

## BIOGRAPHICAL SKETCH

NAME	Womack, James E.		POSITION TITLE	Professor
EDUCATION/TRAINING				
INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY	
Abilene Christian College	B.S.	1964	Mathematics Ed.	
Oregon State University	Ph.D.	1968	Genetics	

### Professional Experience

1968-1971	Assistant Professor, Abilene Christian College
1971-1973	Associate Professor, Abilene Christian College
1973-1975	Visiting Scientist, The Jackson Laboratory
1975-1977	Staff Scientist, The Jackson Laboratory
1977-1983	Associate Professor, Texas A&M University
1983-	Professor, Veterinary Pathology, Texas A&M University
1987-	W.P. Luse Professor, Texas A&M University
1989-1996	Director, Center for Animal Genetics, Institute of Biosciences & Technology
1990-1993	Interim Assistant Department Head, Department of Veterinary Pathobiology, Texas A&M University
2001-Present	Distinguished Professor, Texas A&M University Director, Center for Animal Biotechnology and Genomics, Texas A&M University

### Honors and Awards

Alumni Citation Award, Abilene Christian University, 1983  
 Beecham Award for Research Excellence, 1986  
 Faculty Distinguished Achievement Award for Research, Texas A&M University, 1987  
 Carrington Award for Research in Cell Biology, 1990  
 McMaster Fellow, CSIRO, Australia, 1990  
 Faculty of Genetics Research Award, 1993  
 CIBA Prize for Research in Animal Health, 1993  
 Outstanding Texas Geneticist, Texas Genetics Society, 1996  
 Fellow, American Association for the Advancement of Science, 1999  
 National Academy of Science, USA, 1999  
 Wolf Prize in Agriculture, 2001

### Publications in the last 5 years plus earlier pertinent publications

Barendse, W., Vaiman, D., Kemp, S.J., Sugimoto, Y., Armitage, S.M., Williams, J.L., Sun, H.S., Eggen, A., Agaba, M., Aleyasin, S.A., Band, M., Bishop, M.D., Buitkamp, J., Byrne, K., Collins, F., Cooper, L., Coppettiers, W., Denys, B., Drinkwater, R.D., Easterday, K., Elduque, C., Ennis, S., Erhardt, G., Ferretti, L., Flavin, N., Gao, Q., Georges, M., Gurung, R., Harlizius, B., Hawkins, G., Hetzel, J., Hirano, T., Hulme, D., Jorgensen, C., Kessler, M., Kirkpatrick, B.W., Konfortov, B., Kostia, S., Kuhn, C., Lenstra, J.A., Leveziel, H., Lewin, H.A., Leyhe, B., Lil, L., Martin Burriel, I., McGraw, R.A., Miller, J.R., Moody, D.E., Moore, S.S., Nakane, S., Nijman, I.J., Olsaker, I., Pomp, D., Rando, A., Ron, M., Shalom, A., Teale, A.J., Thieven, U., Urquhart, B.G.D., Vage, D.-I., Van de Weghe, A., Varvio, S., Velmala, R., Vilkki, J., Weikard, R., Woodside, C., Womack, J.E., Zanotti, M., and Zaragoza, P.: A medium-density genetic linkage map of the bovine genome. *Mammalian Genome* 8:21-28, 1997.

Lyons, L.A., Laughlin, T.F., Copeland, N.G., Jenkins, N.A., Womack, J.E. and O'Brien, S.J.: Comparative anchor tagged sequences (CATS) for integrative mapping of mammalian genomes. *Nature Genetics*, 15:47-56, 1997.

Kostia, S., Vilkki, J., Pirinen, M., Womack, J., Barendse, W., and Varvio, S.L.: SINE targeting of bovine microsatellites from bovine/rodent hybrid cell lines. *Mammalian Genome* 8:365-367, 1997.

