNA Complexes", currently grad. Student at UBC. (2014-15)
29. **Tolulope Ifayibi,** Honors Pharmacology, "PSMA aptamer on DNA cages", summer 2015
30. **John Hsu,** NSERC USRA student, "Molecular cloning of long, repetitive DNA", summer 2015
31. **Farhad Khan**, CSACS summer student (joint with Prof. C. Barrett), "Assembly of DNA micelles with cationic polymers for gene silencing", summer 2015
32. **John Hsu,** Undergraduate Research Assistant, "Templated Synthesis of DNA Nanotubes", summer 2016
33. **Farhad Khan,** Summer Honor Research, "Interaction of DNA nanostructures with transfection agents", summer 2016
34. **Hammond Sun**, "Sequence controlled polymers", **Chem. 396**, Fall 2016.
35. **Sanchit Gupta,** "Synthesis of Large Wireframe DNA Cages" NSERC USRA, summer 2017
36. **Alexandra-Carla Bobica** (Fall 2017), "DNA Hybrid Structure Assembly", Chem. 396
37. **Keith Husted** (2017-pres.), joint with Prof. D. Perepichka, "Sequence-Controlled Semiconductive Polymers", Chem. 470
38. **Jian Yin (Sally) Xiao** (Fall 2017), "DNA Ligation and Nanotube Formation", Chem. 396
39. **Pengfei Xu**, (2018), Honors research: "Self-Assembly of DNA Amphiphiles"
40. **Daniel Krauss**, Research course (Chem. 396): "Bacteriophage-aided synthesis of DNA nanostructures"
41. **Amy Bantle**, Honors Research, "Microfluidic Device for DNA Printing"

42. **Sabina Kerbalaeva**, NSERC CREATE, "Gene silencing with DNA nanostructures, Summer 2021
43. **Elizabeth Guettler**, "DNA hydrogels", Summer 2021 (Chem. 470)
44. **Howard Bai**, "DNA nanofibers for gene silencing", Summer 2021
45. **Howard Bai**, DNA nanofibers for gene silencing, 2022
46. **Sally Yao** (NSERC CREATE funding), Biological properties of DNA hydrogels.
47. **Mia Pascall,** Honors research, "Sequence-controlled polymers on DNA"

Former Visiting Undergraduate Students

48. **Claire Rannoux** (2007), CSACS exchange student, currently Procurement Innovation Manager, Givaudan, Switzerland.
49. **Adrienne Langille** (2008), NSERC USRA, exchange student from U. New Brunswick, currently a Dentist.
50. **Michael Hell,** visiting graduate student from Technical University Munich (2008-2009) "Expanding the DNA Assembly Code with Novel Nucleosides", currently Head of Environmental Sustainability Global Healthcare Operations at Merck KGaA, Darmstadt, Germany

Student Awards (selected)

