

Abbreviated CV for Manas Ray

Curriculum Vitae

Manas K. Ray, Ph.D.
Head, Knockout Mouse Core (KOMC)

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Reproduction and Developmental
Biology Laboratory (RDBL)
NIEHS - National Institutes of Health
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Education

1991 Ph.D. in Biochemistry & Molecular Biology, University of Nebraska,
Lincoln, NE
Ph.D. Thesis Title: Role of p67kDa protein in Eukaryotic Protein
Synthesis Initiation

1986 MS in Biochemistry & Molecular Biology, University of Calcutta, India

1983 BS in Chemistry, Scottish Church College, India

Professional Positions

2002 – Present Head, Knockout Mouse Core (KOMC), NIEHS-National Institutes of
Health, RTP, NC 27709

2000 – 2002 Assistant Professor, Eastern Virginia Medical School (EVMS), VA 23510

1997 – 2000 Assistant Professor, Baylor College of Medicine, TX 77030

1992 – 1997 Research Associate, Baylor College of Medicine, TX 77030

1991 – 1992 Research Fellow, University of Nebraska-Lincoln (UNL), NE 68588-0304

1987 – 1991 Ph.D., University of Nebraska-Lincoln (UNL), NE 68588-0304

Service to Committees and Professional Societies

- American Diabetes Association
- American Chemical Society
- Juvenile Diabetes Foundation
- Animal Care and Use Committee (ACUC), EVMS
- Animal Care and Use Committee (ACUC), NIEHS
- NIEHS Health and Safety Committee (current member)

- NIEHS COP (Committee of Promotion) III Committee
- NIEHS Science Day Judge
- NB Core Head Selection Committee
- International Society for Transgenic Technologies (current member)

Invited Speaker

- National Institutes of Health, Bethesda, MD; Laboratory of Ocular Therapeutics, May 6, 1996: Regulation of Cell-Specific Pulmonary Gene Expression.
- Lexicon Genetics, Woodlands, TX; March 17, 2000: Regulation of Cell-Specific Pulmonary Gene Expression, *in vitro* and *in vivo* study.
- University of Miami Diabetes Research Institute, Miami, FL; April 07, 2000: Mouse models to study gene function.
- University of Tennessee at Memphis, TN; June 16, 2001: Transgenic Mouse Model(s) to Study Gene Function(s).
- CuraGen Corporation, Branford, CT; July 16, 2001: Somatostatin receptors in Diabetes.
- NIH -NIDDK, Bethesda, MD; August 21, 2001: *In vivo* analysis of gene function using transgenic and knock out techniques.

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Awards, Grants, and Patents

- National Scholarship Award, Government of India, Ministry of Education, 1977
- SSAT Annual Scientific Meeting, Poster of Distinction in New Orleans, LA, May 17-21, 1998
- NIH - 2RO1 DK 46441-07 (P.I. F. Charles Brunicardi, M.D.) 05/98 – 03/02, 50% Effort (Co-Principal Investigator)
- CNRC - (P.I. - Austin Cooney, Ph.D.); 10/99 – 03/04; 15% Effort, Role: Co-Principal Investigator
- NIH Patent Number: E-328-2008/0; “Transgenic Mice with Conditionally-Enhanced Bone Morphogen Protein (BMP) Signaling: A Model for Human Bone Diseases” with Novartis Pharmaceuticals

Publications

1. Sueyoshi T, Sakuma T, Shindo S, Fashe M, Kanayama T, Ray M, Moore R, Negishi M. A phosphorylation-deficient mutant of retinoid X receptor α at Thr 167 alters fasting response and energy metabolism in mice. *Lab Invest.* (2019). 99, 1470-1483. [PMID: 31152145](#). [PMCID: PMC6759383](#).
2. Gruzdev A, Scott GJ, Hagler TB, Ray MK (2019). CRISPR/Cas9-Assisted Genome Editing in Murine Embryonic Stem Cells. *Methods Mol Biol* 1960, 1-21. [PMID: 30798517](#)
3. Nicol B, Grimm SA, Gruzdev A, Scott GJ, Ray MK, Yao HH (2018). Genome-wide identification of FOXL2 binding and characterization of FOXL2 feminizing action in the fetal gonads. *Hum Mol Genet* 27, 4273-4287. [PMID: 30212841](#); [PMCID: PMC6276834](#).

