

## CURRICULUM VITAE

**NAME:** Barbara Triggs-Raine, BSc (Honours), PhD

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**WEB PROFILE:** <https://umanitoba.ca/medicine/faculty-staff/barbara-triggs-raine>

**PLACE OF BIRTH:** Treherne, Manitoba, Canada

### EDUCATION

1983-1987 PhD, Microbiology, University of Manitoba, Winnipeg, MB (Supervisor: Dr. Peter Loewen)  
*Physical characterization of katG encoding catalase HPI of Escherichia coli*

1979-1983 BSc (Honours), Microbiology, University of Manitoba, Winnipeg, MB

### POSTGRADUATE TRAINING

1989-1991 Postdoctoral Research Fellow, McGill University-Montreal Children's Hospital Research Institute, Montreal, PQ, Canada (Supervisor: Dr. Roy Gravel)

1988-1989 Postdoctoral Research Fellow, Hospital for Sick Children, Toronto, ON, Canada (Supervisor: Dr. Roy Gravel)

### APPOINTMENTS HELD

#### A) ACADEMIC at UNIVERSITY OF MANITOBA

2004-pres Professor, Department of Biochemistry & Medical Genetics, Max Rady College of Medicine, Rady Faculty of Health Sciences

2018-2025 Head, Department of Biochemistry & Medical Genetics, Max Rady College of Medicine, Rady Faculty of Health Sciences

2011-2018 Associate Head, Department of Biochemistry & Medical Genetics, Max Rady College of Medicine, Rady Faculty of Health Sciences

2006-2021 Professor, Department of Pediatrics & Child Health, Max Rady College of Medicine, Rady Faculty of Health Sciences (nil-salary)

2003-2006 Associate Professor, Department of Pediatrics & Child Health, Max Rady College of Medicine, Rady Faculty of Health Sciences (nil-salary)

1997-2003 Associate Professor, Department of Biochemistry & Medical Genetics, Max Rady College of Medicine, Rady Faculty of Health Sciences

1994-1997 Assistant Professor, Department of Human Genetics, Faculty of Medicine (nil-salary)

1991-1997 Assistant Professor, Department of Biochemistry & Molecular Biology, Faculty of Medicine

1987-1988 Research Assistant (Sessional), Department of Microbiology, Faculty of Science

#### B) RESEARCH APPOINTMENTS

2016-pres Investigator, GlycoNet (Canadian Glycomics Network)

2015-2022 Scientific Director, Central Animal Core Facility, Rady Faculty of Health Sciences, University of Manitoba

2014-2019 Chair, Research Advisory Committee, Research Manitoba

2008-2010 Director of Research, Facilities and Space Development, Manitoba Institute of Child Health

2008-pres Scientist, Children's Hospital Research Institute of Manitoba

1991-2005 Investigator, Canadian Genetic Diseases Network, a Network of Centres of Excellence

### C) RESEARCH GROUPS

- 2001-2016 Member, Medical Genetics Research Group (University of Manitoba)  
2001-2013 Lead, Centre for the Investigation of Genetic Disease (University of Manitoba)

### D) BOARD MEMBERSHIPS

- 2022-2027 Trustee, Board of Directors, International Society for Hyaluronan Sciences  
2010-2020 Member, Board of Directors, Children's Hospital Research Institute of Manitoba  
2011-2017 Member, Board of Directors, Research Manitoba

### E) INDUSTRIAL COLLABORATOR

- 2025-pres Collaborator, Erad Therapeutics Inc.  
2020-pres Collaborator, M6P-Therapeutics

### F) SOCIETY MEMBERSHIPS

- American Society of Biochemistry & Molecular Biology  
American Society of Matrix Biology  
International Society for Hyaluronan Sciences  
Canadian Society for Molecular Biosciences

## HONOURS and AWARDS

- 2023 Science Co-op Supervisor Recognition Award, Faculty of Science, University of Manitoba  
2018-2019 Bachelor of Science in Medicine Supervisor Mentorship Award, Manitoba Medical Students' Association (MMSA)  
2017 Nomination for Best Teaching: Small Group Setting, Class of 2020  
2012 Journal of Biological Chemistry: Best of 2012, Glycobiology and Extracellular Matrices  
1995 Rh Award in the Health Sciences  
1992-1997 Medical Research Council of Canada Scholarship  
1991-1992 Manitoba Health Research Council Scholarship  
1988-1991 Medical Research Council of Canada Postdoctoral Fellowship  
1987 NSERC Postdoctoral Fellowship (declined)  
1987 Sigma Xi Student Award for Excellence in Research  
1983-1987 NSERC Postgraduate Scholarship  
1983 Medical Research Council Postgraduate Scholarship (declined)  
1982-1983 NSERC Undergraduate University Summer Research Award  
1979 Chown Centennial Entrance Scholarship, University of Manitoba

## TEACHING

### A) PROGRAM & COURSE DEVELOPMENT

- 2024 BGEN 7130 Genetic Epidemiology of Human Populations (3 cr)- Coordinated 30% of course  
2023 BGEN 7090 Principles and Practice of Human Genetics (3 cr)- Coordinated course  
2016 IMED 7120 Medical Biochemistry (3 cr)- Coordinated course  
2015 CHEM 4370 Glycobiology and Protein Activation (3 cr)- Co-coordinator with Dr. Jeff Wigle  
2000 82.703 Proteins (3 cr)- Coordinated course  
1987 60.444 Environmental Microbiology (3 cr)- Coordinated course  
1987 60.454 Biological Energy Transductions (3 cr)- Coordinated course

### B) UNDERGRADUATE EDUCATION

- 2021 BGEN 3010 Genetics in Biomedicine-developed & taught 5 lectures in Mendelian inheritance  
2015-2019 CHEM 4370 Glycobiology and Protein Activation (3 cr)- taught 18 lectures covering glycolipids, glycosaminoglycans, disorders of glycan synthesis and degradation, glycan methodologies, proteoglycans and lectins  
2014-2016 BGEN 3020 Introduction to Human Genetics- taught 1.5-3.0 h on unique populations in human genetics

2003-2006	BGEN 3020 Introduction to Human Genetics- taught 3 h on animal models of genetic disease
2000-pres	BGEN 4010 Project in Human Genetics (6 cr)- have hosted 5 project students
1987	Environmental Microbiology (3 cr)- taught course
1997	Biological Energy Transductions (3 cr)- taught course covering biological and membrane transport processes

#### C) GRADUATE EDUCATION

2023	BGEN 7090 Principles & Practice of Human Genetics- taught 8.5 h covering history of racism in genetics, Mendelian genetics, and population genetics
2017-2024	BGEN 7144 Clinical Genetics 2- taught 3 h on therapies for metabolic disease
2016-2019	IMED 7120 Medical Biochemistry- taught 13 h of lectures, tutorials and assigned studies covering a review of basic biochemistry, protein structure and function, enzyme kinetics, membrane proteins and transporters, protein modification and glycosylation, minerals and vitamins, nucleic acid metabolism, and heme metabolism
2015-2022	PAEP- 2- 1 hr tutorials on alcohol and diabetes metabolism for physician assistants
2013-2014	PAEP- 2- 1 hr lectures on integrated metabolism for physician assistants
2000-2014	PAEP- 1- 1 hr tutorial on alcohol metabolism for physician assistants
2000-2012	82.702 Proteins (3 cr)- taught 40% of content
1997-2000	82.708 Seminars in Biochemistry- provided verbal and written feedback on seminars
1996-2010	36.724 Nucleic Acids- manipulation, structure and function- taught 1 or 2- 3 hr lectures on molecular analyses in human genetic disease
1992-1997	82.726 Cellular and molecular biochemistry- taught 1 or 2, 3-hr lectures on protein targeting and regulation of protein synthesis

#### D) UNDERGRADUATE MEDICAL EDUCATION

2016-2018	1-3 1 h tutorials in biochemistry for Med I
2013-2014	2 lectures and 4 assigned studies on protein biochemistry for Med I Structure and Function
1999-2015	1-3 1 h tutorials on hematology/oncology for Med II Hematology Block
1999-2008	1 h lecture on hemoglobinopathies for Med II Hematology Block
1994-2001	2 h lecture and 1 h tutorial on energy metabolism in diabetes for Endocrinology Block
1992-2015	2-7 tutorials per year on various aspects of biochemistry for Med 1
1992-pres	2-5 tutorials per year on basic genetics concepts for Med 1 or Med II students
1992	1 h lecture on molecular biology of inheritance for Med 1 Biochemistry

### TRAINEE SUPERVISION

#### A) UNDERGRADUATE and HIGH SCHOOL TRAINEES

2024	Rupinder Pal, Maples Met High School
2023	Mansummeet Singh- Co-op student, Faculty of Science, University of Manitoba
2022	Betselot Betemariam- Student research assistant, University of Winnipeg
2021	Jiyoo Cha- High School student
2020	Deanne Nixie Miao- Honours Genetics project student, University of Manitoba
2020	Nikolas Furletti- Summer NSERC student, University of Winnipeg
2020	Nassiha Alam- Maples Met High School
2019-2020	Shirley Yu- Honours Biology Project, Faculty of Science, University of Manitoba
2019	Emily Barker- GlycoNet funded Co-op student, University of Manitoba
2018	Megan Rodriguez- NSERC funded Co-op student, University of Manitoba
2018	Steven Cooper- BSc(Med) student, University of Manitoba
2018	Natasha Osawa- GlycoNet funded Co-op student, University of Manitoba
2018	Cecily Taylor- Part time undergraduate student, University of Manitoba
2017	Michael Wong- Volunteer undergraduate student, University of Manitoba
2017	Veronica Kielb- Summer student, Western University
2015-2016	Lynne Wang- Volunteer undergraduate student, University of Manitoba

2015 Jean Ding- Summer student, University of Toronto  
 2015 Megan Neufeld- CHRIM funded summer student, University of Manitoba  
 2013-2014 Kassie Kusie- University of Winnipeg Honours Project student  
 2013 Sana Faiyaz- Co-op student, University of Manitoba  
 2012 Jonathon Ripstein- Genetics Honours Project Student, University of Manitoba  
 2012 Lillian Weins- Co-op student, University of Manitoba  
 2010 Christa Kruck- Co-op student, University of Manitoba  
 2010 Mathew Pierce - Summer student, University of Manitoba  
 2010 Ashley Furlong- Summer student, University of Manitoba  
 2010 Keely Hammond- High School student- Be a Gene Researcher for a Week  
 2010 Lucy Wei- High School student- Be a Gene Researcher for a Week  
 2009 Kelly Lau- Co-op student, University of Manitoba  
 2009 Sherry Bilenki- Summer student,  
 2007-2008 Mark Lipson- Summer student, University of Manitoba  
 2007 Nathan Christian- High school student- Sanofi-Aventis Challenge  
 2005 Edgard Mejia- Genetics Honours project student, University of Manitoba  
 2005 Justina Zhang- Genetics Honours project student, University of Manitoba  
 2005 Tagreed Abood- RRC Summer Co-op student  
 2005 Kristy Ransen- RRC Summer Co-op student  
 2005 Maya Weerasinghe- RRC Summer Co-op student  
 2003-2004 Shuangbo Liu- Summer student, University of Manitoba  
 2003 Tonya Ward- High School student- Be a Gene Researcher for a Week  
 2003 Niki Boyko- Summer student, University of Manitoba  
 2002 Margot Plews- Co-op student, University of Manitoba  
 2001 Jacqueline Ching- Summer student, University of Manitoba  
 1999-2000 Brandy Wicklow- BSc(Med), University of Manitoba  
 1999 Micah Simcoff- NCE summer student, University of Manitoba  
 1998 Jonathan Kahanovitch- Visiting High School student  
 1998 Pamela Hadida- Visiting High School student  
 1997 Greg Wasney- Summer student, University of Manitoba  
 1996 Brandy Wicklow- University of Winnipeg project student  
 1995 Adam Cheng- Muscular Dystrophy Association of Canada summer student, University of Manitoba  
 1995 Kerrie Wyant- NCE summer student, University of Manitoba  
 1994 Melanie Richard- University of Winnipeg project student  
 1992-1993 Normal Wasel- BSc(Med) student, University of Manitoba

#### B) GRADUATE MSC TRAINEES

2023 Mehrafarin Ashiri (Co-supervised with Dr. Brian Mark) Using an engineered human hexosaminidase as an enzyme replacement therapy to treat a mouse model of Tay-Sachs Disease  
 2023 Emily Barker- Development and characterization of GM2 gangliosidosis mouse models  
 2021 Promita Ghosh- Biochemical Analysis of HYAL2: Studies of patient mutations and identification of interacting proteins  
 2017 Naimul Hasan- Characterization of mutations and phenotypes associated with HYAL2 deficiency  
 2015 Ramya Vinith- Micro-computed tomography assessment of skeletal structure in a mucopolysaccharidosis IX mouse model  
 2015 Naderah Altaieb- Assessing the potential of rAAV9 systemic gene therapy for GM2 gangliosidosis using Sandhoff mouse model

2012	Lara Gushulak- The contribution of $\beta$ -hexosaminidase and hyaluronidase 1 to hyaluronan turnover
2006	Nehal Patel- The subcellular localization and targeting pathway of hyaluronidase 1
2002	Sherrie Kelly- The role of the hGrb14 adaptor protein BPS domain in insulin signaling
2002	Tamara Shuttleworth- Characterization of the murine Hyal1 and Hyal3 genes, their expression and the design of targeting vectors for generation of Hyal1 and Hyal3 deficient mice
1998	Brian Mark - Structural and functional characterization of <i>Streptomyces plicatus</i> beta-N-acetylhexosaminidase by comparative molecular modeling and site directed mutagenesis
1996	Gillian Knells - Phosphorylation-dependent interaction of human insulin-signalling proteins IRS-1 and SHP-2 in a modified yeast two-hybrid system
1996	Emmanuel Petroulakis- Molecular characterization of beta-hexosaminidase A deficiency in a late-onset GM2 gangliosidosis type 1 patient

#### C) GRADUATE PHD TRAINEES

2016	Biswajit Chowdhury- Determining the role of hyaluronidase 2 in hyaluronan metabolism
2014	Joy Armistead- Role of EMG1 in Bowen-Conradi syndrome and in ribosome biogenesis
2010	Vasantha Arja- Hyaluronan turnover in hyaluronidase 3- and $\beta$ -hexosaminidase deficient mice
2008	Dianna Martin- Characterization of a hyaluronidase 1 (Hyal1) null mouse and an examination of the role of HYAL1 in tissue hyaluronan turnover.
2001	Adriana Alvarez- identification of variants in HEXA among Mexican patients with Tay-Sachs disease (University of Guadalajara join UNESCO project)
1997	Zhimin Cao- Characterization of the benign mutations, R247W and R249W, associated with $\beta$ -hexosaminidase A pseudodeficiency

