

CURRICULUM VITAE

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PERSONAL INFORMATION:

Place of Birth: Kolkata, India

Citizenship: The United States of America

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EDUCATION:

1994-1996: MSc, North Bengal University, Darjeeling Govt. College, West Bengal, India

1997-1998: BEd, Jadavpur University, Kolkata, West Bengal, India

1999-2007: PhD, Kalyani University, Nadia, West Bengal, India

PROFESSIONAL EXPERIENCE:

1997-1999: Part-time Lecturer in Biological Sciences, Maheshtala College, Maheshtala, Kolkata, India.

1999-2001: Research Fellow, Division of Radiation Biology, Inter University Accelerator Centre, New Delhi, India and Division of Zoology, Kalyani University, West Bengal, India.

2001-2003: Assistant Teacher in Biological Sciences, Alida Bagnar High School, South 24 Parganas, West Bengal, India.

2003-2005: Research Fellow, Division of Radiation Biology, Inter University Accelerator Centre, New Delhi, India.

2005-2007: Assistant Teacher in Biological Sciences, Alida Bagnar High School, South 24 Parganas, West Bengal, India.

- 2007-2007: Assistant Professor, Department of Radiobiology, Manipal Life Sciences Center, Manipal University, Karnataka, India.
- 2007-2010: Postdoctoral Research Associate, Armed Forces Radiobiology Research Institute, Bethesda, Maryland, USA.
- 2010-2014: Research Instructor, Division of Radiation Health, Department of Pharmaceutical Sciences, University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA.
- 2014-2016: Assistant Research Professor, Division of Radiation Health, Department of Pharmaceutical Sciences, University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA.
- 2016-Present: Assistant Professor (Tenure-track), Division of Radiation Health, Department of Pharmaceutical Sciences, University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA.

HONORS/AWARDS:

- 1996: Awarded University Medal from North Bengal University (West Bengal, India) for securing **1st Class 2nd position in MSc** with 74.9% marks.
- 1999: **UGC Funded University Project (UFUP)** fellowship by **UGC** from Inter-University Accelerator Centre (New Delhi, **India**).
- 2007: Award of Scholarship for **Postdoctoral Research Associate**, Henry M. Jackson Foundation, Rockville, Maryland, USA.
- 2008: Awards of **Resident Research Associateship** by **National Research Council (NRC)** of **the National Academies** of USA.
- 2009: **Oral presentation in Mini-symposium** of at the 55th Annual Meeting of Radiation Research Society in Savannah, Georgia, USA.
- 2009: **Scholars-in-Training (SIT) Travel Award**, Georgia, USA, Radiation Research Society (RRS).
- 2017: **Early Career Investigator (ECI) Travel Award**, the Grand Fiesta Americana Coral Beach resort in Cancun, Mexico, Radiation Research Society
- 2018: 7th Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE) **Young Investigator Travel award**, Wardman Park Marriott, Washington DC, June 24-26, 2018.
- 2018: **Early Career Investigator (ECI) Travel Award**, Historic Hilton Chicago Hotel, Chicago, September 23-26, 2018.

PROFESSIONAL MEMBERSHIP:

- Regular member of **Radiation Research Society**
- Regular member of **Sigma Xi Scientific Research Society**

PEER-REVIEWED PUBLICATIONS:

2007

1. **Pathak R**, Khuda-Bukhsh AR, Dey SK, Ghosh U, Sen Gupta B, Semwal M, Bhattacharyya NP. Resistance to Induction of Micronuclei, Chromosomal Aberrations

and Apoptosis by ^{60}Co γ - ray in a Cell Strain M5, Derived from Chinese Hamster V79 Cells. *J Radioanal Nucl Chem*, 2007 Nov 274, 441-447.