1. **Faisal Aldaye.** (a) NSERC Doctoral Prize, 2010; (b) Winkler Award for Best Chemistry Ph.D. thesis, McGill, 2009, (c) Governor's Medal for best PhD Thesis, McGill University, (d) IUPAC Young Chemist Prize, 2009 (international); (e) Principal's Prize for Excellence in Research (f) NSERC Postdoctoral Fellowship (g) Udho Parsini Diwan Prize for best paper published in the McGill Chem. Dept in 2006 (h) Macromolecular Science and Engineering Division of the CSC Prize for Best Graduate Ph.D. Work, 2007 (across Canada) (i) Trends in Nanotechnology Conference poster award, Spain, Sept. 2007, (j) Pall Dissertation Award, 2006; (k) CSC Conf. Award, 2006; (l) Sterry Hunt Award,2006; (m) McFee award for excellence in research, 2004-5 and 2005-6; (n) Zamboni award for excellence in research, 2005 and 2006.
2. **Mohammad Askari,** NSERC postdoctoral fellowship (2015-2017)
3. **Nicole Avakyan**. (a) NSERC CGS-M, 2011, (b) FQRNT fellowship 2012, (c) NSERC Doctoral fellowship, 2013-2015, (d) First place, Poster presentation, CSACS student symposium Sept. 2013. (e) Etudiant Chercheur-Etoile, 2016, FQRNT.
4. **Hassan Bazzi.** (a) Ph. D. Degree with Dean's Honor List, 2003, (b) Ambridge Award for Best Ph.D. Thesis in Physical Sciences at McGill, 2004, (c) Winkler Award for Best Chemistry Ph.D. thesis, McGill, 2004, (d) ADESAQ Prize for best doctoral dissertation in natural sciences and engineering in Quebec, 2004, (e) NSERC Postdoctoral Industrial Research Fellowship, 2003-2004, (f) MSED Prize for Best Graduate Ph.D. Work, 2003, (g) Robert Zamboni Prize for Excellence in Research, McGill University, 2002
5. **Jean Bouffard:** (a) Pfizer Summer Research Award in Synthetic Organic Chemistry, Honors research, "DNA-Mimetic Polymers", 2002, (b) Anachemia Prize for Best Honors Thesis Research, McGill University, 2002
6. **Danny Bousmail:** NSERC CREATE Bionanomachines fellowship, 2014-2015.
7. **Katherine Bujold:** (a) NSERC CGS-M, 2011, (b) FQRNT fellowship 2012, (c) NSERC Doctoral fellowship, 2013-2015, (d) Second place, Poster presentation, CSACS student symposium Sept. 2013. (e) Banting postdoctoral fellowship, 2017 (Northwestern U.)
8. **Karina Carneiro**: (a) Best Poster Presentation Award, CSACS Meeting, Sherbrooke 2009; (b) Sterry Hunt teaching award 2009 (c) American Chemical Society AkzoNobel Science Award Finalist, ACS meeting, 2012. (d) NSERC postdoctoral fellowship, UCSF