4. Scott GJ, Gruzdev A, Hagler TB, Ray MK (2018). Trans-inner Cell Mass Injection of Embryonic Stem Cells Leads to Higher Chimerism Rates. *J Vis Exp*. PMID: 29912196; PMCID: PMC6085124.
5. Chen G, Ishan M, Yang J, Kishigami S, Fukuda T, Scott G, Ray MK, Sun C, Chen SY, Komatsu Y, Mishina Y, Liu HX. Specific and spatial labeling of P0-Cre versus Wnt1-Cre in cranial neural crest in early mouse embryos. *Genesis* (2017); 55(6) doi: 10.1002/dvg.23034. Epub 2017 Apr 18. PMID:28371069; PMCID:PMC5473950.
6. Zhang H, Kamiya N, Tsuji T, Takeda H, Scott G, Rajderkar S, Ray MK, Mochida Y, Allen B, Lefebvre V, Hung IH, Ornitz DM, Kunieda T, Mishina Y. Elevated Fibroblast Growth Factor Signaling Is Critical for the Pathogenesis of the Dwarfism in Evc2/Limbin Mutant Mice. *PLoS Genetics*. 2016;12(12): e1006510. Epub 2016/12/28. doi: 10.1371/journal.pgen.1006510. PubMed PMID: 28027321; PMCID: PMC5189957.
7. Badri MK, Zhang H, Ohyama Y, Venkitapathi S, Alamoudi A, Kamiya N, Takeda H, Ray M, Scott G, Tsuji T, Kunieda T, Mishina Y, Mochida Y. Expression of Evc2 in craniofacial tissues and craniofacial bone defects in Evc2 knockout mouse. *Archives of Oral Biology*. 2016; 68:142-52. Epub 2016/05/11. doi: 10.1016/j.archoralbio.2016.05.002. PubMed PMID: 27164562; PMCID: PMC4903910.
8. Zhang Y, McNerny EG, Terajima M, Raghavan M, Romanowicz G, Zhang Z, Zhang H, Kamiya N, Tantillo M, Zhu P, Scott GJ, Ray MK, Lynch M, Ma PX, Morris MD, Yamauchi M, Kohn DH, Mishina Y. Loss of BMP signaling through BMPR1A in osteoblasts leads to greater collagen cross-link maturation and material-level mechanical properties in mouse femoral trabecular compartments. *Bone*. 2016; 88:74-84. Epub 2016/04/27. doi: 10.1016/j.bone.2016.04.022. PubMed PMID: 27113526; PMCID: PMC4899267.
9. Badri MK, Zhang H, Ohyama Y, Venkitapathi S, Kamiya N, Takeda H, Ray M, Scott G, Tsuji T, Kunieda T, Mishina Y, Mochida Y. Ellis Van Creveld2 is Required for Postnatal Craniofacial Bone Development. *The Anatomical Record* (Hoboken, NJ: 2007). 2016;299(8):1110-20. Epub 2016/04/20. doi: 10.1002/ar.23353. PubMed PMID: 27090777; PMCID: PMC4940231.
10. Zhang H, Takeda H, Tsuji T, Kamiya N, Rajderkar S, Louie K, Collier C, Scott G, Ray M, Mochida Y, Kaartinen V, Kunieda T, Mishina Y. Generation of Evc2/Limbin global and conditional KO mice and its roles during mineralized tissue formation. *Genesis* (New York, NY: 2000). 2015. Epub 2015/07/30. doi: 10.1002/dvg.22879. PubMed PMID: 26219237; PMCID: PMC4731321.
11. Ohno M, Kanayama T, Moore R, Ray M, Negishi M. The roles of co-chaperone CCRP/DNAJC7 in Cyp2b10 gene activation and steatosis development in mouse livers. *PLoS One*. 2014;9(12): e115663. Epub 2014/12/30. doi: 10.1371/journal.pone.0115663. PubMed PMID: 25542016; PMCID: PMC4277317.
12. Howden R, Cooley I, Van Dodewaard C, Arthur S, Cividanes S, Leamy L, McCann Hartzell K, Gladwell W, Martin J, Scott G, Ray M, Mishina Y. Cardiac responses to 24 hrs hyperoxia in Bmp2 and Bmp4 heterozygous mice. *Inhalation Toxicology*. 2013;25(9):509-16. Epub 2013/07/24. doi: 10.3109/08958378.2013.808287. PubMed PMID: 23876042.
13. Yang W, Guo D, Harris MA, Cui Y, Gluhak-Heinrich J, Wu J, Chen XD, Skinner C, Nyman JS, Edwards JR, Mundy GR, Lichtler A, Kream BE, Rowe DW, Kalajzic I, David V, Quarles DL, Villareal D, Scott G, Ray M, Liu S, Martin JF, Mishina Y, Harris SE. Bmp2 in osteoblasts of periosteum and trabecular bone links bone formation to vascularization and mesenchymal stem cells. *Journal of Cell Science*. 2013;126(Pt 18):4085-98. Epub 2013/07/12. doi: 10.1242/jcs.118596. PubMed PMID: 23843612; PMCID: PMC3772385.

