

Pad Rengasamy MS PhD DSc

Professor of Anatomy & Director of Anatomy Laboratory
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Education & Training

MS Anatomy, JIPMER, Madras University, Madras, India
PhD Anatomy, Banaras Hindu University, Varanasi, India
DSc Neuro Embryology, Comenius University, Bratislava, Slovakia.

Recent Faculty Appointments:

1. Professor of Anatomy, & Head of Anatomy and Embryology Disciplines, Director of Anatomy Laboratory, Department of Basic Med Sciences, Mercer University School of Medicine, Macon, GA. **Tenured.**
2. Professor of Anatomy, Embryology, Neuroanatomy, and Histology; Director of Medical Anatomy Laboratory, College of Medicine, Central Michigan University, Mt Pleasant, MI. **Tenured.**
3. Professor of Anatomy, Embryology, Neuroanatomy, and Histology; Director of Medical Anatomy Laboratory, California Northstate University College of Medicine, Elk Grove. Sacramento, CA.

Professional Memberships

1. Member of the Society for Birth Defects Research & Prevention [SBDRP-previously known as The Teratology Society]
2. Member of the American Association for Anatomy (AAA)
3. Member of the American Association of Clinical Anatomists (AACA)
4. Member, Publications Committee, "Society for Birth Defects Research & Prevention"

5. Fellow of Institute of Biology (London) - A Royal Chartered Society of the UK, which now remains merged with Royal Society of Biology.
6. Congenital Anomalies (Official journal of the Japanese Teratology Society), Wiley Publisher.
7. Formerly on the Editorial Board of Reproductive Toxicology (Official Journal of the European Teratology Society), Elsevier Publisher

Research Focus

Dr Pad's major research interests include pathogenetic mechanisms of pre-closure and post-closure neural tube defects (NTD) and axial skeletal dysmorphogenesis. His theory is that in a subset of mammalian embryos, a closed neural tube secondarily reopens resulting in open NTD such as anencephaly. His lab successfully developed animal models and investigated pathogenetic mechanisms of NTD at morphological, cellular, and subcellular levels. These anomalies are severe in nature and arise early during gestation. His group published craniofacial and axial skeletal anomalies associated with NTD in mouse embryos following maternal exposure to Retinoic Acid, Alcohol, Anticonvulsant agent Valproic acid, antineoplastic agents Cyclophosphamide, and Chlorambucil as well as environmental toxicants such as Cadmium. He also investigated the role of supplemental folate, methionine, and α -lipoic acid on NTD prevention in mouse models. One of his parallel interests has been the study of diabetic embryopathy which comprises congenital anomalies including caudal dysgenesis, intrauterine growth disorders, and placental pathology. He has authored/co-authored over one hundred research papers including a couple of competency-based medical curriculum papers on competencies, educational goals, and learning objectives for teaching (a) Embryology, and (b) Histology. Dr Pad is enthusiastic about involving students in research; he believes this high-impact learning practice helps them experience the joy of discovery and fosters the creation of a community of inquiry-driven scholar physicians.

Selected Publications

Dr Pad has made a significant contribution to Teratology in terms of teratogenic mechanism, intrauterine growth restriction (IUGR), placental pathology, and morphologic and electron microscopic bases of pathogenetic mechanisms of neural tube defects (NTD) in experimental model systems (over one hundred Publications). The following is a partial list of his papers.

The corresponding author is underlined.

