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Current position: Associate Professor of Immunology,
Department of Molecular & Cellular Biology,
University of Guelph, Guelph, Ontario, Canada N1G 2W1

Personal data: Canadian Citizen

Education:

1987 **D.Sc.** (Docteur es Science)
Pasteur Institute (Univ. of Paris VII), Paris, France
Mention: "**Tres honorable**"

1978 **M.V.Sc.** (Microbiology & Immunology)
Faculty of Veterinary Medicine (Haryana Ag. University), Hisar, India

1976 **B.V.Sc./DVM**
Faculty of Veterinary Medicine (Haryana Ag. University), Hisar, India
Graduated with '**Honours**'
[Academic License (No. 4795)], College of Veterinarians of Ontario

Honours:

- Indo-French Research Scholar (1983-86)
- Medical Scholar, French Medical Research Foundation, Paris, France (1986-87)
- Lupus Fellow, The SLE Foundation, New York, USA (1988)
- The Esther Z. Greenberg Honors Chair in Biomedical Research and Visiting Professor, Oklahoma Medical Research Foundation, USA (1998)
- Consultant, US Veterinary Immune Reagent Network, 2006-present (<http://www.umass.edu/vetimm/ruminants/index.html>).
- Faculty, International Union of Immunological Societies (2002-08)
- Contributor and Curator, "*Bovine V_H and V_λ Genes*", Comparative Immunoglobulin Workshop (<http://www.medicine.uiowa.edu/cigw/cow.htm>) 2001-present.
- IMGT Expert, 2010 – present (<http://imgt.cines.fr/textes/IMGTindex/IMGTexperts.html>)

Professional Service:

- Co-Chair, Session on "*The Immune Repertoire*", American Association of Immunologists Meeting/Experimental Biology, 1998, San Francisco, April 18-22, 1998.
- Chair, Session on "*Ig and TcR Genes*", 5th International Veterinary Immunology Symposium, Ludhiana, India, November 1998.
- Co-Chair, '*Lymphocyte Development*' Workshop, Canadian Society for Immunology Meeting, Chateau Lake Louise, April, 2001.
- Co-Chair, Session on "*Comparative Immunoglobulin Structure and Function*", American

- Association of Immunologists Meeting/Experimental Biology, 2008, San Diego, April 5-9, 2008.
- Chair, Ontario Graduate Studies Scholarship Award Committee Panel (2002), Canada.
 - Member, NIH Grant Review Panel on ‘Specialized Centres of Research on Systemic Lupus Erythematosus’ (2002), USA.
 - Member, American Association of Immunologists, Canadian Society of Immunology, Canadian Society of Microbiology, New York Academy of Science, Academy of Veterinary Allergy & Clinical Immunology.
 - Ad hoc Reviewer, Journal of Immunology, Autoimmunity, Viral Immunology, Molecular Immunology, Developmental and Comparative Immunology, Veterinary Immunology and Immunopathology, Veterinary Microbiology, Canadian journal of Microbiology
 - Ad hoc Reviewer, Grant-in-Aid, Canadian Arthritis Society Grant-in-Aid, Medical Research Council, NSERC Canada, NIH SCOR Program, Health Canada, Michael Smith Foundation for Health Research, Canadian Foundation for Innovation
 - Editor-at-Large, Marcel Dekker Inc., New York; Member, Editorial Board, Journal of Veterinary Allergy & Clinical Immunology

Research interests: Molecular immunoglobulin genetics, Antibody engineering/Single chain Fv and transgenesis, Autoimmunity and systemic autoimmune disease, Therapeutics and vaccines, Immunodiagnostics.

Advanced Studies:

- ‘Phage Display Technology’, Cold Spring Harbor Laboratory, New York, USA (1997)
- ‘Bioinformatics’, Lawrence National Laboratory, Berkley, USA (2004)
- ‘Gene transfer Technology’ (Mouse Developmental genetics), Albert Einstein College of Medicine, New York, USA (2004)

Language skills: English, French, Hindi

Professional Experience:

- 1979-1983 Assistant Professor (Tenured), Department of Vet. Microbiology & Immunology, Faculty of Veterinary Medicine, Haryana Ag. University, Hisar, India.
- 1983-1987 Visiting Scientist, Departments of Immunology and medicine, Pasteur Institute, Paris, France.
- 1987-1990 Research Associate, Department of Microbiology, Mount Sinai School of Medicine, New York, U.S.A.
- 1990-1991 Assistant Research Professor, Dept. Medical Biochemistry, Faculty of Medicine, University of Geneva, Geneva, Switzerland.
- 1991-1999 Assistant Professor, Department of Pathobiology, University of Guelph, Ontario, Canada.
- 01-08/1998 Visiting Professor and Greenberg Scholar, Oklahoma Medical Research Foundation, Oklahoma City, USA.
- 07/2000- Associate Professor, Department of Pathobiology/Microbiology, University of Guelph, Ontario, Canada.

Patent(s):

- “Novel bovine VDJ cassette, *BF1H1*, suitable for antigenization”, U.S. Patent, No. 6,740,747, Granted 2004.
- “Bovine D-genes and their application”, US patent No. 7,196,185, Granted 2007.
- “Development of neutralizing ScFvs against Bovine Herpes Virus type-1 for prevention, therapy and diagnosis of Infectious Bovine Rhino-tracheitis” (PCT International Patent Application filed July, 2008).

Publications:

a. Book:

1. Bona, C. and **Kaushik, A.** (editors) 1992. **Molecular Immunobiology of Self-Reactivity.** Marcel Dekker Inc., New York (Reviewed by Dr. H. Schroeder, Division of Developmental and Clinical Immunology, University of Alabama at Birmingham, Birmingham, AL 35294. *Immunology Today*, 1992. 13:423-24).

b. Book Chapters:

1. Pandey, R. and **Kaushik, A.** 1980. Buffalopox an emerging pox zoonoses. Proc. Intl. Congr. Dis. Cattle. 2:1526-28.
2. Bona, C. A. and **Kaushik, A.** 1990. Development of antibody repertoire. In: The Immunogenetics of Autoimmune Disease. Vol. 1 (Nadir R. Farid, Editor). CRC Press, Boston, pp. 1-14.
3. Mayer, R., Zaghouni, H., **Kaushik, A.**, Kasturi, K., Fidanza, V. and Bona, C. 1990. The expression of Ly-1 and Ig-V gene families in hybridomas producing autoantibodies of various specificities. In: **The Molecular Aspects of Autoimmunity** (Farid, N. and Bona, C., eds.) Academic Press, San Diego, p.1.
4. **Kaushik, A.** 1991. A synopsis of self-reactivity. In: **Molecular Immunobiology of Self-Reactivity** (Bona, C. & **Kaushik, A.**, eds.). Marcel & Dekker Inc. New York, p.1-24 (Immunol. Ser 55:1-24).
5. Bona, C. and **Kaushik, A.** 1991. Development of antibody repertoire. In: **Immunogenetics of autoimmune disease** (Farid, N., ed.) vol. I CRC Press Inc., USA pp.1-18.
6. **Kaushik, A.** and Bona, C. 2002. Genetic origin of murine autoantibodies. In: The Molecular Pathology of Autoimmune Disease (Theofilopoulos, A. N. and Bona, C. A. editors) 2nd edition, Taylor and Francis Publishers, New York, USA, pp 53-67.