#### D) POST-GRADUATE TRAINEES

2020-2024	Elaine Anjos- Designing and developing unique mouse models
2016-2017	Biswajit Chowdhury- Studies of EMT in Hyal2-deficient mouse cardiac cushion explants
2012-2013	Jagdeep Walia- Development of AAV2/9 gene therapy to treat Sandhoff mice
2009-2010	Abrar Hussain- Analysis of the frequency of glycogen storage disease
1997-2000	Katan Badiani- Analysis of the role of Grb14 in insulin signalling

#### E) GRADUATE STUDENT COMMITTEES

2022-pres	Yu Jing- PhD student- Georgia Tech (Supervisor: Dr. Jennifer Curtis)
2018-pres	Berardino Petrilli- PhD student- Department of Biochemistry & Medical Genetics
2015-2024	Andrew Plesniarski- MSc/PhD- Department of Medical Microbiology
2019-2024	Darien Yeung- PhD- Department of Biochemistry & Medical Genetics
2021-2023	Parnia Zavareh- MSc- Department of Oral Biology, Faculty of Dentistry
2017-2022	Taylor Morisseau- MSc/PhD- Department of Pharmacology & Therapeutics
2014-2022	Sacha Blant- PhD- Department of Biochemistry & Medical Genetics
2017-2021	Manoj Medapati- PhD- Department of Oral Biology, Faculty of Dentistry
2017-2020	Graeme Benzie- MSc- Department of Microbiology, Faculty of Science
2014-2020	Natalie Landry- PhD- Department of Physiology & Pathophysiology
2017-2019	Samira Seif- MSc- Department of Physiology & Pathophysiology
2017-2019	Chloe Lepage- MSc- Department of Biochemistry & Medical Genetics
2014-2018	Krista Filomeno- MSc-Department of Physiology & Pathophysiology
2010-2017	Nipun Jayachandran- PhD- Department of Immunology
2010-2016	Edgar Mejia- PhD-Department of Pharmacology & Therapeutics
2014	Lauren Roberts- MSc- Department of Pharmacology & Therapeutics
2011-2014	Hessam Kashani- MSc- Department of Physiology & Pathophysiology
2006-2010	Sara Beiggi- PhD- Department of Biochemistry & Medical Genetics
2005-2013	Josette Northcott- PhD- Department of Biochemistry & Medical Genetics

2005-2008 Yongyao Tan- MSc- Department of Biochemistry & Medical Genetics  
2004-2007 Shauna Loewen- MSc- Department of Biochemistry & Medical Genetics  
2003-2009 Xiaoyang Yang- PhD- Department of Physiology & Pathophysiology  
2003-2007 Alison Chatel- MSc- Department of Biochemistry & Medical Genetics  
2002-2005 Xiaoyang Yang- MSc- Department of Physiology & Pathophysiology  
2002-2005 Jonathon Griffin- MSc- Department of Medical Microbiology  
2002-2007 Alison Steir- MSc- Department of Biochemistry & Medical Genetics  
2002-2006 Kajal Chowdhury- PhD- Department of Chemistry, Faculty of Science  
2001-2010 Paula Espino- PhD- Department of Biochemistry & Medical Genetics  
2001-2008 Taweewat Deemagann- PhD- Department of Microbiology, Faculty of Science  
2001-2006 Sherif Elsaraj- MSc- Department of Oral Biology, Faculty of Dentistry  
2001-2005 Patrick Frosk- PhD- Department of Biochemistry & Medical Genetics  
2001-2004 Kevin Oomah- MSc- Department of Physiology & Pathophysiology  
2000-2002 Clark Phillipson- MSc- Department of Biochemistry & Medical Genetics  
2000-2006 Andrew Ho- MSc- Department of Biochemistry & Medical Genetics  
1999-2002 Kristin Blundell- MSc- Department of Biochemistry & Medical Genetics  
1999-2007 Patrick Chong- PhD- Department of Microbiology, Faculty of Science  
1999-2004 Prashen Chelikani- PhD- Department of Microbiology, Faculty of Science  
1998-2001 Biao Lu- Incomplete- Department of Biochemistry & Medical Genetics  
1997-2001 Christine VandeVelde- PhD- Department of Biochemistry & Molecular Biology  
1997-2000 Ron Agatep- MSc- Department of Human Genetics  
1997-2000 Kathie Chen- MSc- Department of Biochemistry & Molecular Biology  
1997-2003 Virginia Spencer- PhD- Department of Biochemistry & Molecular Biology  
1996-1999 Rhonda Mogk- MSc- Department of Human Genetics  
1995-1999 Robert Kirkpatrick- MSc- Department of Human Genetics  
1996-2002 Ray Bacala- MSc- Department of Biochemistry & Molecular Biology  
1995-2002 Greg Smith- PhD- Department of Biochemistry & Molecular Biology  
1995-2001 Tracey Weiler- PhD- Department of Human Genetics  
1995-2000 Lorraine Yau- PhD- Department of Physiology  
1995-2000 Yuxiang Sun- MSc/PhD- Department of Physiology & Pathophysiology  
1994-1998 Jason Wong- PhD- Department of Biochemistry & Molecular Biology  
1994-1999 Christina Richards- MSc- Department of Biochemistry & Molecular Biology  
1994-1997 Harminder Walia- MSc- Department of Biochemistry & Molecular Biology  
1994-1998 Zhilong Wang- MSc- Department of Biochemistry & Molecular Biology  
1994-1996 Karen Bondy- MSc- Department of Biochemistry & Medical Genetics  
1993-1995 Elizabeth Henson- MSc- Department of Medical Microbiology  
1993-1995 Rachmat Hidajat- MSc- Department of Medical Microbiology  
1993-1995 Blake Ball- MSc- Department of Medical Microbiology  
1993-1996 Kevin Graham- MSc- Department of Human Genetics  
1993-1998 Denis Bosc- PhD- Department of Biochemistry & Molecular Biology

#### F) EXTERNAL EXAMINER

2020 Matthea Sanderson- PhD- University of Alberta  
2015 Jonathan Heppner- PhD- University of British Columbia  
2010 Sky Rousseau- BSc (Med)  
2008 Laurence Jadin- PhD- University of Namur, Belgium  
2008 Siyi Zhang- PhD- University of Toronto  
2003 Maja Popovic- PhD- University of Toronto  
2003 David Sinisac- PhD- University of Toronto  
2002 Suzana Hadjur- PhD- University of British Columbia

1998 Rasekh Rifaat- MSc- University of Manitoba  
 1996 Franeli Yadao- MSc- McGill University  
 1994 Hazeline Roche- MSc- University of Manitoba

**G) DEFENCE CHAIR**

2014 Melissa Herman- PhD  
 2013 Xiaoxia Wang- PhD  
 2012 Danielle Stringer- PhD  
 2009 Eilean McKenzie- PhD  
 2002 Jodi Schoen- PhD  
 1999 Norman Haughey- PhD

**PEER-REVIEWED GRANT SUPPORT**

**A) OPERATIONAL SUPPORT**

2019-2026	Canadian Institutes of Health Research- Project Grant. Development of a therapeutic modality to treat GM2 gangliosidoses. PIs: Mark; Triggs-Raine; Perrault	\$548,000
2017-2026	Natural Sciences and Engineering Research Council of Canada-Discovery Grant Characterization of HYAL2 and non-HYAL2 dependent pathways of hyaluronan degradation. PI: Triggs-Raine	\$280,000
2022-2027	Max Rady College of Medicine- Core Platform Funding. University of Manitoba Small Animal and Materials Imaging Platform. PI: Triggs-Raine transferred to Dr. Michael Jackson in 2023	\$300,000
2022-2027	Max Rady College of Medicine- Core Platform Funding. University of Manitoba Genetic Modelling Core Platform. PI: Triggs-Raine transferred to Dr. Brad Doble in 2023	\$550,000
2021-2024	National Council of Jewish Women of Canada- Operating Grant. Development of a therapy for GM2 gangliosidosis (Tay-Sachs Disease). PI: Triggs-Raine	\$8,000
2018	Networks of Centres of Excellence- GlycoNet Catalyst Grant. Engineering human hexosaminidase for gene and enzyme replacement therapies. PI: Mark; Co-Investigators: Triggs-Raine; Arthur; Perrault	\$75,000
2018-2019	Children’s Hospital Research Institute of Manitoba- Small Grant. Development of a mouse model with late-onset GM2 gangliosidosis. PI: Triggs-Raine	\$5,000
2017-2022	Max Rady College of Medicine- Core Platform Funding. University of Manitoba Small Animal and Materials Imaging Platform. PI: Triggs-Raine; Co-Investigator: Madziak	\$300,000
2017-2022	Max Rady College of Medicine- Core Platform Funding. University of Manitoba Genetic Modelling Centre. PI: Triggs-Raine; Co-Investigator: Madziak	\$550,000
2017-2018	Children’s Hospital Research Institute of Manitoba- Operating Grant. Understanding and treating hyaluronidase 2 (HYAL2) deficiency. PI: Triggs-Raine	\$38,500
2014-2016	Canadian Cancer Society Research Institute- Operating Grant. Evaluation of hyaluronidase 2 as a target for cancer prevention. PI: Triggs-Raine	\$197,362
2016	Research Manitoba- Matching Funds to GlycoNet- Pathogenesis of, and therapeutic approaches for hyaluronidase 2 (HYAL2) deficiency.	\$15,000

2016	PI: Triggs-Raine Network of Centres of Excellence- GlycoNet Catalyst Grant- Pathogenesis of, and therapeutic approaches for hyaluronidase 2 (HYAL2) deficiency.	\$75,000
2015-2016	PI: Triggs-Raine U of Manitoba Faculty of Medicine- Bridge Funding- Determination of the role of hyaluronidase 2 in development and disease.	\$60,000
2012-2017	PI: Triggs-Raine Max Rady College of Medicine- Core Platform Funding. University of Manitoba Small animal and Materials Imaging Core Facility.	\$300,000
2012-2017	PI: Triggs-Raine; Co-Investigators: Halayko; Madziak Natural Sciences and Engineering Research Council- Discovery Grant. Pathways of glycosaminoglycan degradation.	\$130,000
2013-2014	PI: Merz; Co-Investigator: Triggs-Raine Mizutani foundation for Glycosciences- Operating Grant. Determination of the role of hyaluronidase 2 in the uptake of hyaluronan.	\$40,000
2008-2013	PI: Triggs-Raine Canadian Institutes for Health Research- Operating Grant. Constitutive and regulated pathways of hyaluronan degradation.	\$756,110
2012	PI: Triggs-Raine Manitoba Institute for Child Health- Operating Grant. New approaches for the treatment of GM2 gangliosidosis.	\$22,000
2012	PI: Walia; Co-investigator: Triggs-Raine Manitoba Medical Service Foundation- Operating Grant. New approaches for the treatment of GM2 gangliosidosis.	\$22,000
2011	PI: Walia; Co-investigator: Triggs-Raine Manitoba Institute for Child Health- Small Grant. New approaches for the treatment of GM2 gangliosidosis.	\$5,000
2011	PI: Walia; Co-investigator: Triggs-Raine Diagnostic Services Manitoba- Operating Grant. Development of a diagnostic CHIP for the Hutterite population.	\$12,000
2009-2010	PI: Spriggs; Co-investigators: Greenberg; Triggs-Raine Manitoba Institute of Child Health- Operating Grant. Determination of the molecular basis of Bowen-Conradi Syndrome.	\$41,404
2006-2010	PI: Triggs-Raine; Co-investigators: Del Bigio; Ding Canadian Institutes for Health Research- Operating Grant. Identification of the gene causing Bowen-Conradi Syndrome.	\$342,000
2005-2008	PI: Triggs-Raine; Co-investigators: Greenberg; Wrogemann; Zelinski Canadian Institutes for Health Research- Operating Grant. Characterization of the role of hyaluronidases in hyaluronan turnover.	\$410,300
2003-2006	PI: Triggs-Raine Canadian Institutes for Health Research- Operating Grant. Identification of the gene causing Bowen-Conradi Syndrome.	\$374,700
2002-2005	PI: Greenberg; Co-investigators: Triggs-Raine; Wrogemann; Zelinski Canadian Institutes for Health Research- Operating Grant. Characterization of a family of hyaluronidases and their role in hyaluronan degradation.	\$397,482
2004-2005	PI: Triggs-Raine Manitoba Institute for Child Health- Operating Grant. Identification of the gene causing Chudley McCullough Syndrome.	\$45,000
	PI: Chudley; Co-investigator: Triggs-Raine	

2001-2002	Garrod Association- Operating Grant. Lysosomal targeting of hyaluronidase 1. PI: Triggs-Raine; Co-investigator: Pind	\$22,500
2001-2002	Manitoba Institute for Child Health- Special Grant. Centre for the Investigation of Genetic Disease. PI: Triggs-Raine; Co-investigators: 17	\$125,000
1999-2001	Canadian Diabetes Association- Operating Grant. Studies of the role of Grb14 in insulin signaling. PI: Triggs-Raine; Co-investigators: Gietz; Arthur	\$116,000
1998-1999	Canadian Genetic Diseases Network of Centres of Excellence- Operating Grant. Gene Identification: Diabetes. PI: Hayden; Co-Investigator: Triggs-Raine	\$58,437
1998-1999	Manitoba Health Research Council/Merck Frosst/Medical Research Council of Canada- Industrial Partnership Grant. Identification and characterization of protein interactions in the insulin signaling pathway. PI: Gietz; Co-investigator: Triggs-Raine	\$127,000
1998-1999	Medical Research Council of Canada/University of Manitoba- Regional Partnerships Program. Genetic and biochemical analysis of acid-active hyaluronidases. PI: Triggs-Raine	\$72,000
1997-1999	Canadian Diabetes Association- Operating Grant. Studies of the role of Grb14 in insulin signaling. PI: Triggs-Raine; Co-investigators: Gietz/Arthur	\$107,080
1995-1998	Medical Research Council of Canada- Operating Grant. Lysosomal enzyme deficiency and pseudodeficiency: studies of $\beta$ -hexosaminidase and hyaluronidase.	\$174,000
1995-1998	Manitoba Health Research Council/Merck Frosst- Industrial Partnership Grant. Identification and characterization of protein interactions in the insulin signaling pathway. PI: Triggs-Raine; Co-investigator; Gietz	\$230,000
1994-1998	NCE-Provincial Matching Funds- Genotype/phenotype relationships in TSD. PI: Triggs-Raine	\$41,760
1997-1998	Canadian Genetic Diseases Network of Centres of Excellence- Operating Grant. Genotype/Phenotype relationships in TSD and Protein interactions with the insulin receptor/DM kinase. PI: Hayden; Co-Investigator: Triggs-Raine	\$47,000
1996-1997	Canadian Genetic Diseases Network of Centres of Excellence- Operating Grant. An in vitro approach to identify proteins interacting with the (i)insulin receptor and (ii) DM kinase. PI: Hayden; Co-Investigator: Triggs-Raine	\$45,000
1995-1996	Canadian Genetic Diseases Network of Centres of Excellence- Operating Grant. An in vitro approach to identify proteins interacting with the (i)insulin receptor and (ii) DM kinase. PI: Hayden; Co-Investigator: Triggs-Raine	\$58,000
1994-1995	Canadian Genetic Diseases Network of Centres of Excellence- Operating Grant. An in vitro approach to identify proteins interacting with the (i)insulin receptor and (ii) DM kinase. PI: Hayden; Co-Investigator: Triggs-Raine	\$82,000
1993-1994	Canadian Genetic Diseases Network of Centres of Excellence- Operating Grant. Genotype/Phenotype relationships in Tay-Sachs disease.	\$32,500