Messer, L.A., Wang, L., Tuggle, C.K., Yerle, M., Chardon, P., Pomp, D., Womack, J.E., Barendse, W., Crawford, A.M., Notter, D.R. and Rothschild, M.F.: Mapping of the melatonin receptor 1a (MTNR1A) gene in pigs, sheep, and cattle. *Mammalian Genome* 8:368-370, 1997.

Schläpfer, J., Gallagher, D.S., Burzlaff, J.D., Davis, S.K., Taylor, J.F. and Womack, J.E.: Physical mapping of the endothelin receptor type B to bovine Chromosome 12. *Mammalian Genome* 8:380-381, 1997.

Gao, Q. and Womack, J.E.: A genetic map of bovine Chromosome 7 with an interspecific hybrid backcross panel. *Mammalian Genome* 8:258-261, 1997.

Yang, Y. and Womack, J.E.: Construction of a bovine Chromosome 19 map with an interspecies hybrid backcross. *Mammalian Genome* 8:262-266, 1997.

Ryan, A.M., Schelling, C.P., Womack, J.E., and Gallagher D.S., Jr.: Chromosomal assignment of six muscle-specific genes in cattle. *Animal Genetics*, 28:84-87, 1997.

- Gao, Q., Li, Li., and Womack, J.E.: Assignment of the casein kinase II gene family to cattle chromosomes. *Animal Genetics*, 28:146-149, 1997.
- De Hondt, H.A., Gallagher, D., Oraby, H., Othman, O.E., Bosma, A.A., Womack, J.E. and El Nahas, S.M.: Gene mapping in the river buffalo (*Bubalus bubalis* L.): five syntenic groups. *J. Anim. Breed. Genet.* 114:79-85, 1997.
- Messer, L.A., Wang, L., Tuggle, C.K., Yerle, M., Chardon, P., Pomp, D., Womack, J.E., Barendse, W., Crawford, A.M., Notter, D.R., and Rothschild, M.F.: Mapping of the melatonin receptor 1a (*MTNRIA*) gene in pigs, sheep, and cattle. *Mammalian Genome* 8:368-370, 1997.
- Riggs, P.K., Owens, K.E., Rexroad, C.E.III, Amaral, M.E.J. and Womack, J.E.: Development and initial characterization of a *Bos taurus* x *B. gaurus* Interspecific Hybrid Backcross Panel. *J. Heredity* 88:373-379, 1997.
- Bachman, N.J., Riggs, P.K., Siddiqui, N.Y., Rexroad, C.E. III, Amaral, M.E.J., and Womack, J.E.: Structure of the human gene (*COX6A2*) for the heart/muscle isoform of cytochrome *c* oxidase subunit VIa and its chromosomal location in humans, mice and cattle. *Genomics* 43:146-151, 1997.
- Li, L. and Womack, J.E.: Somatic cell mapping of the adenine nucleotide translocator gene family in cattle. *Mammalian Genome* 8:773-774, 1997.
- Elduque, C., Zaragoza, P., and Womack, J.E.: An *EcoRI* polymorphism at the beta-nerve growth factor (*NGFB*) locus in cattle. *Animal Genetics* 28:308-322, 1997.
- Womack, J.E., Johnson, J.S., Owens, E.K., Rexroad, C.E. III, Schläpfer, J., and Yang, Y.-P.: A whole-genome radiation hybrid panel for bovine gene mapping. *Mammalian Genome* 8:854-856, 1997.
- Piedrahita, J.A., Weaks, R., Petrescu, A., Shrode, T.W., Derr, J.N. and Womack, J.E.: Genetic characterization of the bovine leukemia inhibitory factor (*LIF*) gene: isolation and sequencing, chromosome assignment, and microsatellite analysis. *Animal Genetics*, 28:14-20, 1997.
- Bielec, P.E., Riggs, P.K., Womack, J.E. and Busbee, D.L.: A high resolution GBG-banded karyotype of the Atlantic bottlenose dolphin, *Turisops truncatus*: generation of an ideogram, and NOR localization by fluorescence in situ hybridization. *Cytogenet. Cell Genet.* 78:6-11, 1997.
