BIOGRAPHICAL SKETCH-Dr. Reshu Gupta

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EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	MM/YY	FIELD OF STUDY
Rohilkhand University, India	B.Sc.	1998	Biology
Govind Ballabh Pant University of Agriculture & Technology, Pantnagar University, India	M.Sc.	2000	Molecular Biology and Biotechnology
All India Institute of Medical Science, New Delhi, India	PhD	2003-2008	Biotechnology (Genetics)

A) Grants Approved (Co-PI):

Genetics (Diagnosis/Prognosis)

To investigate the role of oral microbiota (oral-gut-liver axis) in liver graft dysfunction/rejection (**ICMR**; In collaboration with ILBS, Delhi-2020)- (INR/- 10million)

Establishment of DBT -NIDAN Kendra for new-born screening of genetic disorders. (**DBT**; In collaboration with SMS Hospital, Jaipur 2022)- (INR/- 14.4 million)

COVID-19 Therapeutics:

A Phase 1/2/3 Study to Evaluate the Safety, Tolerability, and Immunogenicity of Virus-Like Particle-based, PRAK-03202, Vaccine Candidates Against COVID-19. (2021; Approved by **BIRAC**; INR/-220 million)

B) Grants Submitted (Co-PI):

Genetics (Diagnosis/prognosis):

Development of salivary biomarkers in oral squamous cell carcinoma in regional population (In collaboration with Rajasthan University of Health Sciences)

C) Positions: Positions and Employment (Research and Teaching Experience)

2020 -Till now (Leader, Premas Biotech Private Limited, Delhi)

- Currently working on developing miRNAs based prognostic assay (algorithm) to differentiate chemo-resistant and chemo-sensitive Indian triple-negative breast cancer patients.
- Provide training, mentoring and work direction to junior staff for drug substance production (Biopharmaceuticals)
- Designing of assays for screening of anti-cancer agents using AXTEX-4D cell culture platform/troubleshooting
- Molecular simulation studies for drug screening
- Analysing vast data, choosing and prioritising data, and putting the scientific presentation together using scientific judgment
- Management of the project, budget specifications for assigned projects
- Reviews statistical analysis plans and table/figure/listing specifications for appropriate content, and for grammar, format, and consistency
- Writing grants/manuscripts/case studies (One Grant approved-INR 220 million and 4 manuscripts accepted/published)

2019-March 2020 (R&D Head-Functional Genomics in DNA Xperts Pvt Ltd, Delhi)

- Advanced level analytic expertise in the whole exome and whole genome projects from raw data quality control to final functional annotation of variants and their prioritization.
- Comfortable with Genome Analysis Tool Kit (GATK), Burrows Wheelers Aligner (BWA), Bowtie2, Samtools, Vcftools, Bcftools, Picard tools and SnpEFF etc.
- Implementation of bioinformatics analysis on the high-performance computers with 128 core and 256 threads, 512GB RAM and 100 TB storage (AMD Platform)
- Comfortable with Linux (Ubuntu) and command-line shell scripting.
- SNP Discovery using HaplotypeCaller and annotation using SnpEFF
- Troubleshooting and Optimization of a current protocol as well as new protocol wherever required to meet various scientific research goals.
- Provided DNA sequencing related technical support to customers.
- Molecular simulation studies for drug screening
- Leading Machine learning projects to identify microbial resistance genes

2015-2018: Senior Research Scientist: Entrinsic Health Solutions and University of Florida, Gainesville, USA

- For the first time developed radiation toxicity assay (RadTox) for prognosing radiation-induced toxicity in prostate cancer patients
- For the first time developed Q-Clamp diagnostic test (PCR based) for cancer diagnosis in just 2-4 hours

- Developed an amino-acid based product (Enterade) using electrophysiological, molecular and histology approaches for reducing GI toxicity in cancer patients
- 1 Patent granted and 4 Manuscripts published in peer-reviewed journals

2012-2014: Consultant Faculty: Sir Ganga Ram Hospital, New Delhi

- For the first time in India developed modified heat pulse extension PCR for diagnosis of triple nucleotide disorders
- Participated in International conference on Next Revolution in Genetics and Genomics-Applications in Health and Diseases, New Delhi, India 27-29 January 2013
- Subjects taught to medical students: Molecular Genetics
- Help Ph.D. students in bench work in the laboratory.