9. **Katherine Castor**, CIHR Chemical Biology Scholarship, 2009-2010; CIHR Drug Training Scholarship, 2010-2011 and 2011-2012.
10. **Pongphak Chidchob:** (a) David Noble Harpp Fellowship, 2014, (b) NSERC-CREATE Bionanomachines fellowship, 2014-2015.
11. **Jake Dalphond:** (a) MDS Pharma Prize for Best Organic poster, Graduate Research Conference, Concordia University, 2001; (b) Best in Show Poster Award, Inorganic Discussion Weekend, University of Waterloo, 2001
12. **Donatien de Rochambeau**: NSERC-CREATE Bionanomachines fellowship, 2016-2017.
13. **Ilton Daltro:** Postdoctoral fellowship, Government of Brazil, 2011-2013.
14. **Tom Edwardson:** (a) CIHR Drug Training Scholarship, 2011-2012, 2012-2013, (b) CIHR DDTP poster prize, 2012. (c) 2nd Prize for Best Talk, CSACS student symposium, Sept. 2013.(d) MSED-LANXESS Prize for best PhD work in Polymer Chemistry (2014). (e) Pall Dissertation Award, 2014. (f) CSACS Best paper award, 2013. (g) Winkler award for best PhD thesis in Chemistry at McGill, 2014.
15. **Johans Fakhoury:** CIHR Drug Training Postdoctoral Fellowship, 2010-2011 and 2011-2012.
16. **Amine Garci:** Swiss National Foundation postdoctoral fellowship (2016-2018)
17. **Andrea Greschner**: (a) CSC Best talk award in Biological Chemistry division, 2011; (b) FQRNT fellowship, 2011-2012. (c) GREAT Award 2012. (d) FQRNT Chercheur-Etoile, 2012. (e) Manuscript selected by Faculty of 1000 Prime Biology.
18. **Graham Hamblin,** (a) Vanier Fellowship, 2010-2013; (b) NSERC CGS-M fellowship 2009-10; (c) Tomlinson graduate scholarship, 2008-09; (c) NSERC postdoctoral fellowship at Caltech, 2014-2016. (d) Ambridge award for best PhD thesis in Physical Sciences at McGill, 2014; (d) Winkler award for best PhD thesis in Chemistry at McGill, 2014.
19. **Kevin Haenni**, Swiss National Foundation postdoctoral fellowship (2010-2012)
20. **Amani Hariri:** a. Best Article in 2015, CSACS; b. Winkler Best PhD thesis award in Chemistry at McGill 2016
21. **Yoshihiro Ishihara**, (a) NSERC Postgraduate Fellowship (PGSA), 2005-2007
22. **Aurelie Lacroix:** (a) DDTP fellowship 2015-2016; (b) First place at McGill 3 Minute-Thesis, participated in the Quebec provincial 3MT competition (2016). (c)
23. **Christopher Lachance-Brais:** NSERC PGSM
24. **Lucas Lecours** – Merck summer research fellowship
25. **Peggy Lo:** (a) Macromolecular Science and Engineering Division of the CSC Prize for Best Graduate Ph.D. Work, 2007 (across Canada) (b) CIHR Chemical Biology Ph.D. Scholarship, 2007-2008, and 2008-2009
26. **Chris McLaughlin:** 1. CIHR Chemical Biology Ph.D. Scholarship, 2008-2009; 2. Bill and Christina Chan Fellowship in Chemistry for research excellence; 3. Sterry Hunt teaching award 2008; GREAT award 2012. 4. NSERC postdoctoral fellowship at U. Toronto, 2013-2015.
27. **Kim Metera:** (a) MSED/LANXESS Award for best polymer presentation at the CSC Meeting 2008; (b) Robert Zamboni award for research excellence 2008; (c) best talk, CSACS student symposium (2007) (d) McConnell graduate Ph.D. fellowship 2006-2007 (e) NSERC Postgraduate Fellowship 2002-2005, (f) CSC Prize for Best PosterPresentation, 87th Canadian Chemistry Conference and Exhibition, May 2004, London, Ontario; (g) CSC Materials Division Award for Best Poster Presentation, 88th Canadian Chemistry Conference, May 2006, Halifax, NS
28. **Debbie Mitra:** (a) CIHR Chemical Biology Scholarship,2002-2003, (b) First Prize for Best Graduate Talk, 2001 Symposium Annuel de Chimie Inorganique au Quebec (SACIQ), Sherbrooke, Quebec
29. **Alison Palmer** - CIHR Chemical Biology Scholarship, 2004-2005
30. **Michel Paradis** - M. Sc. Degree with Dean's Honor List, 2000
31. **Casey Platnich**, NSERC PGS-M, 2016-2017; NSERC CGSD, 2017
32. **Alexander Prinzen,** NSERC PGS-M, 2016-2017, NSERC PGSD 2017
33. **Janane Rahbani**: (a) DDTP fellowship 2012-2013, (b) NSERC CREATE Bionanomachines fellowship 2013-2014
34. **Felix Rizzutto:** Banting Postdoctoral Fellowship 2018-2020
35. **Alex Rousina-Webb:** NSERC-CREATE Bionanomachines fellowship, 2016-2017.

36. **Fiora Rosati:** Canadian Government Postdoctoral Fellowship, 2011-2012
37. **Chris Serpell** – Tomlinson Postdoctoral Fellowship, 2011-2013, Banting Postdoctoral fellowship, 2012-2014;
38. **Mohamed Slim** - CIHR Chemical Biology Scholarship, 2003-2004
39. ***Empar Vengut Climent*** Fundación Martín Escudero postdoctoral fellowship (2016-2018)
40. **Yongqiang Wen** – CIFAR Junior Fellowship, 2009-2011
41. **Hua Yang:** Robert Zamboni award for research excellence 2008.