- Gao, Q. and Womack, J.E.: Comparative mapping of anchor loci from HSA19 to cattle chromosomes 7 and 18. *Journal of Heredity* 88: 524-527, 1997.
- El Nahas, S.M., Oraby, H.O., Othman, O.E., DeHondt H.A., Bosma, A.A. and Womack, J.E.: Use of molecular markers for the identification of River Buffalo chromosomes: chromosome one. *J. Anim. Breed. Genet.* 114:451-455, 1997.
- Dietz, A.B., Neibergs, H.L., Womack, J.E., and Kehrl, M.E., Jr.: Rapid communication: Single strand conformational polymorphism (SSCP) of bovine tumor necrosis factor alpha. *J. of Animal Science* 75:2567, 1997.
- Elduque, C., Zaragoza, P., and Womack, J.E.: An *EcoRI* polymorphism at the beta-nerve growth factor (*NGFB*) locus in cattle. *Animal Genetics*, 28:322, 1997.
- Schläpfer, J., Kata, S.R., Amarante, M.R., and Womack, J.E.: Syntenic assignment of thrombomodulin (*THBD*) and phosphatidylinositol-specific phospholipase C (*PLC-II*) to bovine chromosome 13. *Animal Genetics* 28:308-309, 1997.
- Bachman, N.J., Riggs, P.K., Siddiqui, N., Makris, G.J., Womack, J.E., Lomax, M.I. Structure of the human gene (*COX6A2*) for the heart/muscle isoform of cytochrome *c* oxidase subunit VIa and its chromosomal location in human, mice, and cattle. *Genomics* 42:146-151, 1997.
- Iannuzzi, L., Skow, L., Di Meo G.P., Gallagher, D.S., and Womack, J.E.: Comparative FISH-mapping of villin (*VIL*) gene in river buffalo, sheep and goat chromosomes. *Chromosome Research* 5:199-202, 1997.
- Elduque, C. and Womack, J.E.: Localization of the beta-nerve growth factor gene (*NGFB*) to bovine chromosome 3. *Mammalian Genome* 8:73-74, 1997
- Elduque, C., Li, L., Barendse, W., and Womack, J.E.: Physical and genetic mapping of the prosaposin gene (*PSAP*) to bovine chromosome 28. *Mammalian Genome* 8:73, 1997.
- Gu, Z.X., Womack, J.E., and Kirkpatrick, B.W.: Synteny mapping of four genes from the short arm of human chromosome 19 to bovine chromosome 7. *Cytogenetics and Cell Genetics*, 79:225-227, 1997.
- Schläpfer, J., Yang, Y., Rexroad, C. III and Womack, J.E.: A radiation hybrid framework map of the bovine chromosome 13. *Chromosome Research* 5:511-519, 1998.
- Yang, Y.-P., Rexroad, C.E. III, Schlapfer, J., and Womack, J.E.: An integrated radiation hybrid map of bovine chromosome 19 and ordered comparative mapping with human chromosome 17. *Genomics* 48:93-99, 1998.
- Gallagher, D.S. Jr., Yang, Y.-P., Burzlaff, J.D., Womack, J.E., Stelly, D.M., Davis, S.K. and Taylor, J.F.: Physical assignment of six type I anchor loci to bovine chromosome 19 by fluorescence *in situ* hybridization. *Anim. Genet.* 29:130-134, 1998.
- Bielec, P.E., Gallagher, D.S., Womack, J.E. and Busbee, D.L.: Homologies between human and dolphin chromosomes detected by heterologous chromosome painting. *Cytogenet. Cell Genet.* 81:18-25, 1998.
- Schläpfer, J., Gallagher, D.S., Jr., Burzlaff, J.D., Womack, J.E., Stelly, D.M., Taylor, J.F., and Davis, S.K.: Comparative mapping of bovine chromosome 13 by fluorescence in situ hybridization. *Animal Genetics* 29:265-272, 1998.

