

F. Abel Ponce de León

Professor and Head

Appointment Department Head and Professor

Research Area Genetics, Structural and Functional Genomics

Appointment History

1997-present	Professor and Head
1992-1997	Associate Professor
1986-1991	Assistant Professor

Graduate Program Affiliations

Animal Sciences – Senior Member
Molecular Veterinary Biosciences – Senior Member

Professional and Honorary Societies

Member, American Association for the Advancement of Science, AAAS
Member, American Genetic Association, AGA
Member, International Society for Animal Genetics ISAG
Member, American Society of Animal Science, ASAS
Member, Poultry Science Association, PSA
Member, Latin American Society of Animal Science, ALPA
Member, Sigma Xi

Five Most Significant Publications

Liu, W., P. Mariani, C.W. Beattie, L.J. Alexander, and F.A. Ponce de León. 2002. A radiation hybrid map for the bovine Y-chromosome. *Mamm. Genome* 13:320-326.

This manuscript describes the first generation and only physical map of the bovine Y-chromosome (BTAY). As 95% of BTAY is not involved in recombination the only possibility is the generation of a physical map based on the use of a radiation hybrid panel. This work required the micro-dissecting and micro-cloning of BTAY, identifying BTAY microsatellite markers and isolating bacterial artificial chromosome clones specific for BTAY.

Cibelli, J.B., S.L. Stice, P.J. Golueke, J.J. Kane, J. Jerry, C. Blackwell, F.A. Ponce de León, and J.M. Robl. 1998. Cloned transgenic calves produced from nonquiescent fetal fibroblasts. *Science* 280:1256-1258.

This manuscript describes our work in somatic cell reprogramming and the generation of the first transgenic cattle clones produced by nuclear transfer of nonquiescent fetal fibroblasts.

Zawada, W.M., J.B. Cibelli, P.K. Choi, E.D. Clarkson, P.J. Golueke, S.E. Witta, K.P. Bell, J. Kane, F.A. Ponce de León, D.J. Jerry, J.M. Robl, C.R. Freed, and S.L. Stice. 1998. Somatic cell cloned transgenic bovine neurons for transplantation in parkinsonian rats. *Nature Medicine* 4:569-574.

This manuscript demonstrates the therapeutic use of neuronal fetal cells obtained from 40 day old cloned fetuses to reduce Parkinsonian symptoms in parkinsonian rats.

Robinson, T.J., W.R. Harrison, F.A. Ponce de León, S.K. Davis, and F.F.B. Elder. 1998. A molecular cytogenetic analysis of X chromosome repatterning in the *Bovidae*: transpositions, inversions and phylogenetic inference. *Cytogenet. and Cell. Genetics* 80: 179-184.

This manuscript describes an evolutionary repatterning of the *Bovidea* X-chromosome and identified three X-chromosome types. The manuscript further consolidates the use of whole chromosome fluorescent in situ hybridization to chromosomal evolutionary reorganization leading to speciation.

Ponce de León, F.A., S. Ambady, G.A. Hawkins, S.M. Kappes, M.D. Bishop, J.M. Robl, and C.W. Beattie. 1996. Development of a bovine X linkage group and painting probes to assess cattle, sheep and goat X-chromosome segment homologies. *Proc. Natl. Acad. Sci. U.S.A.* 93:3450-3454.

This manuscript is the first to describe the generation of chromosome specific genomic DNA libraries obtained by micro-dissection and micro-cloning techniques. The manuscript further describes a comprehensive first generation genetic map for the bovine X-chromosome and the repatterning of the bovine, ovine and caprine X-chromosomes.

Refereed Journal Publications and Book Chapters (Last Five Years)

Authored or co-authored 20 papers in peer-reviewed journals.