c. Peer Reviewed:

7. **Kaushik, A.** and Pandey, R. 1980. Cellular and humoral immune responses to buffalopox virus in experimentally infected mice and rabbits. *Immunology* 41:153-58.
8. **Kaushik, A.** and Pandey, R. 1981. Sequential detection of buffalopox virus antigens in chick embryo cell culture. *Indian Vet. J.* 58:763-65.
9. Srivastava, R., **Kaushik, A.** and Prasad, S. 1982. Enzyme linked immunoabsorbant microassay for detection of serum antibodies to Marek's disease virus in vaccinated chicken. *Acta Virol.* 26:302.
10. Kaushik, A. and Kulshreshtha, R. C. 1982. Serologic evidence of *Coxiella burnetti* infection in black Bengal goats. *HAU J. Res.* 12:202-3.
11. **Kaushik, A.**, Srivastava, R. and Prasad, S. 1983. Prevalence of rotavirus antibody in Indian buffaloes and cattle. *Zbl. Vet. Med.* B30:156-158.
12. Pandey, R., **Kaushik, A.** and Grover, Y. 1985. The biology of orthopox viruses of domestic ruminants. *Progr. Vet. Microbiol. & Immunol.* 1:199-228.

13. **Kaushik, A.**, Poncet, P. and Bussard, A. 1986. Autoantibodies against bromelainized mouse erythrocyte: strain distribution of serum idiotype and relative peritoneal cell activity. **Cellular Immunol.** 102:323-34.
14. Dighiero, G., **Kaushik, A.**, Poncet, P. and Ge, X. 1987. Origin and significance of autoantibodies. **Concept. Immunopathol.** 4:42-76.
15. Dighiero, G., Poncet, P., Matthes, T. and **Kaushik, A.** 1987. Is autoantibody production related to particular B cell subset and V-region genes? **Path. Immunopath. Res.** 6:371-89.
16. Reninger, L., Ollier, P., Poncet, P., **Kaushik, A.** and Jaton, J.C. 1987. Novel V-genes encode virtually identical variable regions of six murine monoclonal anti-bromelain treated red blood cell autoantibodies. **Journal of Immunology** 138:316-23.
17. Dighiero, G., Lim, A., Poncet, P., **Kaushik, A.**, Ge, X. and Mazie, J. C. 1987. Age related natural antibody specificities among hybridoma clones originating from NZB spleen. **Immunology.** 62:341-47.
18. **Kaushik, A.**, Matthes, T. and Dighiero, G. 1988. Do natural autoantibodies help eliminate senescent red blood cells? **Blood Cells** 14:161-70.
19. **Kaushik, A.**, Lim, A., Poncet, P., Ge, X. and Dighiero, G. 1988. Comparative analysis of natural antibody specificities among hybridomas originating from spleen and peritoneal cavity of adult NZB and BALB/c mice. **Scandinavian Journal of Immunology** 27:461-71.
20. Reninger, L., **Kaushik, A.**, Izui, S. & Jaton, J.C. 1988. A member of a new V_H gene family encodes anti-bromelainized mouse red blood cell autoantibodies. **European Journal of Immunology** 18:1521-26.
21. Dighiero, G., Lim, A., Lembzet, M., **Kaushik, A.**, Andrade, L. and Freitas, A. 1988. Comparative study of V_H gene family usage by newborn xid and non-xid mice, newborn and adult NZB and splenic and peritoneal B cell compartments. **European Journal of Immunology** 18:1979-83.
22. **Kaushik, A.**, Schulze, D. H., Bona, C. and Kelsoe, G. 1989. V_κ gene expression does not follow V_H paradigm. **Journal of Experimental Medicine** 169:1859-64.
23. **Kaushik, A.**, Schulze, D. H., Bonilla, F., Bona, C. & Kelsoe, G. 1990. Stochastic pairing of heavy chain and kappa-light chain variable gene families occurs in polyclonally activated B cells. **Proceedings of National Academy of Science (USA)** 87:4932-36.
24. **Kaushik, A.**, Mayer, R., Fidanza, V., Zaghouni, H., Lim, A., Bona, C. & Dighiero, G. 1990. Ly-1 and Ig-V gene expression in natural autoantibody secreting hybridomas. **Journal of Autoimmunity** 3:687-700.
25. Shefner, R., Mayer, R., **Kaushik, A.**, D'Eustachio, P., Bona, C. and Diamond, B. 1990. Identification of a new V_κ gene family that is highly expressed in an autoimmune mouse strain. **Journal of Immunology** 145:1609-14.
26. **Kaushik, A.**, Reninger, L., Kelsoe, G., Jaton, J.C. and Bona, C. 1991. Contribution of the V_H11 gene family to mitogen responsive B cell repertoire in C57BL/6 mice. **European Journal of Immunology** 21:827-30.
27. Schulze, D. H., Mancillas, P., **Kaushik, A.**, Bona, C. and Kelsoe, G. 1992. Mitogen induced V_H and V_κ expression is similar in young adult and aged mice. **Aging Immunol. & Infect. Dis.** 3:127-34.
28. Staempfli, H. R. and **Kaushik, A.** 1993. Clinical reactions of horses to venoms from winged stinging insects. *Equine Vet. Educ.* 5:259-61.
29. Kenney, D. G., Robbins, S. C., Prescott, J., **Kaushik, A.** and Baird, J. D. 1994. *Rhodococcus equi* pneumonia in foal: Development of reactive arthritis and resistance to erythromycin and rifampin during treatment. *Equine Vet. J.* 25:246-48.
30. **Kaushik, A.** 1994. Autoantibody and autoimmune disease. **Immunology Today.** 15:340-41.