2008-2011: Postdoctoral Research associate: University of Illinois, Peoria, IL, USA

- Identify mechanisms and role of proteases (uPA, uPAR, cathepsin-B, MMP-9, MMP-2) in tumorigenesis. My studies present role of uPA/uPAR and cathepsin B shRNA as potential therapeutic agents for tumor treatment, where they can be used either alone or with radiation.

2007-2008: Lecturer: Amity University, Noida, India

- Versatility in teaching various subjects such as Plant molecular biology, Immunology, Recombinant DNA technology, Bioanalytical techniques, Instrumentation, Structural Biology, Biochemistry

D) Awards and Honors

2021: Rising Star Award by Premas Biotech Private Limited
2019: Organized Next Generation Sequencing workshop
2017 Certificate of appreciation: International Journal of Radiology and Radiation Oncology
2017: Technology Innovator award by Office of Technology Licensing, University of Florida
2016: Technology Innovator award by Office of Technology Licensing, University of Florida
2003-2005-Senior Research Fellowship-ICMR
2001-2003-Junior Research Fellowship-ICMR
2001 GATE qualified (All India 17th rank)
2001 ICMR qualified (All India 54th rank; Roll Number 11163)
2000 Best scientific model award

YouTube channel:
https://www.youtube.com/playlist?list=PLx-cjKWSTWO-bXLjK7uDNjcl0yzvt2QSj

E) Other Experience and Professional Memberships

Editorial Boards and Review committee

2020: BMC Medical Genomics
2017: Global journal of Stem cell biology and transplantation
2017: Journal Cellular Physiology and Biochemistry
2017: Elyns Journal of Cancer Research
2016: Biological Chemistry
2015: Biochimie, ELSEVIER EDITORIAL SYSTEM
2010: ANSI journals
Editor of "Medical Research Archives"
Member of Science Advisory Board

F) Memberships

Digestive disease week
Radiation Research Society
Sigma XI: The Scientific Research Society
American Association of Cancer Research (AACR)

G) Seminar/Oral Talk:

- 19th September 2018-Indian Institute of Technology Delhi (IIT) Department of Biochemical Engineering & Biotechnology**:** Role of uPA/uPAR and cathepsin B shRNA and circulating anoctamin-1 RNA as anti-tumour agents and predictor of radiation-induced gastrointestinal toxicity (Invited talk)
- Circulating ANO1 RNA as a biodosimeter and indicator of radiation-induced GI toxicity. Normal Tissue Radiation Effects and Countermeasures. 2017, UAMS Division of Radiation Health Contacts, 14th May 2018 to 17th May 2018, Morrilton, USA, CONTREC 2018 **(Oral presentation)**
- A personalized, in vivo method to quantify the number and repair of DNA base changes induced bay radiation and other carcinogens, Normal Tissue Radiation Effects and Countermeasures. 2017, UAMS Division of Radiation Health Contacts, 14th May 2018 to 17th May 2018, Morrilton, USA, CONTREC 2018 **(Oral presentation)**
- FGF-P: A mimetic biobetter for mitigation of gastrointestinal syndrome, Normal Tissue Radiation Effects and Countermeasures. 2017, UAMS Division of Radiation Health Contacts, 14th May 2018 to 17th May 2018, Morrilton, USA, CONTREC 2018 **(Oral presentation)**

H) Patent Granted:

1. Amino Acid compositions and methods for treating radiation induced diarrhea. **Granted**-Application number- AU2017-338887A1 (Granted in 2020)

I) Selected peer-reviewed publications:

Cancer Genetics:

1. **Gupta R**, Kapuria V, Das SN. Single Nucleotide Polymorphism in TNF-α, TNFR2 gene and TNF-α production in Asian Indians. Immunological Investigations 2009; 38(3-4):240-54)
2. **Gupta, R**., Sharma, SC., Das, SN. Association of TNF-α and TNFR1 promoters and 3′ UTR region of TNFR2 gene polymorphisms with genetic susceptibility to tobacco-related oral carcinoma in Asian Indians. Oral Oncology: 2008 May; 44(5):455-63

Cancer Genetics (Abstracts published in peer reviewed journals)

3. Natalie Lockney, Steven G Swarts, Jennifer Li, Christopher Morris, Randal Henderson, Steven B Zhang, Zhenhuan Zhang, Sadasivan Vidyasagar, Reshu Gupta, Katherine Casey-Sawicki, Robert Zlotecki, Paul Okunieff. Personalized prediction of radiation sensitivity: **Cancer Epidemiology Biomarkers & Prevention**: 9(6): 2020
4. NA Lockney, SG Swarts, J Li, CG Morris, RH Henderson, SB Zhang, Z Zhang, S Vidyasagar, R Gupta, K Casey-Sawicki, RA Zlotecki, P Okunieff. Measuring Radiation Toxicity Using Circulating Cell-Free DNA in Prostate Cancer Patients. **International Journal of Radiation Oncology• Biology• Physics.** 2019 105 (1)

Cancer Genetics (Posters):

1. Paul Okunieff; Steven B. Zhang; Zhenhuan Zhang; Sadasivan Vidyasagar; **Reshu Gupta;** Katherine Casey-Sawicki; Natalie Lockney; and Steven G. Swarts: In vivo method to quantify single DNA base changes induced by radiation and other Carcinogens**,** Radiation Research society, Chicago, 23rd to 26th September 2018
2. Randal Henderson, Paul Okunieff; Steven B. Zhang; Zhenhuan Zhang; Sadasivan Vidyasagar; **Reshu Gupta;** Katherine Casey-Sawicki; Robert Zlotecki; Natalie Lockney; and Steven G. Swarts, Using circulating DNA for quantitation of photon or proton induced cell death, Radiation Research society, Chicago, 23rd to 26th September 2018
3. Okunieff P, Swarts S, **Gupta R**, Zhang S, Zhenhuan Z and Vidyasagar S Personalized genetic age: quantitating radiation induced mutations in non-synonymous DNA regions, 62nd annual meeting, Radiation Research society Hawai, 16-19th October 2016
4. **Gupta, R**., Sharma, SC., Das, SN. Participated and presented the abstract with poster. 'TNFα, TNF R1 and TNF RII gene polymorphism in Indian oral cancer patients in the International Symposium on Diet in Causation & Prevention of Cancer and XXXth Annual Conference of Environmental Mutagen Society of India, Lucknow, March 17-19, 2005

Patents submitted

1. LncRNA as a prognostic biomarker for RIOM in Indian oral cancer patients: Provisional patent file-202011005423-2020
2. miRNA as a biomarker to differentiate chemosensitive and chemoresistant Indian Triple negative breast cancer-Provisional patent file-202011005415-2020

<u>Radiation toxicity (Cancer):</u>

1. **Reshu Gupta**, Liangjie Yin, Astrid Grosche, Xiaodong Xu, Lauren Vaught, Paul Okunieff, Sadasivan Vidyasagar. An amino acid-based oral rehydration solution regulates radiation-induced intestinal barrier disruption; Journal of Nutrition, Volume 150, Issue 5, May 2020, Pages 1100–1108,
2. Yin L, Menon R, **Gupta R**, Vaught L, Okunieff P, Vidyasagar S. Glucose enhances rotavirus enterotoxin-induced intestinal chloride secretion: Pflugers Arch. 2017 **469(9):1093-1105**.
3. Yin L, **Gupta R**, Vaught L, Grosche A, Okunieff P, Vidyasagar S. An amino acid-based oral rehydration solution (AA-ORS) enhanced intestinal epithelial proliferation in mice exposed to radiation. Sci Rep. 2016 Nov 23;6: 37220