- Liu, W.S. & **Ponce de León, F.A.** (2004) Assignment of *Sry*, *Ant3* and *Csf2ra* to the bovine Y ChrY-Chr by FISH and RH mapping. *Animal Biotechnology* (In press).
- Mizoshita, K., Ihara, N., C. M. Carpio, C.M., Bennett, G.L., **Ponce de León, F.A.**, Beattie, C.W. and Y. Sugimoto, Y. (2004). Chromosomal mapping of 65 microsatellites developed from microdissected BTA14 and BTA20 specific genomic libraries. *Animal Genetics* (In Press).
- Liu, W., C.W. Beattie, and **F.A. Ponce de León.** 2003. Bovine X-Chromosome Microsatellite Polymorphisms. *Cytogenet. Genome Res.* 102: 53-58.
- Norbis, N., A.M. Arrey-Wastavino, and **F.A. Ponce de León.** 2003. Teaching vs. Research: Toward the Reconciliation of an Academic Dilemma. *Essays in Education* 5: (Spring 2003), <http://www.usca.edu/essays/vol5spring2004.html>.
- Ambady, S., H.H. Cheng, and **F.A. Ponce de León.** 2002. Development and mapping of micro-satellite markers derived from chicken chromosome-specific libraries. *Poultry Science* 81: 1644-1646
- Liu, W., P. Mariani, C.W. Beattie, L.J. Alexander, and **F.A. Ponce de León.** 2002. A radiation hybrid map for the bovine Y-chromosome. *Mamm. Genome* 13:320-326.
- Reed K.M., N. Ihara, P. Mariani, K.M. Mendoza, L.E. Jensen, R. Bellavia, **F.A. Ponce de León,** G.L. Bennett, Y. Sugimoto, and C.W. Beattie. 2002. High resolution genetic map of bovine chromosome 29 through focused marker development. *Cytogenet. Genome Res.* 46: 210-216.
- Reed, K.M., N. Ihara, **F.A. Ponce de León,** T.S. Sonstegard, T.P.L. Smith, G.L. Bennett, Y. Sugimoto, and C.W. Beattie. 2002. Development of 47 new microsatellite markers from a BTA6 library. *Animal Biotechnology*, 13: 195-202.
- Sun, H.S., S. Whallon, **F.A. Ponce de León,** and B.W. Kirkpatrick. 2002. Rapid communication: Physical mapping of two bovine microsatellite loci. *J. Anim. Sci.* 80:868-869.
- Hyunggee, K., Y. Seungkwon, K. In-Jeong, L.K. Foster, J. Farris, S. Ambady, **F.A. Ponce de León** and D.N. Foster. (2001). Alterations in p53 and E2F-1 function common to immortalized chicken embryo fibroblasts. *Oncogene* 20:2671-2682.
- Ambady, S., S. M. Kappes, C. Park, R.Z. Ma, J.E. Beaver, H.A. Lewin, T.P.L. Smith, C.W. Beattie, P.K. Basrur, and **F.A. Ponce de León.** 2001. Development and mapping of microsatellites from a microdissected BTA 11-specific DNA library. *Animal Genetics* 32:152-155.
- Basrur, P.K., W. Koykul, M. Baguma-Nibasheka, W.A. King, S. Ambady, and **F.A. Ponce de León.** 2001. Synaptic pattern of sex complements and sperm head malformation in X-autosome translocation carrier bulls. *Mol. Reprod. Devel.* 59:67-77.
- Kim, H., S. You, I.-J. Kim, L.K. Foster, J. Farris, S. Ambady, **F.A. Ponce de León,** and D.N. Foster. 2001. Alterations in p53 and E2F-1 function common to immortalized chicken embryo fibroblast cells. *Oncogene* 20:2671-2682.

- Sreekumar, G.P., J.R. Smyth Jr., and **F.A. Ponce de León**. 2001. Molecular characterization of the Smyth chicken sublines and their parental controls by ARFLP and DNA fingerprint analysis. *Poultry Sci.* 80:1-5.
- Sreekumar, G.P., J.R. Smyth Jr., S. Ambady and **F.A. Ponce de León**. 2000. Analysis of the effect of endogenous viral genes in the Smyth line chicken model for autoimmune vitiligo. *Am. J. Pathol.* 156:1099-1107.
- Woollard, J., C.K. Tuggle, and **F.A. Ponce de León**. 2000. Localization of POU1F1 to bovine, ovine and caprine. *J. of Animal Science.* 78:242-243.
- Groenen, M.A.M., H.H. Cheng, N. Bumstead, B.F. Benkel, W.E. Briles, T. Burke, D.W. Burt, L.B. Crittenden, J. Dodgson, J. Hillel, S. Lamont, **A. Ponce de León**, M. Soller, H. Takahashi, and A. Vignal. 2000. A consensus linkage map of the chicken genome. *Genome Research* 10:137-147.
- Ramos, P.S., J.J. Bitgood, and **F.A. Ponce de León**. 1999. Novel chromosomal insertional translocation in chicken uncovered by double color FISH. *Animal Biotechnology* 10: 119-122.
- Ramos, P.S., D. Dias, and **F.A. Ponce de León**. 1999. Molecular cytogenetic analysis of the chicken and red-legged partridge chromosome 4 repatterning. *Animal Biotechnology* 10: 123-126.
- Ladjadi, K., M. Boichard, J.J. Bitgood, and **F.A. Ponce de León**. 1999. International system for standardized avian karyotypes (ISSAK): Standardized banded karyotypes of the domestic fowl (*Gallus domesticus*). *Cytogenet. Cell Genet.* 86:271-276.

Awards

Selected Fellow, 98-99 University of Minnesota CIC Academic Leadership Program. Elected Fellow, American Society for the Advancement of Science (AAAS), 1999.

