

Current address:

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member, Human Genetics Research Group,
Assistant Professor, School of Biotechnology,
Shri Mata Vaishno Devi University (SMVDU),
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Specialization: Ph.D. and Post Doc in Human Genetics

Ph.D. thesis: *Analysis of Genetic Determinants and their Susceptibility to Type 2 Diabetes Mellitus in Northwest Indian Populations*, Guru Nanak Dev University Amritsar and NCAHG, JNU, New Delhi. [2004-2008]

Postdoctoral Research: Human Genetics, *Genetics of autoimmune disorder by high throughput next generation sequencing*, Department of Immunology, University of Texas Southwestern Medical Center, USA. [May 2008 - Nov 2012]

Projects:

1. National Geographic Society, USA Grant under Human Genographic Project “Genetic Diversity and Evolutionary Perspectives in Population Groups of Jammu and Kashmir” (Jan 2014-Jan 2017) [As Co- Principal investigator]
2. UGC Govt. Of India Startup Grant “Replication and characterization of newly identified T2D susceptible genetic loci in Some Indian Population Groups.” [May 2014-May 2016]

Publications and Database Submissions:

Peer Reviewed Journals:

- Sahakyan, H., B. Hooshiar Kashani, R. Tamang, A. Kushniarevich, A. Francis, M. D. Costa, A. K. Pathak, Z. Khachatryan, I. Sharma, M. van Oven, J. Parik, H. Hovhannisyanyan, E. Metspalu, E. Pennarun, M. Karmin, E. Tamm, K. Tambets, A. Bahmanimehr, T. Reisberg, M. Reidla, A. Achilli, A. Olivieri, F. Gandini, U. A. Perego, N. Al-Zahery, M. Houshmand, M. H. Sanati, P. Soares, E. Rai, J. Sarac, T. Saric, V. Sharma, L. Pereira, V. Fernandes, V. Cerny, S. Farjadian, D. P. Singh, H. Azakli, D. Ustek, N. Ekomasova Trofimova, I. Kutuev, S. Litvinov, M. Bermisheva, E. K. Khusnutdinova, N. Rai, M. Singh, V. K. Singh, A. G. Reddy, H. V. Tolks, S. Cvjetan, L. B. Lauc, P. Rudan, E. N. Michalodimitrakis, N. P. Anagnou, K. I. Pappa, M. V. Golubenko, V. Orekhov, S. A. Borinskaya, K. Kaldma, M. A. Schauer, M. Simionescu, V. Gusar, E. Grechanina, P. Govindaraj, M. Voevoda, L. Damba, S. Sharma, L. Singh, O. Semino, D. M. Behar, L. Yepiskoposyan, M. B. Richards, M. Metspalu, T. Kivisild, K. Thangaraj, P. Endicott, G. Chaubey, A. Torroni and R. Villems (2017). "Origin and spread of human mitochondrial DNA haplogroup U7." *Sci Rep* 7: 46044.
- Sharma V, Sharma I, Sethi I, Mahajan A, Singh G, Angural A, Bhanwer AJ, Dhar MK, Singh V, **Rai E**, Sharma S* (2016) “Replication of newly identified type 2 diabetes susceptible loci in Northwest Indian population” *Diabetes Res Clin Pract.* doi: 10.1016/j.diabres.2017.02.013.

- Itty Sethi, G.R. Bhat, Vinod Singh, Rakesh Kumar, AJS Bhanwer, Rameshwar N. K. Bamezai, Swarkar Sharma* **Ekta Rai***. (2016) Role of Telomeres and Associated Maintenance Genes in Type 2 Diabetes Mellitus: A Review. *Diabetes Research and Clinical Practice*. doi: 10.1016/j.diabres.2016.10.015
- Shafat Ali, Shazia Nafis, Ponnusamy Kalaiarasan, **Ekta Rai**, Swarkar Sharma*, Rameshwar NK Bamezai*(2016) Understanding Genetic Heterogeneity in Type 2 Diabetes by Delineating Physiological Phenotypes – SIRT1 and its Gene Network in Impaired Insulin Secretion. *Rev Diabet Stud*, 13(1):17-34
- Raj P, **Rai E**, Song R, Khan S, Wakeland BE, Viswanathan K, et al. Regulatory polymorphisms modulate the expression of HLA class II molecules and promote autoimmunity. *eLife*. 2016;5.
- **Ekta Rai**, Ankit Mahajan, Parvinder Kumar, Arshia Angural, Manoj K Dhar, Sushil Razdan, Kumarasamy Thangaraj, Carol A. Wise, Shiro Ikegawa, Kamal Kishore Pandita, Swarkar Sharma (2016) Whole Exome Screening Identifies Novel and Recurrent WISP3 Mutations Causing Progressive Pseudorheumatoid Dysplasia in Jammu and Kashmir-India. *Nature Scientific Reports* , 13;6:27684. doi: 10.1038/srep27684.
- Varun Sharma, Indu Sharma, Vishav Pratap Singh, Sonali Verma, Anil Pandita, Vinod Singh, Ekta Rai, Swarkar Sharma (2014) mtDNA G10398A Variation Provides Risk to Type 2 Diabetes in Population Group from Jammu Region of India. *MetaGene* 2014 Apr 13. doi:10.1016/j.mgene.2014.02.003.
- **Rai E**, Sharma S, Kaul S, Jain K, Matharoo K, Bhanwer AJS and Bamezai RNK. (2012) The Interactive Effect of SIRT1 Promoter Region Polymorphism on Type 2 Diabetes Susceptibility in the North Indian Population. *PLOS ONE*. 7(11): e48621.
- **Rai E**, Wakeland EK.(2011) Genetic predisposition to autoimmunity--what have we learned? *Semin Immunol*.23(2):67-83.
- Sharma S*, **Rai E**, Sharma P, Jena M, Singh S, Darvishi K, Bhat AK, Bhanwer AJ,Tiwari PK, Bamezai RN. (2009) The Indian origin of paternal haplogroup R1a1(*) substantiates the autochthonous origin of Brahmins and the caste system. *J Hum Genet*.54(1):47-55.
- **Rai E**, Sharma S, Koul A, Bhat A, Bhanwer AJS, Bamezai R (2007). Interaction between the UCP2–866G/A, mtDNA 10398G/A and PGC1 α p.Thr394Thr and p.Gly482Ser polymorphisms in type 2 diabetes susceptibility in North Indian population. *Hum Genet*. 122(5):535-40
- Sharma S*, **Rai E***, Bhat A, Bhanwer AS, Bamezai RN (2007). A Novel Subgroup Q5 of Human Paternal Haplogroup Q in India. *BMC Evol Biol*. 7(1):232 (*equal contribution)
- Bhat A, Koul A, **Rai E**, Sharma S, Dhar MK, Bamezai RN (2007). PGC-1 α Thr394Thr and Gly482Ser variants are significantly associated with T2D in two North Indian populations: a replicate case-control study. *Hum Genet*. 121(5):609-14.
- Darvishi K, Sharma S, Bhat AK, **Rai E**, Bamezai RN (2007). Mitochondrial DNA G10398A polymorphism imparts maternal Haplogroup N a risk for breast and esophageal cancer. *Cancer Lett*; 249(2): 249-55