Radiation Toxicity (Abstracts published in peer reviewed journals):

4. Jing Guo, **Reshu Gupta,** Astrid Grosche, Xiaodong Xu, Liangjie Yin, Sadasivan Vidyasagar. Individual Amino Acids Differentially Mediate Intestinal Barrier Function. **Gastroenterology:** 154(6): 2018
5. **Reshu Gupta,** Astrid Grosche, Xiaodong Xu, Liangjie Yin, Paul Okunieff, Sadasivan Vidyasagar. An Amino Acid-Based Oral Rehydration Solution Increased Zinc Absorption in Irradiated Mice. **Gastroenterology**: 152(7): 2017

Radiation Toxicity (Posters):

1. Yin L, **Gupta R**, Okunieff P, Vidyasagar S Differential activity of NHE3 and NHE2 in the small intestine of irradiated mice, 62nd annual meeting, Radiation Research society, Hawai, 16-19th October 2016

Patents submitted

1. Amino acid compositions for proliferation and differentiation of intestinal stem/progenitor cells: **Published**-Application number BR112019006742A2

<u>Cancer Therapeutics:</u>

1. Ambica Baru, Swati Sharma, Prabuddha Kundu, Biswa Pratim Das Purakayastha, Sameena Khan, Saumyabrata Mazumdar, **Reeshu Gupta**, Nupur Mehrotra Arora. Recapitulating tumor microenvironment using AXTEX-4D for accelerating cancer research and drug screening. Asian Pacific Journal of Cancer Prevention (Accepted 2022)
2. Ambica Baru, Swati Sharma, Biswa Pratim Das Purakayastha, Sameena Khan, Saumyabrata Mazumdar, **Reeshu Gupta**, Prabuddha Kundu, Nupur Mehrotra Arora: AXTEX-4D™: A 3D ex vivo platform for preclinical investigations of immunotherapy agents: Assay and Drug Development Technologies: 2021: 19(6):361-372
3. Ambica Baru, Saumyabrata Mazumdar, Prabuddha Kundu, Swati Sharma, Biswa Pratim Das Purakayastha, Sameena Khan, **Reeshu Gupta,** Nupur Mehrotra Arora: Recapitulating Tumor Microenvironment Using AXTEX-4DTM for Accelerating Cancer Research and Drug Screening. Asian Pac J Cancer Prev. 2022 Feb 1;23(2):561-571.

4. **Gupta R**: Preparation of cancer-related peptide cocktails that target heterogeneously expressed antigens; Michael JP Lawman, Patricia Lawman; Accepted Cancer Vaccines Methods and Protocols, Springer; Methods Mol Biol. 2014;1139:389-404
5. **Gupta R**, Toufaily C, Annabi B; Role of Caveolin-1 and Cavin in Cancer Regulation (Biochimie. 2014 Dec;107 Pt B:188-202)
6. V R Gogineni, **R Gupta***, A K Nalla, K K Velpula and J S Rao. uPAR and cathepsin B shRNA impedes TGF-β1-driven proliferation and invasion of meningioma cells in a XIAP-dependent pathway (Cell Death Dis. 2012 Dec 6;3:e439) (Both V R Gogineni and R Gupta contributed equally)
7. Gogigeni V, Nalla AK, **Gupta R**, Dinh DH, Jeffrey D. Klopfenstein, Rao JS Chk2-Mediated G2/M Cell Cycle Arrest Maintains Radiation Resistance in Malignant Meningioma cells. Cancer Lett. 2011 313(1):64-75.
8. Nalla AK, Gogineni VR, **Gupta R**, Dinh DH, Rao JS. Suppression of uPA and uPAR blocks radiation- induced MCP-1 mediated recruitment of endothelial cells in meningioma. Cell Signal. 2011 Aug;23(8):1299-310.
9. **Gupta R**, Chetty C, Bhoopathi P, Lakka S, Mohanam S, Rao JS, Dinh DH. Downregulation of uPA/uPAR inhibits epithelial-mesenchymal transition (EMT) in intermittent hypoxic DAOY and D283 medulloblastoma cells. Int J Oncol. 2010. 38(3):733-44 Dec 22. doi: 10.3892/ijo.2010.883