- Amarante, M.R.V., Lopes, C.R., and Womack, J.E.: KRN1 maps to bovine chromosome 29. *Animal Genetics* 29:322-332, 1998.
- Yang, Y.-P. and Womack, J.E.: Parallel radiation hybrid mapping: A powerful tool for high-resolution genomic comparison. *Genome Research* 8:731-736, 1998.
- Band, M., Larson, J.H., Womack, J.E. and Lewin, H.A.: A radiation hybrid map of BTA23: Identification of a chromosomal rearrangement leading to separation of the cattle MHC class II subregions. *Genomics* 53:269-275, 1998.
- Gallagher, D.S. Jr., Davis, S.K., De Donato, M., Burzlaff, J.D., Womack, J.E., Taylor, J.F. and Kumamoto, A.T.: A karyotypic analysis of nilgai, *Boselaphus tragocamelus* (Artiodactyla: Bovidae). *Chromosome Research* 6:505-513, 1998.
- Modi, W.S., Amarante, M.R.V., Hanson, M., Womack, J.E. and Chidambaram, A.: Assignment of the mouse and cow CXC chemokine genes. *Cytogenet. Cell Genet.* 81:213-216, 1998.
- Amarante, M.R.V., Lopes, C.R. and Womack, J.E.: Syntenic assignment of CD3G to bovine chromosome 15. *Animal Genetics* 30:66-80, 1999.
- Pirotton, D., Poncelet, D., Grobet, L., Royo, L.J., Brouwers, B., Masabanda, J., Takeda, H., Fries, R., Sugimoto, Y., Womack, J.E., Dunner, S., and Georges, M.: High-resolution, human-bovine comparative mapping based on a closed YAC contig spanning the bovine *mh* locus. *Mammalian Genome* 10:289-293, 1999.
- Gallagher, D.S. Jr., Schlöpfer, J., Burzlaff, J.D., Womack, J.E., Stelly, D.M., Davis, S.K., and Taylor, J.F.: Cytogenetic alignment of the bovine chromosome 13 genome map by fluorescence *in-situ* hybridization of human chromosome 10 and 20 comparative markers. *Chromosome Research* 17:115-119, 1999.
- Antoniou, E., Womack, J.E., and Grosz, M.D.: Synteny mapping of five human chromosome 7 genes on bovine chromosomes 4 and 21. *Cytogenet. Cell Genet.* 84:121-124, 1999.
- Iannuzzi, L., Gallagher, D.S. Jr., Di Meo, G.P., Yang, Y., Womack, J.E., Davis, S.K. and Taylor, J.F.: Comparative FISH-mapping of six expressed gene loci to river buffalo and sheep chromosomes. *Cytogenet. Cell Genet* 84:161-163, 1999.
- Amarante, M.R.V., Gallagher, D.S., Burzlaff, J.D., Lopes, C.R., Womack, J.E., Taylor, J.F., and Davis, S.K.: Physical mapping of ADCY2, FSHB and HBB to bovine chromosome 15 by FISH of bovine bacterial artificial chromosome clones. *Cytogenet. Cell Genet* 85:271-272, 1999.
- Amarante, M.R.V., Lopes, C.R., and Womack, J.E.: Interstitial collagenase precursor gene maps to bovine chromosome 15. *Animal Genetics* 30:227, 1999.
- Amarante, M.R.V., Lopes, C.R., and Womack, J.E.: KRN1 maps to bovine chromosome 29. *Animal Genetics*: 29:323, 1999.
