

Russell S. Fraser, BSc, MSc, DVM, PhD

4-43 Queen Street  
Guelph, Ontario  
N1E 4R5  
Canada  
rfrase03@uoguelph.ca  
mobile: 519-803-0268  
[rfraser.shinyapps.io/shiny\\_cv](http://rfraser.shinyapps.io/shiny_cv)

## EDUCATION

---

- |             |  |
|-------------|--|
| 2018        | <b>Doctor of Philosophy</b><br>Ontario Veterinary College, University of Guelph  |
| 2012 – 2014 | <b>Doctor of Veterinary Science</b> (transfer to PhD 2014/05)<br>Ontario Veterinary College, University of Guelph<br><i>Anatomic Pathology</i> |
| 2012        | <b>Master of Science</b> , One Health (with First Class Honours)<br>Royal (Dick) School of Veterinary Studies, University of Edinburgh         |
| 2008        | <b>Doctor of Veterinary Medicine</b> (with distinction)<br>Ontario Veterinary College, University of Guelph                                    |
| 2004        | <b>Bachelor of Science, Honours</b> (with distinction)<br>University of Guelph   |

## TEACHING AND MENTORING EXPERIENCE

---

- |             |  |
|-------------|--|
| 2018/02/06  | <b>Guest Lecturer</b><br>Gene Expression in Health & Disease, BIOM*6800, University of Guelph <ul style="list-style-type: none"><li>• Lectured in a graduate course on the effects of genetic variation on innate immune resistance to infectious diseases of livestock.</li></ul>   |
| 2012 – 2017 | <b>Resident in Anatomic Pathology</b><br>Dept. of Pathobiology, Ontario Veterinary College, University of Guelph <ul style="list-style-type: none"><li>• Guided final year DVM students through the process of the postmortem examination of common veterinary species, including interpretation of clinical histories, formation of differential diagnoses, proper necropsy technique, and interpretation of gross and histopathological lesions.</li><li>• Evaluated seminar presentations by final year DVM students on various topics in veterinary pathology.</li></ul> |
| 2017/10/04  | <b>Guest Lecturer</b><br>Agricultural Animal Physiology, ANSC*3080, University of Guelph   |

- Presented a 1 hour lecture to approximately 100 undergraduate students emphasizing the role of physiology in the understanding of pathology. Content was delivered through case examples.
- 2017/05/04      **COESP Day: Engaging Your Students**
- Attended a one day conference outlining strategies to implement active learning in both small and large classroom settings.
- 2017/03      **Lecturer**  
Mechanisms of Disease, PABI\*6104, University of Guelph
- Three hours of lecture in a graduate course on next-generation sequencing technologies, their application to research, and the genetic basis of disease.
  - Included writing and marking exam questions.
- 2017/01 – 2017/04      **Graduate Teaching Assistant**  
PATH\*3610, University of Guelph
- Handled questions from an undergraduate class of approximately 400 students on the pathologic basis of disease. Duties included monitoring online message boards, invigilating and marking exams.
- 2017/03      **Pathology Mentor (volunteer)**
- Instructed 2<sup>nd</sup> year DVM members of the OVC Pathology Club and the OTS Fraternity in an after-hours wet-lab.
- 2016      **Pathology Mentor (volunteer)**
- Demonstrated specimens in a pathology wet-lab for DVM students during the 2016 SCVMA conference.
- 2013 – 2016      **Pathology Mentor (volunteer)**
- Taught the basics of a post-mortem examination to members of the OVC Pathology club who were in their 1<sup>st</sup> year of the DVM program.
- 2016      **Graduate Student**  
Dept. Pathobiology, Ontario Veterinary College, University of Guelph
- Supervised Elizabeth MacMillen, a 2<sup>nd</sup> year DVM student. Delivered instruction in laboratory and bioinformatic techniques.
- 2014      **Graduate Student**  
Dept. of Pathobiology, Ontario Veterinary College, University of Guelph
- Supervised Kristen Dienst, a BSc summer student. This included instruction in laboratory techniques and the creation of a scientific poster.
- 2014 – 2016      **Graduate Teaching Assistant (grading)**  
PATH\*3610, University of Guelph
- Graded a portion of the mid-term and final examinations for a class of approximately 500 undergraduate students.
- 2013      **Graduate Student**  
Dept. of Pathobiology, Ontario Veterinary College, University of Guelph

- Supervised Kathryn Reynolds, a BSc summer student. This included instruction in laboratory techniques and the creation of a scientific poster.

