

Curriculum Vita

Kuppareddi Balamurugan, Ph.D.,

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Education

Ph. D. Genetics	1993	University of Madras, Madras, India.
B. Ed. Biology	1984	Annamalai University, Annamalai Nagar, India.
M. Sc. Zoology	1981	Madurai Kamaraj University, Madurai, India.
B. Sc. Zoology-major Chemistry & Botany (minor)	1979	Madurai Kamaraj University, Madurai, India.

Academic and Professional Appointments

2006 - Present	Assistant Professor School of Criminal Justice, University of Southern Mississippi, Hattiesburg, MS, 39406
2003 - 2005	DNA Technical Manager and Biology Section Supervisor Member, Quality Assurance Committee Member, Laboratory Safety Committee Forensic DNA Laboratory, City of Oklahoma City, OK 73102
1996 - 2002	Forensic Scientist – DNA Analysis Unit Indianapolis-Marion County Forensic Services Agency, Indianapolis, IN, 46204
1991 - 1996	Post Doctoral Research Associate Research Institute, Miami Children's Hospital, Miami, FL, 33155
1990 - 1991	Research Associate Diabetes Department, Voluntary Health Services Hospital, Madras, India
1981 - 1983	Research Assistant, Department of Genetics, University of Madras, Madras, India

Special Awards

- 1979 Gold Medal for first rank in B. Sc.
- 1984 Junior Research Fellowship, Council of Scientific and Industrial Research, Government of India. (Fellowship awarded through national merit examination).
- 1987 Senior Research Fellowship, Council of Scientific and Industrial Research, Government of India. (Fellowship awarded based on research competency).
- 2009 Best paper presentation award, International Association for Identification Annual meeting, Tampa, FL, August 2009.

Patents

1. USA Patent # 5,679,635 - Aspartoacylase gene, protein, and methods of screening for mutations associated with Canavan disease.
2. USA Patent # 7,217,547 - Aspartoacylase gene, protein, and methods of screening for mutations associated with Canavan disease.

Teaching experience and Courses taught

1. FSC 140 Introduction to Forensic Sciences
2. FSC 435 Forensic Science Policies and procedures
3. FSC 480 Seminar in Forensic Sciences
4. FSC 491/L Special projects and lab
5. FSC 580 Seminar in Forensic Sciences
6. FSC 601 Forensic Serology
7. FSC 601L Forensic Serology Lab
8. FSC 621 Forensic DNA Technology
9. FSC 621L Forensic DNA Technology Lab
10. FSC 691 Research in Forensic Sciences
11. FSC 698 Thesis in Forensic Sciences

Research Grant award

1. Co-Principal Investigator: Forensic Science Improvement grant US \$ 1,000,000 (\$ one million) National Institute of Justice, Department of Justice, Government of USA. Award period: September 2009 – April 2011.

Courtroom testimony - Expert witness

Testified in court on several cases as an expert witness on forensic DNA analysis.

Research Publications

1. Martin Tracey and Kuppareddi Balamurugan. Selection Pressure. **Brenner's online encyclopedia of Genetics**. Editorial Board reviewed. 2nd edition (In press 2012).
2. Martin Tracey and Kuppareddi Balamurugan. Genetic Equilibrium. **Brenner's online encyclopedia of Genetics**. Editorial Board reviewed. 2nd edition (In press 2012).
3. Martin Tracey and Kuppareddi Balamurugan. Selection Coefficient. **Brenner's online encyclopedia of Genetics**. Editorial Board reviewed. 2nd edition (In press 2012).
4. Kuppareddi Balamurugan, G. Suhasini, M. Vijaya, S. Kanthimathi, Nicole Mullins, Martin Tracey and George Duncan. Y chromosome STR allelic and haplotype diversity in five ethnic Tamil populations from Tamil Nadu, India. **Legal Medicine (Tokyo)**, 12 (5) 2010: 265-269.
5. Kuppareddi Balamurugan, S. Kanthimathi, M. Vijaya, G. Suhasini, George Duncan, Martin Tracey and Bruce Budowle. Genetic variation of 15 autosomal short tandem repeat (STR) loci in four endogamous Tamil populations from Tamil Nadu, South India. **Legal Medicine (Tokyo)**, 12 (6) 2010: 320-323.
6. Kuppareddi Balamurugan, Robert Pomeroy, George Duncan, Martin Tracey. Investigating SNPs flanking the D1S80 locus in a Tamil population from India. **Human Biology**, 82 (2) 2010:221-226.
7. Kuppareddi Balamurugan, N. Prabakaran, George Duncan, Bruce Budowle, Mohammad Tahir and Martin Tracey. Allele Frequencies of 13 STR loci and the D1S80 locus in a Tamil population from Madras, India. **Journal of Forensic Sciences**, 46(4) 2001, 1515-1517.
8. Kuppareddi Balamurugan, Michelle Granoff, Bruce Budowle and Mohammad Tahir. Allele frequencies for four STR loci in African American and Caucasian populations from Marion County Indiana, USA. **Journal of Forensic Sciences**, 46(1) 2001, 189.

