Dr. Rajesh Kumar Gandhirajan
Professor (Human Genetics)
Faculty of Biomedical Sciences and Technology

ORCID: 0000-0002-0039-771X
Scopus ID: 6504073128
Google Scholar: Rajesh Kumar Gandhirajan
Email: rajesh.gandhirajan@sriramachandra.edu.in

PhD/Post Doc supervision slots available: 4

Personal Profile

Cancer Biologist with 18 years international (Germany and USA) research experience in redox signaling, solid/liquid tumors and immunology with advanced techniques, resulting in high impact international peer reviewed research publications. Hands on experience in drug screening, high content imaging, phenologic analysis, high throughput gene expression analysis and target validation *in vitro* and *in vivo* for translational research. Use of advanced image based informatic tools for biological research. Strong project management skills. Experience in teaching post graduate and undergraduate biomedical sciences programs. Designing course work, university administration, member of innovation council. Training research staff, graduate students resulting in completion of projects/publications in time and budget bound manner

Currently Professor in the department of Human Genetics and also innovation ambassador at SRIHER. Teaching records include theory and laboratory exercises in cancer genetics, stem cell and regenerative medicine, radiation genetics, cell and molecular biology and biomarkers of Genetic toxicology.

Research Interests

Inflection of Reactive Oxygen and Nitrogen Species (RONS) in Health and Diseases: RONS plays a vital role in maintaining several cellular processes governing gene expression, metabolism, tissue turnover, immune response, and cell death. ROS imbalance is documented in nearly all pathological conditions. My previous findings have highlighted the role of RONS and calcium in acute lung inflammation (JCI, 2013) mitochondrial metabolism (Cell, 2013) and renal ischemia reperfusion (JBC, 2016) models. Furthermore, role of RONS derived from Cold Atmospheric Plasma (CAP) modulating tumor metabolism, immunogenic cell death (ICD), and tumor survival (Sci.Rep 2018, Redox Biol 2019, BJC 2021,) was recently documented. This warrants for novel anti-cancer therapeutic strategies harnessing RONS induced signaling mechanisms governing both healthy and pathological states for further improving diagnosis and therapeutic options in the clinic. My current research interests include understanding the role of medical RONS (radiation, cold atmospheric plasma, and ROS donor drugs) in regulating metabolism in cancer and cancer stem cells to design and translate effective therapies (Free radical Res 2022, Metabolites; 2023, Stem Cells; 2023). I have been supported by international/national funding bodies like, NIH, DFG and DBT

The Redox lab

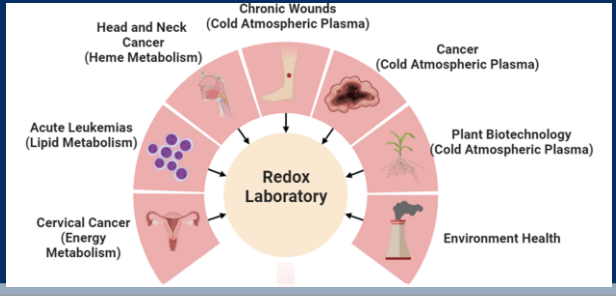
Good scientific practices uphold high ethical standards in research and data collection in our laboratory. We adhere to honesty, accuracy, and transparency when conducting experiments and analyzing results. We use reliable methodologies and techniques, adhere to safety protocols, institutional ethical norms and maintain integrity in reporting findings. Additionally, our lab members respect fellow researchers' work, give credit where it is due, and avoid plagiarism or any form of data manipulation. By following these ethical principles, scientists can uphold the credibility and trustworthiness of their research and contribute to the advancement of knowledge in a responsible and respectful manner.

Lab Members

Roopak Murali (PhD Student): Roopak is working on understanding modulation of ionizing radiation induced amino acid metabolism in cervical cancers

Pooja Singh (PhD student): Pooja is working on oxidant induced metabolic alterations in acute myeloid and acute lymphoid leukemia. Identifying and validating metabolic genes as potential metabolic targets in acute leukemias

Phd and internship opportunities in cold atmospheric plasma are available.



Selected Publications

1. Singh P, Murali R, Shanmugam SG, et al. Aberrant Lipid Metabolic Signatures in Acute Myeloid Leukemia. *Stem Cells*. 2024.

2. Roopak Murali RE, Joanna Pauline Samuel, Pooja Singh, Shivangi Saha, Maneesh Singhal and Rajesh Kumar Gandhirajan. Cold Atmospheric Plasma (CAP) in Wound Healing: Harnessing A Dual Edged Sword. *Redox Experimental Medicine*. 2023;1(1).

3. Murali R, Balasubramaniam V, Srinivas S, et al. Deregulated Metabolic Pathways in Ovarian Cancer: Cause and Consequence. *Metabolites*. 2023;13(4).

4. Gandhirajan RK, Meyer D, Sagwal SK, Weltmann KD, von Woedtke T, Bekeschus S. The amino acid metabolism is essential for evading physical plasma-induced tumour cell death. *Br J Cancer*. 2021;124(11):1854-1863.

5. Gandhirajan RK, Eisenmann S, Sagwal SK, et al. xCT (SLC7A11) expression confers intrinsic resistance to physical plasma treatment in tumor cells. *Redox Biol*. 2020;30:101423.

6. Gandhirajan RK, Meng S, Chandramoorthy HC, et al. Blockade of NOX2 and STIM1 signaling limits lipopolysaccharide-induced vascular inflammation. *J Clin Invest*. 2013;123(2):887-902.

7. Gandhirajan RK, Jain M, Walla B, et al. Cysteine S-Glutathionylation Promotes Stability and Activation of the Hippo Downstream