2. **Pathak R**, Dey SK, Sarma A, Khuda-Bukhsh AR. Genotoxic Effects in M5 Cells and Chinese Hamster V79 Cells after Exposure to ^7Li -beam (LET = 60 keV/ μm) and Correlation of their Survival Dynamics to Nuclear Damages and Cell Death. *Mutat Res*. 2007 Mar 30; 628(1):56-66. [PMID: 17258499]
3. **Pathak R**, Sarma A, Sengupta B, Dey SK, Khuda-Bukhsh AR. Response to High LET Radiation ^{12}C (LET, 295 keV/ μm) in M5 Cells, a Radio Resistant Cell Strain Derived from Chinese Hamster V79 Cells. *Int J Radiat Biol*. 2007 Jan;83(1):53-63. [PMID: 17357440]
4. **Pathak R**, Dey SK, Sarma A, Khuda-Bukhsh AR. Cell Killing, Nuclear Damage and Apoptosis in Chinese Hamster V79 Cells after Irradiation with Heavy-ion Beams of ^{16}O , ^{12}C and ^7Li . *Mutat Res*. 2007 Aug 15;632(1-2):58-68. [PMID: 17532254]
5. Roychoudhury P, Pandit B, **Pathak R**, Chaudhuri K, Bhattacharyya NP. Increased Expression of Genes in a Radio-resistant Cell Strain: Modulation of hnRNP E2, Hsp90, and SSBP2 Genes in γ -irradiated Chinese Hamster V79 Cells. *Int J Low Radiat*. 2007 Mar 4;313-331.

2009

6. **Pathak R**, Ramakumar A, Subramanian U, Prasanna PG. Differential Radio-sensitivities of Human Chromosomes 1 and 2 in One Donor in Interphase- and Metaphase–Spreads after ^{60}Co γ -Irradiation. *BMC Med Phys*. 2009 Jun 16;9:6. [PMID: 19531236; PMCID: [PMC2704179](#)]

2011

7. Berbee M, Fu Q, Boerma M, **Pathak R**, Zhou D, Kumar KS, Hauer-Jensen M. Reduction of Radiation-Induced Vascular Nitrosative Stress by the Vitamin E Analog γ -Tocotrienol: Evidence of a Role for Tetrahydrobiopterin. *Int J Radiat Oncol Biol Phys*. 2011 Mar 1;79(3):884-91. [PMID: 20950957; PMCID: [PMC3023840](#)]

2013

8. Ghosh SP, Singh R, Chakraborty K, Kulkarni S, Uppal A, Luo Y, Kaur P, **Pathak R**, Kumar KS, Hauer-Jensen M, Cheema AK. Metabolomic Changes in Gastrointestinal Tissues after Whole Body Radiation in a Murine Model. *Mol Biosyst*. 2013 Apr 5;9(4):723-31. [PMID: 23403731; PMCID: [PMC3601576](#)]
9. Wray J, Williamson EA, Singh SB, Wu Y, Cogle CR, Weinstock DM, Zhang Y, Lee SH, Zhou D, Shao L, Hauer-Jensen M, **Pathak R**, Klimek V, Nickoloff JA, Hromas R. PARP1 is Required for Chromosomal Translocations. *Blood*. 2013 May 23;121(21):4359-65. [PMID: 23568489; PMCID: [PMC3663429](#)]

2014

10. **Pathak R**, Pawar SA, Fu Q, Gupta PK, Berbée M, Garg S, Sridharan V, Wang W, Biju PG, Krager KJ, Boerma M, Ghosh SP, Cheema AK, Hendrickson HP, Aykin-Burns N, Hauer-Jensen M. Characterization of Transgenic Gfrp Knock-in Mice: Implications for Tetrahydrobiopterin in Modulation of Normal Tissue Radiation Responses. *Antioxid Redox Signal*. 2014 Mar 20;20(9):1436-46. [PMID: 23521531; PMCID: [PMC3936502](#)]
11. Pawar SA, Shao L, Chang J, Wang W, **Pathak R**, Zhu X, Wang J, Hendrickson H, Boerma M, Sterneck E, Zhou D, Hauer-Jensen M. C/EBP δ Deficiency Sensitizes Mice to

