

Curriculum Vitae

Name: Archita Rai
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EDUCATION

PhD (Life Science) 01/08/2018-present	Ongoing Modification of Nrf-2 activity in radioresistance	Homi Bhabha National Institute, Mumbai, India
MSc (2016-2018)	2018 Biotechnology CGPA 8.7/9 Rank 2	South Asian University, New Delhi, India
BSc(H) (2013-2016)	2016 Zoology 86.8% Rank 3	University of Delhi

RESEARCH EXPERIENCE

Area of Research: Understanding the modulation of oxidative stress and radiation response in radio-therapy resistant cancers.

I have explored small molecules, phytochemicals and FDA approved drugs to identify modulators of oxidative stress and radiation response. I have used multiple in-vitro studies to demonstrate ferroptosis as a target for achieving effective radio-sensitization of therapy resistant cancers. I have demonstrated the role of cellular and mitochondrial ROS and intracellular iron levels in modulation of cellular response to radiation.

Summary:

1. I have worked with FDA approved drug Clobetasol propionate to study its radio-sensitizing ability in Keap-1 mutant lung cancer cells by both in vitro and in vivo studies.
2. I have elucidated the molecular mechanism of action of Clobetasol propionate and have studied ferroptosis as a mechanism for radio-sensitization.
3. I have studied the role of mitochondrial reactive oxygen species (ROS) in ferroptosis and radio-sensitization of Keap-1 mutant human lung cancer cells.
4. Currently, I am working on improving the efficacy of Clobetasol propionate through chemical modification.

Previously, as part of MSc dissertation, I initiated studies on polycomb group protein and their role in rice abiotic stress. I identified differentially expressed polycomb proteins of rice in drought and salinity stress.

AWARDS/FELLOWSHIPS/CONFERENCES

1. Participated and presented poster in 2nd HBNI Theme Meeting on Life Sciences held at Saha Institute of Nuclear Physics, Kolkata, February 2023.
2. **Best poster award** at 5th Asian Congress of Radiation Research held at DAE Convention Centre, Mumbai, November 2022.
3. Secured **2nd Rank** in MSc Biotechnology and received **SAU merit scholarship** for being among top scorers in SAU entrance and department exams, **2016-2018** at South Asian University, New Delhi
4. Secured **All India Rank 42** in **Council of Scientific and Industrial Research-Junior Research Fellowship (CSIR-JRF)** Govt. of India held in **June 2018**
5. Secured **All India Rank 22** in **Graduate Aptitude Test in Engineering-(GATE) Biotechnology** held in **February 2018**
6. Received Secured **3rd Rank** in BSc(H) Zoology at Sri Venkateswara College, University of Delhi, **2013-2016**

TRAINING/COURSE

1. Certification for **Online Scientific Writing Program** on the topics Responding to reviewer comments effectively and selecting a journal and preparing a great submission package organized by Editage on the 10th of June, 2020
2. Pursuing **Course on Machine Learning for Bioscience students** organised by Institute of Mathematical Sciences, Chennai.

Experimental Skills:

1. 2D and 3D animal cell culture, cell line maintenance, handling mice for in vivo xenograft models and intraperitoneal injections.
2. Cell biology, immunology and molecular biology techniques including western blotting, immunofluorescence and fluorescence microscopy, qRT-PCR, high content screening using high throughput cell analyzer, spectrofluorimetry and spectrophotometry based assays for determination of cellular redox, antioxidant enzyme activity, cell proliferation, apoptosis, ferroptosis, wound healing assay, intracellular/surface protein expression, transcription factors activity, mRNA levels and other biochemical events inside the cell, DNA/RNA/Protein isolation.
3. Experienced in **flow cytometry, fluorescence-based cell sorting, and analysis of flow cytometric data.**
4. Experienced in assaying **cancer stem cells (CSCs)**, using high throughput analyzer and flow cytometry-based techniques.
5. Experienced in high throughput cell analyser based screening of drug libraries for radio-sensitizing and anti-cancer effects
6. Experienced in handling bioinformatics tools for data mining, analysis, visualization and representation including data from TCGA and other open access cancer data repositories.
7. Experienced in statistical analysis of data, visualization, representation and manuscript writing

INTERNATIONAL PEER REVIEWED JOURNAL PUBLICATIONS

1. **Rai A**, Patwardhan RS, Pachpatil P., Patwardhan S, Sandur SK. Nrf-2 Inhibition Leads to Radio-Sensitization of Human Lung Cancer Cells via Induction of Oxidative Stress, Reduced DNA Damage Repair and Ferroptosis. Abstracts of 5th Asian Congress of Radiation Research (5th ACRR) and 3rd Biennial Meeting of the Society for Radiation Research. **Journal of Radiation and Cancer Research** 13(4):p 146-231, Oct-Dec 2022.
2. Pal D, **Rai A***, Checker R, Patwardhan RS, Singh B, Sharma D & Sandur SK. Role of protein S-Glutathionylation in cancer progression and development of resistance to anticancer drugs. **Archives of BiochemBiophys** (2021): 704;108890. **IF: 4.114 (* Co-first author)**
3. Yadav, N., Nagar, P., Rakhi, R., Kumar, A., **Rai, A.**, & Mustafiz, A. (2022). Transcript profiling of Polycomb gene family in *Oryza sativa* indicates their abiotic stress-specific response. *Functional & integrative genomics*, 22(6), 1211–1227. **IF: 3.674**

References:

1. Santosh K. Sandur, PhD
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