31. Nangpal, A., Knott, J., Lipsanen, V., Bona, C. and **Kaushik, A.** 1995. Contribution of the V λ light-chain to the development of the primary antibody repertoire. **Annals New York Academy of Science.** 764:296-300.
32. **Kaushik, A.** Kelsoe, G. and Jaton, J.-C. 1995. Effect of nude mutation on the murine B cell repertoire. **European Journal of Immunology.** 25:631-34.
33. Emara, M., Tout, N., **Kaushik, A.** and Lam, S. 1995. Diverse V_H and V_K genes encode antibodies to *Pseudomonas aeruginosa* lipopolysaccharide. **Journal of Immunology.** 155:3912-3921.
34. Saitoh, Y., Kelsoe, G., Bona, C. and **Kaushik, A.** 1995. Skewed V_H and V_K gene family expression and pairing occurs among B-lymphocytes in autoimmune motheaten mice. **Autoimmunity.** 21:185-193.
35. Silva, S. V. P. S., Little, P. B. and **Kaushik, A.** 1995. An immunodominant epitope on 40kD outer membrane protein is conserved among different strains of *Haemophilus (Histophilus) somnus*. **Zentralblatt fur Bakteriologie.** 282:449-456.
36. **Kaushik, A.** and Wai-May Lim. 1996. The primary antibody repertoire of normal, immunodeficient and autoimmune mice is characterized by differences in V-gene expression. **Research in Immunology.** 147:9-26.
37. Alexander, H.S., Waisglass, S. E., Lindsay, R.T., Hatch, W. S. & **Kaushik, A.** 1996. An SLE-like syndrome in a cat. *Journal of Vet. Allergy & Clinical Immunology.* 4:124-27.
38. Saini, S. S., Nangpal, A., Teo, K. and **Kaushik, A.** 1996. Murine Vh11 gene family is conserved during evolution. **Experimental and Clinical Immunogenetics** 13:154-60.
39. Bot, A., Nangpal, A., Pricop, L., Bogen, B., **Kaushik, A.** and Bona, C. 1996. V λ -light chain genes reconstitute immune responses to defined carbohydrate antigens or haptens by utilizing different V_H genes. **Molecular Immunology.** 33:1359-68.
40. Lipsanen, V., Walter, B., Emara, M., Lam, J., Siminovitch, K. and **Kaushik, A.** 1997. Restricted CDR3 length of the heavy chain is characteristic of six randomly isolated disease associated V_HJ558⁺ IgM autoantibodies in lupus prone motheaten mice. **International Immunology.** 9:655-64.
41. Lipsanen, V., Walter, B., Emara, M., Lam, J., Siminovitch, K. & **Kaushik, A.** 1997. CDRH3 length is the target of selection of disease associated IgM autoantibodies. **Annals NY Acad. of Science.** 815:448-56.
42. Saini, S. S., Hein, W. and **Kaushik, A.** 1997. A single polymorphic immunoglobulin V_H gene family related to mammalian group I, clan II, is identified in cattle. **Molecular Immunology.** 34:641-651.
43. Saini, S. S. & **Kaushik, A.** 1997. Identification of genetic defect responsible for equine SCID will permit genetic testing of breeding stock. *Journal of Veterinary Allergy and Clinical Immunology.* 5:112-13.
44. Knott, J., Bona, C. and **Kaushik, A.** 1998. The primary antibody repertoire of κ -deficient mice is characterized by predominant V_K1 gene expression, non-stochastic V_K1+V_H gene family pairings and a higher degree of self-reactivity. **Scandinavian Journal of Immunology.** 48:65-73.
45. Rinkardt NE, Kruth SA, **Kaushik A.** 1999. The effects of prednisone and azathioprine on circulating immunoglobulin levels and lymphocyte subpopulations in normal dogs. *Can J Vet Res.* 63:18-24 [Citation: *Clinical Immunology of the Dog & Cat*, 1st ed. (1999) - Michael J. Day, ISU Press, Iowa, Chapter 15, p. 284].
46. Saini, S. S., Allore, B., Jacobs, R. M. and **Kaushik, A.** 1999. Generation of an exceptionally long CDR3H, with multiple cysteine residues, provides a novel mechanism of antibody diversity. **European Journal of Immunology.** 29:2420-26[Veterinary Immunology: An Introduction, 7th ed. (2004) - I. Tizard, W.B. Saunders Co., Chapter 14, p.164].

47. Saini, S.S. and **Kaushik, A.** 2001. Origin of bovine IgM structural variants. **Molecular Immunology**. 38:389-396.
48. **Kaushik, A.** 2001. Evaluation of IL-2 (Leuvectin) gene therapy. **Current Opinion in Investigational Drugs**. 2:976-81.
49. Ramsland, P. A., **Kaushik, A.**, Marchalonis, J. J. and Edmunson, A. B. 2001. Incorporation of long CDR3 into V domains: Implications for the structural evolution of the antibody-combining site. **Exp. Clin. Immunogenetics**. 18:176-98.
50. Saini, S.S. and **Kaushik, A.** 2002. Extensive CDR3H length heterogeneity exists in bovine foetal VDJ rearrangements. **Scandinavian Journal of Immunology**. 55:140-48.
51. **Kaushik, A.**, Shojaei, F. and Saini, S. S. 2002. Novel insight into antibody diversification from cattle. **Veterinary Immunology & Immunopathology** 87:347-350.
52. Saini, S. S. and **Kaushik, A.** 2003. Immunoglobulin genes and their diversification in vertebrates. **Current Trends in Immunology** 4:162-176.
53. Saini, S. S., Farrugia, W., Ramsland, P. A. and **Kaushik, A.** 2003. Bovine IgM antibodies with exceptionally long CDR3H share unique structural properties conferring restricted pairings of V_H and V_λ genes. **International Immunology**. 15:845-53.
54. Saini, S. S., **Kaushik, A.**, Basrur, P. and Yamashiro, S. 2003. Ultrastructural and immunological characteristics of xenogeneic hybridomas originating from bovine leukemia virus infected cattle. **Veterinary Pathology**. 40:460-64.
55. Shojaei, F., Saini S. S., **Kaushik A. K.** 2003. Unusually long germline D_H genes contribute to the generation of exceptionally long CDR3H in bovine antibodies. **Molecular Immunology** 40:61-67.
56. Cassady-Cain, R.L. and **Kaushik, A. K.** 2006. Increased negative B cell selection impairs neonatal B cell repertoire but does not directly lead to generation of disease associated IgM autoantibodies. **International Immunology** 18:661-69 (Supplementary figure S1, tables S1-4 online).
57. Bridle, B.W., Julian, R., Shewen, P.E., Vaillancourt, Jean-Pierre and **Kaushik A. K.** 2006. T lymphocyte subpopulations diverge in Commercially Raised Chickens. **Canadian Journal of Veterinary Research**. 70:183-190.
58. Saini, S.S., Farrugia W., Muthusamy N., Ramsland, P. A. & **Kaushik, A.K.** 2007. Structural evidence for a new IgG1 antibody sequence allele of cattle. **Scandinavian Journal of Immunology**. 65:32-38 (Journal Cover Picture Citation).
59. Koti, M., Kataeva, G. and **Kaushik, A. K.** 2008. Organization of DH-gene locus is distinct in cattle. **Dev. Biol.** (Basel) 132:307-13.
60. **Kaushik, A. K.**, Kehrlis Jr., M. E., Ng, S., Kurtz, A., Koti, M., Shojaei, F. Saini, S. 2009. Somatic mutations and isotype restricted exceptionally long CDR3H contribute to antibody diversification in cattle. **Vet. Immunol. Immunopathol.** 127:106-13.
61. Koti, M. Farrugia, W., Nagy, E., Ramsland P. A. and **Kaushik, A. K.** 2010. Construction of single-chain Fv with two possible CDR3H conformations but similar inter-molecular forces that neutralize bovine herpesvirus 1. **Molecular Immunology**. 47:953-60.
62. Paman, Y., Saini, S. S., Smith, E. and **Kaushik, A. K.** 2010. Organization and genomic complexity of bovine λ-light chain gene locus. **Vet. Immunol. & Pathol.** 135:306-13. (doi:10.1016/j.vetimm.2009.12.012).
63. Ng, S., Lim, S., Daub, A., Saini, S. S. and **Kaushik, A. K.** 2010. Benign monoclonal gammopathy in a dog exhibiting a low antibody titer to *Ehrlichia canis*. **J. Clin. Immunol. & Immunopathol. Res.** 2:9-14.
64. Koti, M., Kataeva, G. and **Kaushik, A. K.** 2010. Novel Atypical Nucleotide Insertions specifically at V_H-D_H Junction Generate Exceptionally Long CDR3H in Cattle Antibodies. **Molecular Immunology**. 47:2119-28.