2011

**Demonstrator in Histology**

Royal (Dick) School of Veterinary Studies, University of Edinburgh

- Instructed 1<sup>st</sup> year DVM students in the basic recognition of histological sections.

## CLINICAL EXPERIENCE

---

2012 – Present

**Resident in Anatomic Pathology**

Ontario Veterinary College, University of Guelph, Ontario

- Performed gross and histopathological postmortem examinations on common domestic species. Ordered ancillary testing when necessary.
- Trimmed and performed histopathological interpretation of biopsy specimens (routine H&E, IHC, and various special stains) from the OVC-VTH.
- Delivered concise and timely pathology reports to clinicians at the OVC-VTH. Communicated when necessary with clinicians before, during, and after the microscopic examination of biopsy specimens.

2009 – 2011

**Associate Veterinarian**

Animal Health Clinic, Montreal, Québec

- Confidently practiced small animal medicine, including surgery, internal medicine, radiology, critical care and emergency medicine, and cytology.
- Emphasis placed on clear communication skills with clients and staff.
- Worked closely with small animal shelters to help manage and prevent spread of contagious disease.

2010 – 2011

**Volunteer Veterinarian**

AIDS Community Care Montreal, Montreal, Québec

- Provided veterinary care for low-income, HIV positive members of the ACCM at no cost, taking care to address the specific needs of the immunosuppressed clientele.

2008 – 2009

**Associate Veterinarian**

Sechelt Animal Hospital, Sechelt, B.C.

- Examined, diagnosed and treated a variety of medical and surgical conditions of dogs and cats, with emphasis on compassionate and high quality care.
- Improved on both routine and emergency soft-tissue surgical skills.
- Provided 24 hour emergency service for the lower Sunshine Coast Regional District.
- Continued developing strong communication skills, both with clients and staff, in order to better provide and direct medical care.

## RESEARCH EXPERIENCE

---

2018 – Present

### **Post-Doctoral Fellow**

Dept. of Pathobiology, University of Guelph

- Responsible for the bioinformatic analysis of a genome-wide association study of ~ 3000 pigs with and without infectious diseases.
- The pipeline accounted for genetic relatedness of animals, and used software such as GCTA, ASReml, and Plink.
- Oversaw the progress and learning of MSc candidates.

2012 – 2018

### **Graduate Student (PhD, DVSc)**

Dept. of Pathobiology, University of Guelph

- Applied next-generation sequencing technologies in the investigation of the genetics of innate immune disease resistance in cattle, horses, and pigs. Discovered and characterized novel and existing sequence variants, used *in silico* tools to predict functional effects, and performed eQTL analysis.
- Developed strong bioinformatic and data science skills, including the usage of Unix, Perl, Python, R, and various standard bioinformatics software tools (e.g. GATK, Picard, and Samtools).
- Wrote manuscripts, presented talks and posters at international and local conferences, supervised undergraduate and MSc students.

2012

### **Graduate Student (MSc)**

Roslin Institute, University of Edinburgh

- Investigated the pathogenesis of influenza A by examining the molecular mechanisms of host adaptation.
- Utilized molecular virology laboratory techniques such as site-directed viral mutagenesis, Western blot, PCR, microscopy, cell culture, virus culture and fitness assays, and DNA sequencing.
- Took an analytical and systematic approach to research problems, looking for patterns, identifying key issues, and seeking solutions.

2004

### **Undergraduate Research**

Dept. of Biomedical Sciences, University of Guelph

- Ran several long-duration experiments with live rodents on the cardiovascular effects of the hormone relaxin.
- Became comfortable with the handling and medicating of small rodents.
- Gained experience harvesting tissue and preparing and examining histological slides for immunofluorescence.