TEACHING EXPERIENCE

Teaching Awards:

2021 **Cottrell STAR award** for research and teaching excellence, Research Corporation.
2005 McGill University, Faculty of Scienc***e, Leo Yaffe Award*** for excellence in teaching
2003 McGill University, ***Principal's Prize for Excellence in Teaching*** (Assistant Professor Category)
2002 Research Corporation***, Cottrell Scholar Award*** for excellence in research and teaching. (U.S.A. and Canada-wide award in Chemistry, Physics and Astronomy

Graduate Course Development and Teaching at McGill

- *Chem 582*:
  Supramolecular Chemistry
  20-30 graduate and advanced undergraduate students
  39 lecture hours/term
  Taught 5 times; 2013 (twice in Fall and Winter) , 2016 (Winter), 2017 (Winter), 2021 (Fall)
- *Chem. 520:*
  Methods in Chemical Biology
  approx. 20 fourth year and graduate students
  9 lectures/term (Fall 2009, Fall 2021)
- *Chem. 571:*
  Polymer Synthesis
  20-40 graduate and advanced undergraduate students
  Taught 11 times; each Winter term: 2002-2009 and each Fall 2009-2011
  39 lecture hrs/term.
- *Chem. 552:* Physical Organic Chemistry (Spring 1999); approx. 10 graduate and advanced undergraduate students, 15 lecture hours / term
- *Chem. 611:* Topics in Inorganic Chemistry, 10 graduate students, 39 lecture hours/term (Fall 1998)

Undergraduate Course Development and Teaching at McGill:

- *Chem. 212:* Organic Chemistry I; approx. 350-700 students, 39 lecture hours / term
- *Chem. 302*: Organic Chemistry III, approx. 100-150 Third-year students, 39 lecture hours / term
- *Chem. 203:* Survey of Physical Chemistry (Fall 1998); approx. 40 first-year students, 6 lecture hours / term
- *Chem. 199:* Why Chemistry? (Fall 1999, Fall 2000, Fall 2006, Fall 2009); approx. 10 first-year students, 3 lectures / term

Teaching Publication:

- H. Sleiman, T. Tohme, M. Masri, M. Rifai, S. Chami, Chemistry, First Year Secondary, Lebanese Educational Center for Research and Development, 1998, Beirut, Lebanon; Textbook was adopted by Lebanese public schools starting 1999.

ADMINISTRATIVE ROLES

Contributions at the Department of Chemistry, McGill University:

- **Chair**, **Search Committee** for a faculty position in Polymer Chemistry at McGill University.
- Member of **Search Committee** for Canada Excellence Research Chair position in RNA Therapeutics, 2022
- Member of ***Search Committee*** for a faculty position in Computational Chemistry (2018)
- Member of ***Search Committee*** for a faculty position joint Pharmacology/Chemistry in Molecular Toxicology and Green Chemistry. (2017)
- Member of ***Search Committee*** for a faculty position in Chemical Biology (2016)
- ***Chair, Awards Committee*** (2007-2011), and (2015-present)
- Member, ***Planning and Priorities Committee*** (2007-present)
- Member, **Search Committees** for Senior Organic Faculty position and Bio-nano position (2007)
- Member, ***Chemistry Curriculum Committee***, 1999-2014
- ***Undergraduate Advisor for Chemistry Majors*** (Class of 2005)
- Member, ***Scholarships Committee***, 2003-2004
- ***President, McGill Chemical Society***, 2000-2001
- ***Assistant Coordinator, Faculty Search Committee for the NSERC University Faculty Award Position***, 2000-2001
- Member, ***Graduate Recruiting Committee***, 2000-2001
- Member, ***Safety Committee***, 1999-2000
- Member, ***Undergraduate Instruments Sub-Committee***, 1999-2000

Contributions at McGill University:

