

# Gustavo Carrero

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## Teaching and Work Experience

### **Assistant Professor** (August 2007 – Present)

*Faculty of Science and Technology, Centre for Science, Athabasca University  
Edmonton, Canada.*

Courses: Linear Algebra I, Linear Algebra II, Ordinary Differential Equations, Partial Differential Equations, Computer-oriented Approach to Statistics, Complex Variables, Research Methods in Science, Math Projects.

Main Responsibilities: Coordination of the course, tutoring, grading, and supervision of undergraduate math projects. Course development.

### **Faculty of Science and Technology Undergraduate Program Director** (January 2015 – June 2018)

*Faculty of Science and Technology, Athabasca University,  
Edmonton, Canada.*

### **Adjunct Professor** (January 2008 – Present)

*Department of Mathematical & Statistical Sciences, University of Alberta,  
Edmonton, Canada.*

Main Responsibilities: Tutoring and supervision of graduate and/or undergraduate students.

### **Invited Lecturer** (January 2010 – April 2010)

*Departamento de Cómputo Científico y Estadística, Universidad Simón Bolívar  
Caracas, Venezuela*

Course: Introduction to Mathematical Biology

### **Educational Coordinator for the International Graduate Training Centre (IGTC) in**

#### **Mathematical Biology** (April 2008 – December 2008)

*Pacific Institute for the Mathematical Sciences (PIMS). Department of Mathematical & Statistical  
Sciences, University of Alberta.*

*Edmonton, Canada.*

Main Responsibilities: Coordination of fellowships granted to graduate students by the IGTC.

### **Postdoctoral Fellow** (July 2006 – July 2007)

*Department of Oncology, Cross Cancer Institute, Faculty of Medicine and Dentistry,  
University of Alberta, Edmonton, Canada.*

Supervisor: Dr. Michael Hendzel

#### Main responsibilities:

- To use partial differential equations and statistical analysis to study the effect of post-translational modifications on the binding affinity of histone H1 to the chromatin structure.
- To design a graphical user interface that enables the automated estimation of biophysical parameters describing the dynamics of chromatin-associated proteins.

**Sessional Lecturer (2003-2017)**

*Department of Mathematical & Statistical Sciences, University of Alberta.  
Edmonton, Canada.*

**Courses and terms:**

- Math 337 (Introduction to Partial Differential Equations): Summer 2017, Summer 2016, Summer 2013, Summer 2012.
- Math 334 (Introduction to Differential Equations): Spring 2015, Spring 2018
- Math 201 (Differential Equations): Summer 2014.
- Math 125 (Linear Algebra I): Fall 2006.
- Math 114 (Elementary Calculus I): Fall 2003.
- Math 113 (Elementary Calculus I): Spring 2003, Spring 2004, Spring 2006.
- Math 102 (Applied Linear Algebra): Winter 2007.

**Main Responsibilities:**

- Full responsibility for the course content, assignments, and grading.
- Supervision of Teaching Assistants responsible for the labs.

**Research Technician (September 2005 – June 2006)**

*Alberta Cancer Board, Department of Experimental Oncology, Cross Cancer Institute.  
Edmonton, Canada.*

**Main responsibilities:**

- To receive direct hands-on experience and training in experimental microscopy techniques used to visualize and quantify nuclear protein dynamics.
- Analysis of experimental data using mathematical models.

**Research Assistant (May – August 2000 – 2005, September – December 2004 & 2005)**

*Department of Mathematical & Statistical Sciences, University of Alberta.  
Edmonton, Canada.*

**Main Responsibilities:**

- Discussion of Ph.D. thesis results with supervisor and peers.
- Presentation of Ph.D. thesis results (posters or talks) in conferences and/or meetings.

**Teaching Assistant (Fall and Winter 1999, 2000, 2001, 2002; Winter 2003)**

*Department of Mathematical & Statistical Sciences, University of Alberta.  
Edmonton, Canada.*

**Courses:** Math 113 (Elementary Calculus), Math 100 (Calculus I), Math 102 (Applied Linear Algebra)

**Main Responsibilities:** Responsible for assistance in lab and help sessions, and labs grading.

**Assistant Professor (November 1998 - August 1999)**

*Department of Mathematics, Faculty of Sciences, Universidad de Los Andes.  
Mérida, Venezuela.*

**Semesters and courses:**

- Semester A and B, 1999: Mathematics 40 (Introduction to Ordinary and Partial Differential Equations).