Cancer Therapeutics (Posters):

1. Nalla AK, Rao Gogineni V**, Gupta R**, Rao JS. Recruitment of endothelial cells by radiation induced monocyte chemoattract protein-1 in meningioma is blocked by suppression of urokinase plasminogen activator, 2-6 April, AACR, Florida USA, 2011
2. Rao Gogineni V, Nalla AK, **Gupta R**, Gorantla B, Gujrati M, Dinh DH, Fassett D, Klopfenstein JD, Rao JS Radiation inducible silencing of uPA and uPAR in vitro and in vivo in meningioma. AACR, USA, 17th -21th April 2010
3. **Gupta R**, Chetty C, Bhoopathi P, Lakka S, Fassett D, Klopfenstein JD, Dinh DH, Gujrati M, Rao JS, Downregulation of uPA/uPAR Inhibits Epithelial to Mesenchymal Transition (EMT) in Intermittent Hypoxic DAOY and D283 Medulloblastoma Cells. AACR, USA, 17th -21th April 2010
4. Zhang Z, Zhang M, Zhang S, Yin L, Liu C, Sawicki K, Gupta R, Vidyasagar S, Zhang L, Swarts S and Okunieff P. PA1 downregulation sensitizes radiation induced tumor cell suppression in vitro. 62nd annual meeting, Radiation Research society Hawai, 16-19th October 2016

Patents submitted

1. Materials and methods for inhibiting Tumor Growth. **Publication Number**: WO/2019/070750

Disease Biology

1. PRAK-03202: A triple antigen virus-like particle (VLP) vaccine candidate against SARS CoV-2: Saumyabrata Mazumder[1]*, Ruchir Rastogi[1]*, Avinash Undale[1]*, Kajal Arora[1]*,

Nupur Mehrotra Arora[1]*, Biswa Pratim[1], Dilip Kumar[1], Abyson Joseph[1], Bhupesh Mali[1], Vidya Bhushan Arya[1], Sriganesh Kalyanaraman[1], Abhishek Mukherjee[1], Aditi Gupta[1], Swaroop Potdar[1], Sourav Singha Roy[1], Deepak Parashar[1], Jeny Paliwal[1], Sudhir Kumar Singh[1], Aelia Naqvi[1], Apoorva Srivastava[1], Manglesh Kumar Singh[1], Devanand Kumar[1], Sarthi Bansal[1], Satabdi Rautray[1], Manish Saini[1], Kshipra Jain[1], **Reeshu Gupta[1]**, and Prabuddha Kumar Kundu[1.] **Heliyon, 2021:7(10), e08124**

2. Praveen Mathur, Priyanka Udawat, Priyanshu Mathur, Dr Dilip Ramrakhiani, Sandeep Mathur, S Sitaraman, RK Gupta, Saurav Sultania and **Reshu Gupta** (Corresponding author). Adjuvant therapy and Association of Cytomegalovirus with Biliary Atresia: Indian Journal of Pediatrics (Accepted 2022). https://doi.org/10.1007/s12098-022-04093-4.
3. Ashwani Kumar, **Reshu Gupta (corresponding author)**, Nidhi Mangal, Rabiya Parveen; Lowest deficiency of Vitamin D and Vitamin B12 in Indian old population and postmenopausal women: Indian Journal of Public Health Research & Development 2020: 11 (7):1027-1033

Patents submitted

1. Use of Select Set of Amino Acids for Wound Healing. International Patent Application No.: PCT/US2017/055167