1993	PI: Hayden; Co-Investigator: Triggs-Raine NCE-Provincial Matching Funds- Genotype/phenotype relationships in TSD. PI: Triggs-Raine	\$5,000
1993-1994	Manitoba Medical Service Foundation- Operating Grant. Analysis of $\beta$ -hexosaminidase deficiency in Franco Americans. PI: Triggs-Raine	\$47,000
1993-1994	Thorlakson Foundation- Operating Grant. Myotonic Dystrophy. PI: Gietz; Co-Investigator: Triggs-Raine	\$12,000
1991-1994	Medical Research Council of Canada- Operating Grant. Structure/function analysis of $\beta$ -hexosaminidase. PI: Triggs-Raine	\$184,680
1991-1992	Manitoba Health Research Council- Establishment Grant and Scholarship Award. PI: Triggs-Raine	\$80,000
1991-1992	University of Manitoba- Small Grants Competition. Isolation of mouse cDNA clones encoding $\beta$ -hexosaminidase proteins. PI: Triggs-Raine	\$3663
1991-1992	Manitoba Health Research Council- Operating Grant. Mutational analysis of the $\alpha$ -subunit of $\beta$ -hexosaminidase. PI: Triggs-Raine	\$40,000

#### B) INFRASTRUCTURE FUNDING

2012-2017	Canadian Foundations for Innovation- Murine Micro-CT/Optical Imaging Laboratory. Co-PIs: Triggs-Raine/Halayko	1,277,982
1992	Canadian Genetic Diseases Network of Centres of Excellence- Equipment Grant. Electroporator. PI: Triggs-Raine	\$5,398

#### PUBLISHED WORKS

##### A) MANUSCRIPTS- (\* indicate trainees from the Triggs-Raine lab; ^indicate technical staff supervised by Triggs-Raine)

1. Ashiri M\*, Barker EN\*, Wang W, Zhao Y, Liu S, Liu L, Wu X, Ding H, Hemming R<sup>^</sup>, Whitehead S, Mark BL, and **Triggs-Raine B**. (2025) Comparison of the effectiveness of the engineered enzyme HexM and its mannose-6-hyper-phosphorylated form (PhosHexM) for GM2 ganglioside reduction in a TSD mouse. In preparation
2. Barker EN\*, Ashiri M\*, Saville JT, Hemming R<sup>^</sup>, Furletti N\*, Dhume SH, Yu S\*, Anjos E\*, Wu X, Fresnoza A<sup>^</sup>, Merz DC, Jackson M, Ding H, Del Bigio M, Siddiqui T, Fuller M, Mark BL and **Triggs-Raine BL** (2025) Generation of mice with combined *Hexa* Gly269Ser KI or KO and *Neu3* KO alleles to create new models of GM2 gangliosidosis. Dis Model Mech, Submitted
3. **Triggs-Raine B**, Fink SP. (2024) Genetic deficiencies of hyaluronan degradation. Cells, 13(14):1203, doi: 10.3390/cells13141203
4. Field JT, Chapman D, Hai Y, Ghavami S, West AR, Ozerklig B, Saleem A, Kline J, Mendelson A, Kindrachuck J, **Triggs-Raine B**, Gordon JW. (2023) The mitophagy receptor Nix coordinates nuclear calcium signalling to modulate the muscle phenotype. BioRxiv, doi: <https://doi.org/10.1101/2023.03.18.532760>
5. Maharaj AV, Cottrell E, Thanasupawat T, Joustra SD, **Triggs-Raine B**, Fujimoto M, Kant S, van der Kaay D, Clement-de Boers A, Brooks AS, Rinne T, Metherell LA, Aguirre GA, de Cortázar Larrea MIC, Massoud A, Van Duyvenvoorde HA, De Bruin C, Hwa V, Klonisch T, Hombach-Klonisch S, Storr HL. (2024) Characterization of HMGA2 variants expands the spectrum of Silver-Russell syndrome. JCI Insight. 9(6):e169425, doi: 10.1172/jci.insight.169425
6. Ghavami S, Abrishami P, Afifi S, et al. Diversity, equity and inclusion in autophagy research. (2022)

Autophagy <https://doi.org/10.1080/15548627.2022.2140551>

7. Benzie G, Bouma K, Battellino T, Cooper S\*, Hemming R<sup>^</sup>, Kammouni W<sup>^</sup>, Liu L, Do C, Khajehpour M, Perreault H, Kornfeld S, **Triggs-Raine B**, Mark BL (2021) Increased phosphorylation of HexM improves lysosomal uptake and potential for managing GM2 gangliosidoses. *BBA Adv* 2:100032, doi: 10.1016/j.bbadv.2021.100032.
8. Terceiro L, Blanchard A, Edechi C, Freznosa A<sup>^</sup>, **Triggs-Raine B**, Leygue E, Myal Y (2022) Generation of prolactin-inducible protein (Pip) knockout mice by CRISPR/Cas9-mediated gene engineering. *Can J Physiol Pharmacol* 100(1):86-91, doi: 10.1139/cjpp-2021-0306.
9. Fasham J, Lin S, Ghosh P\*, Radio FC, Farrow EG, Thiffault I, Kussman J, Zhou D, Hemming R<sup>^</sup>, Zahka K, Chioza BA, Wenger OK, Gunning AC, Wright C, Pizzi S, Onesimo R, Zampino G, Barker E\*, Osawa N\*, Rodriguez MC\*, Neuhann T, Zackai EH, Keena B, Capasso J, Levin AV, Bhok E, Hakonarson H, Jackson A, Chandler KE, Banka S, Lupski JR, Sheppard SE, Tartaglia FM, **Triggs-Raine B**, Crosby AH, Baple EL (2022) Elucidating the clinical spectrum and molecular basis of HYAL2 deficiency. *Genet Med* 24(3):631-44, doi: 10.1016/j.gim.2021.10.014. (co-corresponding author)
10. Medapati MR, Singh N, Bhagirath AY, Duan K, **Triggs-Raine B**, Batista EL, Chelikani P (2021) Bitter taste receptor T2R14 detects quorum sensing molecules from cariogenic *Streptococcus mutans* and mediates innate immune responses in gingival epithelial cells. *FASEB J* 35(3):e21375, doi: 10.1096/fj.202000208R.
11. Tseng V, Allawzi A, Prohaska C, Hernandez-Lagunas L, Elajaili H, Cali V, Midura R, Hascall V, **Triggs-Raine B**, Petrache I, Hart CM, and Nozik-Grayck E. (2020) Extracellular superoxide dismutase regulates early vascular hyaluronan remodeling in hypoxic pulmonary hypertension. *Sci Rep* 10(1):280, doi: 10.1038/s41598-019-57147-7.
12. Park S, Kim YH, Jeong PS, Park C, Lee JW, Kim JS, Wee G, Song BS, Park BJ, Kim SH, Sim BW, Kim SU, **Triggs-Raine B**, Baba T, Lee SR, Kim E (2019) SPAM1/HYAL5 double deficiency in male mice leads to severe male subfertility caused by a cumulus oocyte complex penetration defect. *FASEB J*, 33 (12): 14440-9, doi: 10.1096/fj.201900889RRR.
13. Mymin D, Salen G, **Triggs-Raine B**, Waggoner DJ, Dembinski T, Hatch GM (2018). The natural history of phytosterolemia: Observations on its homeostasis. *Atherosclerosis* 269:122-8, doi: 10.1016/j.atherosclerosis.2017.12.024.
14. Muggenthaler M, Chowdhury B\*, Hasan SN\*, Cross HE, Mark B, Patton MA, Ishida M, Behr ER, Sharma S, Zahka K, Blakley B, Jackson M, Lees M, Dolinsky V, Stanier P, Salter C, Baple E, Crosby AH<sup>1</sup>, **Triggs-Raine B**<sup>1</sup>, Choiza BA (2017) Mutation in HYAL2, encoding hyaluronidase 2, cause a syndrome of orofacial clefting and cor triatriatum sinister in humans and mice. *PLoS Genet* 13(1):e1006470, doi: 10.1371/journal.pgen.1006470. (<sup>1</sup>Co-corresponding authors)
15. Chowdhury B\*, Xiang B, Liu X-Q, Hemming R<sup>^</sup>, Dolinsky VW, **Triggs-Raine B** (2017) Hyaluronidase 2-deficiency causes increased mesenchymal cells, congenital heart defects, and heart failure. *Circ Cardiovasc Genet* 10(1): e001598, doi: 10.1161/CIRCGENETICS.116.001598.
16. **Triggs-Raine B**, Dyck T, Boycott KM, Innes MA, Ober C, Parbossingh JS, Botkin A, Greenberg CR, Spriggs EL (2016) Development of a diagnostic chip to screen for 30 autosomal recessive disorders in the Hutterite population. *Mol Genet Genomic Med* 4(3): 312-21, doi: 10.1002/mgg3.206.
17. Schroeder ML, **Triggs-Raine B**, Zelinski T. (2016) Genotyping an immunodeficiency causing c.1624-11G>A ZAP70 mutation in Canadian Mennonites. *BMC Med Genet* 17:50, doi: 10.1186/s12881-016-0312-4.
18. Chowdhury B\*, Xiang B, Muggenthaler M, Dolinsky VS, **Triggs-Raine B** (2016). Hyaluronidase 2 deficiency is a molecular cause of cor triatriatum sinister in mice. *Int J Cardiol* 209:281-3, doi: 10.1016/j.ijcard.2016.02.072.
19. Chowdhury B\*, Hemming R<sup>^</sup>, Faiyaz S\*, **Triggs-Raine B** (2016) Hyaluronidase 2 (HYAL2) is expressed in endothelial cells, as well as some specialized epithelial cells, and is required for normal hyaluronan catabolism. *Histochem Cell Biol* 145:53-66, doi: 10.1007/s00418-015-1373-8.
20. **Triggs-Raine B**, Natowicz M. (2015) Biology of hyaluronan: Insights from genetic disorders of hyaluronan metabolism. *World J Biol Chem* 6(3):110-20, doi: 10.4331/wjbc.v6.i3.110.