**Main Responsibilities:**

- To adapt course content to Biology students.
- Full responsibility for lectures, labs, and grading.

**Instructor (September 1996 - October 1998)**

*Department of Mathematics, Faculty of Sciences, Universidad de Los Andes.  
Mérida, Venezuela.*

**Semesters and courses:**

- Semesters A and B, 1998: Mathematics 0 (Arithmetic, Fundamental Algebra, and Trigonometry)
- Semesters A and B, 1997: Mathematics 21 (Calculus in several variables).

**Main Responsibilities:** Full responsibility for the course content, lectures, and grading.

**Tutor (Preparador)** (September 1992 – July 1993)  
*Department of Mathematics, Universidad Simón Bolívar.*  
*Caracas, Venezuela.*  
Courses: First-Year Calculus.

## Education and Training

**Postdoctoral Fellow / Research Technician** (2005 – 2007)  
*Department of Oncology, Cross Cancer Institute,*  
*Faculty of Medicine and Dentistry, University of Alberta.*  
*Edmonton, Canada.*  
Supervisor: Dr. Michael Hendzel

**Ph.D. in Applied Mathematics (Mathematical Biology)** (1999 – 2005)  
*Department of Mathematical & Statistical Sciences, University of Alberta.*  
*Edmonton, Canada.*  
Thesis supervisor: Dr. Gerda de Vries  
Thesis topic: Quantifying and modelling the spatio-temporal dynamics of proteins in the cell nucleus.

**M.Sc. in Mathematics**, 1998  
*Department of Mathematics, Faculty of Sciences, Universidad de Los Andes.*  
*Mérida, Venezuela.*  
Thesis supervisor: Dr. Marcos Lizana  
Thesis topic: Analytic semigroups and epidemiological models.

**B.Sc. in Mathematics (Cum Laude)**, 1996  
*Department of Mathematics, Universidad Simón Bolívar.*  
*Caracas, Venezuela.*

## Graduate Students

- Carlos Contreras (Ph.D. student at the Department of Mathematical and Statistical Sciences, University of Alberta, Sept. 2013 – present).  
Research Topic: Effect of radiation on cell survival.  
(Co-supervision with Dr. Gerda de Vries, Department of Mathematical and Statistical Sciences, University of Alberta).
- Vishaal Rajani (M.Sc. student at the Department of Mathematical and Statistical Sciences, University of Alberta, Sept. 2008 – Aug. 2010).  
Research Topic: Mathematical analysis of Single-Particle Tracking (SPT) data.  
(Co-supervision with Dr. Gerda de Vries, Department of Mathematical and Statistical Sciences, University of Alberta, and Dr. Christopher Cairo, Department of Chemistry, University of Alberta).
- Carlos Contreras (M.Sc. student at the Department of *Cómputo Científico y Estadística*, Universidad Simón Bolívar, Venezuela, Sept. 2009 – Dec. 2011).  
Research Topic: Mathematical modelling of histone H1 dynamics.  
(Co-supervision with Dr. Minaya Villasana, Department of *Cómputo Científico y Estadística*, Universidad Simón Bolívar, Venezuela).
- Harun Kalayci (M.Sc. student at the Department of Mathematical and Statistical Sciences, University of Alberta, May 2010 – March 2012).  
Research Topic: Mathematical analysis of Single-Particle Tracking (SPT) trajectories.  
(Co-supervision with Dr. Gerda de Vries, Department of Mathematical and Statistical Sciences, University of Alberta).