2002

### **Summer Student**

Meakins-Christie Lab, McGill University

- Investigated the effects of CD8<sup>+</sup>γγ T-cells on the late allergic airway response in rats. Performed numerous *in vivo* procedures on rats, including bronchoalveolar lavage, anesthesia, and the collection of physiological data.
- Performed immunomagnetic cell sorting and maintained cell cultures.

## AWARDS, SCHOLARSHIPS, AND FELLOWSHIPS

---

2017/04/20	Korean-Canadian Dr. F. Schofield Memorial Scholarship (\$2000)
2016/12/06	2016 ACVP Young Investigator Award (3 <sup>rd</sup> place) (\$200 USD)
2016 – 2017	Queen Elizabeth II Scholarship in Science & Technology (\$15,000)
2016/05/05	Winner, Oral Presentations (PhD), Swine Research Day (\$200)
2015 – 2016	Ontario Graduate Scholarship (\$15,000)
2014/06/09	Canadian Bioinformatics Workshops Registration Award (\$565)
2014 – 2017	Ontario Veterinary College PhD Fellowship (\$30,000 / annum)
2014/02/07	Winner, Three Minute Thesis Competition, DVSc Category (\$100)
2012 – 2014	Graduate Teaching Assistantship and Bursary (\$4921.67 / annum)
2012 – 2014	Graduate Research Assistantship (\$16,200 / annum)
2012 – 2014	Graduate Service Assistantship (\$11,074 / annum)
2012	Pfizer Prize for Best Student 2011 – 2012 MSc One Health
2012/12	ACVP Resident/Graduate Student Travel Award (\$500 USD)
2012/09	6 <sup>th</sup> Orthomyxovirus Research Conference Travel Grant (\$500 USD)
2012	Wellcome Trust Science Writing Competition (Shortlisted finalist)
2011	Easter Bush Research Consortium and Pfizer Bursary (£4000 GBP)

## PUBLICATIONS

---

### Journal Publications

**Fraser, RS**, Lumsden, JS, Lillie, BN (2018). Identification of polymorphisms in the bovine collagenous lectins and their association with infectious diseases in cattle. *Immunogenetics*. doi:10.1007/s00251-018-1061-7.

Wills, S, Beaufreres, H, Brisson, B, **Fraser, RS**, Smith, DA (2018). Pancreatitis and systemic coronavirus infection in a ferret (*Mustela putorius furo*). *Comparative Medicine*. doi: 10.30802/AALAS-CM-17-000109.

**Fraser, RS**, Arroyo, LG, Meyer, A, Lillie, BN. Identification of genetic variation in equine collagenous lectins using targeted resequencing. *Vet Immunol and Immunopathol (under review)*.

Isogai S, Athiviraham A, **Fraser RS**, Taha R, Hamid Q, Martin J (2007). Interferon- $\gamma$ -dependent inhibition of late allergic airway responses and eosinophilia by CD8<sup>+</sup> $\gamma\delta$  T-cells. *Immunology* 122:230-8. doi:10.1111/j.1365-2567.2007.02632.x

Silvertown JD, **Fraser RS**, Poterski RS, Geddes B, Summerlee AJS (2005). Central Effects of Long-Term Relaxin Expression in the Rat. *Ann. N.Y. Acad. Sci.* 1041:1-7. doi: 10.1196/annals.1282.033

### Textbook Chapters

Prescott, JF, Menzies, PI, **Fraser, RS**, Clostridial abomasitis. In: Uzal, F, Songer, JG, Popoff, M, Prescott, JF. *Clostridial infections of animals*. Wiley-Blackwell (2016).

## Journal Publications (*in preparation*)

Snyman, HN, **Fraser, RS**, Meyer, A, Hammermueller, JD, Squires, EJ, Caswell, JL, Hayes, MA, Lillie, BN. Constitutive variation in the hepatic innate immunome of healthy pigs. *In preparation for submission to Immunogenetics*.

**Fraser, RS**, Meyer, A, Snyman, HN, Hayes, MA, Lillie, BN. Identification and frequency of local expression quantitative trait loci in the innate immunome of diseased and healthy pigs. *In preparation for submission to Animal Genetics*.