9. Kuppareddi Balamurugan, Bruce Budowle and Mohammad Tahir. Allele frequencies for nine STR loci in African American and Caucasian populations from Marion County, Indiana, USA. **Journal of Forensic Sciences**, 45(3) (2000) 744-746.
10. Mohammad Tahir, Kuppareddi Balamurugan, Usman Tahir, Muhammad Amjad, Mohsen Ba Owan, Omar Chaudhary, James Hamby, Bruce Budowle and Rene Herrera. Allelic Distribution of nine Short Tandem Repeat (STR), HLA-DQA1, and Polymarker loci in an Omani sample population. **Forensic Science International**, 109 (2000) 81-85.
11. Mohammad A. Tahir, Sudhir Sinha, Carol Rogers, Usman Tahir, Kuppareddi Balamurugan, Nahedh Al-Kubaidan, Abdul Rauf Choudhry, Bruce Budowle and Muhammad Amjad. Distribution of HLA-DQA1 and Amplitype PM Locus Alleles in a Saudi Arabian Population Sample. **Journal of Forensic Sciences**, 45(10) (2000) 236.
12. Sudhir Sinha, Muhammad Amjad, Carol Rogers, James Hamby, Usman Tahir, Kuppareddi Balamurugan, Nahedh A. Al'Kubaidan, Abdul Rauf Choudhry, Bruce Budowle and Mohammad Tahir. Typing of eight Short Tandem Repeat (STR) loci in a Saudi Arabian Population. **Forensic Science International**, 104 (1999) 143-146.
13. Mohammad A. Tahir, Carol Rogers, Mohammad AlKhayyat, Mona El-Gohary, Bruce Budowle and Kuppareddi Balamurugan. Distribution of D1S80 alleles in the Bahrainian population, **Journal of Forensic Sciences**, 44(6) (1999) 1314-1315.
14. K. Balamurugan, H. Abdel-Rehman, G.T. Duncan, B. Budowle, S. Anderson, J. Macechko, A.H. Khan, M. Tracey and M. Tahir. Distribution of D1S80 alleles in the Jordanian population. **International Journal of Legal Medicine**, 111(1998) 276-277.
15. George T. Duncan, Kuppareddi Balamurugan, Bruce Budowle, Jill Smerick and Martin L. Tracey. Microvariation at the human D1S80 locus. **International Journal of Legal Medicine**, 110(1997)150-154.
16. George Duncan, Kuppareddi Balamurugan, Bruce Budowle and Martin Tracey. Hinf I/Tsp509 I and BsoF I polymorphisms in the flanking regions of the human VNTR locus D1S80. **Genetic Analysis: Biomolecular Engineering**, 13(1996) 119-121.
17. R. Kaul, G.P. Gao, K. Balamurugan, and R. Matalon. Canavan Disease: Molecular Basis of Aspartoacylase Deficiency. **Journal of Inherited Metabolic Diseases**, 17 (1994) 295-297.
18. Rajinder Kaul, Guang P. Gao, Maria Aloya, Kuppareddi Balamurugan, Arlene Petrosky, Kimberlee Michals and Reuben Matalon. Canavan Disease: Mutations among Jewish and Non-Jewish patients. **American Journal of Human Genetics**, 55 (1994) 34-41.