## Undergraduate Students

- Ben Passmore (Undergraduate student at the Faculty of Science and Technology, Athabasca University, May 2020 – present, Supervision of a Mitacs Research Training Award Project).
- Juan Sebastian Salamando (Undergraduate student from the Facultad de Ingeniería y Ciencias, Pontificia Universidad Javariana Cali, Colombia. Supervision of Undergraduate Thesis, Nov. 2018 – March 2020).
- Jingyi Lin (Mitacs Globalink Undergraduate student from the School of Mathematics and Statistics, Huazhong University of Science and Technology (HUST), China. Supervision of a Mitacs Globalink Project, July 2019 – October 2019).
- Kaitlyn Brown (Mitacs Globalink Undergraduate student from the Science and Engineering Faculty, Queensland University of Technology, Australia. Supervision of a Mitacs Globalink Project, June 2017 – Sept 2017).  
Research Topic: Modelling the spread of happiness.
- Joel Makin (Mitacs Globalink Undergraduate student from the School of Mathematics and Applied Statistics, University of Wollongong, Australia. Supervision of a Mitacs Globalink Project, May 2016 – July 2016).  
Research Topic: Analysis of mathematical models of happiness.
- Stephanie Mah (Undergraduate student at the Department of Mathematical and Statistical Sciences, University of Alberta, Jan 2015 – April 2015, Supervision of MATH499 Project).  
Research Topic: Modelling the dynamics of individual happiness.
- Isabella Lin (Undergraduate student at the Department of Mathematical and Statistical Sciences, University of Alberta, Jan 2014 – April 2014, Supervision of MATH496 Project).  
Research Topic: Modelling the spread of happiness as an infectious disease.
- Rochelle Nieuwenhuis (Undergraduate student at the Department of Mathematical and Statistical Sciences, University of Alberta, May 2011 – Aug. 2011).  
Research Topic: Mathematics of Single-Particle Tracking (SPT).  
(Co-supervision with Dr. Gerda de Vries, Department of Mathematical and Statistical Sciences, University of Alberta).

## Awards and Scholarships

### Assistant Professor

- Athabasca University Academic Research Fund (yearly from 2013 -2020)
- Mitacs Globalink (2016, 2017, and 2019)
- Athabasca University Academic Research Fund-Publication (2018)
- Athabasca University Academic and Professional Development Fund Award (yearly 2008-2019)
- Athabasca University Research Incentive Grant (2007 -2013)

### Postdoctoral Fellow

- Alberta Heritage Foundation for Medical Research (AHFMR) fellowship award (2006-2007)

### Graduate

- J. Gordin Kaplan Graduate Student Award (2004)
- First Place in the Poster Competition at the MITACS 5<sup>th</sup> Annual Conference and Atlantic Interchange (2004)
- Andrew Stewart Memorial Graduate Prize. University of Alberta, Edmonton, Canada (2004)
- Josephine Mitchell Scholarship. Department of Mathematical and Statistical Sciences. University of Alberta, Edmonton, Canada (2003)
- FS Chia PhD Scholarship. University of Alberta, Edmonton, Canada (1999-2003)
- First Place in the Poster Competition at the MITACS Third Annual General Meeting (2002)
- Faculty of Science Graduate Teaching Assistantship Scholarship. University of Alberta, Edmonton, Canada (2002)
- Honourable Mention in the Poster Competition at the CAIMS/SCMAI Annual Meeting (2001)
- Faculty of Science Graduate Teaching Assistantship Scholarship. University of Alberta, Edmonton, Canada (2001)
- Faculty of Science Graduate Teaching Assistantship Scholarship. University of Alberta, Edmonton, Canada (2000)

## Undergraduate

- Award for Excellence (“Premio a la Excelencia USB/MARAVEN”). Universidad Simón Bolívar, Caracas, Venezuela (1996)

## Publications

### Ph.D. Thesis

- G. Carrero. *Quantifying and Modelling the Spatio-Temporal Dynamics of Nuclear Proteins*. University of Alberta, Edmonton, Canada.

### M.Sc. Thesis

- G. Carrero. *Soluciones Periódicas Estables para un Sistema Epidemiológico con Difusión*. Universidad de Los Andes, Mérida, Venezuela.

### Recently submitted

- G. Carrero, J. Makin, and P. Malinowski. *A mathematical model for the dynamics of happiness*. Submitted to R. Soc. Open Sci., 2020.