## Conference Presentations & Abstracts

**Fraser, RS**, Cousto, L, Jensen, M, zur Linden, A, Plattner, BL. 360-degree torsion of the gallbladder and quadrate liver lobe in a German shepherd dog. Poster presentation by RS Fraser at the 2017 ACVP and ASCVP Concurrent Annual Meeting, 2017/11/04-2017/11/08, Vancouver, BC, Canada.

**Fraser, RS**, Snyman, HN, Meyer, A, Hammermueller, JD, Lillie, BN. Combining targeted next-generation sequencing and microarray analysis for cis expression quantitative loci analysis of the porcine innate immunome. Poster presentation by RS Fraser at the 36<sup>th</sup> International Society for Animal Genetics Conference, 2017/07/16-2017/07/21, Dublin, Ireland.

**Fraser, RS**, Snyman, HN, Hammermueller, JD, Meyer, A, Lumsden, JS, Arroyo LH, Hayes, MA, Lillie BN. Unravelling the genetics of infectious disease susceptibility in livestock with the use of high throughput technology. Oral presentation by RS Fraser at the 2017 CAHLN Conference, 2017/06/04-2017/06/07, Guelph, Ontario, Canada.

**Fraser, RS**, Snyman, HN, Hammermueller, JD, Meyer, A, Lumsden, JS, Arroyo LH, Hayes, MA, Lillie BN. Utilization of high-throughput technologies to investigate the pathogenomics of infectious disease susceptibility in livestock. Poster presentation by RS Fraser at the 2016 ACVP and ASCVP Concurrent Annual Meeting, 2016/12/3 - 2016/12/7, New Orleans, Louisiana, U.S.A.

**Fraser, RS**, Snyman, HN, Meyer, A, Hammermueller, JD, Lillie, BN. Next-generation sequencing driven identification of expression quantitative trait loci in the porcine innate immunome. Oral presentation by RS Fraser at the 2016 Graduate Student Research Symposium, 2016/11/16, Guelph, Ontario, Canada.

**Fraser, RS**, Meyer, A, Snyman, HN, Hammermueller, JD, Hayes, MA, Lillie, BN. Expression quantitative trait locus analysis of porcine innate immune genes. Poster presentation by RS Fraser at the geXc Toronto 2016 symposia, 2016/10/04, Toronto, Ontario, Canada.

**Fraser, RS**, Meyer, A, Arroyo, LG, Hammermueller, JD, Lillie, BN. Identification of novel genetic variants in the equine collagenous lectin genes through targeted, next-generation re-sequencing. Oral and poster presentation by RS Fraser at the 35<sup>th</sup> International Society for Animal Genetics Conference, 2016/07/24 - 2016/07/28, Salt Lake City, Utah, U.S.A.

**Fraser, RS**, Hammermueller, JD, Lumsden, JS, Hayes, MA, Lillie, BN. Use of targeted next-generation re-sequencing in the identification of polymorphisms in the bovine collagenous lectin gene family. Poster presentation by RS Fraser at the 35<sup>th</sup> International Society for Animal Genetics Conference, 2016/07/24 - 2016/07/28, Salt Lake City, Utah U.S.A.

**Fraser, RS**, Snyman HN, Meyer, A, Hammermueller, JD, Lillie, BN. Identification of germline variants in porcine innate immune genes using next-generation sequencing. Oral presentation by RS Fraser at the Swine Research Day, Ontario Veterinary College, 2016/05/04, Guelph, ON, Canada.

**Fraser, RS**, Hammermueller, JD, Meyer, A, Lillie, BN. Investigating infectious disease susceptibility in horses through targeted next-generation resequencing of the collagenous lectin gene family. Oral presentation by RS Fraser at the Graduate Student Research Symposium, Ontario Veterinary College, 2015/11/18, Guelph, ON, Canada.

**Fraser, RS**, Meyer, A, Hammermueller, JD, Lillie, BN. Identification of defects in equine innate infectious disease resistance through targeted resequencing of the collagenous lectin gene family. Poster presentation by RS Fraser at the Toronto NGS Symposium, 2015/10/22, Toronto, ON, Canada.

Dienst, KA, **Fraser, RS**, Hammermueller, JD, Lillie, BN. Investigating mechanisms of genetic regulation of pattern recognition receptor mediated innate disease resistance in domestic animals. Poster presentation by K. Dienst at the SLRP Research Session; 2014/08/12; Guelph, ON, Canada.