21. Feng D, Su R-C, Zou L, **Triggs-Raine B**, Huang S, Xie J. (2015) Increase of a group of PTC+ transcripts by curcumin through inhibition of the NMD pathway. *Biochim Biophys Acta* 1849 (8):1104-15, doi: 10.1016/j.bbagr.2015.04.002.
22. Armistead J\*, Patel N\*, Wu X, Hemming R<sup>^</sup>, Chowdhury B\*, Basra GS\*, Del Bigio MR, Ding H, **Triggs-Raine B**. (2015) Growth arrest in the ribosomopathy, Bowen-Conradi syndrome, is due to dramatically reduced cell proliferation and a defect in mitotic progression. *BBA Mol Basis Dis* 1852:1029-37, doi: 10.1016/j.bbadis.2015.02.007.
23. Walia JS\*, Altaieb N\*, Bello A, Kruck C\*, LaFave MC, Varshney GK, Burgess S, Chowdhury B\*, Hurlbut D, Hemming R<sup>^</sup>, Kobinger GP, **Triggs-Raine B**. (2015) Long term correction of Sandhoff disease following intravenous delivery of rAAV9 to mouse neonates. *Mol Ther* 23 (3):414-22, doi: 10.1038/mt.2014.240.
24. Armistead J\*, Hemming R<sup>^</sup>, Patel N\*, **Triggs-Raine B**. (2014) Mutation of EMG1 causing Bowen-Conradi syndrome results in reduced cell proliferation rates concomitant with G2/M arrest and 18S rRNA processing delay. *BBA Clin* 1:33-43, doi: 10.1016/j.bbacli.2014.05.002.
25. Armistead J\*, **Triggs-Raine B** (2014) Diverse diseases from a ubiquitous process: the ribosomopathy paradox. *Febs Letters* 588:1491-1500, doi: 10.1016/j.febslet.2014.03.024.
26. Chowdhury B\*, Hemming R<sup>^</sup>, Hombach-Klonisch S, Flamion B, **Triggs-Raine B**. (2013) Murine hyaluronidase 2-deficiency results in extracellular hyaluronan accumulation and severe cardio-pulmonary dysfunction. *J Biol Chem* 288: 520-8, doi: 10.1074/jbc.M112.393629.
27. Hussain A\*, Armistead J\*, Gushulak L\*, Kruck C\*, Pind S, **Triggs-Raine B**, Natowicz MR (2012) The adult polyglucosan body disease mutation GBE1 c.1076A>C occurs at high frequency in persons of Ashkenazi Jewish background. *Biochem Biophys Res Commun*, 426(2):286-8, doi: 10.1016/j.bbrc.2012.08.089.
28. Doherty D, Chudley AE, Coghlan G, Ishak GE, Innes AM, Lemire EG, Rogers RC, Mhanni A, Phelps IG, Jones SJM, Zhan SH, Fejes AP, Shahin H, Kanaan, M, Akay H, Tekin M, FORGE Canada Consortium, **Triggs-Raine B**, Zelinski T. (2012) GPM2 mutations cause the brain malformations and hearing loss of Chudley-McCullough Syndrome. *Am J Hum Genet* 90:1088-93, doi: 10.1016/j.ajhg.2012.04.008.
29. Gushulak L\*, Hemming R<sup>^</sup>, Martin D\*, Seyrantepe V, Pshezhetsky A, **Triggs-Raine B**. (2012). Hyaluronidase 1 and  $\beta$ -hexosaminidase have Redundant Functions in hyaluronan and chondroitin sulphate degradation. *J Biol Chem* 287:16689-97, doi: 10.1074/jbc.M112.350447.
30. Myrie SB, Mymin D, **Triggs-Raine B**, Jones PJH. (2012) Serum lipids, plant sterols and cholesterol kinetics responses to plant sterol supplementation in phytosterolemia heterozygotes and control individuals. *Am J Clin Nutr* 95:837-44, doi: 10.3945/ajcn.111.028985.
31. Dumaresq-Doiron K, Edjekouane L, Orimoto AM, Yoffou PH, Gushulak L\*, **Triggs-Raine B**, Carmona EJ Cell Physiol. (2012) Hyal-1 but not Hyal-3 deficiency has an impact on ovarian folliculogenesis and female fertility by altering the follistatin/activin/smad3 pathway and the apoptotic process. *J Cell Physiol* 227:1911-22, doi: 10.1002/jcp.22919.
32. Imundo L, Leduc CA, Guha S, Brown M, Perino G, Gushulak L\*, **Triggs-Raine B**, Chung WK. (2011). A complete deficiency of Hyaluronoglucosaminidase 1 (HYAL1) presenting as familial juvenile idiopathic arthritis. *J Inherit Metab Dis* 34:1013-22, doi: 10.1007/s10545-011-9343-3.
33. Wu X, Sandhu S, Patel N\*, **Triggs-Raine B**, Ding H. (2010). Emg1 is essential for mouse pre-implantation embryo development. *BMC Dev Biol* 10:99-105, doi: 10.1186/1471-213X-10-99.
34. Chatel A, Hemming R<sup>^</sup>, Hobert J, Natowicz MR, **Triggs-Raine B**, Merz, DC. (2010). The *C. elegans* hyaluronidase: a developmentally significant enzyme with chondroitin-degrading activity at both acidic and neutral pH. *Matrix Biol* 29:494-502, doi: 10.1016/j.matbio.2010.05.005.
35. Reese KL, Aravindan RG, Griffiths GS, Shao M, Wang Y, Galileo DS, Atmuri V\*, **Triggs-Raine BL**, Martin-Deleon PA. (2010). Acidic hyaluronidase activity is present in mouse sperm and is reduced in the absence of SPAM1: Evidence for a role for hyaluronidase 3 in mouse and human sperm. *Mol Reprod Dev* 77(9): 759-72, doi: 10.1002/mrd.21217.
36. Armistead J\*, Khatkar S<sup>^</sup>, Meyer B, Mark B, Patel N\*, Coghlan G, Lamont RE, Liu S, Wiechert J, Cattini PA, Koetter P, Wrogemann K, Greenberg G, Entian K-D, Zelinski T, **Triggs-Raine B**. (2009) Mutation of a gene

- essential for ribosome biogenesis, EMG1, causes Bowen-Conradi Syndrome. *Am J Hum Genet* 84(6):728-39, doi: 10.1016/j.ajhg.2009.04.017.
37. Jadin L, Wu X, Ding H, Frost GI, Onclinx C, **Triggs-Raine B**, Flamion B (2008). Skeletal and hematological anomalies in HYAL2 deficient mice: a second type of mucopolysaccharidosis IX? *FASEB J*, 22: 4316-26, doi: 10.1096/fj.08-111997.
  38. Atmuri V\*, Martin DC\*, Hemming R<sup>^</sup>, Gutson A, Byers S, Sahebjam S, Thliveris JA, Mort JS, Carmona A, Anderson JE, Dakshinamurti S, **Triggs-Raine B**. (2008) Hyaluronidase 3 (Hyal3) knockout mice do not display evidence of hyaluronan accumulation. *Matrix Biol* 27:653-60, doi: 10.1016/j.matbio.2008.07.006.
  39. Martin DC\*, Atmuri V\*, Hemming R<sup>^</sup>, Farley J, Mort JS, Byers S, Hombach-Klonisch S, Csoka AB, Stern R, **Triggs-Raine BL** (2008) A mouse model of Mucopolysaccharidosis IX exhibits osteoarthritis. *Hum Mol Genet*, 17:1904-15, doi: 10.1093/hmg/ddn088.
  40. Hemming R<sup>^</sup>, Martin DC\*, Slominski E, Nagy JI, Halayko AJ, Pind S, **Triggs-Raine BL** (2008) Mouse Hyal3 encodes a 45- to 56-kDa glycoprotein whose overexpression increases hyaluronidase 1 activity in cultured cells. *Glycobiology*, 18(4):280-9, doi: 10.1093/glycob/cwn006.
  41. Zelinski T, Coghlan G, Mauthe J, **Triggs-Raine BL** (2007) Molecular basis of succinylcholine sensitivity in a prairie Hutterite kindred and genetics characterization of the region containing the BCHE gene. *Mol Genet Metab* 90:210-6, doi: 10.1016/j.ymgme.2006.10.009.
  42. Martin DC\*, Mark BL, **Triggs-Raine BL**, Natowicz, MR. (2007) Evaluation of the risk for Tay-Sachs Disease in individuals of French-Canadian ancestry living in New England. *Clin Chem* 53: 392-8, doi: 10.1373/clinchem.2006.082727.
  43. Lamont RE, Loredano-Osti J, Roslin NM, Mauthe J\*, Coghlan G, Nylén E, Frappier D, Innes AM, Lemire EG, Lowry RB, Greenberg CR, **Triggs-Raine BL**, Morgan K, Wrogemann K, Fujiwara TM, Zelinski T. (2005) A locus for Bowen-Conradi syndrome maps to chromosome region 12p13.3. *Am J Med Genet A* 132A: 136-43, doi: 10.1002/ajmg.a.30420.
  44. Wicklow B\*, Ivanovich JL, Plews MM\*, Salo T<sup>^</sup>, Noetzel MJ, Leuder GT, Cartegni L, Kaback MM, Sandhoff K, Steiner RD, and **Triggs-Raine BL**. (2004) Severe subacute GM2 gangliosidosis caused by an apparently silent HEXA mutation (V324V) that results in aberrant splicing and reduced HEXA mRNA. (2004) *Am J Med Genet*: 127A:158-66, doi: 10.1002/ajmg.a.20633.
  45. Sellers EAC, **Triggs-Raine BL**, Greenberg C, and Dean HJ. (2002) The prevalence of the HNF-1 $\alpha$  G319S mutation in Canadian aboriginal youth with type 2 diabetes mellitus. *Diabetes Care* 25: 2202-6, doi: 10.2337/diacare.25.12.2202.
  46. Shuttleworth TL\*, Wilson MD, Wicklow BA\*, Wilkins JA, and **Triggs-Raine BL**. (2002) Characterization of the murine hyaluronidase gene region reveals complex organization and co-transcription of Hyal1 with downstream genes, Fus2 and Hyal3. *J Biol Chem* 277:23008-18, doi: 10.1074/jbc.M108991200.
  47. **Triggs-Raine BL**, Kirkpatrick RD\*, Kelly SL\*, Norquay LD, Cattini PA, Yamagata K, Hanley AJG, Zinman B, Harris SB, Barrett PH, and Hegele RA (2002) HNF-1 $\alpha$  G319S, a transactivation-deficient mutant, is associated with altered dynamics of diabetes onset in an Oji-Cree community. *Proc Natl Acad Sci USA* 99:4614-9, doi: 10.1073/pnas.062059799.
  48. Alvarez-Rodriguez A\*, **Triggs-Raine B**, Barros-Nunez P, and Lozano CM. (2001) A novel HEXA mutation [1393 G-to-A (D465N)] in a Mexican Tay-Sachs Disease patient. *Hum Mutat* 17(5):437, doi: 10.1002/humu.1128.
  49. Mark BL, Vocadlo DJ, Knapp S, **Triggs-Raine BL**, Withers, SG, and James MNG. (2001) Crystallographic evidence for substrate-assisted catalysis in a bacterial  $\beta$ -hexosaminidase. *J Biol Chem* 276: 10330-7, doi: 10.1074/jbc.M011067200.
  50. Hemming R<sup>^</sup>, Agatep R, Badiani K\*, Wyant K\*, Daly R, Arthur G, Gietz D, and **Triggs-Raine B**. (2001) Human growth factor receptor bound 14 binds the activated insulin receptor and alters the insulin-stimulated tyrosine phosphorylation levels of multiple proteins. *Biochem Cell Biol* 79:1-12.
  51. **Triggs-Raine B**, Salo T<sup>^</sup>, Zhang H<sup>^</sup>, Wicklow B\*, and Natowicz MR. Mutations in HYAL1, a member of a tandemly distributed multigene family encoding disparate hyaluronidase activities, cause a newly

- described lysosomal disorder, MPS IX. (1999) *Proc Natl Acad Sci USA* 96: 6296-300, doi: 10.1073/pnas.96.11.6296.
52. Mark BL\*, Wasney GA\*, Salo T<sup>^</sup>, Khan AH, Cao Z\*, Robbins PW\*, James MNG, and **Triggs-Raine BL** (1998) Structural and functional characterization of *Streptomyces plicatus*  $\beta$ -N-acetylhexosaminidase by comparative molecular modeling and site directed mutagenesis. *J Biol Chem* 273: 19618-24, doi: 10.1074/jbc.273.31.19618.
  53. Petroulakis E\*, Cao Z-M\*, Clarke, JTR, Mahuran DJ, Lee G, **Triggs-Raine BL**. (1998) A W474C amino acid substitution affects early processing of the  $\alpha$ -subunit of  $\beta$ -hexosaminidase A and is associated with subacute GM2 gangliosidosis. *Hum Mutat* 11: 432-42, 10.1002/(SICI)1098-1004(1998)11:6<432::AID-HUMU3>3.0.CO;2-Z.
  54. Prence EM, Jerome CA\*, **Triggs-Raine BL**, Natowitz, MR. (1997) Heterozygosity for Tay-Sachs disease among individuals of French Canadian background living in Massachusetts. *J Med Screen* 4: 133-6, doi: 10.1177/096914139700400304.
  55. Weiler T, Greenberg CR, Nylén E, Morgan K, Fujiwara TM, Crumley J, Zelinski T, Halliday W, Nickel B, **Triggs-Raine B**, Wrogemann K (1997) Limb girdle muscular dystrophy in Manitoba Hutterites does not map to any of the known LGMD loci. *Am J Med Genet* 72: 363-8, doi: 10.1002/(sici)1096-8628(19971031)72:3<363::aid-ajmg22>3.0.co;2-q.
  56. Gietz RD, **Triggs-Raine B**, Robbins A, Graham KC, Woods RA (1997) Identification of proteins that interact with a protein of interest: applications of the yeast two-hybrid system. *Mol Cell Biochem* 172: 67-79.
  57. Cao ZM\*, Petroulakis EP\*, Salo T<sup>^</sup>, **Triggs-Raine BL** (1997) Benign mutations, R247W and R249W, cause  $\beta$ -hexosaminidase A pseudodeficiency by reducing  $\alpha$ -subunit protein levels. *J Biol Chem*, 272: 14975-82, doi: 10.1074/jbc.272.23.14975.
  58. Jerome CA\*, Scherer SW, Tsui L-C, Gietz RD, **Triggs-Raine BL**. (1997) Assignment of growth factor receptor bound protein 10 (GRB10) to human chromosome 7p11.-p12. *Genomics* 40:215-6, doi: 10.1006/geno.1996.4535.
  59. Richard M\*, Erenberg G, **Triggs-Raine BL**. (1995) An A-to-G mutation at the +3 position of intron 8 of the HEXA gene is associated with exon 8 skipping and Tay-Sachs disease. *Biochem Mol Med* 55: 74-6, doi: 10.1006/bmme.1995.1035.
  60. Greenberg CR, Reimer D, Singal R, **Triggs-Raine B**, Chudley AE, Dilling LA, Philipps S, Haworth J, Seargeant LE, Goodman SI. (1995). A G-to-T transversion at the +5 position of intron 1 in the glutaryl CoA dehydrogenase gene is associated with the Island Lake variant of glutaric acidemia type I. *Hum Mol Genet* 4: 493-5, doi: 10.1093/hmg/4.3.493.
  61. **Triggs-Raine BL**, Richard M\*, Wasel N\*, Prence E, Natowicz M. (1995) Mutational analyses of Tay-Sachs disease: studies on Tay-Sachs carriers of French-Canadian background living in New England. *Am J Hum Genet* 56:870-9.
  62. Brown DH, **Triggs-Raine BL**, McGinniss MJ, Kaback MM. (1995) A novel mutation at the invariant acceptor splice site of intron 9 in the HEXA gene [IVS9-1 G>T] detected by a PCR-based diagnostic test. *Hum Mut* 5:173-4, doi: 10.1002/humu.1380050211.
  63. Zahradka P, Harris KD, **Triggs-Raine B**, Lamontagne G, Leblanc N. (1995) PCR-based analysis of voltage-gated K<sup>+</sup> channels in vascular smooth muscle. *Mol Cell Biochem* 145: 39-44, doi: 10.1007/BF00925711.
  64. Grinshpun J, Khosravi R, Peleg L, Goldman B, Kaplan F, **Triggs-Raine B**, Navon R. (1995) An Alu polymorphism in the HEXA gene is common in Ashkenazi and Sephardic Jews, Israeli Arabs, and French Canadians of Quebec and Northern New England. *Hum Mut* 6: 89-90, doi: 10.1002/humu.1380060118.
  65. **Triggs-Raine BL**, Benoit G, Salo T<sup>^</sup>, Trasler J, Gravel RA. (1994) Characterization of the murine  $\beta$ -hexosaminidase (HEXB) gene. *Biochem Biophys Acta* 1227:79-86, doi: 10.1016/0925-4439(94)90110-4.
  66. Wakamatsu N, Benoit G, Lamhonwah A-M, Zhang Z-X, Trasler JS, **Triggs-Raine BL**, Gravel RA. (1994) Gene structure and analysis of the 5' flanking region of the mouse HEXA gene. *Genomics* 24:110-9, doi: 10.1006/geno.1994.1587.