Invited Lectures (13)

- “Food Animal Cloning: How and Why” May 2004. Minnesota State University, Mankato, Minnesota.
- “Advances in the use of Avian PGCs for the generation of transgenic birds” Symposium on Cloning and Animal Genetics. September 2003, Universidad Peruana Cayetano Heredia, Faculty of Veterinary Sciences, Lima Peru.
- “Bioinformatics” Symposium on Cloning and Animal Genetics. September 2003, Universidad Peruana Cayetano Heredia, Faculty of Veterinary Sciences, Lima Peru.
- “Structure and organization of the mammalian genome” Symposium on Cloning and Animal Genetics. September 2003, Universidad Peruana Cayetano Heredia, Faculty of Veterinary Sciences, Lima Peru.
- “Genetic variation and genome evolution” and “Mammalian Genomics” Post graduate course on “Genética e Sociedade” April 2002. Science Faculty, University of Lisbon, Lisbon, Portugal.
- “Molecular selection of progeny sex in cattle” April 2002, Symposium organized by the Office of Technology Transfer, University of Minnesota, Minneapolis, Minnesota.
- “Physical mapping of BTAY”, Departmental seminar, March 2002. University of Minnesota, St. Paul, Minnesota.
- “Sex Chromosomes in the Bovidae” 15th European Colloquium on Animal Cytogenetics and Gene Mapping, June 2002, Sorrento Italy.
- “From structural to Functional Genomics” Chinese Academy of Agricultural Sciences, October 2002. University of Beijing, Beijing, China.
- “Bioethics and Policy of Biotechnology” Panel Member, Round Table discussion. Symposium on Biotechnology in Agriculture, May 2001, University of Minnesota, St Paul.
- “Gene regulation in chicken pectoralis muscle before hatching and at 30 days of after hatching” April 2000. Department of Animal Science, University of New Hampshire.
- “Competitive advantage of chickens genetically altered to produce biologicals” BioTherapeutics '99, Animal-Based BioTherapeutics. October 1999. Washington D.C.

“Bioinformatics: an opportunity and a challenge” NCA-6 administrators meeting, January 1999, New Jersey.

Funding (last 5 yrs) – \$1,114,081

USDA. Genetic linkage map for the turkey. K. Reed (PI). 2003-06. \$382,028.

USDA. Development of a contig map to localize male fertility QTLs in BTAY. 2001-04. \$220,000.

USDA. Development of an F-2 population for dairy QTL mapping. Y. Da (PI). 1999-03. \$50,000.

Hubbard. Gift. 2001. \$3,800.

Nextran. Gift. 2001. \$6,500.

UMASS/Cyagra. Transgenic strategy for production of single sex offspring. 1998-01. \$111,755.

USDA. Comparative and QTL region-specific, genetic and physical maps for bovine. 1996-01. \$219,669.

CIMA. Development of long term cell culture conditions for chicken primordial germ cells and embryonic stem cells. 1997-00. \$548,357.

USDA. 11th North American Colloquium on Domestic Animal Cytogenetics and Gene Mapping. 1998-99. \$4,000.

Courses Taught (Last Five Years)

Designator	Name	Credits	% Effort	Term	Year
Agri 1910	Freshman Seminar – Animal Biotech	2	33%	Fall	2000
Agri 1910	Freshman Seminar – Animal Biotech	2	33%	Fall	2001
Agri 1910	Freshman Seminar – Animal Biotech	2	33%	Fall	2002

Service

Editorial board, *Animal Biotechnology*.

Associate Editor, *Journal of Poultry Science*, Molecular Biology section

Reviewer, *J. of Heredity*, *Biochemical Genetics*, *Animal Genetics*, *Gene*, *Mammalian Genome*, *J. of Animal Science*, *Genetics*, *Selection and Evolution*, and *Cytogenetics and Cell Genetics*.

Grant Reviewer: NSF, NRI-USDA.

Director, Animal Biotechnology Center.

Participant, International Delegations, one to New Zealand, one to China.

Organized and Chaired, 11th North American Colloquium on Domestic Animal Cytogenetics and Gene Mapping.

Genetic Mechanisms Study Group.

Member, Organizing Committee of the International Society of Animal Genetics Member, EC Program Evaluation Committee of the Institute for Biological and Environmental Science (CBA), University of Lisbon, Portugal (1997-2000).

Service to National and Regional Research Committees

Member, NC-1010, Interpreting cattle genomic data: biology, applications and outreach.

Member, NC-1008, Advanced technologies for the genetic improvement of poultry.

Chair ('97), Member NRSP-8, National animal genome research project.

Secretary ('99-'01), Member, NCA-6 Departments of Dairy, Poultry and Animal Science Administrators.

Member, NC-209, Genetic improvement of dairy cattle using molecular markers.

Member, NC-168, Advanced technologies for the genetic improvement of poultry.