14. Yumoto K, Thomas PS, Lane J, Matsuzaki K, Inagaki M, Ninomiya-Tsuji J, Scott GJ, Ray MK, Ishii M, Maxson R, Mishina Y, Kaartinen V. TGF-beta-activated kinase 1 (Tak1) mediates agonist-induced Smad activation and linker region phosphorylation in embryonic craniofacial neural crest-derived cells. *The Journal of Biological Chemistry*. 2013;288(19):13467-80. Epub 2013/04/03. doi: 10.1074/jbc.M112.431775. PubMed PMID: 23546880; PMCID: PMC3650384.
15. Komatsu Y, Yu PB, Kamiya N, Pan H, Fukuda T, Scott GJ, Ray MK, Yamamura K, Mishina Y. Augmentation of Smad-dependent BMP signaling in neural crest cells causes craniosynostosis in mice. *Journal of bone and mineral research: the official journal of the American Society for Bone and Mineral Research*. 2013;28(6):1422-33. Epub 2013/01/03. doi: 10.1002/jbmr.1857. PubMed PMID: 23281127; PMCID: PMC3638058.
16. Arao Y, Hamilton KJ, Ray MK, Scott G, Mishina Y, Korach KS. Estrogen receptor alpha AF-2 mutation results in antagonist reversal and reveals tissue selective function of estrogen receptor modulators. *Proceedings of the National Academy of Sciences of the United States of America*. 2011;108(36):14986-91. Epub 2011/08/30. doi: 10.1073/pnas.1109180108. PubMed PMID: 21873215; PMCID: PMC3169108.
17. Stumpo DJ, Broxmeyer HE, Ward T, Cooper S, Hangoc G, Chung YJ, Shelley WC, Richfield EK, Ray MK, Yoder MC, Aplan PD, Blackshear PJ. Targeted disruption of Zfp36l2, encoding a C/EBP tandem zinc finger RNA-binding protein, results in defective hematopoiesis. *Blood*. 2009;114(12):2401-10. Epub 2009/07/28. doi: 10.1182/blood-2009-04-214619. PubMed PMID: 19633199; PMCID: PMC2746470.
18. Scott GJ, Ray MK, Ward T, McCann K, Peddada S, Jiang FX, Mishina Y. Abnormal glucose metabolism in heterozygous mutant mice for a type I receptor required for BMP signaling. *Genesis (New York, NY: 2000)*. 2009;47(6):385-91. Epub 2009/04/10. doi: 10.1002/dvg.20513. PubMed PMID: 19358156; PMCID: PMC2758535.
19. Inagaki M, Omori E, Kim JY, Komatsu Y, Scott G, Ray MK, Yamada G, Matsumoto K, Mishina Y, Ninomiya-Tsuji J. TAK1-binding protein 1, TAB1, mediates osmotic stress-induced TAK1 activation but is dispensable for TAK1-mediated cytokine signaling. *The Journal of Biological Chemistry*. 2008;283(48):33080-6. Epub 2008/10/03. doi: 10.1074/jbc.M807574200. PubMed PMID: 18829460; PMCID: PMC2586273.
20. Singh AP, Castranio T, Scott G, Guo D, Harris MA, Ray M, Harris SE, Mishina Y. Influences of reduced expression of maternal bone morphogenetic protein 2 on mouse embryonic development. *Sexual Development: genetics, molecular biology, evolution, endocrinology, embryology, and pathology of sex determination and differentiation*. 2008;2(3):134-41. Epub 2008/09/05. doi: 10.1159/000143431. PubMed PMID: 18769073; PMCID: PMC2632600.
21. Inagaki M, Komatsu Y, Scott G, Yamada G, Ray M, Ninomiya-Tsuji J, Mishina Y. Generation of a conditional mutant allele for Tab1 in mouse. *Genesis (New York, NY: 2000)*. 2008;46(8):431-9. Epub 2008/08/12. doi: 10.1002/dvg.20418. PubMed PMID: 18693278; PMCID: PMC2637350.
22. Wang Y, Yabuuchi A, McKinney-Freeman S, Ducharme DM, Ray MK, Chawengsaksophak K, Archer TK, Daley GQ. Cdx gene deficiency compromises embryonic hematopoiesis in the mouse. *Proceedings of the National Academy of Sciences of the United States of America*. 2008;105(22):7756-61. Epub 2008/05/31. doi: 10.1073/pnas.0708951105. PubMed PMID: 18511567; PMCID: PMC2409377.
23. O'Bryan MK, Takada S, Kennedy CL, Scott G, Harada S, Ray MK, Dai Q, Wilhelm D, de Kretser DM, Eddy EM, Koopman P, Mishina Y. Sox8 is a critical regulator of adult Sertoli cell function and male fertility. *Developmental Biology*. 2008;316(2):359-70. Epub 2008/03/18. doi: 10.1016/j.ydbio.2008.01.042. PubMed PMID: 18342849; PMCID: PMC2375044.