67. Strasberg PM, **Triggs-Raine BL**, Warren IB, Skomorowski M-A, McInnes B, Becker LE, Callahan JW, Clarke JTR. (1994) Genotype-Phenotype pitfalls in Gaucher disease. *J Clin Lab Anal* 8(4): 226-36, doi: 10.1002/jcla.1860080409.
68. Cao Z-M\*, Natowicz MR, Kaback MM, Prence E, Lim-Steele J, Brown D, Chabot TD\*, **Triggs-Raine BL**. (1993) A second mutation associated with apparent  $\beta$ -hexosaminidase A pseudodeficiency: identification and frequency estimation. *Am J Hum Genet* 53: 1198-205.
69. Greenberg CR, Taylor CLD, Haworth JC, Philipps S, Seargeant LE, **Triggs-Raine B**, and Chodirker BN. (1993). A homoallelic gly317-asp mutation causes the perinatal lethal form of hypophosphatasia in Canadian Mennonites. *Genomics* 17:215-7, doi: 10.1006/geno.1993.1305.
70. Akerman BR, Zielenski J, **Triggs-Raine BL**, Prence EM, Natowicz M, Lim-Steele JS, Kaback MM, Mules EH, Thomas GH, Clarke JTR, Gravel RA. (1992) A mutation common in non-Jewish Tay-Sachs disease: frequency and RNA studies. *Hum Mut* 1(4):303-9, doi: 10.1002/humu.1380010407.
71. **Triggs-Raine BL**, Mules EH, Kaback MM, Lim-Steele JST, Dowling CE, Akerman BR, Natowicz MR, Grebner EE, Navon R, Welch JP, Greenberg CR, Thomas GH, Gravel RA. (1992) A pseudodeficiency allele common in non-Jewish Tay-Sachs carriers: implications for carrier screening. *Am J Hum Genet* 51: 793-801
72. **Triggs-Raine BL**, Akerman BR, Clarke JTR, Gravel RA. (1991) Sequence of DNA flanking the exons of the HEXA gene, and identification of mutations in Tay-Sachs disease. *Am J Hum Genet* 49: 1041-54.
73. Gravel RA, **Triggs-Raine BL**, Mahuran D. (1991) Genetics and Biochemistry of Tay-Sachs disease. *Can J Neurol Sci* 18: 419-23, doi: 10.1017/s0317167100032583.
74. Switala J, **Triggs-Raine BL**, Loewen PC. (1990) Homology among bacterial catalase genes. *Can J Microbiol* 36 (10): 728-31, doi: 10.1139/m90-123.
75. Loewen PC, Switala J, Smolenski M, **Triggs-Raine BL**. (1990) Molecular characterization of three mutations in katG, affecting the activity of hydroperoxidase I of *Escherichia coli*. *Biochem Cell Biol* 68: 1037-44, doi: 10.1139/o90-153.
76. Mahuran DJ, **Triggs-Raine BL**, Feigenbaum AJ, Gravel RA. (1990) The molecular basis of Tay-Sachs Disease: mutation identification and diagnosis. *Clin Biochem* 23(5): 409-15, doi: 10.1016/0009-9120(90)90153-l.
77. **Triggs-Raine BL**, Feigenbaum ASJ, Natowicz M, Skomorowski MA, Schuster SM, Clarke JTR, Mahuran DJ, Kolodny EH, Gravel, RA. (1990) Screening for carriers of Tay-Sachs disease among Ashkenazi Jews: Comparison of DNA-based and enzyme-based tests. *New Engl J Med* 323:6-12, doi: 10.1056/NEJM199007053230102.
78. **Triggs-Raine BL**, Archibald A, Gravel RA, Clarke JTR. (1990) Prenatal exclusion of Tay-Sachs disease using DNA diagnostics. *Lancet* 335:1164, doi: 10.1016/0140-6736(90)91170-f.
79. **Triggs-Raine BL**, Gravel RA. (1990) Diagnostic heteroduplexes: Simple detection of carriers of a 4 bp insertion mutation in Tay-Sachs disease. *Am J Hum Genet* 46:183-4.
80. Mulvey MR, Sorby PA, **Triggs-Raine BL**, Loewen PC. (1988) Cloning and physical characterization of katE and katF, required for catalase HPII expression in *Escherichia coli*. *Gene* 73: 337-45, doi: 10.1016/0378-1119(88)90498-2.
81. **Triggs-Raine BL**, Doble BW, Mulvey MR, Sorby PA, Loewen PC. (1988) Nucleotide sequence of katG, encoding catalase HPI of *Escherichia coli*. *J Bacteriol* 170: 4415-19, doi: 10.1128/jb.170.9.4415-4419.1988.
82. **Triggs-Raine BL**, and Loewen PC. (1987) Physical characterization of katG encoding catalase HPI of *Escherichia coli*. *Gene* 52: 121-8, doi: 10.1016/0378-1119(87)90038-2.
83. Loewen PC, Switala J, and **Triggs-Raine BL**. (1985) Catalases HPI and HPII in *Escherichia coli* are induced independently. *Arch Biochem Biophys* 243: 144-9, doi: 10.1016/0003-9861(85)90782-9.
84. Loewen PC, **Triggs BL**, George CS, and Hrabarchuk BE. (1985) Genetic mapping of katG, a locus that affects synthesis of the bifunctional catalase-peroxidase hydroperoxidase I in *Escherichia coli*. *J Bacteriol* 162: 661-7, doi: 10.1128/jb.162.2.661-667.1985.

85. Loewen PC, **Triggs BL**. (1984) Genetic mapping of katF, a locus that with katE affects the synthesis of a second catalase species in *Escherichia coli*. *J Bacteriol* 160: 668-75, doi: 10.1128/jb.160.2.668-675.1984.
86. Loewen PC, **Triggs BL**, Klassen GR, Weiner JH. (1983) Identification and physical characterization of a ColE1 hybrid plasmid containing a catalase gene of *Escherichia coli*. *Can J Biochem Cell Biol* 1: 1315-21, doi: 10.1139/o83-168.

#### B) BOOK CHAPTERS

1. Harris C, Harris D, Nelson T, Roberts G, Rockman-Greenberg C, **Triggs-Raine B**, Charette JM (2021) Bowen-Conradi Syndrome: a lethal ribosomopathy. In preparation.
2. **Triggs-Raine B**, Ghosh P\*, Natowicz M. Mucopolysaccharidosis IX in *Lysosomal Storage Disorders: A Practical Guide*", 2nd edition, Atul Mehta and Bryan Winchester, Co-editors, Wiley Publishing, 2021.
3. Armistead JA\* and **Triggs-Raine B**. EMG1 harbouring the Bowen-Conradi syndrome D86G substitution localizes normally but has reduced stability. In: *Ribosomes: Molecular Structure, Role in Biological Functions and Implications for Genetic Diseases*. Nova Publications, 2013.
4. Martin DC\*, and **Triggs-Raine B**. Tay-Sachs Disease. In: *Encyclopedia of Molecular Mechanisms of Disease*. Springer, 2008.
5. **Triggs-Raine B**, Dyck T\*, Hemming R<sup>^</sup>, Martin D\*, Patel N\*, Salo T<sup>^</sup>, Slominski E, Natowicz M, Pind S. (2004) Unravelling the function of hyaluronidase gene products: development of mouse models of hyaluronidase deficiency. *Proc of the International Hyaluronan Society: Hyaluronan 2003*, On-line <http://www.matrixbiologyinstitute.org/ha03/ch3/index.htm>.
6. **Triggs-Raine B**, Mahuran DJ, and Gravel RA. Naturally occurring mutations in GM2 gangliosidosis: A compendium. In *Tay-Sachs Disease* (Desnick RJ, and Kaback MM, Eds.). *Advances in Genetics*, Vol. 44:199-224, doi: 10.1016/s0065-2660(01)44081-8.
7. Dakshinamurti K and **Triggs-Raine B**. Biotin and multiple carboxylase deficiency. In *Clinical studies in Medical Biochemistry*. (Glew, Robert H., Ed), Oxford University Press, 1996.

#### C) PATENTS and LICENSES

1. Licensing of HYAL1 antibody to Santa Cruz
2. Licensing of HYAL1 antibody to Sigma

#### D) ABSTRACTS

1. Ashiri M\*, Barker E\*, Wang W, Zhao Y, Liu S, Liu L, Hemming R<sup>^</sup>, Anjos E\*, Wu W, Ding H, Whitehead W, **Triggs-Raine B**, Mark B (2023) Comparison of an engineered enzyme HexM and its mannose-6-hyperphosphorylated form (PhosHexM) as a potential therapy for GM2 ganglioside reduction in a TSD mouse model. *Manitoba Neurosciences Network Conference, Winnipeg, Mb, June 2023*.
2. Field JT, Chapman D, Ghavami S, West AR, Saleem A, Kindrachuk J, **Triggs-Raine B**, and Gordon JW. The mitophagy receptor Nix coordinates nuclear calcium signaling to modulate the muscle phenotype. *Diabetes Canada, Montreal, 2023*.
3. Maharaj AV, Cottrell E, Thanasupawat T, Joustra SD, **Triggs-Raine B**, Fujimoto M, Kant S, van der Kaay D, Clement-de Boers A, Brooks AS, Rinne T, Metherell LA, Aguirre GA, de Cortázar Larrea MIC, Massoud A, Van Duyvenvoorde HA, De Bruin C, Hwa V, Klonisch T, Hombach-Klonisch S, Storr HL. (2023) Identification and characterisation of novel HMGA2 variants expands the clinical spectrum of Silver-Russell syndrome. *European Society of Paediatric Endocrinology, Netherlands, 2023*.
4. Ashiri M\*, Barker E\*, Wang W, Zhao Y, Liu S, Liu L, Hemming R<sup>^</sup>, Anjos E\*, Wu W, Ding H, Whitehead W, **Triggs-Raine B**, Mark B (2023) Comparison of an engineered enzyme HexM and its mannose-6-hyperphosphorylated form (PhosHexM) as a potential therapy for GM2 ganglioside reduction in a TSD mouse model. *Manitoba health Research Forum, Winnipeg, Mb, June 2023*.
5. Barker E\*, Miao D\*, Hemming R<sup>^</sup>, Anjos E\*, Hasan N\*, Chowdhury B\*, Atukorallaya D, Jackson M, Jha A, **Triggs-Raine B**. (2023) Characterization of defects in mind-line bone and cartilage patterning with increased hyaluronan and reduced cellular condensation in HYAL2-deficient mice. *HA 2023, Portland OR, June 2023*.

6. Kammouni W<sup>^</sup>, Chowdhury B<sup>\*</sup>, Fresnoza A<sup>^</sup>, Hemming R<sup>^</sup>, West A, Kern C, Sugi Y, **Triggs-Raine B.** (2023) Hyaluronidase 2 deficiency results in increased epithelial to mesenchymal transition in the mouse cardiac cushion. HA 2023, Portland OR, June, 2023.
7. Jing Y, Powell K, Cohen S, Faubel J, **Triggs-Raine B**, Curtis JE (2023) Dynamic hyaluronan biomimetic glycocalyx: studying glycocalyx-mediated cell behaviors. HA 2023, Portland OR, June, 2023.
8. Alizadeh J, Lorzadeh S, **Triggs-Raine B**, Ghavami S (2022) Mitophagy and Non-small Cell Lung Cancer Metastasis. Computational Oncology and Personalized Medicine, April 27, 2022.
9. Cottrell E, Maharaj AV, **Triggs-Raine B**, Thanasupawat T, Fujimoto N, Hwa V, Klonisch T, Hombach-Klonisch S, Storr HL (2022) Characterisation of the first heterozygous missense HMGA2 variant helps delineate the crucial functional roles of a novel growth gene. 60th European Society for Paediatric Endocrinology Meeting, Rome, Italy, September, 2022.
10. Hombach-Klonisch S, Thanasupawat T, **Triggs-Raine B**, Cottrell E, Storr H, Klonisch T. A HMGA2 mutation associated with Silver Russel Syndrome causes developmental phenotypes in transgenic mice. 5th Canadian Symposium on Telomeres and Genome Integrity, May 3-6, Canmore, Alberta.
11. Field JT, Chapman DC, LeDuc R, Kindrachuk J, Ghavami S, **Triggs-Raine B**, Gordon JW. Molecular regulation of mitophagy controls myostatin signaling and the muscle phenotype. EMBO Workshop- Muscle formation, maintenance, regeneration, and pathology. April 24-29, 2022, Gouvieux, France.
12. Ghosh P<sup>\*</sup>, Hemming R<sup>^</sup>, Barker E<sup>\*</sup>, Rodriguez M<sup>\*</sup>, Osawa N<sup>\*</sup>, **Triggs-Raine B.** *De novo* discovery of seven novel HYAL2 mutations in patients with cleft lip and/or palate cause HYAL2-deficiency: A biochemical insight. 16th Annual Child Health Research Days, Oct 7-8, 2020, Virtual.
13. Ghosh P<sup>\*</sup>, Villacrés C, Lao Y, Spicer V, Furletti NR<sup>\*</sup>, Krokhin O, **Triggs-Raine B.** Identification of Proteins in Proximity to HYAL2 Using the BioID System, 33rd Annual Canadian Health Research Forum, Aug 24-28, 2020.
14. Benzie G, **Triggs-Raine B**, Mark B. Structural Characterization and Upregulated Mannose-6-Phosphate Receptor Mediated Endocytosis of An Engineered Hybrid  $\beta$ -Hexosaminidase 103rd Canadian Chemistry Conference and Exhibition (CCCE 2020), May 24-29, 2020, Virtual.
15. **Triggs-Raine B**, Hemming R<sup>^</sup>, Rodriguez M<sup>\*</sup>, Osawa N<sup>\*</sup>, Bhoj E, Neuhann T, Capasso J, Levin A, Zackai EH, Keena B, Li D, Hakonarson H, Sheppard S. Characterization of mutations causing human hyaluronidase 2 deficiency. Hyaluronan 2019, June 9-13, 2019, Cardiff, Wales.
16. **Triggs-Raine B**, Chowdhury B<sup>\*</sup>, Hasan N<sup>\*</sup>. Hyaluronidase 2 is essential for normal vertebrate development. Hyaluronan 2017, June 11-15, 2017, Cleveland, OH.
17. Chowdhury B<sup>\*</sup>, Hasan SMN<sup>\*</sup>, **Triggs-Raine B.** Understanding the pathogenesis of hyaluronidase 2 (HYAL2)-deficiency in the developing heart. GlycoNet Annual Meeting, May 8-11, 2017, Banff, AB
18. Hasan SMN<sup>\*</sup>, Chowdhury B<sup>\*</sup>, Hemming R<sup>^</sup>, Mark B, **Triggs-Raine B.** Analysis of two novel mutations in HYAL2 associated with orofacial clefting in humans. Annual Child Health Research Day, October 6, 2016, Winnipeg, MB.
19. Chowdhury B<sup>\*</sup>, Xiang B, Liu X-Q, Hemming R<sup>^</sup>, Dolinsky VW, Triggs-Raine B. Disruption of hyaluronan degradation due to hyaluronidase 2 deficiency causes increased mesenchymal cells, congenital heart defects and heart failure. 2016 Canadian Glycomics Symposium, May 16-20, 2016, Banff, AB
20. Blakely B, **Triggs-Raine B**, Chowdhury B<sup>\*</sup>. Hyaluronidase 2 and Hearing. 2015 Annual CORLAS Meeting, Aug 22-25, 2015, San Francisco, CA.
21. Chowdhury B<sup>\*</sup>, Xiang B, Hemming R<sup>^</sup>, Dolinsky V, **Triggs-Raine B.** Valve thickening and atrial enlargement in Hyaluronidase 2 knockout mice lead to progressive diastolic dysfunction. American Society for Matrix Biology Biennial Meeting, Oct. 12-14, 2014, Cleveland, OH.
22. Chowdhury B<sup>\*</sup>, Xiang B, Dolinsky V, Hemming R<sup>^</sup>, **Triggs-Raine B.** Murine hyaluronidase 2 (HYAL2) is required for normal palate and cardiac development. 10th Annual Child Health Research Day, Oct. 1, 2014, Winnipeg, MB.