### Refereed Journal Articles

- C. Contreras, G. Carrero, and G. de Vries (2019). *A Mathematical Model for the Effect of Low-Dose Radiation on the G2/M Transition*. *Bulletin of Mathematical Biology*, 81(10), pp. 3998-4021. DOI 10.1007/s11538-019-00645-6.
- C. Contreras, M. Villasana, M.J. Hendzel, and G. Carrero (2018). *Using a model comparison approach to describe the assembly pathway for histone H1*. *PLoS ONE* 13(1): e0191562. <https://doi.org/10.1371/journal.pone.0191562>
- G. Carrero, C. Contreras, and M.J. Hendzel. *Visualizing the distribution of proteins and estimating their kinetic parameters using Virtual Photoactivated Fluorescence (VPAF)*. *GSTF Journal on Bioinformatics and Biotechnology*, 1 (2011), pp. 24-30.
- V. Rajani, G. Carrero, D.E. Golan, G. de Vries, and C.W. Cairo. *Analysis of molecular diffusion by first-passage time variance identifies the size of confinement zones*. *Biophysical Journal*, 100 (2011), pp. 1463-1472.
- N. Raghuram, G. Carrero, T.J. Stasevich, J.G. McNally, J. Th'ng, M.J. Hendzel. *Core Histone Hyperacetylation Impacts Cooperative Behavior and High-Affinity Binding of Histone H1 to Chromatin*, *Biochemistry*, 49 (2010), pp. 4420-4431.
- N. Raghuram, G. Carrero, J. P Th'ng, and M.J. Hendzel. *Molecular dynamics of histone H1*. *Biochemistry and Cell Biology*, 87 (2009), pp. 189-206.
- D. McDonald, G. Carrero, C. Andrin, G. de Vries, and M.J. Hendzel. *Nucleoplasmic  $\beta$ -actin exists in a dynamic equilibrium between low-mobility polymeric species and rapidly diffusing populations*, *Journal of Cell Biology*, 172 (2006), pp. 541-552.
- G. Carrero, M.J. Hendzel, and G. de Vries. *Modelling the Compartmentalization of Splicing Factors*, *Journal of Theoretical Biology*, 239 (2006), pp. 298-312.
- G. Carrero, E. Crawford, M.J. Hendzel, and G. de Vries. *Characterizing Fluorescence Recovery Curves for Nuclear Proteins Undergoing Binding Events*, *Bulletin of Mathematical Biology*, 66 (2004), pp. 1515-1545.
- G. Carrero, E. Crawford, J. Th'ng, G. de Vries, and M.J. Hendzel. *Quantification of Protein-Protein and Protein-DNA Interactions In Vivo, Using Fluorescence Recovery After Photobleaching*, *Methods in Enzymology*, 375 (2004), pp. 415-442.
- G. Carrero, D. McDonald, E. Crawford, G. de Vries, and M.J. Hendzel. *Using FRAP and mathematical modeling to determine the in vivo kinetics of nuclear proteins*, *Methods*, 29 (2003), pp. 14-28.
- G. Carrero, M. Lizana. *Pattern Formation in a SIS Epidemiological Model*, *Canadian Applied Mathematics Quarterly*, 11 (2003), pp. 1-22.

## Conference Proceedings

- G. Carrero, M.J. Hendzel, *Virtual Photo Activated Fluorescence (VPAF): obtaining PAF data from FRAP experiments*. Proceedings of the Annual International Conference on Bioinformatics and Computational Biology (BICB 2011), doi:10.5176/978-981-08-8119-1 BICB06, p.B-1-B-5.
- Carrero, G., Raghuram, N., Th'ng, J., and Hendzel, M. *A Method for Assessing Kinetic Changes of Histone H1 after Post-Translational Modifications*. AIP Conf. Proc. 1168, Vol.2, p.1306-1309, (2009).

## Abstracts

- G. Carrero, C. Contreras, M. J. Hendzel. *Using Mathematical Modelling to Understand the Role of Linker Histone Dynamics in DNA Packaging*. Journal of Proteins and Proteomics, Vol. 3, Number 2, (2012), JPP5-JPP6.
- N. Raghuram, G. Carrero, J. P Th'ng, and M. J Hendzel. *Differential response of histone H1 variants to in vivo treatment of histone deacetylase inhibitors*. Biochemistry and Cell Biology, 87 (2009), p.380.