- Rexroad, C.E. III, and Womack, J.E.: Parallel RH mapping of BTA1 with HSA3 and HSA21. *Mammalian Genome* 10:1095-1097, 1999.
- O'Brien, S.J., Menotti-Raymond, M., Murphy, W.J., Nash, W.G., Wienberg, J., Stanyon, R., Copeland, Neal G., Jenkins, N.A., Womack, J.E., and Graves, J.A.M.: The promise of comparative genomics in mammals. *Science* 286:458-481, 1999.
- Gu, Z., Womack, J.E., and Kirkpatrick, B.W.: A radiation hybrid map of the bovine Chromosome 7 and comparative mapping with human Chromosome 19 p arm. *Mammalian Genome* 10:1112-1114, 1999.
- Rexroad, C.E., Schlöpfer, J.S., Yang, Y., Harlizius, B., and Womack, J.E.: A radiation hybrid map of bovine chromosome one. *Animal Genetics* 30, 325-332, 1999.
- Gallagher, D.S. Jr., Davis, S.K., De Donato, M., Burzlaff, J.D., Womack, J.E., Taylor, J.F., and Kumamoto, A.T.: A molecular cytogenetic analysis of the tribe Bovini (Artiodactyla: Bovidae: Bovinae) with an emphasis on sex chromosome morphology and NOR distribution. *Chromosome Research* 7:481-492, 1999.
- DeDonato, M., Gallagher, D.S., Davis, S.K., Ji, Y., Burzlaff, J.D., Stelly, D.M., Womack, J.E. and Taylor, J.F.: Physical assignment of microsatellite-containing BACs to bovine chromosomes. *Cytogenet. Cell* 87:59-61, 1999.
- Gellin, J., Brown, S., Marshall Graves, J.A., Rothschild, M., Schook, L., Womack, J., and Yerle, M.: Comparative gene mapping workshop: progress in agriculturally important animals. *Mammalian Genome* 11:140-144, 2000.
- Karall-Albrecht, C., Groenen, M.A.M., van der Poel, J.J., Barendse, W., Womack, J.E., Kalm, E., and Looft, C.: Mapping of 16 ESTs expressed in the bovine mammary gland during lactation. *Mammalian Genome* 11:320-325, 2000.
- Ozawa, A., Band, M.R., Larson, J.H., Donovan, J., Green, C.A., Womack, J.E., and Lewin, H.A.: Comparative organization of cattle chromosome 5 revealed by comparative mapping by annotation and sequence similarity and radiation hybrid mapping. *PNAS*, 97:4150-4155, 2000.
- Amarante, M.R.V., Yang, Y.P., Kata, S.R., Lopes, C.R., and Womack, J.E.: RH maps of bovine Chromosomes 15 and 29: conservation of human Chromosomes 11 and 5. *Mammalian Genome* 11:364-368, 2000.
- Bielec, P., Gallagher, D., Yang, Y.-P., Womack, J.E., Davis, S., Taylor, J. and Busbee D.: Assignment<sup>1</sup> of crystallin b-polypeptide 1 (CRYBA1) to Atlantic bottlenose dolphin chromosome band 16p 11 by in situ hybridization. *Cytogenet Cell Genet* 89:96-97, 2000.
- Band, M.R., Larson, J.H., Rebeiz, M., Green, C.A., Heyen, D.W., Donovan, J., Windish, R., Steining, C., Mahyuddin, P., Womack, J.E., and Lewin, H.A.: An ordered comparative map of the cattle and human genomes. *Genome Research* 1359-1368, 2000.