- Faculty of Science, ***Selection Committee*** for Canada Research Chair, James McGill and William Dawson Awardees (2017)
- Member, ***Advisory Committee for the Selection of a Dean of the Faculty of Engineering***, 2012
- Member, ***University Tenure Committee*** for the Faculty of Religious Studies, 2010.
- Member**,** Selection Committee for ***Leo Yaffe Teaching Award, Faculty of Science***, 2007-present
- Member***, McGill Association of University Teachers (MAUT) Executive Council*** (elected for a two-year term 2004-2006)
- Member**,** Selection Committee, ***McGill Tomlinson Teaching and Learning Improvement Fund***, 2003-2005
- Member, Selection Committee, ***McGill Conference and Seminar Grants Committee***, 2003-2005
- Member, Selection Committee for ***the Principal's Prize for Excellence in Teaching,*** 2002-2005

External Contributions:

- Member, Selection Panel for the ***Cram Lehn Pedersen Prize***, International Society for Macrocyclic and Supramolecular Chemistry, 2016-present
- Member, Selection Panel for the ***Izatt-Christensen Award***, International Society for Macrocyclic and Supramolecular Chemistry, 2016-present
- Co-chair, ***External Evaluation Committee for the Department of Chemistry, Dalhousie*** University, Dalhousie University, 2014
- Member, Selection Committee for ***Strem Awards***, Canadian Society for Chemistry, 2009
- Member, ***Advisory Committee for the Qatar Foundation Science Strategy***: Advised the Qatar Foundation on its National Science Strategy, Creation of Qatar Institutes (Biomedical, Energy, Computing) and its relations with Arab Expatriate Scientist Community, 2010-2013

Reviewing and Editorial Work:

- ***Associate Editor, Journal of the American Chemical Society***, 2018-pres.

- ***Member,*** Editorial Advisory Board, J. Am. Chem. Soc., Chem., *Bioconjugate Chem., JOC, Nanoscale Horizons, ChemBioChem.*
- ***Member, Canada Foundation for Innovation (CFI) College of Reviewers, Leaders Opportunities Fund (LOF),*** 2005-present
- ***Member, Natural Sciences and Engineering Council of Canada (NSERC) College of Reviewers, Special Research Opportunities Grant (SRO)***, 2004-present
- ***Grant Evaluation Panel Member,*** *King Abdullah University of Science and Technology (KAUST)*, 2010-present.
- ***Member, NSERC Selection Committee, Strategic Project Grants, New Directions***, 2003-2004
- ***Member, Fonds pour la Formation de Chercheurs et l'Aide à la Recherche (FCAR, now FQRNT) Evaluation Committee for Ph.D. Fellowships*** (Committee 03A- Chemistry), 2002-2003
- ***Research Grant Referee for:*** NSERC, NSERC Strategic Grants Program, FQRNT Equipe program, CFI (Canada Foundation for Innovation), Petroleum Research Fund (USA), Research Corporation (USA), Alberta Medical Heritage Foundation.
- ***Journal Referee for:*** Science, Nature Nanotechnology, Nature Chemistry, PNAS, Journal of the American Chemical Society, Angewandte Chemie, CHEM, Nat. Commun., ACS Nano, Organic Letters, Nanoletters, Macromolecules, ACS Macro Letters, Chemistry, a European Journal, Bioconjugate Chemistry, Langmuir, Inorganic Chemistry, Macromolecular Chemistry and Physics, Chem. Phys., European Journal of Inorganic Chemistry, J. Inorg. Biochem.