65. Koti, M., Nagy, E. and **Kaushik, A. K.** 2011. A single point mutation in framework region 3 of heavy chain affects viral neutralization dynamics of single-chain Fv against bovine herpes virus type 1. 29: 7905-7912.
66. Pasman, Y., Bhogal, R., and **Kaushik, A. K.** 2012. Novel Perspective on Antibody Diversification from Bovine Immunoglobulin Genetics. *Submitted*.
67. Pasman, Y., Nagy, E., and **Kaushik, A. K.** 2012. Enhanced virus neutralization by multimerized scFvs against bovine herpes virus type 1. *Submitted*.
68. Saini, S.S., Maiti, N. K., and **Kaushik, A.K.** 2012. Partial characterization of immunoglobulin C μ gene of water buffalo (*Bubalus bubalis*). *Submitted*.

d. Other:

69. **Kaushik, A.** and Batra, S. K. 1980. Cloning FMD virus. **Bioscience**. 30:568 (letter).
70. **Kaushik, A.**, Grover, Y.P. and Pandey, R. 1983. Buffalopox - a specific disease of water buffaloes. **Buffalo Bulletin**. 2:3-15.
71. Saini, S. S. and **Kaushik, A.** 1997. Variable-region heavy chain Ig genes as molecular selection markers for disease resistance in cattle. Dairy Research, University of Guelph, pp 6-8.
72. **Kaushik, A.**, B. Mallard, P. Shewen, and B. Wilkie. 1999. Need for research in companion animal vaccinology. *Canadian Veterinary Journal*. 40:381-382 (Letter).
73. **Kaushik, A.** 2000. Book review: Day, Michael J. Clinical Immunology of Dog and Cat. Iowa State University Press, Ames, 1999, 288 pp. (ISBN 0-8138-2340-4) *Canadian Veterinary Journal*. 41:885.
74. Saini, S. S. and **A. Kaushik.** 2002. Strategies to develop novel vaccines using bovine antibody. Ontario Beef Research Update, University of Guelph and Ontario Ministry of Agriculture and Food, pp 49-52.
75. Kaushik, A. 2003. Editorial: Veterinary Clinical Immunology in Twilight Zone. *J. Caribb. Vet. Med. Assoc.* 3:1-2.
76. Saini, S. S. and **A. Kaushik.** 2003. Definition of allotypic and structural markers of bovine IgM antibodies. Ontario Beef Research Update, University of Guelph and Ontario Ministry of Agriculture and Food, pp 32-34.
77. **Kaushik, A.** and Poncet, P. 2010. Honorary Professor Alain E. Bussard (25th May 1917–15th March 2010). *Euro. J. Immunol.* 40:1522-24.
78. **Kaushik, A.** and Poncet, P. 2010. Obituary: Honorary Professor Alain E. Bussard (25th May 1917–15th March 2010). *Immunol. Lett.* 131:1-2.
79. Kaushik, A. 2011. Handbook of Therapeutic Antibodies: Technologies, Emerging Developments and Approved Therapeutics (Book review). *Eur. J. Immunol.* 2011. 41: 566–567.

Publication summary:

Book	Refereed Publication	Book Chapter	Book Reviews/ Editorial/Other	Conference/Poster/ Presentations/Abstract	Invited Presentation
1	60 (+3)	6	11	56	26
Total:		76		82	

Original Research Citation in Textbook(s):

- i. Veterinary Immunology: An Introduction, 7th ed. (2004) - I. Tizard, W.B. Saunders Co., Chapter 14, p.164.
- ii. Clinical Immunology of the Dog & Cat, 1st ed. (1999) - Michael J. Day, ISU Press, Iowa, Chapter 15, p. 284.

DNA Sequences deposited and annotated via GenBank:

1. Bovine Immunoglobulin Genes (V_H - D_H - J_H - $C\mu/C\gamma$; $V\lambda$ - $J\lambda$ - $C\lambda$) - 121
2. Bovine D-genes and RSS (**Dh1, Dh2 and DH3/RSS**) - 8
3. Murine Immunoglobulin Genes (V_H - D_H - J_H ; $V\kappa$ - $J\kappa$) -110
4. Bovine D-gene locus (~35kB; yet to be annotated)
5. ScFv DNA Sequences (yet to be annotated)

Abstracts and Conference Presentation:

1. Pandey, R. and **Kaushik, A.** 1980. Buffalopox an emerging pox zoonoses. *Intl. Congr. Dis. Cattle*. Tel Aviv, Israel, October 20-23, 1981.
2. Srivastva, R., **Kaushik, A.** and Prasad, S. Micro-ELISA for detection of Marek's disease virus antibodies in vaccinated flocks. 8th Annual Meeting of *Indian Immunology Society*, Bombay, November 21-23, 1981.
3. Srivastva, R., **Kaushik, A.** and Prasad, S. Prevalence of rotavirus antibody among cattle in India. 9th. Annual Meeting of *Indian Immunology Society*, New Delhi, October 30-31, 1982.
4. **Kaushik, A.**, Grover, Y. and Pandey, R. Immunity to buffalopox virus. **6th Intl. Congr. Virol.** Sendai, Japan, September 1-7, 1984.
5. **Kaushik, A.**, Poncet, P. and Bussard, A. Anti-bromelainized mouse erythrocyte autoantibody idiotype: strain distribution. **7th European Immunology Meeting**, Jerusalem, Israel, September 8-13, 1985.
6. **Kaushik, A.**, Poncet, P. & Bussard, A. Autoantibodies anti-bromelainized mouse erythrocyte: strain distribution and relative peritoneal activity. **VIth Intl. Congr. Immunol.**, Toronto, Canada, July 6-11, 1986.
7. Poncet, P., Lim, A., **Kaushik, A.**, Ge, X., Mazie, J.C. & Dighiero, G. Natural autoantibody repertoire in newborn and adult NZB mice. **VIth Intl. Congr. Immunol.**, Toronto, Canada, July 6-11, 1986.
8. **Kaushik, A.**, Poncet, P., Ge, X., Lim, A. & Dighiero, G. Comparative natural B cell autoreactive repertoire in NZB mouse spleen and peritoneal cells. Joint meeting of The **Gesellschaft fur Immunologie and the Societe Francaise d'Immunologie**, Strasbourg. 1986. (*Immunobiology* 173:212).
9. Ge, X. R., A. Kaushik, P. Poncet, and G. Dighiero. 1986. Monoclonal antiidiotypic antibodies against an indiotype related to autoantibodies reactive with bromelain-treated mouse red blood cells. **Gesellschaft fur Immunologie and the Societe Francaise d'Immunologie**, Strasbourg. 1986. (*Immunobiology* 173:210).
10. Lim, A., P. Poncet, A. Kaushik, X. R. Ge, J. C. Mazie, and G. Dighiero. 1986. Natural B cell autoreactive repertoire against DNA, cytoskeleton proteins and TNP in NZB mice during ontogeny. **Gesellschaft fur Immunologie and the Societe Francaise d'Immunologie**, Strasbourg. (*Immunobiology* 173:214).
11. **Kaushik, A.**, Schulze, D., Bona, C. & Kelsoe, G. Murine V_κ gene expression violates the V_H paradigm. **FASEB Meeting**, New Orleans, 1989, (FASEB J. 3:A1094, #5038).
12. **Kaushik, A.**, Schulze, D., Bonilla, F., Bona, C. & Kelsoe, G. Construction of immunoglobulin repertoire. **VIIth Intl. Congr. Immunol.**, Berlin, West Germany, 1989.
13. **Kaushik, A.**, Schulze, D., Bonilla, F., Bona, C. & Kelsoe, G. Stochastic V_H+V_κ pairings occur among mitogen activated C57BL/6 B splenocytes. **FASEB Meeting**, 1990 (FASEB J. 4:A2193, #2883).
14. **Kaushik, A.**, Kelsoe, G. & Bona, C. Autoimmune me^v mice express aberrant V_κ repertoire. **VIIIth Intl. Congr. Immunol.**, Budapest, Hungary, 1992.

15. Teo, K., Siminovitch, K. and **Kaushik, A.** Spontaneous autoantibodies from autoimmune me^v mice recognize hsp70 stress protein. **CSM and SIM Joint Annual Meeting.** Toronto, 1993.
16. Silva, S. V. P. S., Little, P. B. and **Kaushik, A.** Construction of murine monoclonal antibodies against *Haemophilus somnus*. **CSM and SIM Joint Annual Meeting.** Toronto, 1993.
17. Nangpal, A., Lipsanen, V., Knott, J., Bona, C. and **Kaushik, A.** Non-random V_H gene expression occurs in the adult κ-deficient mice. **New York Academy of Science Meeting** (Immunoglobulin gene expression in development and disease), Montreal, 1994 (Nangpal, A., J. Knott, V. Lipsanen, C. Bona, and A. Kaushik. 1995. Contribution of the V-lambda light chain to the development of the primary antibody repertoire. In *Immunoglobulin Gene Expression in Development and Disease*. New York Acad Sciences, New York. 296-300).
18. Lipsanen, V., Walter, B., Emara, M., Lam, J., Siminovitch, K. and **Kaushik, A.** Murine IgM pathological autoantibodies are structurally different from natural autoantibodies. **9th Intl. Congr. Immunol.** San Francisco, 1995.
19. Knott, J. and **Kaushik, A.** Construction of primary antibody repertoire in kappa-deficient mice. **9th Intl. Congr. Immunol. , San Francisco,** 1995.
20. Saini, S. S., Nangpal, A., Teo, K. and **Kaushik, A.** Homologues of murine V_H11 gene are conserved during evolution (Invited oral presentation in the workshop on Immunoglobulins and Fc Receptors) **4th. Intl. Vet. Immunol. Symposium.** Davis, California, July 1995.
21. Saini, S. S. and **Kaushik, A.** Bovine variable region immunoglobulin heavy chain genes: Structural analysis and genomic complexity. **ASBMB/ASIP/AAI Joint Meeting.** New Orleans, June, 1996 (Saini, S. S., and A. Kaushik. 1996. Bovine variable-region immunoglobulin heavy chain genes - Structural analysis and genomic complexity. *FASEB J.* 10:991).
22. Lipsanen, V., Walter, B., Emara, M., Lam, J., Siminovitch, K. and **Kaushik, A.** CDRH3 length is the target of selection of disease-associated IgM autoantibodies. *B Lymphocytes and Autoimmunity.* Annals NY Acad. Sci.815:448-54.
23. Saini, S.S., Hein, W.R., Jacobs, R. & **Kaushik, A.** A single polymorphic immunoglobulin V_H gene family is predominantly expressed in the peripheral antibody repertoire of cattle. **Canadian Society for Immunology Meeting,** Chateau Lake Louise, Canada, Spring, 1997.
24. Bridle, B.W., Julian, R.J., Shewen, P.E., Vaillancourt, J.-P. & **Kaushik, A.** Age and strain associated differences in chicken peripheral blood lymphocytes. **Canadian Society for Immunology Meeting,** Chateau Lake Louise, Canada, Spring, 1997.
25. Bridle, B.W., Julian, R.J., Shewen, P.E., Vaillancourt, J. -P. & **Kaushik, A.** Age and strain associated differences in chicken peripheral blood lymphocytes. 49th CVMA Convention, Saskatoon, SA, July, 1997.
26. Bridle, B.W., Julian, R.J., Shewen, P.E., Vaillancourt, J.-P. & **Kaushik, A.** Age and strain associated differences in chicken peripheral blood lymphocytes. Conference on Infectious Diseases in Animals, National Animal Disease center, USDA-ARS, Ames, Iowa, May 1997.
27. Saini, S. S., Allore, B., Jacobs, R. M. and **Kaushik, A.** 1998. Generation of an exceptionally long CDR3H, with multiple cysteine residues, provides a novel mechanism of antibody diversity. **FASEB/AAI Joint Meeting.** San Francisco, USA, May 1998 (Saini, S. S., B. Allore, R. M. Jacobs, and A. Kaushik. 1998. Generation of an exceptionally long CDR3H, with multiple cysteine residues, provides a novel mechanism of antibody diversity. *FASEB J.* 12:A885-A885, 5124).
28. Saini, S.S. and **Kaushik, A.** Allelic and splice site-associated variants of bovine IgM antibodies. **International Congress of Immunology,** New Delhi, India, November 1998.
29. Saini, S.S. and **Kaushik, A.** Repetitive codons GGT and TAT characterise the DH encoded CDR3H region of Ig from bovine fetal B cells. **International Veterinary immunology**