- Rexroad, C.E.III, Owens, E.K., Johnson, J.S. and Womack, J.E.: A 12000 rad whole genome radiation hybrid panel for high resolution mapping in cattle: characterization of the centromeric end of chromosome 1. *Animal Genetics* 31:262-265, 2000.
- Shay, T.L., Berghmans, S., Segers, K., Meyers, S., Beever, J.E., Womack, J.E., Georges, M., Charlier, C., and Cockett, N.E. Fine-mapping and construction of a bovine contig spanning the ovine *callipyge* locus. *Mammalian Genome* 12:141-149, 2000.
- El Nahas, S.M., de Hondt, H.A., and Womack, J.E.: Current status of the river buffalo (*Bubalus bubalis* L.) gene map. *J. Heredity*, 92:221-225, 2001.
- Iannuzzi, L., Gallagher, D.S., Di Meo, G.P., Schlapfer, J., Perucatti, A., Amarante, M.R.V., Incarnato, D., Davis, S.K., Taylor, J.F., and Womack, J.E.: Twelve loci from HSA10, HSA11 and HSA20 were comparatively FISH-mapped and river buffalo and sheep chromosomes. *Cytogenet Cell Genet* 93:124-126, 2001.
- Dorroch, U., Goldammer, T., Brunner, R.M., Kata, S., Kühn, C. and Womack, J.E. and Schwerin, M.: Isolation and characterization of hepatic and intestinal expressed sequence tags potentially involved in trait differentiation between cows of different metabolic type. *Mammalian Genome* 12:528-537, 2001.
- Wang, Y.-H., McWilliam, S.M., Barendse, W., Kata, S.R., Womack, J.E., Moore, S.S., and Lehnert, S.A.: Mapping of 12 bovine ribosomal protein genes using a bovine radiation hybrid panel. *Animal Genetics*, 32:269-273, 2001.
- Goldammer, T., Kata, S.R., Brunner, R.M., Dorroch, U., Sanftleben, H., Schwerin, M., and Womack, J.E.: A comparative radiation hybrid map of bovine chromosome 18 and homologous chromosomes in human and mice. *Proc. Natl. Acad. Sci. USA*, 99:2106-2111, 2002.
- Chowdhary, B.P., Raudsepp, T., Honeycutt, D., Owens, E.K., Piumi, F., Guérin, G., Matise, T.C., Kata, S., Womack, J.E., and Skow, L.C.: Construction of a 5000rad whole-genome radiation hybrid panel in the horse and generation of a comprehensive and comparative map for ECA11. *Mammalian.Genome* 13:89-94, 2002.
- Amaral, M.E.J., Kata, S.R., and Womack, J.E.: A radiation hybrid map of bovine X Chromosome (BTAX). *Mammalian Genome* 13:268-271, 2002.
- Takeda, H., Takami, M., Oguni, T., Tsuji, T., Yoneda, K., Sato, H., Ihara, N., Itoh, T., Kata, S.R., Mishina, Y., Womack, J.E., Moritomo, Y., Sugimoto, Y. and Kunieda, T.: Positional cloning of the gene LIMBIN responsible for bovine chondrodysplastic dwarfism. *Proc. Natl. Acad. Sci.*, 99:10549-10554, 2002.
- Winter, A., Krämer, W., Werner, F.A., Kollers, S., Kata, S., Durstewitz, G., Buitkamp, J., Womack, J.E., Thaller, G., and Fries, R.: Association of a lysine-232/alanine polymorphism in a bovine gene encoding acyl-CoA:diacylglycerol acyltransferase (*DGATI*) with variation at a quantitative trait locus for milk fat content. *Pro. Natl. Acad. Sci.* 97:9300-9305, 2002.
- Chowdhary, B.P., Raudsepp, T., Kata, S.R., Goh, G., Millon, L.V., Allan, V., Piumi, F., Guérin, G., Swinburne, J., Binns, M., Lear, T.L., Mickelson, J., Murray, J., Antczak, D.F., Womack, J.E., and Skow, L.C.: The first-generation whole-genome radiation hybrid map in the horse identifies conserved segments in human and mouse genome. *Genome Research*, 1:742-751, 2003.
- Amaral, M.E.J., Kata, S.R., and Womack, J.E.: A radiation hybrid map of bovine X Chromosome (BTAX). *Mammalian Genome* 13:268-271, 2002.
- Takeda, H., Takami, M., Oguni, T., Tsuji, T., Yoneda, K., Sato, H., Ihara, N., Itoh, T., Kata, S.R., Mishina, Y., Womack, J.E., Moritomo, Y., Sugimoto, Y. and Kunieda, T.: Positional cloning of the gene LIMBIN responsible for bovine chondrodysplastic dwarfism. *Proc. Natl. Acad. Sci.*, 99:10549-10554, 2002.
- Winter, A., Krämer, W., Werner, F.A., Kollers, S., Kata, S., Durstewitz, G., Buitkamp, J., Womack, J.E., Thaller, G., and Fries, R.: Association of a lysine-232/alanine polymorphism in a bovine gene encoding acyl-CoA:diacylglycerol acyltransferase (*DGATI*) with variation at a quantitative trait locus for milk fat content. . *Pro. Natl. Acad. Sci.* 97:9300-9305, 2002.
- Chowdhary, B.P., Raudsepp, T., Kata, S.R., Goh, G., Millon, L.V., Allan, V., Piumi, F., Guérin, G., Swinburne, J., Binns, M., Lear, T.L., Mickelson, J., Murray, J., Antczak, D.F., Womack, J.E., and Skow, L.C.: The first-generation whole-genome radiation hybrid map in the horse identifies conserved segments in human and mouse genome. *Genome Research*, 1:742-751, 2003.
- Brunner, R.M., Sanftleben, H., Goldammer, T., Kühn, C., Weikard, R., Kata, S.R., Womack, J.E., and Schwerin, M.: The telomeric region of BTA18 containing a potential QTL region for health in cattle exhibits high similarity to the HSA19q region in humans. *Genomics*, 81:270-278, 2003.
- White, S.N., Kata, S.R., and Womack, J.E.: Comparative fine maps of bovine toll-like receptor 4 and toll-like receptor 2 regions. *Mammalian Genome*, 14:149-155, 2003.
- Krum, S.A., Womack, J.E., and Lane, T.F.: Bovine BRCA1 shows classic responses to genotoxic stress but low *in vitro* transcriptional activation activity. *Oncogene*, 22:6032-6044, 2003.
- White, S.N., Taylor, K.H., Abbey, C.A., and Gill, C.A., and Womack, J.E.: Haplotype variation in bovine Toll-like receptor 4 and computational predication of a positively selected ligand-binding domain. *Pro. Natl. Acad. Sci.* 100: 10364-10369, 2003.