19. Rajinder Kaul, K. Balamurugan, Guang P. Gao and Reuben Matalon. Canavan Disease: Genomic organization and localization of human ASPA to 17p13-ter and conservation of the gene during evolution. **Genomics**, 21 (1994) 364-370.
20. Rajinder Kaul, Guang Ping Gao, Kuppareddi Balamurugan and Reuben Matalon. Cloning of the human aspartoacylase cDNA and a common missense mutation in Canavan disease. **Nature Genetics**, 5 (1993) 118-123.
21. K. Balamurugan. Genetic studies on Mucopolysaccharidoses. In:(eds.Santhiya ST, et al.) **Perspectives in Man and Environment**, University of Madras, Madras (1990) p30-33.
22. B. Madhavarao, S.K. Gupta, K.A. Abraham, K.M. Marimuthu, K. Balamurugan, K.N. Reddy, S.R. Gupta and J.S. Murthy. Rare multivalvular involvement in a family of Scheie syndrome. **Indian Journal of Pediatrics**, 55 (1988) 317-322.

Manuscript in preparation:

23. Robert Pomeroy, Kuppareddi Balamurugan, S Wong, George Duncan. High Resolution Melt (HRM) analysis of the minisatellite locus D1S80 and its potential use as a forensic screening tool. **Analytical Biochemistry**, manuscript submitted, February 2010.
24. Kuppareddi Balamurugan, George Duncan, Martin Tracey. DNA sequence characteristics and repeat structure of the human D1S80 locus. Manuscript in preparation.
25. Kuppareddi Balamurugan, George Duncan and Rene Herrera. Y chromosomal STR characteristics of a Rwanda population. Manuscript in preparation.
26. Kuppareddi Balamurugan, Jennifer Hammons, George Duncan and Martin Tracey. SNPSTR characteristics of human D21S11 microsatellite locus. Manuscript in preparation.

Papers presented at Conferences

1. Kuppareddi Balamurugan. Y chromosome STR allelic and haplotype diversity in five ethnic Tamil populations. Invited lecture at “Forensic Population Genetics workshop” (Sunny Isles Beach, Florida August 1-5, 2010). Sponsored by National Institute of Justice, and Florida International University, Miami, FL.
2. Nicole Mullins, Thomas Pittman, Dean Bertram and Kuppareddi Balamurugan. Comparison of the Amplification Efficiencies of Different Taq DNA Polymerases: Paper presented at the 95th Annual meeting of the **International Association for Identification**, Spokane, WA, July 11-17, 2010.

3. Jennifer Hammons, Thomas Pittman, Dean Bertram and Kuppareddi Balamurugan. Identification and uses of SNPSTRs for forensic DNA analysis. Paper presented at the 95th Annual meeting of the **International Association for Identification**, Spokane, WA, July 11-17, 2010.
4. Sean Kochtitzky, Thomas Pittman, Dean Bertram and Kuppareddi Balamurugan. A statistical comparison of four chemical processes used to oxidize pre-fired brass cartridge casings for fingerprints. Paper presented at the 95th Annual meeting of the **International Association for Identification**, Spokane, WA, July 11-17, 2010.
5. Ashlyn Harmon, Kuppareddi Balamurugan, Dean Bertram and Thomas Pittman. Comparison of extraction techniques for -9-tetrahydrocannabinol from urine. Paper presented at the 95th Annual meeting of the **International Association for Identification**, Spokane, WA, July 11-17, 2010.
6. Nicole Thompson, Thomas Pittman, Dean Bertram, Kuppareddi Balamurugan. A Study of Multiple Differential DNA Extractions with Low DNA Quantities. Paper presented at the 74th Annual meeting, Mississippi Academy of Sciences, Hattiesburg, MS. February, 11-12, 2010. **Journal of the Mississippi Academy of Sciences**, 55 (1) 2010, 137.
7. Jennifer Hammons, Dean Bertram, Thomas Pittman, Kuppareddi Balamurugan. The significance of Whole Genome Amplification in forensic science. Paper presented at the 74th Annual meeting, Mississippi Academy of Sciences, Hattiesburg, MS. February, 11-12, 2010. **Journal of the Mississippi Academy of Sciences**, 55 (1) 2010, 138.
8. Nicole Thompson, Dean Bertram, Thomas Pittman, Kuppareddi Balamurugan. Multiple Differential DNA Extractions from simulated sexual assault kit samples for enhanced DNA recovery. Paper presented at the Annual meeting of the **International Association for Identification**, Tampa, FL. Aug 17-19, 2009.
9. Jennifer Hammons, Dean Bertram, Thomas Pittman, Kuppareddi Balamurugan. Whole Genome Amplification and its uses in forensic sciences. Paper presented at the Annual meeting of the **International Association for Identification**, Tampa, FL. Aug 17-19, 2009.
10. Kuppareddi Balamurugan, Robert S Pomeroy, George Duncan and Martin Tracey. Linkage of restriction site polymorphisms at the minisatellite D1S80 locus in a Tamil population from India. Paper presented at the 2nd **Genetics Society of America** annual meeting. SanDiego, CA. January 5-8, 2008.
11. R. Matalon, R. Kaul, M. Aloya, M. Jin, S. Stoiloff, P. Nallasivam, K. Balamurugan, and K. Michals (1994). Carrier rate of Canavan disease among Ashkenazi Jewish Individuals. 5th annual **Miami Children's Hospital Research Institute Symposium**, Miami, FL. Dec. 5-7, 1994.