- Symposium**, Ludhiana, India, November 1998.
30. Saini, S.S. and **Kaushik, A.** Restricted VH+V λ pairings occur in bovine IgM antibodies with exceptionally long CDR3H. **FASEB/AAI Joint Meeting**. Washington D.C., March 1999.
 31. Cassady, R.L. and **Kaushik, A.** Increased negative B cell selection impairs neonatal IgM repertoire. Canadian Society for Immunology Meeting, Chateau Lake Louise, April 2001.
 32. Saini, S.S. and **Kaushik, A.** Structural and functional properties of bovine V λ -light chains. **Canadian Society of Immunology Meeting**, Chateau Lake Louise, Canada, April 2001.
 33. F. Shojaei, Surinder S. Saini, A. Wildeman and **A. Kaushik.** Both long and short germline D_H genes exist in cattle. **International Veterinary Immunology Symposium**, Uppsala, Sweden, July 2001.
 34. Saini, S.S. and **Kaushik, A.** Structural and functional properties of bovine V λ -light chains. . **International Veterinary Immunology Symposium**, Uppsala, Sweden, July 2001.
 35. Cassady, R. L. and **Kaushik A.,** Increased negative B cell selection impairs neonatal IgM repertoire. **International Immunology Congress**, Stockholm, Sweden, July 2001.
 36. F. Shojaei, Surinder S. Saini, A. Wildeman and **A. Kaushik.** Both long and short germline D_H genes exist in cattle. **International Immunology Congress**, Stockholm, Sweden, July 2001.
 37. Saini, S.S. and **Kaushik, A.** Structural and functional properties of bovine V λ -light chains. **International Immunology Congress**, Stockholm, Sweden, July 2001.
 38. Cassady, R.L. and **Kaushik, A.** Increased negative B cell selection impairs neonatal IgM repertoire. "SLE: Targets for New Therapeutics" NIH Meeting, Washington DC, USA, January 2002.
 39. F. Shojaei, Surinder S. Saini and **A. Kaushik.** Unusually long germline DH genes contribute to the generation of exceptionally long CDR3H in bovine antibodies. American Association of Immunologists/FASEB Meeting, 2003. *FASEB J.* 17(7):C190.
 40. Saini, S.S. and **Kaushik, A.** Bovine IgG1 allotype. **International Veterinary Immunology Symposium**, Montreal, July 2004.
 41. Koti, M., Kataeva, G. and **Kaushik, A. K.** Identification of novel bovine D_H genes. **International Immunology Congress.** Rio de Janerio, Brazil, 2007 [*Vet. Immunol. Immunopathol.* 128 (2007) 318].
 42. Koti, M., Kataeva, G. and **Kaushik, A. K.** Organization of D-gene locus is distinct in cattle. **International Immunology Congress.** Rio de Janerio, Brazil, 2007.
 43. Koti, M., Nagy, E. and **Kaushik, A. K.** Construction of immunodiagnostic and therapeutic bovine antibodies as single chain Fv (scFv). International Veterinary immunology Symposium, Sao Paulo, Brazil, 2007 [*Vet. Immunol. Immunopathol.* 128 (2009) 211–347].
 44. Koti, M., Kataeva, G. and **Kaushik, A. K.** Significant germline D_H gene size heterogeneity exists in cattle. International Symposium on Animal Genomics for Animal Health. Paris, France, October, 2007.
 45. Koti, M. and **Kaushik, A.** and Koti, M.K. Novel Mechanisms generate exceptionally long CDR3H in cattle antibodies. **FASEB/AAI Joint Meeting**. San Diego, USA, April, 2008 [*The FASEB Journal.* 2008; 22:863.3.].
 46. Koti, M., Kataeva, G. and **Kaushik, A. K.** Novel 'Conserved Genomic Sequence' (CSGS) additions at VH-DH junction generate exceptionally long CDR3H in cattle antibodies. 21st Annual Meeting of the Canadian Society for Immunology. Mont-Tremblant, Quebec, April, 2008.
 47. Koti, M., Nagy, E. and **Kaushik, A. K.** Single point mutation in FR3 of engineered scFv affects viral neutralization without loss of epitope specificity. 21st Annual Meeting of the Canadian Society for Immunology. Mont-Tremblant, Quebec, April, 2008.