23. Feng D, Su R, Cheng Y, Lobo VG, Meng Y, Zou L, **Triggs-Raine B**, Huang S, Xie J. Inhibition of nonsense-mediated decay by curcumin. RNA 2014, 19th Annual Meeting of the RNA Society, June 3, 2014, Quebec City, Quebec.
24. Chowdhury B\*, Hemming R<sup>^</sup>, Faiyez S\*, **Triggs-Raine B**. Murine hyaluronidase 2 (HYAL2) is required for high molecular mass hyaluronan (HA) catabolism. 9th Annual Child Health Research Day, Oct. 3, 2013, Winnipeg, MB.
25. Vinith R\*, **Triggs-Raine B**. Assessment of bone structure and density in a mouse model of mucopolysaccharidosis IX using micro-computed tomography. 9th Annual Child Health Research Day, Oct. 3, 2013, Winnipeg, MB.
26. Altaieb N\*, Walia J\*, Kruck C\*, Hemming R<sup>^</sup>, **Triggs-Raine B**. Effective rAAV2/9 gene therapy to treat GM2 gangliosidosis. 9th Annual Child Health Research Day, Oct. 3, 2013, Winnipeg, MB.
27. Chowdhury B\*, Hemming R\*, **Triggs-Raine B**. Tissue distribution and function of murine hyaluronidase 2 (HYAL2). Hyaluronan 2013, Oklahoma City, June 2-7th, 2013.
28. Walia JS\*, Bello A\*, Altaieb N\*, Kruck C\*, Hemming R<sup>^</sup>, **Triggs-Raine B**. Intravenous AAV9 based gene therapy corrects a mouse model of Sandhoff disease. 16th Annual American Society of Gene and Cell Therapy. Salt Lake City, May 15-18th, 2013.
29. **Triggs-Raine B**. MPS IX: Clinical presentation and lessons from mice. LSD Club Meeting, Hotel Nelligan, Montreal, QC, May 9-10, 2013.
30. Gushulak L\*, Chowdhury B\*, **Triggs-Raine B**. MPS IX, clinical presentation and lessons from mice. 12th International Symposium on MPS and Related Diseases. NH Leewenhorst, Noordwijkerhout, The Netherlands, Jun 28-July 1, 2012.
31. Walia JS\*, Bello A, Kruck C\*, Hemming R<sup>^</sup>, Rickey DW, Kobinger GP, **Triggs-Raine B**. New approaches to gene therapy for the GM2 gangliosidoses. 7th Annual Child Health Research Day, The Manitoba Institute of Child Health, Winnipeg, MB, October, 2011.
32. Gushulak L\*, Hemming R<sup>^</sup>, **Triggs-Raine B**. Hyaluronidase 1 and  $\beta$ -hexosaminidase have redundant functions in hyaluronan breakdown. 7th Annual Child Health Research Day, The Manitoba Institute of Child Health, Winnipeg, MB, October, 2011.
33. Chowdhury B\*, Hemming R<sup>^</sup>, Hombach-Klonisch S, **Triggs-Raine B**. Murine Hyaluronidase 2-deficiency results in severe cardio-pulmonary dysfunction due to extracellular hyaluronan accumulation. 7th Annual Child Health Research Day, The Manitoba Institute of Child Health, Winnipeg, MB, October, 2011.
34. Armistead J\*, Del Bigio M, **Triggs-Raine B**. Temporal and spatial expression of EMG1 protein in human brain. 7th Annual Child Health Research Day, The Manitoba Institute of Child Health, Winnipeg, MB, October, 2011.
35. Myrie SB, Mymin D, **Triggs-Raine B**, Jones PJH. Similar serum lipids and plant sterol responses to plant sterol supplementation in heterozygous phytosterolemics and wild-type cohort. Experimental Biology 2011, Washington, DC. FASEB J, April 2011.
36. **Triggs-Raine B**, Chowdhury B\*, Hemming R<sup>^</sup>, Flamion B, Hombach-Klonisch S. Cardiac pathology in a mouse model deficient in Hyaluronidase 2. Gordon Research Conferences: Proteoglycans, Proctor Academy, New Hampshire, July 12-16, 2010.
37. Gushulak L\*, Chowdhury B\*, Arja V\*, Martin D\*, **Triggs-Raine B**. Exploiting mouse models to define the pathway of hyaluronan catabolism. Models of Human Diseases, Toronto, June 26, 2010.
38. **Triggs-Raine B**, Chowdhury B\*, Gushulak L\*, Arja V\*, Flamion B, Hombach-Klonisch S. Studying the phenotypes resulting from hyaluronidase deficiency- what have we learned? Hyaluronan 2010, Kyoto, Japan, June 6-12, 2010.
39. Armistead J\*, Patel N\*, Hemming R<sup>^</sup>, Nylen E<sup>^</sup>, Lau K\*, **Triggs-Raine B**. Deficiency of EMG1 in fibroblasts and lymphoblasts of Bowen-Conradi syndrome patients does not cause a detectable alteration in ribosome biogenesis. Ribosomes 2010, Orvieto, Italy, May 3-7, 2010.

40. Chowdhury B\*, Hemming R<sup>^</sup>, Jassal DS, Flamion B, Hombach-Klonisch S, **Triggs-Raine B**. Cardiac manifestations in Hyaluronidase 2 KnockOut (KO) mice. Graduate Student Research in Pathology, Anaheim CA, April 25, 2010.
41. Chowdhury B\*, Hemming R<sup>^</sup>, Jassal DS, Flamion B, Hombach-Klonisch S, Triggs-Raine B. Cardiac manifestations in Hyaluronidase 2 KnockOut (KO) mice. Experimental Biology 2010, Anaheim CA, April 25-30, 2010.
42. Carmona E, Dumaresq-Doiron K, Orimoto AM, Yoffou PH, Edjekouane L, **Triggs-Raine B**. Impact of Hyaluronidase-1 and Hyaluronidase-3 deficiency on mouse female reproduction. 42nd SSR Annual Meeting in Pittsburgh, PA, July 18-22, 2009.
43. Armistead J\*, Khatkar S<sup>^</sup>, Meyer B, Koetter P, Nylen E<sup>^</sup>, Liu S\*, Coghlan G, Wrogemann K, Greenberg C, Entian KD, Zelinski T, **Triggs-Raine B**. The ribosomal Biogenesis protein EMG1 is mutated in Bowen-Conradi Syndrome. 58th Annual Meeting of the American Society of Human Genetics, Philadelphia, PA, October, 2008.
44. Armistead J\*, Khatkar S<sup>^</sup>, Patel N\*, Nylen E<sup>^</sup>, Liu S\*, Coghlan G, Wrogemann K, Greenberg C, Zelinski T, **Triggs-Raine B**. The ribosomal biogenesis protein EMG1 is mutated in Bowen-Conradi Syndrome. 4th Annual Child Health Research Day, Winnipeg, MB October 1-2, 2008.
45. Martin DC\*, Atmuri V\*, Hemming RJ<sup>^</sup>, Farley J, Mort JS, Byers S, Hombach-Klonisch S, Stern R, **Triggs-Raine BL**. Mice deficient in Hyaluronidase 1 display degenerative joint disease similarly to human Mucopolysaccharidosis IX. First Annual Canadian Genetic Diseases Meeting, St. Saveur, Quebec, April 9-12, 2008.
46. Hobert JA, Chatel A, Hemming R<sup>^</sup>, **Triggs-Raine B**, Natowicz MR, Merz DC. The C. elegans Hya-1 mutant: insights for human hyaluronidase and MPS IX. 57th Annual Meeting of the American Society of Human Genetics, San Diego CA, October, 2007.
47. Srinivasan G, Atmuri V\*, Basu S, **Triggs-Raine B**. Airway hyperresponsiveness in acute allergen sensitized and challenged hyaluronidase-3 knockout mice is influenced by gender. 2007 Pediatric Academic Societies' and Eastern PSR Annual Meetings, Toronto, ON, May, 2007.
48. **Triggs-Raine BL**, Hemming RJ<sup>^</sup>, Martin DC\*, Slominski E, Nagy JI, Pind S. Mouse HYAL3 encodes a 45-56 kDa glycoprotein whose stable overexpression increases HYAL1 activity. Hyaluronan 2007, Charleston, SC, April, 2007.
49. Martin DC\*, Atmuri V\*, Hemming RJ<sup>^</sup>, Stern R, **Triggs-Raine BL**. Mice deficient in hyaluronidase 1 (HYAL1) do not model mucopolysaccharidosis IX. Hyaluronan 2007, Charleston, SC, April, 2007.
50. Atmuri V\*, Martin D\*, Byers S, Hemming RJ<sup>^</sup>, Mort JS, Anderson J, **Triggs-Raine BL**. Generation and characterization of hyaluronidase 3 (HYAL3) deficient mice. Hyaluronan 2007, Charleston, SC, April, 2007
51. Jadin L, Wu X, **Triggs-Raine B**, Ding H, Flamion B. Generation and characterization of a Hyaluronidase 2 (HYAL2) knockout mouse. Hyaluronan 2007, Charleston, SC, April, 2007.
52. Atmuri V\*, Martin D\*, Byers S, Hemming R<sup>^</sup>, Mort J, Anderson J, and **Triggs-Raine B**. Generation and characterization of a Hyaluronidase 3 Deficient Mouse Model. World Organization for Research in Lysosomal Disorders, Orlando, Florida, December 2006.
53. Natowicz MR, Martin DC\*, Mark BL and **Triggs-Raine B**. Evaluation of the risk for Tay-Sachs Disease in individuals of French Canadian ancestry living in New England. 56th Annual Meeting of the American Society for Human Genetics, New Orleans, LO, October 9-13, 2006.
54. Martin D\*, Atmuri V\*, Hemming R<sup>^</sup> and **Triggs-Raine B**. Characterization of a Hyaluronidase 1 Deficient Mouse Model. 45th Annual Meeting of the Am. Soc. Cell Biol., San Francisco, CA December 10-14, 2005.
55. Chudley AE, and **Triggs-Raine B**. Chudley-McCullough Syndrome. A review and report on two newly identified families. 26th Annual David W. Smith Workshop on Malformation and Morphogenesis, Iowa City, Iowa, August 2-5, 2005. Proc of the Greenwood Genetics Centre.
56. Atmuri V\*, Martin DC\*, Hemming R<sup>^</sup>, Byers S, and **Triggs-Raine B**. Characterization of Hyaluronidase 3 (Hyal3) Deficient Mice. Cancer Research Across the Spectrum: National Meeting for Trainees, Quebec, May 9-11, 2005.