Organization of Conferences and Lecture Series:

- ***Symposium Organizer, "***Nucleic Acids as Tools for Biology and Materials Science", IUPAC/CSC Meeting, Montreal, 2020
- ***Symposium co-Organizer,*** CSC 2017 (Toronto), "Nanobiology"
- ***Symposium Co-Organizer,*** "Supramolecular Materials", CSC Meeting, June 2014, Vancouver
- ***Symposium Co-Organizer,*** "Supramolecular Materials", CSC Meeting, May 2013, Quebec City
- ***Member, Advisory Board***, IUPAC Polymers in Organic Chemistry Conference 2012
- ***Symposium Organizer,*** "Macromolecular Engineering with Biomolecules", IUPAC POC Meeting, Doha, Jan. 2012.
- ***Co-Chair, Materials Section of the Canadian Society for Chemistry Conference***, 2011, Montreal
- ***Symposium Organizer***, "Advanced Materials by Self-Assembly", 2008 CSC Meeting, Edmonton, AB
- ***Symposium Organizer,*** "DNA Nanotechnology", 2008 CIFAR Meeting, Vancouver, BC
- ***Session Chair, "***Metal-Containing Polymers and Materials" 234th ACS Meeting, Boston, MA, 2007
- ***Session Chair,*** 88th Canadian Society for Chemistry Conference, Saskatoon, May 2005
- ***Member of the Organizing Committee***, Int. Conf. Res. Science Techn., Beirut, Lebanon, March 2005
- ***Session Chair***, "Supramolecular Chemistry Symposium", 224th ACSMeeting, Boston, MA, Aug. 2002
- ***Symposium Organizer***, "Bioinorganic Chemistry" 84th CSC Conf. Montreal, May 2001
- ***President, McGill Chemical Society Lecture Series***, 2000-2001

RESEARCH IMPACT

Our research focuses on using DNA as a building block to create nanostructures for applications as targeted therapeutics for cancer treatment. As exemplified by the recent COVID-19 mRNA vaccine, we are witnessing a revolution in therapeutic treatment: nucleic acids (RNA and DNA) are highly selective new therapeutics and can address diseases that are difficult or impossible to treat with small molecule pharmaceuticals. However, there are still significant barriers slowing the broad adoption of nucleic acid therapies in the clinic. Nucleic acids are degraded in the blood by enzymes, show poor cellular uptake, accumulate in the liver, are difficult to deliver to

other organs, and can cause immune side effects. Nucleic acid therapy stands to revolutionize cancer treatment and provide curative solutions if these barriers are overcome.

Our research program aims to develop DNA nanostructures that overcome the challenges associated with the delivery of nucleic acid therapies, precisely delivering these therapies to cancer cells, and advancing the field of precision cancer treatment (oncology). These nanomedicines target cancer-driving molecules that are patient-specific and stimulate the immune system to recognize and kill tumors.

1. ***DNA Cages and Nanotubes.*** When we started this research program, the field of DNA nanotechnology was in its infancy: structures were made exclusively using DNA base-pairing, and complex three-dimensional nanostructures were challenging to construct. We developed a new research area, that merges supramolecular chemistry with DNA nanotechnology. We integrated DNA nanostructures with functional organic, inorganic, and polymeric molecules (*Science 2008*, *Nat. Rev. Mater. 2017*), which significantly enhanced the range of structures that can be obtained and resulted, for the first time, in modular and robust access to three-dimensional DNA nanostructures.

We reported the first DNA cages (*JACS 2007*) and nanotubes (*Nat. Nanotech.* 2009, *Nat. Chem. 2015, ACS Nano 2013*), where we could precisely control and vary geometry, length (*Nat. Commun. 2015*) and dynamic character (*ACS Nano 2015 and 2018*). These features strongly influence biological efficacy, but they are not well-controlled in other nanomaterials. Therapeutics and nanoparticles (*Nat. Chem. 2010, Nat. Chem. 2013, JACS 2016*) can be encapsulated inside these cages, and for the first time in the field, they can then be released when specific biological molecules are present. We examined the interaction of DNA cages with cells (*JACS 2012, ACS Central Sci. 2019*). Remarkably, we discovered that encapsulating nucleic acid therapies into DNA nanostructures significantly improves their efficacy. (*Chem. Sci* 2021) These structures are stable in body fluids (*Chem. Comm. 2013*), readily enter cancer cells and have favorable in vivo biodistribution (*Chem. Sci. 2017, JACS 2017*)