1. Padmanabhan R, Ahmad I (1997) Retinoic acid-induced asymmetric craniofacial

- growth and cleft palate in the TO mouse fetus. *Reprod Toxicol* 11:843-860.
2. Padmanabhan R (1998) Retinoic acid-induced caudal regression syndrome in the mouse fetus. *Reprod Toxicol* 12:139-151
 3. Al-Gazali LI, Striha L, Dawodu A, Bakir M, Varghese M, Varady E, Scorer, J, Abdulrazzaq YM, Bener A, Padmanabhan R (1999) Pattern of central nervous system anomalies in a population with a high rate of consanguineous marriages. *Clinical Genetics* 55(2): 95-102.
 4. Padmanabhan R, Naruse I, Shiota K (1999) Caudal dysgenesis in staged human embryos (Carnegie stages 16-23). *Am J Med Genet* 87(2): 115-127.
 5. Padmanabhan R and Samad PA (1999) Chlorambucil-induced post closure exencephaly and axial skeletal abnormalities in rat fetuses. *Reproductive Toxicology* 13(3): 189-201.
 6. Padmanabhan R, Abdulrazzaq YM, Bastaki MA (2000) Valproic acid-induced congenital malformations: Clinical and experimental observations. *Cong Anom* 40:259-268.
 7. Abdulrazzaq YM, Padmanabhan R, Bastaki SMA, Ibrahim A, Bener A (2001) Placental transfer of vigabatrin (γ -vinyl-GABA) and its effect on concentrations of amino acids in the embryo of TO mice. *Teratology*, 63:127-133.
 8. Al-Gazali LI, Padmanabhan R, Melnyk S, Yi P, Pogribny, IP, Pogribna M, Bakir M, Hamid ZA, Abdulrazzaq Y, Dawodu A, James SJ (2001) Abnormal folate metabolism and genetic polymorphisms of the folate pathway in a child with Down syndrome and neural tube defect. *Am J Med Genet* 103(2): 128-132.
 9. Padmanabhan R, Shafiullah M (2001). Intrauterine growth retardation in experimental diabetes. Possible role of the placenta. *Arch Physiol Biochem* 109:260-271.
 10. Padmanabhan R, Ibrahim A, Bener A (2002) Effect of maternal methionine pre-treatment on alcohol-induced exencephaly and axial skeletal dysmorphogenesis in mouse fetuses. *Drug Alcohol Depend* 65(3): 263-81.
 11. Abdulrazzaq Y, Al-Gazali LI, Bener A, Hossein M, Varghese M, Dawodu A, Padmanabhan R, (2003) Folic acid awareness and intake survey in the United Arab Emirates. *Reproductive Toxicology* 17:171-176.
 12. Al-Gazali LI, M. Bakir, Z. Hamid, E. Varady, M. Varghes, D. Haas, A. Bener, R. Padmanabhan, Abdulrazzaq YM, Dawodu A (2003) Birth prevalence and pattern of osteochondrodysplasias in an inbred high-risk population *Birth Defects Research Part A: Clinical and Molecular Teratology* 67(2): 125-132.
 13. Padmanabhan R, Shafiullah M (2003) Amelioration of sodium valproate-induced neural tube defects in mouse fetuses by maternal folic acid supplementation during gestation. *Cong Anom* 43: 29-40.
 14. Al-Gazali LI, Hertecant J, Ahmed R, Padmanabhan R (2003) Further Delineation of Hennekam Syndrome *Clin Dysmorphology* 12:227-232.
 15. Padmanabhan R, Abdulrazzaq YM, Bastaki, SMA, Shafiullah M, Chandranath I (2003) Experimental studies on reproductive toxicologic effects of lamotrigine. *Birth Defects Research Part B: Developmental and Reproductive Toxicology* 68(5): 428-438.
 16. Ahmed I, Calle Y, Sayed MA, Kamal JM, Padmanabhan R, Manser E, Meiners S, Nur-E-Kamal A (2004) A. Cdc42-dependent nuclear translocation of non-receptor tyrosine kinase, ACK. *Biochem Biophys Res Commun.* 314(2): 571-579.
 17. Al Ghafli MH, Padmanabhan R, Kataya HH, Berg B (2004) Effects of alpha-lipoic acid supplementation on maternal diabetes-induced growth retardation and congenital anomalies in rat fetuses. *Mol Cell Biochem* 261(1-2):123-35.
 18. Padmanabhan R, Shafiullah M (2004) Effect of maternal diabetes and ethanol interactions on embryo development in the mouse. *Mol Cell Biochem* 261(1-2):43-56.
 19. Padmanabhan R, Padmanabhan RR. (2004) Experimental studies on cervical and

- lumbar ribs in mouse embryos. *Cong Anom* 44:156-171. [featured on cover page]
20. Padmanabhan R, Al-Menhali NM, Ahmed I, Kataya, HH, Ayoub MA (2005) Histological, histochemical, and electron microscopic changes of the placenta induced by maternal exposure to hyperthermia in the rat. *Int J Hyperthermia* 21(1):29-44.
 21. Rizk DE, Padmanabhan R, Tariq S, Shafiullah M, Ahmed I (2006) Ultra-structural morphological abnormalities of the urinary bladder in streptozotocin-induced diabetic female rats. *Int Urogynecol J Pelvic Floor Dysfunct.* 2006 Feb;17(2):143-54. doi: 10.1007/s00192-005-1359-5. Epub 2005 Jul 14. PMID: 16021327.
 22. Abdulrazzaq YM, Padmanabhan R, Salim MA Bastaki SMA, Ibrahim A, Nurulain M, and Shafiullah M (2005) Effect of maternal administration of vigabatrin during late gestation on fetoplacental amino acid profile in the mouse. *Reprod Toxicol* 20:549-560.
 23. Padmanabhan R (2006) Etiology, pathogenesis, and prevention of neural tube defects. *Congenital Anomalies (Kyoto)*. 46(2):55-67. Invited Review.
 24. Padmanabhan R, Shafiullah M and Benedict S. (2006) Effect of maternal exposure to homocystine on sodium valproate-induced neural tube defects in the mouse embryos. *Eur J Nutr.*45:311-319.
 25. Padmanabhan R, Al-Menhali NM, Tariq S, Shafiullah M. (2006) Mitochondrial dysmorphology in the neuroepithelium of rat embryos following a single dose of maternal hyperthermia during gestation. *Exp Brain Res.* 173(2):298-308.
 26. Padmanabhan R, Shafiullah M, Singh S. (2006) Beneficial effect of supplemental lipoic acid on diabetes-induced pregnancy loss in the mouse. *Ann N Y Acad Sci* 1084:118-131.
 27. Padmanabhan R, Abdulrazzaq YM, Bastaki SMA (2008) Valproic acid-induced congenital malformations: Clinical and experimental observations. *Congenit Anom (Kyoto)* 40(4): 259-268. <https://doi.org/10.1111/j.1741-4520.2000.tb00923.x>
 28. Padmanabhan R, Shafiullah M (2008) Amelioration of sodium valproate-induced neural tube defects in mouse fetuses by maternal folic acid supplementation during gestation. *Congenit Anom (Kyoto)* 43(1): 29-40 <https://doi.org/10.1111/j.1741-4520.2003.tb01024.x>
 29. Padmanabhan R, Abdulrazzaq YM, Bastaki SM, Nurulain M, Shafiullah M. (2010) Vigabatrin (VGB) administered during late gestation lowers maternal folate concentration and causes pregnancy loss, fetal growth restriction, and skeletal hypoplasia in the mouse. *Reprod Toxicol.*29 (3):366-77.

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