57. Atmuri V\*, Martin DC\*, Anderson J and **Triggs-Raine B**. The generation and characterization of a hyaluronidase 3 (Hyal3) Knockout Mouse. Canadian Genetic Diseases Network Annual Scientific Meeting, 2004.
58. Patel N\*, Hemming R<sup>^</sup>, Slominski E, Pind S. and **Triggs-Raine B**. Processing and targeting of HYAL1, the enzyme deficient in Mucopolysaccharidosis-IX. Canadian Genetic Diseases Network Annual Scientific Meeting, 2004.
59. **Triggs-Raine B**, Hemming R<sup>^</sup>, Martin D\*, Patel N\*, Salo T<sup>^</sup>, Dyck T\*, Slominski E, Natowicz M, and Pind S. Hyaluronidases: Toward unravelling the function of the individual gene family members. Hyaluronan 2003, Cleveland, OH.
60. Wicklow B\*, Salo T<sup>^</sup>, Steiner R, and **Triggs-Raine B**. Identification and characterization of the molecular basis of  $\beta$ -hexosaminidase deficiency in an atypical case of GM2 gangliosidosis. University of Manitoba, Proceedings, Bachelor of Science in Medicine, 2001.
61. Natowicz MR and **Triggs-Raine B**. Mucopolysaccharidosis IX: An update on this hyaluronidase deficiency disorder and the complexity of the organization of the hyaluronidase genes. Strategies for Therapy of MPS and Related Diseases, June 21-24, UCLA, 2001.
62. Shuttleworth T\*, Wicklow B\*, and **Triggs-Raine B**. Characterization of Hyal1, the mouse homolog of the enzyme deficient in Mucopolysaccharidosis IX. Strategies for Therapy of MPS and Related Diseases, June 21-24, UCLA, 2001.
63. Badiani K\*, Hemming R\*, Gietz RD, and **Triggs-Raine B**. Effect of overexpression of hGrb14 on Akt kinase and insulin signaling. American Diabetes Association, Texas, 2000.
64. Shuttleworth T\*, Wicklow B\*, **Triggs-Raine B**. Characterization of the mouse Hyal1 gene encoding hyaluronidase 1. Human Genome Meeting, Vancouver, B.C, 2000.
65. Badiani K\*, Hemming R\*, **Triggs-Raine B**. Effect of overexpression of hGrb14 on insulin signalling. Canadian Federation of Biological Societies 42nd Annual Meeting, Winnipeg, MB 1999.
66. **Triggs-Raine B**, Salo T<sup>^</sup>, Wicklow B\*, Natowicz M. Mutations in the gene for hyaluronidase 1 cause Mucopolysaccharidosis (MPS) IX. Canadian Federation of Biological Societies 42nd Annual Meeting, Winnipeg, MB, 1999. Invited Speaker.
67. **Triggs-Raine B**, Hemming R\*, Agatep R\*, Badiani K\*, Wyant K\*, Arthur G, and Gietz RD. Interaction of the human Grb14 adaptor protein with the activated insulin receptor. Can. J. Diabetes Care 22 A34
68. Mark B\*, Salo T<sup>^</sup>, Cao Z\*, and **Triggs-Raine B**. Characterization of *Streptomyces plicatus*  $\beta$ -hexosaminidase through site directed mutagenesis. 17th International Congress of Biochemistry and Molecular Biology, San Francisco, California, 1997.
69. Robbins A, Graham KC, Gietz RD, **Triggs-Raine B**. The identification of specific proteins that interact with the cytoplasmic kinase domain of the human insulin receptor in the yeast two-hybrid system. Canadian Genetics Society, Winnipeg, 1996.
70. Salo T<sup>^</sup>, Cao Z\*, **Triggs-Raine B**. Characterization of a *Streptomyces*  $\beta$ -hexosaminidase homologous to human  $\beta$ -hexosaminidase. Canadian Genetics Society, Winnipeg, 1996.
71. Petroulakis E\*, Cao Z\*, **Triggs-Raine B**. Characterization of a mutant Hex A isoenzyme associated with late-onset Tay-Sachs disease. Canadian Genetics Society, Winnipeg, 1996.
72. Cao Z\*, Petroulakis E\*, Salo T<sup>^</sup>, **Triggs-Raine B**. Transient expression of  $\beta$ -hexosaminidase pseudodeficiency mutations, R247W and R249W, allows them to be readily differentiated from disease-causing mutations. Canadian Genetics Society, Winnipeg, 1996.
73. Gietz RD, Robbins A, Cheng A\*, Waring J, Korneluk RG, **Triggs-Raine B**. The identification of proteins that interact with the myotonic dystrophy DM kinase. Canadian Genetics Society Winnipeg, 1996.
74. Wicklow B\*, Petroulakis E\*, Jerome C\*, Dakshinamurti K, **Triggs-Raine B**. Characterization of an Asp444His substitution associated with partial biotinidase deficiency. Canadian Genetics Society, Winnipeg, 1996.
75. Jerome C\*, Robbins A, Gietz RD, **Triggs-Raine B**. The identification of proteins interacting with the insulin-receptor using the yeast two-hybrid system. Canadian Genetics Society, Winnipeg, 1996.

76. Knells G\*, Graham K, Robbins A, Rennie S, **Triggs-Raine B**, Gietz RD. Development of a "Kinase-ON/OFF" yeast two hybrid screening system. NCE Genetics, Vancouver, 1996.
77. Richard M\*, Natowicz M, **Triggs-Raine BL**. Molecular characterization of a novel HEXA mutation at the +3 position of intron 8 in a Tay-Sachs disease patient. Am J Hum Genet. 55 (Suppl): A363, 1994.
78. Petroulakis E\*, Cao Z\*, Salo T<sup>^</sup>, Clarke J, **Triggs-Raine BL**. A Trp474Cys mutation in the alpha-subunit of beta-hexosaminidase causes a subacute encephalopathic form of GM2 Gangliosidosis, Type I. Am J Hum Genet 55 (Suppl): A363, 1994.
79. **Triggs-Raine B**, Prence E, Richard M\*, Wasel N\*, Natowicz M. Molecular analysis of  $\beta$ -hexosaminidase A (Hex A) deficiency among persons of French-Canadian background living in New England. Am J Hum Genet 55 (Suppl): A246, 1994
80. Cao Z\*, Petroulakis E\*, Salo T<sup>^</sup>, **Triggs-Raine B**. Expression of the benign HEXA mutations, Arg247Trp and Arg249Trp, associated with  $\beta$ -hexosaminidase A pseudodeficiency. Am J Hum Genet 55 (Suppl): A215.
81. Phaneuf D, Gerytz A, **Triggs-Raine B**, Trasler J, Marth J, Gravel RA. Inactivation of the  $\beta$ -subunit of lysosomal  $\beta$ -hexosaminidase by targeted disruption of the HEXB gene in mice. Am J Hum Genet 55 (Suppl): A235, 1994.
82. Wakamatsu N, Gertz A, Trasler JM, **Triggs-Raine B**, Marth J, Gravel RA. Cloning characterization and targeting of the mouse HEXA gene. Am J Hum Genet 55 (Suppl): A248, 1994.
83. Murphy LC, Dotzlaw H, Coutts A, **Triggs-Raine B**. Insertion mutations in the estrogen receptor mRNA of some human breast cancer biopsy samples. The Endocrine Society Meeting, 1994.
84. Richard M\*, **Triggs-Raine BL**. Characterization of the molecular basis of  $\beta$ -hexosaminidase deficiency in a Tay-Sachs disease patient. PUBS, 1994.
85. Wasel N\*, Cao Z\*, Richard M\*, Natowicz M, **Triggs-Raine BL**. Tay-Sachs disease risk in Franco-Americans. (Midwest Medical Research Forum XXV, Omaha, 1994 and Clin Res 42:4394.
86. Akerman BR, Zielenski J, **Triggs-Raine BL**, Prence EM, Natowicz M, Lim-Steele JST, Kaback MM, Mules EH, Thomas GH, Clarke JTR, Gravel RA. A mutation common in non-Jewish Tay-Sachs disease: frequency and RNA studies. Am J Hum Genet 51: A164, 1992.
87. Greenberg CR, Taylor CLD, Haworth JC, Philipps S, Seargeant LE, **Triggs-Raine B**, Chodirker BN. Detection of mutations causing Hypophosphatasia in Canadian Mennonites. Am J Hum Genet 51: A169,1992
88. **Triggs-Raine BL**, Natowicz MR, Kaback MM. Identification of a second mutation associated with  $\beta$ -hexosaminidase A pseudodeficiency. Am J Hum Genet 51: A179, 1992.
89. Greenberg CR, Taylor CLD, Haworth JC, Seargeant LE, **Triggs-Raine B**, Chodirker BN. Detection of mutations causing hypophosphatasia in Canadian Mennonites. Clin Invest Med 15:(supp) A524, 1992.
90. **Triggs-Raine BL**, Gravel RA. Characterization of the mouse HEXB Gene. Can Fed of Biol Soc 35th Annual Meeting, Victoria, 1992.
91. **Triggs-Raine BL**, Akerman BR, Clarke JTR, Gravel RA. Screening for mutations causing Tay-Sachs disease by heteroduplex analysis: Identification of a deletion in intron 9 of HEXA that results in aberrant splicing. Am J Hum Genet 47: A942, 1990.
92. **Triggs-Raine BL**, Feigenbaum ASJ, Skomorowski MA, Natowicz M, Kolodny E, Clarke JTR, Mahuran DJ, Gravel RA. Ashkenazi Tay-Sachs disease: Comparison of DNA- and enzyme-based methods for carrier testing. Am J Hum Genet 45: A226, 1989.
93. **Triggs-Raine B**, Feigenbaum A, Gravel R, Mahuran D. Mutations in the GM2 gangliosidoses (Tay-Sachs and Sandhoff Disease). 8th International Congress of Clinical Enzymology, Toronto, Canada, 1989.
94. Loewen P, **Triggs-Raine B**, Smolenski M, and Switala J. Identification of amino acid changes affecting the activity of hydroperoxidase I. Can Fed of Biol Soc 32nd Annual Meeting, Calgary, 1989.
95. **Triggs-Raine BL**, Loewen PC. Nucleotide sequence and precise genomic location of katG encoding the *Escherichia coli* catalase HPI. North Western Molecular Biology Conference. Banff, Alberta. 1988.
96. Doble BW, **Triggs-Raine BL**, and Loewen PC. Precise genomic location of katG encoding the *Escherichia coli* catalase HPI. PUBS 22nd Annual Meeting, Winnipeg, 1988.

97. **Triggs-Raine BL**, Loewen PC, and Duckworth HW. DNA sequence analysis of *katG* encoding catalase HPI of *Escherichia coli*. Can Fed of Biol Soc 30th Annual Meeting, Winnipeg, 1987.
98. **Triggs-Raine BL**, Loewen PC. The physical characterization of *katG* encoding catalase HPI. Can Fed of Biol Soc 29th Annual Meeting, Guelph, 1986.
99. **Triggs B**, Smolenski M, and Loewen PC. Physical characterization of a novel catalase HPII in *Escherichia coli*. Can Fed of Biol Soc 27th Annual Meeting, Saskatoon, 1984.

#### E) INVITED PRESENTATIONS (Selected)

1. A Manitoba journey: from gene identification to gene therapy in unique populations, 20th Annual Child Health Research Days, October 22, 2024.
2. Development of a therapy for GM2. NTSAD Annual Family Conference, April 12, 2024.
3. My career in science. In celebration of Women's History Month, St. Mary's Academy, Winnipeg, Manitoba, March 5, 2024.
4. Hyaluronan in genetic development and disease. Department of Chemistry, Brandon University, March 21, 2023.
5. Services offered by the animal imaging and transgenic cores, University of Manitoba, August 31, 2022.
6. CRISPR/Cas9-a revolution in gene editing. Canadian Association of Genetic Counsellors Annual Education Conference, Winnipeg Manitoba, Sept. 11-14, 2019.
7. CRISPR/Cas9- a revolution in gene editing. Let's Talk Science- Genetalks, Winnipeg, May 14, 2019.
8. Characterization of mutations causing human hyaluronidase 2 deficiency. HA 2019, Cardiff, United Kingdom, June, 2019.
9. Hyaluronan: an apparently simple inert polysaccharide is a critical player in normal development. Canadian Glycomics Symposium, Banff, AB, May 15-17, 2019.
10. Short presentation and Panel Discussion. International Women's Day presented by WISDOM: Women in Science Development, Outreach & Mentoring, Canada Inns Destination Centre, Winnipeg, MB, March 8, 2019.
11. Hyaluronan degradation by *hyal2* in human and mouse development. Gordon Research Conference on Proteoglycans, July 8-13, 2018.
12. Hyaluronidase 2 is essential for normal heart development. Cardiovascular Medicine Grand Rounds, Louisville, Kentucky, April 11, 2018.
13. Using CRISPR to modify the mouse genome. Pharmacology Seminar Series, University of Manitoba, Jan 19, 2018.
14. CRISPR technology in gene editing, BrEath Seminar Series, Children's Hospital Research Institute of Manitoba, Oct 27, 2017.
15. Hyaluronidase 2 is essential for normal vertebrate development. Hyaluronan 2017, Cleveland OH, June 13, 2017.
16. CRISPR Technology in Gene Editing, in Lentiviral Vector Viral Particles Research Workshop, Jan. 27, 2017.
17. Hyaluronidase deficiency: A novel cause of syndromic cleft palate, Department of Physiology and Pathophysiology, University of Manitoba, Nov. 30, 2016.
18. Using CRISPR to create transgenic mouse models, 2nd Annual CRISPR workshop, Winnipeg, MB, Oct. 26, 2016.
19. Pathogenesis of, and therapeutic approaches for, hyaluronidase 2 (HYAL2) deficiency, GlycoNet 2016, Banff, AB, May 18, 2016.
20. Are hyaluronidases targets for cancer prevention? 6th Dependence Receptor Meeting (DepRec 2015), Tumor Microenvironment, Signaling and Dependence. Tianjian, China, April 7-10, 2015.
21. Devising a model for hyaluronan degradation through the study of enzyme deficiency states. The Manitoba Group in Protein Structure and Function Seminar Series. February 18, 2015.
22. Hyaluronan Degradation at Hyaluronan Guest Symposium, American Society of Matrix Biology, Cleveland, Ohio, Oct 12, 2014

23. Tissue distribution and function of murine hyaluronidase 2 (HYAL2), Hyaluronan 2013, Oklahoma City, Oklahoma, June 7, 2013.
24. Hyaluronidases: Toward unravelling the function of the individual gene family members. Hyaluronan 2003, Cleveland, OH, 2003.
25. What does the mapping of the human genome really mean?, Get to Know Research at your University, Winnipeg Art Gallery, April 27, 2003
26. Mucopolysaccharidosis IX: An update on this hyaluronidase deficiency disorder and the complexity of the organization of the hyaluronidase genes. Strategies for Therapy of MPS and related diseases, UCLA, June 21-24, 2001.
27. Identifying protein partners in insulin signaling, Dept. Zoology, University of Manitoba, February, 1998.
28. Benign mutations in Tay Sachs Screening, Dept. Anatomy, University of Manitoba, November, 1993.