built with cattle BAC-ends and human genome sequence. Genome Research, 1966-1973, 2003.

Grants in the Last 5 years

- 1991-1996 Constructing a microsatellite/cosmid map of the bovine genome. Principal Investigator, \$261,239 from USDA (NRICGP).
- 1992-1995 Physical gene mapping of the river buffalo. Principal Investigator, \$180,797 from USDA (NARP, EGYPT)
- 1993-1998 Biochemical genetic monitoring of rodents. Principal Investigator, \$328,621 from NIH (NO1-CM-37536).
- 1993-1998 NAGRP Coordinator for Cattle Genome Research. Principal Investigator, \$480,000 from USDA (NAGRP).
- 1995-1998 Constructing an anchored comparative map of the bovine genome. Principal Investigator. \$250,000 from the USDA (NRI).
- 1997-2000 Radiation hybrid mapping of the bovine genome. Principal Investigator. \$190,000 from USDA (NRI).
- 1998-2000 An anchored comparative map of the river buffalo genome. Co-Principal Investigator. \$22,993 NSF (US-Egypt).
- 1998-2000 Radiation hybrid mapping of cattle ESTs for high resolution comparative mapping. Co-Principal Investigator with H. Lewin, U. Illinois. \$250,000 from USDA-NRI (\$107,500 to TAES)..
- 1998-2000 Biochemical genetic monitoring of rodents. Principal Investigator. \$454,466 from NIH (NO2 CM-87014).
- 1998-2003 NAGRP Coordinator for Cattle Genome Research. Principal Investigator. \$480,000 from USDA (NAGRP)..
- 1999-2002 Production of a 25,000 cattle ESTs and development of a high resolution radiation hybrid map. Co-principal Investigator with H. Lewin, U. Illinois. \$750,000 from USDA-NRI (\$176,460 to TAES).
- 2000-2001 Parallel radiation hybrid mapping for isolating economically important genes in cattle. Principal. \$180,973 from Texas Advanced Technology Program.. Investigator