24. Feng JQ, Scott G, Guo D, Jiang B, Harris M, Ward T, Ray M, Bonewald LF, Harris SE, Mishina Y. Generation of a conditional null allele for Dmp1 in mouse. *Genesis* (New York, NY: 2000). 2008;46(2):87-91. Epub 2008/02/08. doi: 10.1002/dvg.20370. PubMed PMID: 18257058; PMCID: PMC3568775.
25. Okada Y, Scott G, Ray MK, Mishina Y, Zhang Y. Histone demethylase JHDM2A is critical for Tnp1 and Prm1 transcription and spermatogenesis. *Nature*. 2007;450(7166):119-23. Epub 2007/10/19. doi: 10.1038/nature06236. PubMed PMID: 17943087.
26. Fukuda T, Scott G, Komatsu Y, Araya R, Kawano M, Ray MK, Yamada M, Mishina Y. Generation of a mouse with conditionally activated signaling through the BMP receptor, ALK2. *Genesis* (New York, NY: 2000). 2006;44(4):159-67. Epub 2006/04/11. doi: 10.1002/dvg.20201. PubMed PMID: 16604518.
27. Ray MK, Fagan SP, Brunicardi FC. The Cre-loxP system: a versatile tool for targeting genes in a cell- and stage-specific manner. *Cell Transplantation*. 2000;9(6):805-15. Epub 2001/02/24. PubMed PMID: 11202567.
28. Kleinman RM, Fagan SP, Ray MK, Adrian TE, Wong H, Imagawa D, Walsh JH, Brunicardi FC. Differential inhibition of insulin and islet amyloid polypeptide secretion by intraislet somatostatin in the isolated perfused human pancreas. *Pancreas*. 1999;19(4):346-52. Epub 1999/11/05. PubMed PMID: 10547194.
29. Ray MK, Fagan SP, Moldovan S, DeMayo FJ, Brunicardi FC. Development of a transgenic mouse model using rat insulin promoter to drive the expression of CRE recombinase in a tissue-specific manner. *International Journal of Pancreatology: official journal of the International Association of Pancreatology*. 1999;25(3):157-63. Epub 1999/08/24. PubMed PMID: 10453417.
30. Ray MK, Fagan SP, Moldovan S, DeMayo FJ, Brunicardi FC. Beta cell-specific ablation of target gene using Cre-loxP system in transgenic mice. *The Journal of Surgical Research*. 1999; 84(2):199-203. Epub 1999/06/08. doi: 10.1006/jsre.1999.5642. PubMed PMID: 10357920.
31. Ray MK, Fagan SP, Moldovan S, DeMayo FJ, Brunicardi FC. A mouse model for beta cell-specific ablation of target gene(s) using the Cre-loxP system. *Biochemical and Biophysical Research Communications*. 1998;253(1):65-9. Epub 1999/01/06. doi: 10.1006/bbrc. 1998. 9714. PubMed PMID: 9875221.
32. Fagan SP, Azizzadeh A, Moldovan S, Ray MK, Adrian TE, Ding X, Coy DH, Brunicardi FC. Insulin secretion is inhibited by subtype five somatostatin receptor in the mouse. *Surgery*. 1998;124(2):254-8; discussion 8-9. Epub 1998/08/26. PubMed PMID: 9706146.
33. Magdaleno SM, Wang G, Jackson KJ, Ray MK, Welty S, Costa RH, DeMayo FJ. Interferon-gamma regulation of Clara cell gene expression: in vivo and in vitro. *The American Journal of Physiology*. 1997;272(6 Pt 1): L1142-51. Epub 1997/06/01. doi: 10.1152/ajplung.1997.272.6. L1142. PubMed PMID: 9227516.
34. Magdaleno SM, Wang G, Mireles VL, Ray MK, Finegold MJ, DeMayo FJ. Cyclin-dependent kinase inhibitor expression in pulmonary Clara cells transformed with SV40 large T antigen in transgenic mice. *Cell Growth & Differentiation: The Molecular Biology Journal of the American Association for Cancer Research*. 1997;8(2):145-55. Epub 1997/02/01. PubMed PMID: 9040936.
35. Ray MK, Wang G, Barrish J, Finegold MJ, DeMayo FJ. Immunohistochemical localization of mouse Clara cell 10-KD protein using antibodies raised against the recombinant protein. *The Journal of Histochemistry and Cytochemistry: Official Journal of the Histochemistry Society*. 1996;44(8):919-27. Epub 1996/08/01. PubMed PMID: 8756763.
36. Ray MK, Chen CY, Schwartz RJ, DeMayo FJ. Transcriptional regulation of a mouse Clara cell-specific protein (mCC10) gene by the NKx transcription factor family members thyroid