- Bhat A, Koul A, Sharma S, **Rai E**, Bukhari SI, Dhar MK, Bamezai RN (2007). The possible role of 10398A and 16189C mtDNA variants in providing susceptibility to T2D in two North Indian populations: a replicative study. *Hum Genet*; 120(6): 821-6.
- Sharma S, Saha A, **Rai E**, Bhat A, Bamezai R (2007). Human mtDNA hypervariable regions, HVR I and II, hint at deep common maternal founder and subsequent maternal gene flow in Indian population groups. *J Hum Genet*; 50(10): 497-506.

Book chapter Published:

- Gochhait S, Malhotra D, **Rai E** and Bamezai RNK (2007) Automated Fluorescence Sequencing and Troubleshooting (In) *Advanced techniques in soil Microbiology* (eds) Verma A and Oelmuller R. Springer-Verlag Berlin Heidelberg Germany.

NCBI Genbank submission:

- NCBI dbSNP submissions (BUILD 127): ss65713825 (rs41352448): Y-haplogroup Q lineage present in Indian population.
- NCBI dbSNP submissions (BUILD 127): ss65917443: Novel polymorphism in the 5'utr region of Human SIRT1 gene (at position -863), probably a HNF-1alpha (Hepatocyte Nuclear Factor 1alpha) binding site.
- NCBI Gene bank submissions: Accession no: AY642000 to AY642023 (24 Submissions). Novel mutations detected in mtDNA HVR II from individuals of different Indian Populations.

Educational Qualifications

DEGREE	UNIVERSITY (Session)	SUBJECTS STUDIED	GRADE
B.Sc. (B.Sc Biological Sciences)	M.L.B. Autonomous Girls College (Govt.), Barkatullah University Bhopal, India. (1998-2001)	Zoology, Botany and Chemistry.	A
M.Sc. (Biotechnology)	Department of Biotechnology and Bioinformatics Centre, Barkatullah University, Bhopal, India. (2001-2003)	Biochemistry, Cell and Molecular Biology, Applied Microbiology and Immunology, Biostatistics, Bioinformatics, Genetics, Tumor Biology and Recombinant DNA Technology, Biochemical Engineering, Food, Industrial and Environmental Biotechnology, Cell and Tissue Culture Technology, Plant and Animal Biotechnology, Biotechnology and Business Management	A
Ph.D. (Human Genetics)	Guru Nanak Dev University, Amritsar and NCAHG, JNU, New Delhi (2004-2008)	Analysis of Genetic Determinants and their Susceptibility to Type 2 Diabetes Mellitus in Northwest Indian Populations	Awarded
UGC-CSIR NET JRF	UGC-CSIR INDIA (2005-2008)		completed
Diploma in Basic Computing and Web Designing	Boston's Computer Institute, Mumbai, India. 2000-2001 (Part-time)	Computer fundamentals, Windows/Internet, MS Office, Relational Database Management System (MS Access), SQL Prompts. Programming Fundamentals, C Language, HTML, DHTML, Front Page. Animation and Imaging Software	Completed

Other Experience:

- Worked on High Throughput Next Generation Sequencing technology and data analysis during Post-Doc from Department of Immunology, University of Texas Southwestern Medical Center, USA.
- Worked in Center for Cellular and Molecular Biology (CCMB), Hyderabad (July 2002 – January 2003) for M.Sc. dissertation project entitled ‘Screening of Human WDR13 gene in transgenic mice and its Copy Number Analysis.’
- Worked as Lecturer-Biotechnology at Department of Biotechnology and Bioinformatics Center, Barkatullah University, Bhopal (2003-2004).
- Attended the third international workshop on genetic Epidemiological and Statistical Methods organized by TCG-ISI Centre for Population Genetics, Kolkata, India and University of Pittsburgh, USA [4-14, January 2006].