## Presentations (Invited talks, contributed talks, and posters)

2020

- *Teaching mathematics courses online at Athabasca University. Challenges during the COVID-19 pandemic*. Invited talk at the session “Experiencias en la docencia mediada por TIC (Tecnologías de Información y Comunicación)” at Foros REDIS (Red Colombiana de Programas de Ingeniería de Sistemas y Afines), August 11, 2020. Virtual meeting.
- *Individualized study as a relevant mode of teaching mathematics courses remotely during the COVID-19 pandemic*. Invited talk at the CMS (Canadian Mathematical Society) COVID-19 Research and Education Meeting (CCREM), July13-16, 2020. Virtual meeting.

2019

- *A mathematical model for assessing the effect of low-dose radiation on the G2/M transition*. Invited talk at the Seminario GEMA y Semillero de Investigación Dinámica no lineal en MEMS y otros osciladores, Nov. 29, 2019. Pontificia Universidad Javeriana Cali, Colombia.
- *A mathematical model for assessing the effect of low-dose radiation on the G2/M transition*. Invited talk at the Workshop and International Seminar on Complexity Sciences, CoSIAM 2019, Nov. 22-23, 2019. Fundación Universitaria Konrad Lorenz, Bogotá, Colombia.
- *Student Population Dynamics of the BSc Programs at AU: A Mathematical Modelling Approach*. AU (Athabasca University) Learning Conference, Sep. 27-28, 2019, Radisson Hotel Edmonton South, Edmonton, Canada.

2018

- *Modelling the spread of happiness*. Workshop and International Seminar on Complexity Sciences, CoSIAM 2018b, Nov. 24, 2018. Universidad Católica de Colombia, Bogotá, Colombia.
- *A Mathematical Model for the dynamics of happiness*. Workshop and International Seminar on Complexity Sciences, CoSIAM 2018b, Nov. 23, 2018. Universidad Católica de Colombia, Bogotá, Colombia.
- *A Mathematical Model for the dynamics of happiness*. Seminario del Doctorado de la Facultad de Ingeniería y Ciencias, Nov. 20, 2018, Universidad Nacional de Colombia, Sede Manizales, Manizales, Colombia.
- *A Mathematical Model for the dynamics of happiness*. Seminario del Doctorado de la Facultad de Ingeniería y Ciencias, Nov. 16, 2018, Pontificia Universidad Javeriana, Cali, Colombia.
- *A Mathematical Model for the spread of happiness*. Collaborative Mathematical Biology Group, University of Alberta, Aug. 20, 2018, University of Alberta, Edmonton, AB, Canada.
- *The Dynamics of Human Happiness: a Mathematical Model*. 10<sup>th</sup> Biennial International Meaning Conference, Aug.2-5, 2018, Richmond, BC, Canada.
- *Women mathematicians in Canada: Developing and shaping the field of mathematical biology*. Impact of Women Mathematicians on Research and Education in Mathematics BIRS (Banff International Research Station) Workshop, Banff, Canada, March 16-18, 2018.

2017

- *Understanding the dynamics of happiness through mathematical modelling*. International Conference on Applied Mathematics and Informatics (ICAMI), Nov.26-Dec.1, 2017, San Andres Island, Colombia.
- *Understanding human being happiness through mathematical modelling*. Alberta Mathematics Dialogue, May 4-5, 2017, MacEwan University, Edmonton, AB, Canada.
- *A mathematical modelling approach to the understanding of happiness*. Mathematical Biology Seminar, University of Alberta, March 27, 2017, Edmonton, Canada.

2016

- *Describing and quantifying the binding pathway of histone H1*. Contributed talk at the 2016 Canadian Mathematical Winter Meeting, Dec.2-5, 2016, Niagara Falls, Ontario, Canada.
- *Understanding the cell survival fraction of irradiated cells through cell cycle modelling*. Poster presentation at SMS 2016 - Séminaire de Mathématiques Supérieures 2016, May 30 - June 10, 2016. Edmonton, AB, Canada.

