

BIOGRAPHICAL SKETCH

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NAME Barbara Anne Croy	POSITION TITLE Professor and Tier 1 Canada Research Chair in Reproduction, Development and Sexual Function		
eRA COMMONS USER NAME B_Anne_Croy			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of Guelph, Guelph, Ontario Canada	DVM	1964-1969	Veterinary Medicine
University of Toronto, Institute of Medical Sciences	PhD	1970-1974	Immunology
Brock University, St. Catharines, Ontario	PDF-parttime	1980-1985	Developmental Biology

A. Positions and Honors.**Positions and Employment**

1970-1974 MRC (Canada) Fellow, University of Toronto, Toronto, ON
 1975-1997 Partner, Animal Health Services, St. Catharines, ON (private veterinary practice)
 1981-1982 Lalor Foundation Research Fellow, Biological Sciences, Brock University, St. Catharines, ON
 1985-1990 Associate Professor, Biomedical Sciences, University of Guelph, Guelph, ON
 1991-2004 Professor, Biomedical Sciences, University of Guelph, Guelph, ON
 1991-2007 Adjunct Prof, Dept of Molecular Immunology, Roswell Park Cancer Institute, Buffalo, NY
 2003-present Adjunct Professor, Dept of Obstetrics & Gynecology, McMaster University, Hamilton, ON
 2004-present Adjunct Professor, Department of Obstetrics & Gynecology, Queen's University
 2005-present Adjunct Professor, Department of Microbiology & Immunology, Queen's University
 2004-2009 Adjunct Professor, Department of Biomedical Sciences, U. Guelph, Guelph, ON
 2004-2010 Adjunct Professor, Dept of Human Biology and Nutritional Sciences, U. Guelph, Guelph, ON
 2004-2018 Tier 1 Canada Research Chair in Reproduction, Development and Sexual Function

Selected Honors

1992 Smith, Kline Beecham Award for Research Excellence
 1999 JCB Grant Senior Scientist Award, Canadian Association for Anatomy, Neurobiology & Cell Biology
 2002 Ontario Veterinary Medical Association Award of Merit
 2002-2004 University of Guelph President's Distinguished Faculty Award
 2004-2011 Tier 1 Canada Research Chair (CIHR)
 2005 Blackwell Munsgaard Senior Scientist Award, Am. Society of Reproductive Immunology

Service to the Research Community

NIH Study Section Human Embryology and Development HED1: permanent member 1995-1999,
 NIH Study Sections on Oncology, Allergy and Immunology, HED1, Pregnancy and Perinatology, ad hoc
 1991-1995; 2000-2007.
 NIH Consultant/Reviewer, U54 Centers Program, Washington, DC, November 17-19, 2008
 CIHR Grants Review Endocrinology Panel, member 2008-2011
 Consultant and External Reviewer: 6th Framework of Excellence European Consortium on Embryo
 Implantation Control (EMBIC), 2005-7.
 Editorial Boards: Placenta 1999-2002; 2003-2005.
 Laboratory Animal Science/Comparative Medicine 1996-present
 American Journal of Reproductive Immunology 1994-2005. 2006-2009.

Biology of Reproduction 1988-1995; 1999-2003, 2006-present
 Journal of Reproductive Immunology 1987-2005; Section editor 1996-1999
 Cellular and Molecular Immunology, 2009-present
 Guest Editor: Special Topic Issue on SCID mice. Lab An Sci 43: 1993
 Special Topic Issue on Uterine Natural Killer cells. Nat. Immunity 15:1997
 2008 Thematic Issue Immunological Investigations "Maternal Fetal Immunology"
 Trophoblast Research, Placenta V29; 2008. Annual issue summarizing 2007 meeting of the
 International Federation of Placenta Associations.
 Co-Chair 13th IFPA/2nd PAA Conference "Placenta-Platform for Life", Kingston, ON, Aug 17-21, 2007
 Vice-Chair, Reproductive Tract Gordon Conference 2010 and Co-Chair 2012 with Dr. F. DeMayo, Houston, TX
 Director, Human Placenta Summer Workshop International Course, Queen's University, 2006-2010

B. Selected peer-reviewed publications (in chronological order). Selected from 214 full papers and 223 published abstracts.