48. Pasman, Yfke, Saini, Surrinder, Smith, Elspeth and **Kaushik, Azad**. 2010. Organization of bovine lambda light chain locus. 23rd Canadian Society for Immunology Meeting, Niagra Falls, Ontario (April 23-26, 2010).
49. Pasman, Yfke, Nagy, Eva and **Kaushik, Azad**. 2010. Monomeric and multimerized scFv neutralize bovine herpes virus-1. 23rd Canadian Society for Immunology Meeting, Niagra Falls, Ontario (April 23-26, 2010).
50. Pasman, Yfke, Saini, Surrinder, Smith, Elspeth and **Kaushik, Azad**. 2010. Organization of bovine lambda light chain genes on chromosome 17. 97th AAI Meeting, Baltimore, USA (May 8-11, 2010); J. Immunol., 184: 43.14. (*Invited presentation at Block Symposium*)
51. Pasman, Yfke, Nagy, Eva and **Kaushik, Azad**. 2010. Construction of multimerized scFv that neutralize Bovine Herpes Virus-1 97th AAI Meeting, Baltimore, USA (May 8-11, 2010); J. Immunol. 184: 52.12.
52. Pasman, Yfke, Saini, Surrinder, Smith, Elspeth and **Kaushik, Azad**. 2010. Organization of bovine lambda light chain genes on chromosome 17. 97th AAI Meeting, Baltimore, USA (May 8-11, 2010); J. Immunol., 184: 43.14. (*Invited presentation at Block Symposium*)
53. Pasman, Yfke, Nagy, Eva and **Kaushik, Azad**. 2010. Construction of multimerized scFv that neutralize Bovine Herpes Virus-1. 14th International Congress of Immunology, Kobe, Japan (August 22-27, 2010).
54. Pasman, Yfke, Saini, Surrinder, Smith, Elspeth and **Kaushik, Azad**. 2010. Organization of bovine lambda light chain genes. 14th International Congress of Immunology, Kobe, Japan (August 22-27, 2010).
55. Pasman, Yfke, Saini, Surrinder, Smith, Elspeth and **Kaushik, Azad**. 2010. Restricted V λ 1-J λ 3-C λ 3 recombinations encode the most λ -light chain repertoire in cattle. 9th International Veterinary Immunology Symposium, Tokyo, Japan (August 16-20, 2010).
56. Pasman, Yfke, Nagy, Eva and **Kaushik, Azad**. 2010. Multimerized scFv neutralize Bovine Herpes Virus- 1 with higher efficacy. 9th International Veterinary Immunology Symposium, Tokyo, Japan (August 16-20, 2010).
57. Pasman, Yfke, and **Kaushik, Azad**. 2011. Functional scFvs against bovine herpesvirus-1 show differential cleavage and glycosylation patterns. 98th AAI Meeting, San Francisco, USA (May 13-17, 2011)
58. Pasman, Yfke, and **Kaushik, Azad**. 2011. Differential cleavage and glycosylation patterns are noted in functional scFvs against bovine herpesvirus-1 expressed in *P. pastoris*. 24th Canadian Society for Immunology Meeting, Chateau lake Louise (April 8-11, 2011)

Invited lectures:

1. 'Peritoneal B cell and autoimmunity'. Round Table Conference on Autoimmunity, Pasteur Institute, Paris, June 1987.
2. 'Vh11: a new murine gene family'. University of Texas Medical Branch, Galveston, Texas 77550, April 1988.
3. 'Idiotype and structure of autoantibodies reactive with bromelain treated red blood cells'. Mount Sinai School of Medicine, New York, May, 1988.
4. 'Molecular analysis of natural autoantibodies'. National Institute of Immunology, New Delhi, September 1988.
5. 'Phenomenon of autoimmunity', University of Missouri, Columbia, February 1990.
6. 'Construction of immunoglobulin repertoire', University of Geneva Medical School, Geneva, September 1990.
7. 'Idiotype: Concepts and Applications'. University of Guelph, Guelph, 1991.

8. 'Construction of antibody repertoire'. University of Guelph, Guelph, 1992.
9. 'B lymphocyte, Immunodeficiency and Autoimmunity', Mount Sinai School of Medicine, New York, December 1994.
10. 'Molecular immunobiology of self reactive autoantibodies', Molecular biology 1995 Conference, San Diego, 1995.
11. 'CDR3H length in health and disease', Oklahoma Medical Research Foundation, Oklahoma City, 1997.
12. 'Current perspectives on B-1 lymphocytes and immune response', International Centre of Genetic Engineering and Biotechnology, New Delhi, 1998.
13. 'Novel insight through bovine immunoglobulin genes', Department of Molecular Biology, University of Guelph, 1999.
14. 'Of mice, cattle and antibodies', Ohio State University Children's Hospital, February 2001.
15. 'Novel insight into antibody diversification from cattle'. International Veterinary Immunology, Symposium, Uppsala, Sweden, July 2001.
16. 'Bovine Antibody gene Technology in Health and Disease', Angenics, University of Guelph, Guelph, November, 2001.
17. 'Bovine Antibody Transgenesis', Albert Einstein College of Medicine, New York, USA, 2004.
18. 'The dogma of cattle antibody', Institute for Molecular Biology and Biotechnology, Vrije Universiteit Brussel, Brussel, Belgium, October, 2005.
19. 'Immunoglobulin genetics', Round Table Meeting, INSERM Unit, L'Ecole de la Médecine, Paris, France, February, 2006.
20. 'Antibodies: Structure, Function and Application. South Dakota State University, Brookings, USA, November 2, 2007.
21. 'Translational aspects of bovine antibodies in animal health'. Ontario Ministry of Agriculture and Food, Guelph, Ontario, Canada, November 28, 2007.
22. 'Bovine antibody genetics in health and disease', IMGT, CNRS, Université Montpellier 2, Montpellier, France, February 2010.

Thesis Supervised:

1. **Joy Knott, MSc Thesis (1995)**. "Construction of primary antibody repertoire in kappa-deficient mice". University of Guelph, Guelph, Ontario, Canada.
2. **Byrum Bridle, MSc Thesis (1997)**. "Age and strain related influences on commercially raised chicken peripheral blood lymphocytes". University of Guelph, Guelph, Ontario, Canada.
3. **Surinder Saini, PhD Thesis (1999)**. "Molecular immunogenetics of bovine antibody", University of Guelph, Guelph, Ontario, Canada.
4. **Robin Cassady, MSc Thesis (2000)**. "Increased negative selection during ontogeny impairs IgM antibody repertoire", University of Guelph, Guelph, Ontario, Canada.
5. **F. Shojei, MSc Thesis (2001)**. "Molecular aspects of bovine D-genes". University of Guelph, Guelph, Ontario, Canada.
6. **Madhuri Koti, PhD Thesis (2007)**. "Immunogenetics of bovine antibody diversity and construction of recombinant therapeutic antibody". University of Guelph, Guelph, Ontario, Canada.
7. **Yfke Pasman, MSc Thesis (2010)**. "Structural and functional aspects of engineered antibody against Bovine Herpes Virus-1. University of Guelph, Guelph, Ontario, Canada.
8. **Yfke Pasman, PhD Thesis (in progress)**. Structural and functional aspects of engineered antibody for development of vaccines and therapeutics.