- transcription factor 1 and cardiac muscle-specific homeobox protein (CSX). *Molecular and Cellular Biology*. 1996;16(5):2056-64. Epub 1996/05/01. PubMed PMID: 8628271; PMCID: PMC231192.
37. Ray MK, Magdaleno SW, Finegold MJ, DeMayo FJ. cis-acting elements involved in the regulation of mouse Clara cell-specific 10-kDa protein gene. In vitro and in vivo analysis. *The Journal of Biological Chemistry*. 1995;270(6):2689-94. Epub 1995/02/10. PubMed PMID: 7852338.
 38. Ray MK, Magdaleno S, O'Malley BW, DeMayo FJ. Cloning and characterization of the mouse Clara cell specific 10 kDa protein gene: comparison of the 5'-flanking region with the human rat and rabbit gene. *Biochemical and Biophysical Research Communications*. 1993; 197(1): 163-71. Epub 1993/11/30. PubMed PMID: 7916613.
 39. Ray MK, Chakraborty A, Datta B, Chattopadhyay A, Saha D, Bose A, Kinzy TG, Wu S, Hileman RE, Merrick WC, et al. Characteristics of the eukaryotic initiation factor 2 associated 67-kDa polypeptide. *Biochemistry*. 1993;32(19):5151-9. Epub 1993/05/18. PubMed PMID: 8098621.
 40. Ray MK, Datta B, Chakraborty A, Chattopadhyay A, Meza-Keuthen S, Gupta NK. The eukaryotic initiation factor 2-associated 67-kDa polypeptide (p67) plays a critical role in regulation of protein synthesis initiation in animal cells. *Proceedings of the National Academy of Sciences of the United States of America*. 1992;89(2):539-43. Epub 1992/01/15. PubMed PMID: 1346232; PMCID: PMC48274.
 41. Datta B, Ray MK, Chakraborty D, Gupta NK. Roles of eIF-2 and eIF-2-associated proteins in regulation of protein synthesis during growth of animal cells in culture. *Indian Journal of Biochemistry & Biophysics*. 1988;25(6):478-82. Epub 1988/12/01. PubMed PMID: 3255662.

Book Chapters:

1. Gupta NK, Datta B, Ray MK, Roy AL. Protein Synthesis Initiation in Animal Cells. In: Ilan J, editor. *Translational Regulation of Gene Expression 2*. Boston, MA: Springer US; 1993. p. 405-31.
2. Wu S, Ray MK, Gupta S, N.K. G, editors. *Peptide Chain Initiation Factor, Characteristics, Gene Cloning and Possible Therapeutic Uses. Downstream Processing in Biotechnology: Proceedings of an International Seminar*; 1992; New Delhi: Tata-McGraw Hill Company.
3. Gupta NK, Datta B, Roy AL, Ray MK, editors. *Peptide Chain Initiation in Animal Cells: Mechanism and Regulation* 1990; Berlin, Heidelberg: Springer Berlin Heidelberg.