Reynolds, KE, **Fraser, RS**, Hammermueller, JD, Lillie, BN. Identification and tissue localization of equine and bovine collagenous lectins. Poster presentation by K. Reynolds at the SLRP Research Session; 2013/08/13; Guelph, ON, Canada.

**Fraser, RS**, Föglein, A, Jagger, BW, Wise, HM, Taubenberger, JK, Digard, P. Influence of charge at residue 627 of PB2 on polymerase function in influenza A. Poster presentation by RS Fraser at the Centre for Public Health and Zoonoses Scientific Symposium; 2013/06/06; Guelph, ON, Canada.

**Fraser, RS**, Föglein, A, Jagger, BW, Wise, HM, Taubenberger, JK, Digard, P. Influence of charge at residue 627 of PB2 on polymerase function in influenza A. Poster presentation by RS Fraser at the 6<sup>th</sup> Orthomyxovirus Research Conference; 2012/09/19-22; Montreal, PQ, Canada.

**Fraser, RS**, Föglein, A, Jagger, BW, Wise, HM, Taubenberger, JK, Digard, P. Influence of charge at residue 627 of PB2 on polymerase function in influenza A. Poster presentation by RS Fraser at the ACVP/ASCP 2012 Annual Meeting; 2012/12/1-5; Seattle, WA, U.S.A.

## Non-Peer Reviewed Publications

Pors, J, **Fraser, RS**, Fraser, RS (2017). Duncan McEachern and the One Health movement. The Pharos 80:12-19. Online access: <http://alphaomegaalpha.org/pharos/2017/Summer/2017-3-CompleteIssue.pdf>

**Fraser, RS**. (2012). The strange future of antibiotics. Wellcome Trust Science Writing Prize. <https://blog.wellcome.ac.uk/2012/11/29/the-strange-future-of-antibiotics/>. Last accessed: 2018-05-10.

## INVITED TALKS AND LECTURES

---

2014/01/24     Invited speaker at the BioMedical Sciences Student Association Leadership Conference

## ACADEMIC SERVICE

---

2015 – 2018	Graduate Student Representative, Dept. of Pathobiology Faculty Meetings
2013 – 2018	Interviewer in the multiple mini interviews for incoming DVM students
2017	Member of the selection committee for Administrative Assistant to the Chair
2013 – 2016	Participated in various capacities (judge, mentor) for the SLRP/CORE program at OVC
2014	Judge, Faculty 3-Minute Thesis Competition
2013	Provided support and expertise for a published case report by E. Denstedt (PMID: 24489399)
2013, 2014, 2016, 2017	Judge, oral presentations, Graduate Student Research Symposium, OVC
2007 – 2008	CVSA Representative, Information Technology Student Advisory Committee, University of Guelph
2005 – 2008	Technical Director, Central Veterinary Students Association (CSVA)

## PROFESSIONAL QUALIFICATIONS

---

2017/03/16     ACVP, Phase I

## PROFESSIONAL MEMBERSHIPS

---

2012 – Present	College of Veterinarians of Ontario
2016 – 2017	International Society for Animal Genetics
2009 – 2011	Ordre des Médecins Vétérinaire du Québec
2008 – 2011	International Veterinary Academy of Pain Management
2008 – 2009	College of Veterinarians of British Columbia
2004 – 2008	Canadian Veterinary Medical Association



## ADDITIONAL TRAINING

---

2016	Canadian Bioinformatics Workshop: Informatics for RNA-seq Analysis
2014	Canadian Bioinformatics Workshop: Informatics on High-Throughput Sequencing Data

## LANGUAGE COMPETENCIES

---

English: Fluent written and oral  
French: Average written and oral

## COMMUNITY INVOLVEMENT

---

2016 – 2017	Active member of the Guelph Coalition for Active Transport
2016 – 2017	Member of a support group for a Syrian refugee family.
2015 – 2017	Scout Leader with the 2 <sup>nd</sup> Guelph Cubs
2016/05	Volunteer with the Special Olympics
2010 – 2011	Volunteer veterinarian with AIDS Community Care Montreal