Post-Doctoral Fellows Supervised:

1. Dr. Alpina Nangpal (Murine VLambda genes) - 1993-95
2. Dr. Arvind Kashyap (Murine VH Genes) - 1996-97
3. Dr. Surinder Saini (Bovine antibody transgenesis) - (2000-2003)
4. Dr. Raspal Bhogal (Bovine immunoinformatics) - (2009-)

Thesis Defence Examination Committee:**University of Guelph:**

1. Y. F. Tian, MSc, 1991 (Microbiology)
2. A. DeLaPana, MSc, 1994 (VMI)
3. J. Knott, MSc, 1995 (VMI)
4. G. Appleyard, PhD 1995 (VMI)
5. E. Gallo-Hendriks, PhD, 1996 (Molec. Biol.)
6. Nancy Tout, PhD, 1997 (Microbiology)
7. H. S. Banga, PhD, 1997 (Pathobiology)
8. N. Reinhardt, DVSc, 1997 (Clinical studies)
9. Byram Bridle, MSc, 1997 (Pathobiology)
10. S. S. Saini, PhD, 1999 (Pathobiology)
11. M. Mohammad, PhD, 1999 (Ani.Poultry Sc.)
12. F. Shojaei, MSc, 2001 (Pathobiology)

Other Universities:

13. Ziyuan Zhang, PhD, 2002 (Immunology), University of Manitoba, Winnipeg, Manitoba
14. Aarti, PhD, 2010 (Immunology), Indraprastha University, New Delhi, India

PhD Qualifying Examination Committee:

1. John Papp, 1992 (Vet. Microbiology and Immunology)
2. Greg Appleyard, 1993 (Vet. Microbiology and Immunology)
3. Weerapong Koykul, 1993 (Biomedical Science)
4. Surinder S. Saini, 1996 (Vet. Microbiology and Immunology)
5. Ted Fjallman, 2004 (Environmental Biology)
6. Nina Weisser, 2005 (Environmental Biology)
7. X. Xie, 2006 (Environmental Biology)

Member Advisory Committee:

1. Malcolm Weir, MSc, 1993.
2. Phillip Ng, MSc, 1994.
3. Greg Appleyard, PhD, 1995.
4. Shirley, Furesz, PhD, 1996.
5. S. Reddy, PhD, 1996
6. Weerapong Koykul, PhD, 1996
7. Nancy Tout, PhD, 1997
8. Nancy Reinhardt, DVSc, 1997
9. L. Braz-ruivo, DVSc, 1997
10. J. Reddy, PhD, 1997
11. B. Messingher, DVSc, 1998
12. Mollie Ferassis, DVSc, 1999
13. Nina Weisser, MSc/PhD, 2003-Present
14. Xuemei Xie, Ph D, 2005-Present

Undergraduate Literature/Research Project Students:

<u>Department/Program</u>	<u>Student</u>	<u>Semester, Year</u>
<i>Biomedical Science</i>	Bev Walter	F, W, S, 1993-1994
	Melissa Gray	S, 1994
	Mark R. Jonkman	W, S, 1994
	Elizabeth Davidson	F, 1994; W, 1995
	Wai-May Lim	F, 1994; S, 1995
	Mark Belletrutti	F, W, 1995-1996
	Jana Cartier	W, 1999
	F. Zelster	S, 1999
	Bethany Lowe	W, 2000
	Melissa Cogswell	W, 2001
	Pravin Vijayan	W, 2004
	Timothy Patterson	W, 2005
	Kathryn Smith	W, 2009
	Miyuki Kumagai	F, 2010, F2011
	<i>Molecular Biology and Genetics</i>	Jennifer Richardson
Andrea Kurtz		F and W, 2002
Christina Southey		F and W, 2003-04
Brooke Janson		S, 2007
<i>Veterinary Medicine</i>	S. Ng	S, 2000
	<i>Microbiology</i>	Andrea E. Jacob
Adam Crossley		S, 2003
Heidi Machina		F, 2003
Fred Zelster		F, 2004
Lindsay Baltjes		W, 2005
<i>Arts and Science</i>	Richard W. Gilbert	F, 2009

Teaching:

Developed 'Immunology' curriculum at both undergraduate (BSc and DVM) and graduate level including multi media and problem/case based learning. Developed an elective in Clinical Veterinary Immunology for Final year DVM students, apart from core basic immunology in the new DVM curriculum and integrating learning first via webCT/Blackboard/D2L. The, 'Learning Materials on Core Immunology' for BSc 3rd and 4th year level students delivered online via WebCT/Blackboard/D2L have been developed in addition to graduate level 'Advances in Immunology' course. A laboratory manual of 'Basic immunological Techniques' has been developed that is used at senior and graduate level courses. The learning materials provide innovative personalized active learning approach.

Graduate: 91-610: Immunobiology (1991-1996, 2009-12)
91-611: Topics in Immunology (1991, 1992*, 1993)
91-695: Special Topic in VMI* (1992)
Guest lectures: General Pathology (1997-98); Vet. Internal Medicine (1999-2002)
MICR 6423: Advances in Immunology and Immunochemical Techniques (2003-04; 2005-08*)

Undergraduate: 65-409/410: Immunology & Serology/MICR 3230 Immunology-I (1992-1995, 1999-2012*)
93-355: Veterinary Immunology (1994, 1995*, 1996*, 1997-1999, 2000-02*)
93-485: Health management, 4th year rotation, (1992-1995)
98-450/4511/4521: Biomedical research Project (1992-1997, 1999-2005)
Elective in Clinical Immunology* (1992, 1993-1997)
MICR 4240*, MICR 4310* and MICR 4230: Immunology II (1994-2002; 2003*, 2005-11*)
MICR4530 (W2012*)
MICR4240 (Topics in Microbiology)/ (MI4310/4320) Research Project I/II (2002-03, 2008) *
Univ1200: Immunity and Health (2006-09)*

*Course Co-ordinator

Service:

- Member, College Library Committee (1992-96)
- Member, Department Graduate Studies and Research Committee (1996-99)
- Member, Pet Trust Research Award Panel (1999-2002)
- Member, Ontario Graduate Studies Scholarship Award Committee (2001)
- Member, Department T&P Committee (2003)
- Chair, Department Biosafety Committee (2003-04)
- Chair, Ontario Graduate Studies Scholarship Award Committee Panel (2002)
- Member, NIH Review Panel on SCOR on SLE (2002)
- Member, Peer Review Panel, Health Canada (2003)
- Chief, Clinical Immunology Service, 1992-2002; developed and introduced a number of Diagnostic tests in the Clinical Immunology Laboratory.
- Member, University of Guelph Faculty Association Council (2004 -07)
- Member, University Student Service Fee Committee (2005 -06)
- Member, UGFA Health and safety Committee (2005 -06)
- Member, University Student Judicial Committee (2006-09)
- Reviewer, BC Innovation Council: BCIC Innovation Scholars (2010)
- Ad hoc Reviewer, Journal of Immunology, Autoimmunity, Viral Immunology, Molecular Immunology, Developmental and Comparative Immunology, Veterinary Immunology and Immunopathology, Veterinary Microbiology, Journal of Molecular Recognition
- Ad hoc Reviewer, Grant-in-Aid, Canadian Arthritis Society Grant-in-Aid, Medical Research Council, NSERC Canada, NIH Study Section, Health Canada, Michael Smith Foundation for Health Research, Canadian Foundation for Innovation
- Editor-at-Large, Marcel Dekker Inc., New York; Member, Editorial Board, Journal of Veterinary Allergy & Clinical Immunology