We designed a DNA cage that stays closed until it encounters a cancer-specific molecule; this molecule acts as a "key" to unzip, open the DNA cage (*Chem. Sci. 2014*) and release the drug cargo (*JACS 2016, ACS Appl. Mat. Interfaces*, 2019). This is an important demonstration of the ability of these cages to act as targeted drug delivery vehicles. We examined the interaction of DNA structures with lipid bilayers and created membrane protein-mimicking structures that float on the lipid surface or embed and act as a nanopores. (*JACS 2019*). These cages and nanotubes have been adopted by many research groups for drug delivery and biophysical studies.

We synthesized the first metal-DNA cage, for catalysis and in vivo imaging (*Nat. Chem. 2009*). To do this, our group pioneered the incorporation of transition metals into the corners of DNA nanostructures, creating a new class of highly stable, redox and photoactive metal-DNA structures (*Angew. Chem. 2008, 2009, 2010*, *Langmuir 2015, Nanoscale, 2019*)

In conclusion, our team has developed a new class of nucleic acid nanostructures that tackle significant issues in precision oncology: delivering cancer treatments to tumor cells rather than healthy ones, silencing cancer-causing genes, and combating cancer drug resistance. Importantly as well, unlike conventional approaches such as DNA origami, which use hundreds of different DNA strands, our structures are built from a minimum number of DNA strands and are thus ideally suited for biological in vivo applications. Our work was highlighted in the journals *Nature* (which called the structures "Gene Boxes"), *Nature Materials*, *Materials Today*, and resulted in interviews and features in scientific and popular media (*The Scientist*, *Wired*, *Chemistry World, Can. Chem. News, Nano Today, Quebec Science, TeleQuebec, Decouverte*). It was selected by the Faculty of 1000 Biology and led to an invitation from the journal *Science* (2008) to write a review on the field, and more recently, to an invitation to write a review article on the field which appeared in *Nature Reviews Materials* in 2017.

2. ***Reprogramming DNA Assembly with a Small Molecule.*** The DNA "alphabet" (A, T, G and C) is the underlying code that gives rise to the double helix structure. Scientists would like to develop a larger, designer alphabet of DNA bases to create more varied DNA structures. This goal, however, requires costly and complex synthetic procedures. We discovered that when cyanuric acid, an inexpensive small molecule, is added to DNA strands, it coaxes them to assemble into a completely new structure: a triple helix that grows into long fibers, with the bases organized in a continuous hydrogen-bonded structure. This simple, inexpensive way to expand the DNA alphabet into a new material can be potentially applied to tissue regeneration and materials science. (*Nat. Chem. 2016*, topped the journal's most-read list for approx. two months, *Nat Commun. 2019*). This led to the stiffest reported DNA hydrogels for drug delivery and tissue engineering, that are biocompatible, non-toxic, stimuli-responsive, and inexpensive for scale-up production (*Nat. Mater. 2020*, *Nat. Chem. 2021, JACS 2021, subm. to Nat. Chem.*).

In addition, we reported a new class of platinum complexes that stabilize a DNA structure called the guanine quadruplex, and inhibit cancer-specific mechanisms, leading to selective antitumor therapeutics. (*JACS 2017, Inorg. Chem. 2014, Chem. Eur. J. 2013, ChemMedChem 2012, JACS 2008, Chem. Eur. J. 2007)*