- Ionizing Radiation-Induced Hematopoietic and Intestinal Injury. *PLoS One*. 2014 Apr 18;9(4):e94967. [PMID: 24747529; PMCID: [PMC3991713](#)]
12. Cheema AK, **Pathak R**, Zandkarimi F, Kaur P, Alkhalil L, Singh R, Zhong X, Ghosh S, Aykin-Burns N, Hauer-Jensen M. Liver Metabolomics Reveals Increased Oxidative Stress and Fibrogenic Potential in Gfrp Transgenic Mice in Response to Ionizing Radiation. *J Proteome Res*. 2014 Jun 6;13(6):3065-74. [PMID: 24824572; PMCID: [PMC4053308](#)]
 13. **Pathak R**, Shao L, Chafekar SM, Feng W, Ponnappan U, Fink LM, Zhou D, Hauer-Jensen M. IKK β Regulates Thrombomodulin in a Klf2-Dependent Manner. *J Thromb Haemost*. 2014 Sep;12(9):1533-1544. [PMID: 25039491; PMCID: [PMC4163124](#)]
 14. You Y, Wen R, **Pathak R**, Li A, Li W, St Clair D, Hauer-Jensen M, Zhou D, Liang Y. Latexin sensitizes leukemogenic cells to gamma-irradiation-induced cell cycle arrest and cell death through Rps3 pathway. *Cell Death Dis*. 2014 Oct 23;5:e1493. [PMID: 25341047; PMCID: [PMC4237263](#)]

2015

15. **Pathak R**, Cheema AK, Boca SM, Krager KJ, Hauer-Jensen M, Aykin-Burns N. Modulation of Radiation Response by the Tetrahydrobiopterin Pathway. *Antioxidants (Basel)*. 2015 Jan 22;4(1):68-81. [PMID: 26785338; PMCID: [PMC4665563](#)]
16. **Pathak R**, Shao L, Ghosh SP, Zhou D, Boerma M, Weiler H, Hauer-Jensen M. Thrombomodulin Contributes to Gamma Tocotrienol-Mediated Lethality Protection and Hematopoietic Cell Recovery in Irradiated Mice. *PLoS One*. 2015 Apr 10;10(4):e0122511. [PMID: 25860286; PMCID: [PMC4393275](#)]
17. Nzabarushimana E, Prior S, Miousse IR, **Pathak R**, Allen AR, Latendresse J, Olsen RH, Raber J, Hauer-Jensen M, Nelson GA, Koturbash I. Combined Exposure to Protons and ⁵⁶Fe Leads to Over-expression of Il13 and Reactivation Repetitive Elements in the Mouse Lung. *Life Sci Space Res (Amst)*. 2015 Nov;7:1-8. [PMID: 26553631; PMCID: [PMC4641818](#)]
18. Miousse IR, Chalbot MC, **Pathak R**, Lu X, Nzabarushimana E, Krager K, Aykin-Burns N, Hauer-Jensen M, Demokritou P, Kavouras IG, Koturbash I. In Vitro Toxicity and Epigenotoxicity of Different Types of Ambient Particulate Matter. *Toxicol Sci*. 2015 Dec;148(2):473-87. [PMID: 26342214; PMCID: [PMC5009441](#)]
19. Wu Y, Lee SH, Williamson EA, Reinert BL, Cho JH, Xia F, Jaiswal AS, Srinivasan G, Patel B, Brantley A, Zhou D, Shao L, **Pathak R**, Hauer-Jensen M, Singh S, Kong K, Wu X, Kim HS, Beissbarth T, Gaedcke J, Burma S, Nickoloff JA, Hromas RA. EEPD1 Rescues Stressed Replication Forks and Maintains Genome Stability by Promoting End Resection and Homologous Recombination Repair. *PLoS Genet*. 2015 Dec 18;11(12):e1005675. [PMID: 26684013; PMCID: [PMC4684289](#)]

2016

20. Liu YL, Yan Y, Webster C, Shao L, Lensing SY, Ni H, Feng W, Colorado N, **Pathak R**, Xiang Z, Hauer-Jensen M, Li S, Zhou D, Emanuel PD. Timing of the loss of PTEN protein determines disease severity in a mouse model of myeloid malignancy. *Blood*. 2016 Apr 14; 127(15):1912-22. [PMID: 26764354; PMCID: [PMC4832508](#)]
21. Ghosh SP, **Pathak R**, Kumar P, Biswas S, Bhattacharyya S, Kumar VP, Hauer-Jensen M, Biswas R. Gamma-Tocotrienol Modulates Radiation-Induced MicroRNA