- 2010 B.A. Croy, J.H. Zhang, C. Tayade, F. Colucci, H. Yadi and A. Yamada. "Analysis of uterine Natural Killer cells in mice" In Natural Killer Cell Protocols: Cellular and Molecular Methods, Methods in Molecular Biology Series 612:465-503. Humana Press. K. Campbell, M. Colonna, editors.
- 2010 S.D. Burke, V. Barrette, J. Bianco, J.G. Thorne, A.T. Yamada, S.C. Pang, M.A. Adams and B.A. Croy. Patterns of blood pressure regulation during murine pregnancy. Hypertension, 55: 2010 55(3):729-737.
- 2010 E. Leno-Durán, J. Bianco, K. Hatta and B. A. Croy. Placental and fetal hypoxia are not primary outcomes from failure of spiral arterial modification in mice. Placenta, 31:731-737.
- 2010 A.V.C. Seaward, S.D. Burke and B.A. Croy. Interferon gamma contributes to pre-implantation embryonic development in NOD mice. Hum. Reprod. 25(11):2829-39. ePub Sep 2
- 2009 J.H. Zhang, A. T. Yamada and B.A. Croy. DBA-lectin reactivity defines natural killer cells that have homed to mouse decidua. Placenta. 30:968-973.
- 2009 N.F. Linton, J.M. Wessels, S.A. Cnossen, M.J. van den Heuvel, B.A. Croy and C. Tayade. Angiogenic DC-SIGN+ cells are present at the attachment sites of epitheliochorial placentae. Immunol Cell Biol. 88:63-71
- 2009 K. Hatta, M. J. van den Heuvel and B.A. Croy. NK cells detect changes in adaptive immunity within mouse decidua from gestation day eight. Placenta 30:501-506.
- 2009 K. Hatta, M. J. Bilinski, J. K. Haladyn, J. Horrocks, M. J. van den Heuvel, J. J. Roy, V. K. Han, and B. A. Croy. Cytokine array comparisons of plasma from cycling fertile women on cycle day 5 and ovulation. Am. J. Reprod. Immunol. 62:158-164.
- 2009 S.P. Murphy, C. Tayade, A. Ashkar, K. Hatta, J. Zhang and B.A. Croy. Interferon gamma in successful pregnancies. MiniReview. Biol Reprod. 80:848-859.
- 2009 B. A. Croy, J.M. Wessels, N.F. Linton, C. Tayade. Comparison of immune cell recruitment and function in endometrium during development of epitheliochorial (pig) and hemochorial (mouse and human) placentas (invited review). Placenta (Trophoblast Research) 23:S26-S31.
- 2008 J. Bianco, K. Stephenson, A.T. Yamada and B.A. Croy. Time-course analyses addressing the acquisition of DBA-lectin reactivity in mouse lymphoid organs and uterus during the first week of pregnancy. Placenta 29:1009-1015.
- 2008 C.G. Peralta, V.K. Han, J. Horrocks, B.A. Croy and M.J. van den Heuvel. CD56bright cells increase expression of $\alpha 4$ integrin at ovulation in fertile cycles. J Leukocyte Biol. 84:1065-1074.
- 2008 J. Zhang, H. Dong, J. Wang, S. Zhu and B.A. Croy. Murine uterine natural killer cells contribute to EphrinB2/EphB4 interactions during implantation site angiogenesis and spiral arterial modification. Biol. Reprod. 79:450-458.
- 2007 S.D. Burke, H. Dong, A.D. Hazan, B.A. Croy. Aberrant endometrial features of pregnancy in diabetic NOD mice. Diabetes. 56:2919-2926.
- 2007 C. Tayade, Y. Fang, D. Hilchie and B.A. Croy. Lymphocyte contributions to altered endometrial angiogenesis during early and midgestation fetal loss. J.Leukocyte Biol 82:877-886.
- 2007 C. Tayade, D. Hilchie, H. He, Y. Fang, L. Moons, P. Carmeliet, R. Foster and B.A. Croy. Genetic deletion of placenta growth factor in mice alters uterine Natural Killer cells. J. Immunology, 178:4167-4275.