12. Kaul R, Matalon R, Gao GP, Balamurugan K, Michals K, Aloya M, Petrosky A, Dorland L, Duran M and Shutgens RBH. Spectrum of Canavan mutations among Jewish and non-Jewish patients. *The American Journal of Human Genetics*, 55(3), (1994), Supplement, A41. (Paper presented at the 44th annual meeting of the **American Society of Human Genetics**, Oct.18-22, 1994, Montreal, Quebec, Canada).
13. Balamurugan K, Krishnaswami CV, Vijayakumar G, Subramaniam JR, Chellamariappan M and Ashabai PV. Genetic and dermatoglyphic studies in Juvenile Insulin dependent Diabetics. In: Abstracts of the **VII National congress on Diabetes**, Dec. 10-12, 1990, Bhopal, India.
14. Balamurugan K and Marimuthu KM. Metacarpophalangeal pattern profile analysis in Mucopolysaccharidoses. In: Abstracts of the XV Annual conference of the **Indian Society of Human Genetics and National symposium on chromosomes in health and disease**, Madras, India, Jan. 18-20, 1990.
15. Balamurugan K and Marimuthu KM. The Iduronidase deficient Mucopolysaccharidoses: clinical and biochemical studies. In: Abstracts of the first **International congress on Mucopolysaccharidosis and related diseases**, May 20-22, 1988, Minneapolis, MN.
16. Balamurugan, K and Marimuthu, KM. Cardiovascular abnormalities in Scheie's syndrome. **Genome**, 30, suppl.1, 1988, p218.
17. Balamurugan K and Marimuthu KM. Heterogeneity in the Hurler-Scheie compound syndrome. In: Abstracts of the XIII Annual conference of the **Indian Society of Human Genetics**, Madurai, India, Oct. 26-28, 1987.
18. Balamurugan K and Marimuthu KM. Hurler's syndrome. A Clinical, biochemical and radiological study. In: Abstracts of the XII Annual conference of the **Indian Society of Human Genetics**, Feb.28-Mar.2, 1987, Calcutta, India.
19. Balamurugan K and Marimuthu KM. Scheie's syndrome. A clinical and biochemical study. In: Abstracts of the XII Annual conference of the **Indian Society of Human Genetics**, Feb.28-Mar.2, 1987, Calcutta, India.
20. Parvathy MR, Balamurugan K and Marimuthu KM. Mucopolysaccharidoses - Clinical, Radiological, Biochemical and Genetic evaluation. In: Abstracts of contributed papers, Part I, **XV International congress of Genetics**, New Delhi, India. Dec. 12-21, 1983. p 384.
21. Parvathy MR, Balamurugan K, Prema L and Marimuthu KM. A study of Mucopolysaccharidoses in Madras population. In: Abstracts of **International symposium on recent trends in Medical Genetics**, Madras, India, Dec.8-10, 1983, p.25.