2015

- *A Three Population Model for Quantifying Changes in Linker Histone Dynamics: Its Application After Acetylation and Its Simplification*. Contributed talk at Eighth Annual International Symposium on Biomathematics and Ecology: Education and Research (BEER-2015), October 9 – 11, 2015, Illinois State University, Normal, IL, USA.
- *Modelling the spread of happiness*. Poster and Paper presentations at the Athabasca University Research Forum, April 14, 2015, Matrix Hotel, Edmonton, AB, Canada.
- *Understanding the Dynamics of Linker Histone Using Mathematical Modeling and FRAP Experiments*. Contributed talk at XIII International Conference on Mathematical Biology, March 23 – 24, 2015, Prague, Czech Republic.

2014

- *Describing and quantifying the binding pathway of histone H1*. Contributed talk at the 9<sup>th</sup>. European Conference on Mathematical and Theoretical Biology (ECMTB), June 15-19, 2014, Chalmers University of Technology, Gothenburg, Sweden.
- *Understanding the role of linker histone in DNA packaging*. Invited talk at the Alberta Mathematics Dialogue (AMD) 2014, May 1-2, 2014, The University of Alberta Augustana Campus, Camrose, Alberta, Canada.

2013

- *Understanding the binding pathway of Histone H1 using a model comparison analysis and FRAP experiments*. Poster presentation at EMBO Conference Series on Chromatin and Epigenetics, May 08-12, 2013, EMBL Advanced Training Centre, Heidelberg, Germany.
- *Understanding the binding pathway of Histone H1 to the chromatin structure*. Poster presentation at the 2013 Athabasca University Research Forum (From Idea to End User), April 25, 2013, Edmonton, Canada.

2012

- *Using Mathematical Modelling to Understand the Role of Linker Histone Dynamics in DNA Packaging*. Invited talk at the International Interdisciplinary Science Conference (I-ISC) On “Protein Folding and Diseases”. December 8-10, Jamia Millia University, New Delhi, India.
- *The practice of meditation and its benefits in the workplace*. Presentation at the Lunch and Learn AU-Wellness talk series. November 7, 2012, AU-Edmonton, Canada.
- *Understanding aspects of DNA packaging with Mathematical Modelling*. Presentation at the Arts and Science Research Talk Series. October 19, 2012, AU-Edmonton, Edmonton, Canada.
- *Studying the Mobility of Membrane Receptors using Single Particle Tracking (SPT)*. Invited talk at the 2012 Athabasca University Research Forum, April 10, 2012, Edmonton, Canada.

2011

- *Understanding Histone H1 Binding Mechanism through Model Comparison and FRAP Experiments*. Contributed talk at the 7th International Congress on Industrial and Applied Mathematics - ICIAM 2011, July 18-22, 2011, Vancouver Convention Centre, Vancouver, Canada.
- *Modelling the binding mechanism of linker histone*. Poster presentation at the 2011 Athabasca University Research Forum (Conducting Interdisciplinary and Multi-Disciplinary Research), April 20, 2011, Edmonton, Canada.
- *Virtual Photo Activated Fluorescence (VPAF): obtaining PAF data from FRAP experiments*. Paper presentation at the Annual International Conference on Bioinformatics and Computational Biology (BICB), Feb.28-Mar.1, 2011, Singapore.

2010

- *Using Single Particle Tracking (SPT) to Study the Diffusion Properties of Membrane Receptors*. Invited talk at the 12<sup>th</sup>. International Conference of International Academy of Physical Sciences (CONIAPS XII), December 22-24, 2010. University of Rajasthan, Jaipur, India.
- *Modelling and Quantifying the Dynamics of Histone H1 and Nuclear Actin using FRAP experiments*. Invited lecture at the Department of Mathematics of the University of Rajasthan, December 20, 2010, Jaipur, India.
- *Interpreting Single Particle Tracking (SPT) data with a correlated random walk and a first-passage time algorithm*. Invited lecture at the Centre of Bioinformatics of the University of Allahabad, December 16, 2010, Allahabad, India.
- *Assessing the response of Histone H1 variants to the anticancer drug TSA*. Invited lecture at the Centre of Bioinformatics of the University of Allahabad, December 14, 2010, Allahabad, India.
- *Modelling and Quantifying the Dynamics of Histone H1 and Nuclear Actin using FRAP experiments*. Invited lecture at the Centre of Bioinformatics of the University of Allahabad, December 13, 2010, Allahabad, India.
- *Interpreting Single Particle Tracking Data with a Correlated Random Walk and a first-passage time algorithm*. Invited talk at 31st Annual Meeting of CAIMS\*SCMAI 2010 (Canadian Applied and Industrial Mathematics Society). July 17 – July 20, 2010, St. John's, Newfoundland, Canada.
- *Estudiando la difusión de receptores celulares mediante el seguimiento espacio-temporal de partículas individuales*. Invited talk at the Coloquio del Departamento de Cómputo Científico y Estadística, Universidad Simón Bolívar, July 23, 2010. Caracas, Venezuela.