## PROFESSIONAL SERVICE & ADMINISTRATION

### A) INTERNATIONAL

2023-pres	Co-Chair, HA 2025 Program Committee
2022-2023	Member, HA 2023 Program Committee
2021-pres	Chair, Web Site Management Committee, ISHAS
2021	Promotion Review for Case Western Reserve University School of Medicine

### B) NATIONAL AND PROVINCIAL

2023-2025	Member, Genomics and Bioinformatics Operations Committee, Shared Health/Cancer Care/University of Manitoba
2022	Member, Search Committee, CancerCare Manitoba Research Institute
2018	Symposium Chair, Annual Glycomics Symposium, Banff, AB 2018
2017-2020	Member, Children's Hospital Research Institute of Manitoba Nominating & Governance Committee
2017-2019	Member, Space Committee, Children's Hospital Research Institute of Manitoba
2016-2017	Member, Planning Committee for Canadian Glycomics Symposium, Banff, AB 2017
2015	External Reviewer, Promotion Evaluation, McMaster University
2004-2010	Member, JBRC 6th Floor Planning Committee, Manitoba Inst. for Child Health
1996-2001	Member, Training Committee, Canadian Genetic Diseases Network
1996-2001	Member, Planning and Priorities Committee, Canadian Genetic Diseases Network
1998	Member, Organizing Committee, 1998 CFBS Genetics Symposium
1991-pres	Member, CAWIS (Manitoba Chapter) now WISDOM (Women in Science, Development, Outreach, and Mentoring at University of Manitoba)

### C) LOCAL AND UNIVERSITY

#### i) University

2023-2025	Member, U of Manitoba Academic Hiring Improvement Committee
2023	Member, Oral Biology Program Review Committee
2022-pres	Member, Senior Scholars Working Group
2022	Member, Search Committee for Dean, Rady Faculty of Health Sciences & Max Rady College of Medicine
2022	Member, Responsible Conduct of Research –Investigation Committee
3032	Member, Search Committee, Associate Vice-President Research
2020	Member, Canada Research Continuity Emergency Fund Committee
2016-2022	Member, Animal Care Education Committee
2016-2017	Member, Microbiology Search Committee
2015-2023	Member, University Committee on Animal Care
2010-2022	Member, CFI Advisory Committee
2009-2012	Member, Animal Protocol Management Review Committee

2009 Member, Microbiology/Chemistry Program Review Committee  
2007-2008 Observer, CFI Advisory Committee  
2007 Member, Program Review Team, Department of Immunology  
2004-2007 Member, Bannatyne Campus Health Research Ethics Board  
1999 Member, Review Committee for Head, Department of Chemistry  
1999 Member, Search Committee, Assistant Professor, Department of Microbiology  
1998-2000 Member, Faculty Council, Graduate Studies  
1998 Member, Search Committee, Dept. of Microbiology

**ii) Rady Faculty of Health Sciences/Max Rady College of Medicine**

2024-pres Member, School of Biomedical Sciences Working Group  
2024 Member, Search Committee, Head of Department of Immunology  
2024 Member, Search Committee, CRC Tier 1 Clinical Trials  
2023-2025 Member, Dept Pediatrics & Child Health Promotion Committee  
2023-2025 Member, Research Advisory Committee Executive, RFHS  
2023 Member, Tenure and Promotion Committee, College of Dentistry  
2023 Member, College of Medicine 140<sup>th</sup> Anniversary Committee  
2022-pres Member, Royal College Residency Programs-Research Committee  
2021 Member, Search Committee for Pharmacology & Therapeutics Head of Department  
2020-2021 Member, Search Committee, Director for Proteomics and Systems Biology  
2019 Member, Search Committee for Anatomy Head of Department  
2019 Member, Search Committee for Immunology Head of Department  
2018-pres Member, CCMG Fellowship Committee  
2018 Member, Search Committee for Pediatrics & Child Health Head of Department  
2018-2023 Member, Complex Data Implementation Committee  
2018-2025 Member, College Executive Council, Max Rady College of Medicine  
2018-2025 Member, RFHS Graduate and Post-Doctoral Studies Discussion Group  
2018-2025 Member, Department Heads Council  
2017 Member, Anatomy Search Committee  
2016-2025 Member, Research Advisory Committee  
2016-2022 Chair, Local Animal Users Committee  
2013-2014 Member, Search Committee, Bihler Chair in Regenerative Medicine  
2013-2014 Member, Graduate Excellence in Education Committee  
2011-2012 Member, Search Committee, Dept. Physiology, Faculty of Medicine  
2011-2014 Member, Search Committee, GSK Chair, Faculty of Medicine  
2010-2016 Member, Local Animal Users Committee, Faculty of Medicine  
2010 Member, Accreditation MS Standards Subcommittee  
2005 Member, Medical Student Interview Committee for Admissions  
2004-2014 Member, Genetic Modelling Centre User Group, Faculty of Medicine  
2004-2013 Member, Student Appeals Committee, Faculty of Medicine  
2004-2006 Member, Ad-Hoc Committee for Review of Tenure and Promotion Guidelines  
2004-2005 Member, Biochemistry & Medical Genetics Dept. Head Search Committee  
2002-2004 Member, Search Committee (x3), Dept. of Immunology  
2002-2016 Member, Dean's Nominating Committee, Faculty of Medicine  
1999 Member, Search Committee for Head of Biochemistry & Medical Genetics  
1998-2001 Member, Faculty of Medicine Graduate Student Committee  
1998-1999 Member, Search Committee, Assistant Professor, Dept. of Medical Microbiology  
1997 Member, Search Committee, Assistant Professor, Dept. of Oral Biology  
1991-pres Member, Faculty Council

**iii) Department of Biochemistry & Medical Genetics**

2024	Chair, 25 <sup>th</sup> Anniversary and Homecoming Planning Committee
2023	Chair, Search Committee, Instructor
2022-2023	Chair, Search Committee, Assistant/Associate Professor
2022	Chair, Search Committee, Instructor
2021-2022	Chair, Search Committee, Assistant Professor
2020-2021	Chair, Search Committee, Assistant Professor
2017-2018	Member, Search Committee, Assistant Professor
2017	Chair, Search Committee, Genetic Counselling Program Director
2011-2012	Member, Search Committee, Assistant Professor
2007-2011	Chair, Appointments, Promotions and Tenure Committee
2006-2008	Chair, Community Building Task Force
2005	Member, Search Committee, Assistant Professor
2003	Member, Search Committee, Assistant Professor
2000-2001	Chair, Graduate Program Merger Committee
1999	Member, Search Committee, Vascular Research Group Assistant Professor
1998-2001	Chair, Graduate Student Affairs Committee
1998	Member, Search Committee, Breast Cancer Research Group Assistant Professor
1998	Volunteer, Scitrek'98
1997-1999	Member, Graduate Acceptance Committee, Dept. Human Genetics
1995	Member, Search Committee, Dept. Biochemistry & Molecular Biology
1992-2006	Member, Graduate Student Acceptance Committee, Dept. Biochem/Mol Biol
1991-1995	Member, Med I Teaching Committee, Dept. Biochemistry & Molecular Biology
1991-pres	Member, Department Council

#### D) EDITING and MANUSCRIPT REVIEW

2024/2025 Guest Editor- Cells Special Issue "Role of Hyaluronan in Human Health and Disease".  
**Peer-Reviewed Articles for:** Nature Communications, American Journal of Human Genetics, American Journal of Medical Genetics, BMC Genetics, BMC Medical Genetics, Brain and Behavior, Canadian Journal of Physiology and Pharmacology, Cardiology in the Young, European Journal of Human Genetics, Gene, Gene Therapy, Glycobiology, Matrix Biology, Molecular Genetics and Metabolism, Molecular and Cellular Biochemistry, Mutation Research, Orphanet Journal of Rare Diseases, Pediatric Neurology, Plant Biotechnology Journal, PLoS One, Journal of Biological Chemistry, Mutation Research

#### E) RESEARCH GRANT REVIEW

2022	Member, Thorlakson Foundation Scientific Review Committee
2021-2023	Member, NSERC-DG Internal Grant Review Committee
2021-2024	Member, Clinical Investigation A: Reproduction, Child and Youth Health Panel, CIHR
2019	Member, Genetics G Panel, CIHR
2017	Reviewer, FNRS
2017	Member, Foundation Review Stage 1, CIHR
2017-2020	Member, Panel 1501 Genes, Cells & Molecules, NSERC
2016-1017	Chair, Bridge Grants Competition, Research Manitoba
2016	Reviewer, Ohio Cancer Research Associates
2016	Member, Internal Grants Competition, University of Manitoba
2016, 2018, 2024	External Reviewer, Catalyst Grants, Canadian Glycomics Network
2014-2015	Member, Strategic Investments in Research and Innovation, Research Manitoba
2014	Scientific Officer, Manitoba Research Chairs, Manitoba Health Research Council
2013	Member, Team Grant, Health Challenges in Chronic Inflammation, CIHR
2013-2017	Member, Projects, Grants & Awards Committee, Cancer Care Foundation
2010-2012	Member, Genetics Panel, CIHR
2007-2010	Member, Thorlakson Foundation Scientific Review Committee

2008	Member, Manitoba Institute for Child Health Grant Review Committee
2008	Member, Manitoba Health Research Council Grant Review Committee
2007	Member, Genetics Panel, CIHR
2004-2007	Member, Genetics Special Project Grants, CIHR
2003	Member, Manitoba Institute of Child Health Grant Review Committee
1999-2002	Member, University of Manitoba Grants Review Committee
1999-2001	Member, Manitoba Cancer Care Foundation Scientific Advisory Committee
1999-2001	Member, Manitoba Health Research Council Review Committee
1999	Reviewer, The Hospital for Sick Children, Toronto, ON
1998-2000	Member, Grants Review Committee, Canadian Diabetes Association
1996-pres	<i>Ad Hoc</i> Reviewer, National Science & Engineering Research Council
1996-2004	Member, Core Facilities Review and Training Committees, Canadian Genetics Diseases Network
1995-1998	Member, Genetics Panel, Medical Research Council of Canada
1993-1995	Member, Grants Review Panel, Sellers' Foundation

#### F) PERSONNEL AWARDS REVIEW

2025	External Review, NSERC: Arthur B. McDonald Fellowships
2024	Member, Aubie Angel/Ken Hughes Awards
2022	Member, Dr. Forough Khadem Scholarship Review Committee
2018	Member, Selection Committee for Samuel Weiner Distinguished Visitor Award
2018	Member, Henry G. Friesen Chair Renewal Review Committee
2014	Member, Review Committee, Henry Friesen Research Chair
2010	Member, Major Students Award Committee, U. of Manitoba
2007-2010	Member, New Investigators A/B/C Committees, CIHR
2006	Member, BSc(Med) Prize Committee
2004-2007	Chair, Women's Health Research Foundation Awards Committee
2003	Member, Women's Health Research Foundation Awards Committee
2002-2006	Member, CIHR Training in Innovative Technologies Annual Review Committee
2001-2002	Member, Alberta Heritage Foundation Scholarship Advisory Committee
1998-2000	Member, BSc (Med) Prize Committee

#### G) ADDITIONAL SERVICE (Selected)

2024	Poster Judge, Canadian Society for Molecular Biosciences, Winnipeg, June 7, 2024
2024	Poster Judge, Biochemistry & Medical Genetics Annual Research Day, June 10, 2024
2024	Poster Judge, Enrich Research Day, October 1, 2024
2024	Judge, Dr. GoodBear's Den, Child Health Research Days, 2024
2023	Poster Judge, Graduate Studies 75 <sup>th</sup> Anniversary, November 30, 2023
2015-2023	Poster Judge, Child Health Research Days
2018	Poster Judge, Manitoba Undergraduate Healthcare Symposium
2018	Poster Judge, University of Manitoba Undergraduate Posters
2010	Poster Judge, Canadian Student Health Research Forum
2009-2010	Member, Residents Research Day Review Committee
2009	Judge, Pediatric Residents' & Fellows' Research Competition
2005	Judge, Pediatric Residents' and Fellows' Research Competition

#### H) FORMAL MENTORSHIP (Selected)

2020-2024	Member, Mentorship Committee for Dr. Kaarina Kowalec
2017	University of Manitoba Career Mentor Program- Jisoo Han
2015-2017	CHRM Mentorship Program: Mentee – Dr. Carrie Daymont

#### I) INTERVIEWS (Selected)

2024	Celebrating 25 years of innovation in the department of biochemistry & medical genetics, UM News, Rady Faculty of Health Sciences
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2024 Ntsad.org/GM1-and Gm2-Infantile-and-juvenile-research-breakout summary  
 2019 Misprint, An article on research into the genetics of unique populations of Manitoba, University Alumni Magazine UM Today  
 2017 Many questions, few answers: no strength in numbers for families of children diagnosed with rare diseases. Sept. 30, 2017 Winnipeg Free Press  
 2015 So what can you do with a science degree? UM News, Faculty of Science  
 2009 Researchers hope discovery helps cure genetic disorder. May 29, 2009 Winnipeg Free Press  
 2002 U of M researchers to share \$3 million. April 12, 2002 Winnipeg Free Press

**PROFESSIONAL DEVELOPMENT (Selected; U of Manitoba unless otherwise stated)**

2024 Biosafety Permit Administration  
 2024 Accessibility Training- Information and Communication Standard  
 2023 University Governance for Department Heads  
 2023 Supporting International Students, Faculty of Graduate Studies  
 2023 Manitoba Indigenous Cultural Safety Training (MICST)  
 2023 Indigenous Health, Social Justice, and Anti-racism, Departmental Teaching Retreat, June 16  
 2022 4-Seasons of Reconciliation, Special Campaign 2022, First Nations University  
 2022 Self-Assessment and Readiness for Difficult Conversations with Students, November 17  
 2022 A Path to Reconciliation with the NCTR-Part 2: Inuit and Metis experiences in Indian Residential Schools  
 2022 A Path to Reconciliation with the NCTR-Part 1: Historical Overview, October 5  
 2022 Conversations on Inclusive and Anti-Racist pedagogies: Islamophobia in Teaching and Learning, The Centre for the Advancement of Teaching and Learning, September 29  
 2022 Financial Stewardship & Ethical Conduct  
 2022 RFHS Network for Women Leaders (September to December)  
 2022 An Improved Solution for Generating Large CRISPR HDR Knock-ins, March 22  
 2022 Equity in Science: Allies With a Common Goal, Rady EDI, January 27  
 2021 Micro-credentials- II: Focus on Pre-Professional Programs and Practitioners, October 8  
 2021 Accessibility Training- Information Relating to Responsibilities when Leading, Coordinating or Monitoring Others  
 2021 Accessibility Training- Recruitment & Selection  
 2021 Accessibility Training- Introduction to the Regulation  
 2021 Micro-credentials: An Overview from a National and UM Perspective, July 23  
 2021 You're Richer Than You Think: Your Role in Utilizing Endowed Donor Funds, April 23  
 2021 Creating Animations with Powtoon, February 26  
 2021 Academic Career Advancement, Rady Faculty of Health Sciences, February 23  
 2021 Embedding Videos, Biochemistry Faculty Development Workshop, February 19  
 2021 Podcasting, Biochemistry Faculty Development Workshop, February 12  
 2020 Writing Effective EDI Statements, November 9  
 2020 Communication Tools on UMLearn  
 2020 Writing Learning Objectives, Office of Educational and Faculty Development  
 2019 Workshop for Academic Administrators  
 2019 Conducting Effective Performance Evaluations, Workshop for Academic Administrators  
 2018 The UMFA Collective Agreement, Workshop for Academic Administrators  
 2018 UMLearn DayLight Workshop  
 2017 Accessibility Training- Customer Service  
 2015, 2020 UMLearn Content Workshop  
 2015 UMLearn Course Set-Up Workshop  
 2015 Financial Essentials for Directors, Crown Corporations Council, Winnipeg

2015           Illustrator MUME 1085, Red River Community College, Winnipeg  
2014           Board Performance Training, Crown Corporations Council, Winnipeg  
2003           Principles of Microscopy and Imaging CIHR Strategic Training Program  
1999           Teaching Improvement Program Workshop