Career and Research accomplishments and Training

1. Member of the team responsible for isolating and characterizing the human Aspartoacylase gene and identifying the mutations (1991-1996).
2. Responsible for isolating, characterizing and mapping the human Aspartoacylase gene (1991-1996).
3. Responsible for isolating, characterizing and mapping the mouse Aspartoacylase gene and constructing a vector for a gene knockout mouse model of Canavan disease (1991-1996).
4. PCR amplification, cloning and sequencing of the human VNTR locus D1S80 and identification of polymorphism in different population.
5. Organized DNA sequencing workshop at Miami Children's Hospital, in collaboration with Florida International University, Miami, FL.
6. Standardization and Validation of Short Tandem Repeat (STR) project and application of the same to forensic case work and population frequency data.
7. Special education and training on PE ABI 377 DNA sequencer and PE ABI 310 genetic analyzer at FBI academy, Quantico, VA. 1996.
8. Participant, Annual meeting of the American Academy of Forensic Sciences, San Francisco, CA. Feb. 9-14, 1998.
9. Participant in the workshop on "Sexual Assault evidence analysis", conducted by the American Academy of Forensic Sciences, San Francisco, CA, Feb. 9, 1998.
10. Participant in the workshop on "The Science of forensic STR analysis and data interpretation", organized by the American Academy of Forensic Sciences, San Francisco, CA, Feb. 10, 1998.
11. Participant in the workshop on "The application of DNA analysis in Forensic science" at Carleton University, Ottawa, Canada, in collaboration with Royal Canadian Mounted Police, Ottawa, Canada, June 22-25, 1998.
12. Participant in the workshop and training on "Advanced AmpFISTR & ABI PRISM 310 Genetic Analyzer" conducted by Applied Biosystems (ABI), Foster City, California, at Indianapolis Marion County Forensic Services Agency, Indianapolis, IN. Jan 19-22, 1999.
13. Participant in the symposium on "DNA Forensics" organized by Cambridge Healthtech Institute at Springfield, VA. May 31 – June 2, 2000.

14. Participant in the symposium on “11th International symposium on Human Identification”, organized by Promega Corporation, Biloxi, MS 2000.
15. Participant in the symposium on “12th International symposium on Human Identification”, organized by Promega Corporation, Biloxi, MS 2001.
16. Participant in the “DNA Audit Document Training” organized by the FBI, California Association of Criminalists and Northwest Association of Forensic Scientists, Reno, NV, April 7-8, 2003.
17. Federal Bureau of Investigations (FBI) certified DNA laboratory auditor, April 2003.
18. Participant in the “Fourth Annual DNA grantees’ workshop” organized by the National Institute of Justice, at Washington, DC, USA, June 23-25, 2003.
19. Invited lecture: Forensic DNA analysis and interpretation. Homicide School 2003, Oklahoma City police department, City of Oklahoma, OK.
20. Participant of the 56th American Academy of Forensic Sciences meeting at Dallas, TX. February 16-21, 2004.
21. Participant of the FBI Laboratory’s CODIS training v 5.7 at Vienna, VA. May 3-7, 2004.
22. Participant at the 15th International Symposium on Human Identification organized by Promega Corporation at Phoenix, AZ. October 4-7, 2004.
23. Participant at the annual CODIS users meeting at Arlington, VA. November 15-17, 2004.
24. Participant at the 2nd Genetics Society of America annual meeting, San Diego, CA. January 5-8, 2008.
25. Participant at the International Association for Identification annual meeting, Tampa, FL. August 17-19, 2009.
26. Participant at the International Association for Identification annual meeting, Spokane, WA, July 11-17, 2010.
27. Participant at the 74th Annual meeting, Mississippi Academy of Sciences, Hattiesburg, MS. February 11-12, 2010.

Current Research Interests

1. Identification of Single Nucleotide Polymorphism in different populations and its use in human identification.

2. Short tandem Repeat polymorphism and human identification.
3. Structure and evolution of D1S80 locus in humans and non human primates and their usefulness in population differentiation.
4. Identification of mutational mechanisms and transmission of mutations from parents to offspring.
5. Short Tandem Repeat mutations and sequence characteristics of various repeat regions of DNA.
6. Whole Genome Amplification and its use in human identification.
7. Identification of SNPSTR in human genome and uses for human identification.
8. Population characteristics and genetic analysis using human populations.
9. Y chromosomal human DNA polymorphisms for human identification.

University Committee Services

2006 – 2009	Member - College of Science and Technology (CoST) Research Advisory Committee.
2006 – 2009	Member - College of Science and Technology Innovations awards committee (part of CoST Research Committee)
2006 – present	Graduate and Undergraduate student advisor
2006	Chair – Department Faculty Search Committee
2007	Member – Department Chair Search Committee
2008 – 2010	Member, Department Scholarship Committee
2008 - present	Member, Department Curriculum committee
2008-2009	Member, Department Tenure and Promotions guidelines committee
2008	Member, Department grievance resolution committee
2008 - present	Chair, Graduate student thesis committee
2008 - present	Member, Graduate student thesis committee
2008	Member, Doctoral student dissertation committee