2009

- *Describing the motion of cellular proteins at individual and population levels*. Invited talk at MITACS 2009 Annual Conference. May 31 – June 6, 2009, Fredericton, New Brunswick.
- *Assessing kinetic changes of histone H1 after hyperacetylation*. International Conference on Numerical Analysis and Applied Mathematics. September 18-22, 2009, Rethymno, Crete, Greece.
- *Studying Actin and Histone H1 dynamics using FRAP experiments*. Invited talk at the Coloquio del Departamento de Cómputo Científico y Estadística, Universidad Simón Bolívar, October 9, 2009. Caracas, Venezuela.

2008

- *Information session on the International Graduate Training Centre in Mathematical Biology*. Second IGTC Annual Research Summit. September 21, 2008, Banff International Research Station, Banff, Canada.
- *Modelando la Compartimentalización de factores splicing*. Invited talk at the Coloquio de Matemáticas, Universidad Simón Bolívar, Venezuela, June 25, 2008.
- *Un Modelo Matemático para la Formación de Compartimientos de Factores Splicing*. Invited talk at the Seminario del Grupo de Ecuaciones Diferenciales, Universidad de Los Andes, Mérida, Venezuela, June 11, 2008.
- *Studying nuclear actin and histone H1 dynamics using FRAP experiments*. Invited talk at the Second Canada-France Congress, Canadian Applied and Industrial Mathematics Society (CAIMS), University of Quebec, Montreal, June 1-5, 2008.
- *Parameter Estimation*. Invited Lecture at the PIMS Mathematical Biology Summer Workshop, May 6-16, 2008, University of Alberta, Edmonton, Canada.

- *Mathematical analysis of FRAP data reveals a differential response of histone H1 variants to the anticancer drug TSA.* Invited talk at the PIMS-MITACS Mathematical Biology Seminar Series. February 11, 2008, University of Alberta, Edmonton, Canada.

2007

- *Quantifying Protein Interactions using FRAP and Mathematical Models.* Invited talk at the Microscopical Society of Canada Annual Meeting. June 12-15, 2007, University of Alberta, Edmonton, Canada.
- *Dynamics of Regulatory Proteins. Current Mathematical Research and Future Directions.* Invited talk at Athabasca University, May 28, 2007.

2006

- *Virtual Photo-Activated Fluorescence (VPAF): Obtaining PAF data from FRAP experiments.* Contributed talk and accepted abstract at the 2006 CSHL (Cold Spring Harbor Laboratory) meeting on "Dynamic Organization of Nuclear Function". September 27- October 1, 2006, Cold Spring Harbor Laboratory, Long Island, New York.

2005

- *A mathematical model for the formation of nuclear speckles.* Poster presentation at the 2005 FASEB Summer Research Conferences "Nuclear Structure and Cancer". June 25-30, 2005, Vermont Academy, Saxtons River, Vermont.
- *Modeling the compartmentalization of splicing factors.* Invited talk at the Mathematical Biology Seminar of the Mathematics Department, University of British Columbia, Vancouver, BC, March 30, 2005.