- Expression in Mouse Spleen. *Radiat Res.* 2016 May;185(5):485-95. [PMID: 27128741; PMCID: [PMC4893953](#)]
22. **Pathak R***, Bachri A, Ghosh SP, Koturbash I, Boerma M, Binz RK, Sawyer JR, Hauer-Jensen M. The Vitamin E Analog Gamma-Tocotrienol (GT3) Suppresses Radiation-Induced Cytogenetic Damage. *Pharm Res.* 2016 Sep;33(9):2117-25. [PMID: 27216753; PMCID: [PMC4967083](#)]
 23. Chang J, Luo Y, Wang Y, **Pathak R**, Sridharan V, Jones T, Mao XW, Nelson GA, Boerma M, Hauer-Jensen M, Zhou D, Shao L. Low Doses of Oxygen Ion Irradiation Cause Acute Damage to Hematopoietic Cells in Mice. *PLoS One.* 2016 Jul 1; 11(7):e0158097. [PMID: 27367604; PMCID: [PMC4930193](#)]
 24. Prior S, Miousse IR, Nzabarushimana E, **Pathak R**, Skinner C, Kutanzi KR, Allen AR, Raber J, Tackett AJ, Hauer-Jensen M, Nelson GA, Koturbash I. Densely Ionizing Radiation Affects DNA Methylation of Selective LINE-1 Elements. *Environ Res.* 2016 Oct; 150:470-481. [PMID: 27419368; PMCID: [PMC5003736](#)]
 25. **Pathak R**, Wang J, Garg S, Aykin-Burns N, Petersen KU, Hauer-Jensen M. Recombinant Thrombomodulin (Solulin) Ameliorates Early Intestinal Radiation Toxicity in a Preclinical Rat Model. *Radiat Res.* 2016 Aug; 186(2):112-20. [PMID: 27459702; PMCID: [PMC4995594](#)]
 26. **Pathak R***, Ghosh SP, Zhou D, Hauer-Jensen M. The Vitamin E analog Gamma-Tocotrienol (GT3) and Statins Synergistically Up-Regulate Endothelial Thrombomodulin (TM). *Int J Mol Sci.* 2016 Nov 18; 17(11) [PMID: 27869747; PMCID: [PMC5133932](#)]
 27. Miousse IR, Koturbash I, Chalbot MC, Hauer-Jensen M, Kavouras I, **Pathak R**. Analysis of the Ambient Particulate Matter-induced Chromosomal Aberrations Using an In Vitro System. *J Vis Exp.* 2016 Dec 21;(118). [PMID: 28060322; PMCID: [PMC5226431](#)]

2017

28. **Pathak R***, Koturbash I, Hauer-Jensen M. Detection of Inter-chromosomal Stable Aberrations by Multiple Fluorescence In Situ Hybridization (mFISH) and Spectral Karyotyping (SKY) in Irradiated Mice. *J Vis Exp.* 2017 Jan 11; (119). [PMID: 28117817; PMCID: [PMC5352253](#)]
29. Miousse IR, Chang J, Shao L, **Pathak R**, Nzabarushimana É, Kutanzi KR, Landes RD, Tackett AJ, Hauer-Jensen M, Zhou D, Koturbash I. Inter-Strain Differences in LINE-1 DNA Methylation in the Mouse Hematopoietic System in Response to Exposure to Ionizing Radiation. *Int J Mol Sci.* 2017 Jul 4; 18 (7). pii: E1430. [PMID: 28677663; PMCID: [PMC5535921](#)]
30. Wang J, **Pathak R**, Garg S, Hauer-Jensen M. Fibrinogen deficiency suppresses the development of early and delayed radiation enteropathy. *World J Gastroenterol.* 2017 Jul 14; 23 (26):4701-4711. [PMID: 28765691; PMCID: [PMC5514635](#)]
31. Chang J, Wang Y, **Pathak R**, Sridharan V, Jones T, Mao XW, Nelson GA, Boerma M, Hauer-Jensen M, Zhou D, Shao L. Whole body proton irradiation causes acute damage to bone marrow hematopoietic progenitor and stem cells in mice. *Int J Radiat Biol.* 2017 Dec;93 (12):1312-1320. [PMID: 28782442; PMCID: [PMC6693495](#)]

32. Miousse IR, **Pathak R**, Garg S, Skinner CM, Melnyk S, Pavliv O, Hendrickson H, Landes RD, Lumen A, Tackett AJ, Deutz NEP, Hauer-Jensen M, Koturbash I. Short-term dietary methionine supplementation affects one-carbon metabolism and DNA methylation in the mouse gut and leads to altered microbiome profiles, barrier function, gene expression and histomorphology. *Genes Nutr.* 2017 Sep 6; 12:22. [PMID: 28904640; PMCID: [PMC5588631](#)]
33. Wang Y, Chang J, Li X, **Pathak R**, Sridharan V, Jones T, Mao XW, Nelson GA, Boerma M, Hauer-Jensen M, Zhou D, Shao L. Low doses of oxygen ion irradiation cause long-term damage to bone marrow hematopoietic progenitor and stem cells in mice. *PLoS One.* 2017 Dec 12; 12(12):e0189466. [PMID: 29232383; PMCID: [PMC5726652](#)]