- 2007 B.A. Croy, J.P. di Santo, M. Manz and R.B. Bankert. Murine Models of Immune Deficiency (invited chapter) IN Mouse in Biomedical Research, J.G. Fox, S.W. Barthold, M.T. Davisson, C.E. Newcomer, F. Quimby and A.S. Smith (eds) Elsevier Publishing Corp. 2nd Edition, Volume 2, Diseases, Academic Press, Burlington MA, pp 275-290.
- 2006 C. Tayade, G.P. Black, Y. Fang and B.A. Croy. Differential gene expression in endometrium, endometrial lymphocytes and trophoblasts during successful and abortive embryo implantation. J Immunol., 176:148-156.
- 2005 C. Tayade, Y. Fang, G.P. Black, V.A. Paffaro, A. Erlebacher and B.A. Croy. Transcription of Eomes and T-bet during differentiation and effector function development of mouse uterine natural killer cells. J Leukocyte Biol. 78:1347-1355.
- 2005 X. Xie, H. He, M. Colonna, T. Seya and B.A. Croy. Pathways participating in activation of mouse uterine Natural Killer cells during pregnancy. Biol Reprod. 73:510-518.
- 2005 H. He, D. McCartney, Q. Wei, S. Esadeg, J. Zhang, A. Hayes, F. Van Leuven and B.A. Croy. Characterization of a novel mouse alpha 2 macroglobulin gene expressed in reproductive and cardiovascular tissue. Biol Reprod 72:266-275.
- 2005 B.A. Croy and X. Xie. In vivo models for studying uterine natural killer cells, IN: Methods in Molecular Medicine 122: Placenta and Trophoblast: Methods and Protocols V2, Ch 5 p77-92. M.J. Soares and J.S. Hunt. Eds. Humana Press Inc., Totowa, NJ.
- 2005 A.M. Borzychowski, B.A. Croy, W.L. Chan, C.W.G. Redman and I.L. Sargent. Changes in systemic type 1 and type 2 immunity in normal pregnancy and pre-eclampsia may be mediated by natural killer cells. Eur J Immunol. 35:3054-3063.
- 2003 A.M. Borzychowski, S. Chantakru, K. Minhas, V.A. Paffaro, Jr., A.T. Yamada, H. He, K.S. Korach, and B.A. Croy. Functional analysis of murine uterine Natural Killer cells genetically devoid of estrogen receptors. Placenta 24: 403-411. 2003 S. Chantakru, W-C. Wang, M. van den Heuvel, S. Bashar, A. Simpson, Q. Chen, B.A. Croy, and S.S. Evans. Coordinate regulation of lymphocyte-endothelial interactions by pregnancy-associated hormones. J Immunol. 171: 4011-4019.
- 2003 A.A. Ashkar, G.P. Black, Q. Wei, H. He, L. Liang, J.R. Head and B.A. Croy. Assessment of requirements for IL-15 and IRFs in uterine natural killer cell differentiation and function during pregnancy. J Immunol. 171: 2937-2944.
- 2000 A. Ashkar, J.P. Di Santo and B.A. Croy. Interferon- γ contributes to initiation of uterine vascular modification, decidual integrity and uterine NK cell maturation during normal murine pregnancy. J Exp Med 192: 259-270 with accompanying Editorial Commentary F1-F4.
- 1998 J. Guimond, B. Wang and B.A. Croy. Engraftment of NK cells reverses the reproductive deficits in pregnancy NK cell and T cell deficient Tg ϵ 26 mice. J Exp Med. 187: 217-223.
- 1985 B.A. Croy, J. Rossant and D.A. Clark. Effects of alteration in the immuno-competent status of Mus musculus females on the survival of transferred Mus caroli embryos. J. Reprod. Fert. 74: 479-489.
- 1985 J. Rossant and B.A. Croy. Genetic identification of tissue of origin of cellular populations within the mouse placenta. J. Embryol. exp. Morph. 86: 177-189.

Research Support

Ongoing Research Support

AWARD TITLE (Award Interval)	ROLE	PROJECT GOALS
Analysis of uterine natural killer cell promotion of endometrial angiogenesis <i>March 2006 to March 2011 NSERC Discovery Renewal Pending</i>	Principal Investigator	1) To determine if there is a unique pro- or pre-uNK cell. 2) To characterize changes in gene expression and functions of mouse uterine spiral arteries during pregnancy-induced modification 3) address regulatory interactions between dendritic cells (DC) and uNK cells

Principal Investigator/Program Director (Last, First, Middle):

AWARD TITLE (Award Interval)	ROLE	PROJECT GOALS
Evaluation of Natural Killer cell contributions to the known elevated risk for pre-eclampsia in diabetic pregnancy <i>Oct. 2008 to Sept. 2013 CIHR Operating</i>	Principal Investigator	1) Continue to phenotype blood NK cell subsets of type 1 diabetic women for chemokine and homing receptor expression and function 2) In mice, to address the effects of diabetes on endothelial and uNK cell interactions including Ephrin gene expression 3) Using radiotelemetry, to define the role of lymphocyte-based RAS on gestational regulation of blood pressure in normal and diabetic mice.
Therapeutic promotion of porcine fetal survival <i>May2009 – April 2011 NSERC / AAFC Partnership with Bioniche Life Sciences and Ontario Pork</i>	Co-PI (C. Tayade PI)	1) To assess MNAC (an commercial prototype biological) on pregnancy promotion in pigs 2) To assess post farrowing survival and growth rates to market weight 3) To assess implantation site angiogenic responses to treatment at the molecular level 4) To assess in mice fertility enhancement effects over multiple parities and transgenerationally
Advanced phenomics of experimental cardiovascular conditions and treatments <i>Jan. 2009 – April 2010 Canada Foundation for Innovation Leaders' Opportunity Fund</i>	Co-PI (M. Adams PI)	Infrastructure for radiotelemetric and myographic studies of mouse hemodynamic functions.