2004

- *Modeling the compartmentalization of splicing factors.* Presentation at the PIMS-MITACS Mathematical Biology Seminar Series of the Department of Mathematical and Statistical Sciences, University of Alberta, Edmonton, AB, September 27, 2004.
- *Modeling the compartmentalization of splicing factors.* Poster presentation at the International Conference for Mathematics in Biology and Medicine. July 25-28, 2004, University of Michigan, Ann Arbor, Michigan.
- *Modeling the compartmentalization of splicing factors.* Poster presentation at the Canadian Mathematical Society (CMS) and Canadian Applied and Industrial Mathematics Society (CAIMS) Summer 2004 Meeting. June 13-15, 2004, Dalhousie University, Halifax, Nova Scotia.
- *Modeling the compartmentalization of splicing factors.* Poster presentation at the Mathematics of Information Technology and Complex Systems (MITACS) Fifth Annual Conference and Atlantic Interchange. June 9-12, 2004, Dalhousie University, Halifax, Nova Scotia.
- *A mathematical model for the compartmentalization of splicing factors.* Invited talk at the Biomathematics Seminar of the Department of Mathematics, Vanderbilt University, Nashville, TN, February 18, 2004.

2003

- *Characterizing the qualitative behaviour of fluorescence recovery curves for nuclear proteins undergoing binding-unbinding events.* Invited talk at the BIRS Workshop "Mathematical Biology: From Molecules to Ecosystems: The legacy of Lee Segel". July 05-10, 2003, Banff International Research Station.
- *Characterizing the qualitative behaviour of fluorescence recovery curves for nuclear proteins undergoing binding-unbinding events.* Contributed talk at the Fourth Geoffrey J. Butler Memorial Conference. June 17-21, 2003, University of Alberta.

2002

- *Interpreting GFP-Actin Dynamics in FRAP Experiments with a Compartmental Model.* Contributed talk at the SIAM Symposium on Computational Models and Simulations for Intra-Cellular Processes. October 4-5, 2002, Washington, D.C.
- *Interpreting GFP-Actin Dynamics in FRAP Experiments with a Compartmental Model.* Contributed talk at the 5th Americas Conference on Differential Equations and Nonlinear Dynamics. July 7-12, 2002, University of Alberta.

- *Pattern Formation in a SIS Epidemiological Model*. Poster presentation at the 5th Americas Conference on Differential Equations and Nonlinear Dynamics. July 7-12, 2002, University of Alberta.
- *Interpreting GFP-Actin Dynamics in FRAP Experiments with a Compartmental Model*. Poster presentation at the Mathematics of Information Technology and Complex Systems (MITACS) Third Annual General Meeting. May 23-25, 2002, University of British Columbia.

2001

- *Assessing the influence of the nuclear membrane on the estimation of diffusion coefficients for mobile proteins*. Poster presentation at the Canadian Applied and Industrial Mathematical Society (CAIMS) Annual Meeting. June 7-9, 2001, University of Victoria.

### **Conference/Seminar Organizer and Session Chair**

- Chair of the session “Life Sciences” at the 7th International Congress on Industrial and Applied Mathematics - ICIAM 2011, July 18-22, 2011, Vancouver Convention Centre, Vancouver, Canada.
- Chair of a session at the Annual International Conference on Bioinformatics and Computational Biology (BICB), Feb.28-Mar.1, 2011, Singapore.
- Chair of the applied mathematics session of the the 12<sup>th</sup>. International Conference of International Academy of Physical Sciences (CONIAPS XII), December 22-24, 2010. University of Rajasthan, Jaipur, India.
- Organizer of the PIMS Mathematical Biology Seminar Series. Fall Term (September-December) 2008. Department of Mathematical and Statistical Sciences, University of Alberta, Edmonton, Canada.
- Organizer of the Second IGTC Annual Research Summit. September 21, 2008. Banff International Research Station, Banff, Canada.

### **Additional Information**

- Reviewer of articles for the following Refereed Journals: Discrete Dynamics in Nature and Society, Differential Equations and Dynamical Systems, Integrative Biology, Journal of Theoretical Biology, Bulletin for Mathematical Biology, Simulation Modelling Practice and Theory, Journal of Applied Mathematics and Physics.
- Competent user of Maple, MATLAB, XPP, and XTC.
- Fluent in English and Spanish (writing, reading, and conversation). Basic knowledge of French.
- Volunteer at the Project Adult Literacy Society (P.A.L.S.), Edmonton, Alberta, Canada. Feb. 2011 – August 2013.