3. ***DNA Structures as a Printing Press***. We recently made an exciting discovery: DNA structures can be used not as permanent scaffolds, but as a temporary "printing press" to create programmable nanomaterials. The binding information contained in these structures can be transferred onto gold nanoparticles; these particles become just as programmable as the original structure. The DNA "printing press" can then be re-used, significantly reducing fabrication costs. This introduces the fundamental notion that supramolecular information can be transmitted from one material to another through a chemical process (*Nat. Chem.* 2016). This paper generated press in numerous chemistry, biology, and physics news outlets, including *Can. Chem. News,* and was top 2% for online attention. We have now applied the concept of "DNA printing" to synthetic polymers (*Nat. Chem. 2018*), and small molecules (*Angew. Chem.* 2018, *Chem* 2020) to encode DNA's structural programmability in materials self-assembly. This ability to copy the recognition motifs from one material to another, addresses the current bottleneck of the field- the synthetic scalability of DNA structures. It is now used by many research groups to make DNA-printed materials for diagnostic and plasmonic applications. We are now developing DNA "printing" for the design of "mini-proteins"- multi-peptide units that function like antibodies and that are precisely organized by DNA scaffolds.

4. ***Sequence-Controlled Polymers.*** Sequence-defined polymers (SCPs) are macromolecules in which the monomer units are arranged in a specific order along the chain. This sequence regulation plays a fundamental role in structural control and molecular recognition of biopolymers, such as DNA and proteins. SCPs were touted as a "holy grail' in polymer science, but the non-biological synthesis of these polymers is challenging. To augment the range of nucleic acid nanostructure applications, we developed a simple and high-yield synthesis of sequence-controlled polymers attached to nucleic acids. (*Angew. Chem. 2014, 'Very Important Paper', Polym. Chem. 2016, JACS 2018, J. Org. Chem. 2018*). Our polymers assemble into spherical, cylindrical, or lamellar nucleic acid nanostructures through unprecedented mechanisms (*JACS 2018, Chem 2021, Angew. Chem. 2022, in rev.*), and these conjugates show outstanding gene silencing activity, along with the ability to encapsulate small molecules that re-sensitize resistant cancer cells to chemotherapy (*Chem. Sci. 2017, Chem. Sci. 2021).* Combining these polymers with DNA nanostructures led to emergent, protein-inspired self-assembly (*JACS 2014, 'Spotlight', JACS 2016*). Using this strategy, we recently developed an efficient and versatile route to highly modified aptamer therapeutics. Aptamers are antibody mimics made from nucleic acids; however, they lack diversity in their chemical functional groups. Our method augments aptamers with a highly diverse chemical space, making them much closer to antibodies and enzymes while preserving stability, ease of synthesis and discovery. (*Nat. Chem.* 2022, in revision, *ChemRxiv 2022*, *Provisional Patent App., 2020, in collaboration with Galenvs Biosciences).*

As a result of these discoveries, we were recently approached by the company *Alnylam Pharmaceuticals*, Boston, USA for a collaboration. Alnylam is one of the most important companies in the field of nucleic acid therapeutics,

and they developed the first FDA-approved siRNA therapeutic in 2018. The company is working with us on improving the efficacy of their siRNA therapies using our sequence-controlled polymers. This research also resulted in research contracts and awards with the companies L'Oreal, IntelGenX and Grifols.

5. ***Temporal Growth in Self-Assembly.*** We demonstrated the synthesis of long DNA strands (1000-2000 bases) with any desired length and sequence patterns, by using a small number of building blocks with repeating DNA sequences. Long DNA strands consisting of repetitive sequences are valuable tools for the production of engineered structural protein polymers (elastin, collagen) and nucleases for gene editing, however, their construction had been time-consuming and error-prone. Drawing inspiration from solid-phase synthesis, we used *time*, or order of addition, as a parameter to define structural complexity (*Nat. Commun. 2015*). DNA building blocks with complementary regions are sequentially assembled with *in-situ* ligation, followed by enzymatic enrichment. This allows the use of repeating units to define structure, but any number of unique strands can be inserted to create addressable regions (*Nat. Chem. 2015)*. This powerfully addresses the problem of DNA nanostructure scalability by making structures from a minimum number of repeat units (*ACS Nano 2016*) and organizing DNA origami into higher-order structures (*Nanoscale 2018).*