2018

34. Banerjee S, Shah SK, Melnyk SB, **Pathak R**, Hauer-Jensen M, Pawar SA. Cebp^d Is Essential for Gamma-Tocotrienol Mediated Protection against Radiation-Induced Hematopoietic and Intestinal Injury. *Antioxidants (Basel).* 2018 Apr 6;7(4). [PMID: 29642403; PMCID: [PMC5946121](#)]
35. Ghosh U, Binz RL, Sadhukhan R, Sarma A, Dey SK, Hauer-Jensen M, **R. Pathak***. ¹²C-Beam Induces More Chromosomal Damage In Chemo-Radio-Resistant Cells Than ¹⁶O-Beam. *Research and Reviews: Journal of Pharmacy and Pharmaceutical Sciences.* 2018 May 14; 7(2):e-ISSN:2320-1215.
36. **Pathak R***, Shah SK, Hauer-Jensen M. 2018. Therapeutic potential of natural plant products and their metabolites in preventing radiation enteropathy resulting from abdominal or pelvic irradiation. *Int J Radiat Biol.* 2018 Dec 7:1-43. [PMID: 30526224; PMCID: [PMC6461490](#)]
37. Ewing LE, Miousse IR, **Pathak R**, Skinner CM, Kosanke S, Boerma M, Hauer-Jensen M, Koturbash I. NZO/HILtJ as a novel model for the studies on the role of metabolic syndrome in acute radiation toxicity. *Int J Radiat Biol.* 2018 Dec 18:1-21. [PMID: 30561233; PMCID: [PMC6581619](#)]

2019

38. Aykin-Burns N, **Pathak R**, Boerma M, Kim T, Hauer-Jensen M. Utilization of vitamin E analogs to protect normal tissues while enhancing antitumor effects. *Semin Radiat Oncol.* 2019 Jan;29(1):55-61. [PMID: 30573184; PMCID: [PMC6309800](#)]
39. Garg S, Sadhukhan R, Banerjee S, Savenka AV, Basnakian AG, McHargue V, Wang J, Pawar SA, Ghosh SP, Ware J, Hauer-Jensen M, **Pathak R***. Gamma-Tocotrienol Protects the Intestine from Radiation Potentially by Accelerating Mesenchymal Immune Cell Recovery. *Antioxidants (Basel).* 2019 Mar 6;8(3). pii: E57. [PMID: 30845647; PMCID: [PMC6466604](#)]
40. **Pathak R**, Kumar VP, Hauer-Jensen M, Ghosh SP. Enhanced Survival in Mice Exposed to Ionizing Radiation by Combination of Gamma-Tocotrienol and Simvastatin. *Mil Med.* 2019 Mar 1;184(Supplement_1):644-651. [PMID: 30901461]
41. Binz RL, Tian E, Sadhukhan R, Zhou D, Hauer-Jensen M, **Pathak R***. Identification of novel breakpoints for locus- and region-specific translocations in 293 cells by molecular cytogenetics before and after irradiation. *Sci Rep.* 2019 Jul 22;9(1):10554. [PMID: 31332273; PMCID: [PMC6646394](#)]

2020

42. Ewing LE, Miousse IR, **Pathak R**, Skinner CM, Kosanke S, Boerma M, Hauer-Jensen M, Koturbash I. NZO/HILtJ as a novel model for the studies on the role of metabolic syndrome in acute radiation toxicity. *Int J Radiat Biol*. 2020 Jan;96(1):93-99. [PMID: 30561233; PMCID: [PMC6581619](#)]
43. Miousse IR, Ewing LE, Skinner CM, **Pathak R**, Garg S, Kutanzi KR, Melnyk S, Hauer-Jensen M, Koturbash I. Methionine dietary supplementation potentiates ionizing radiation-induced gastrointestinal syndrome. *Am J Physiol Gastrointest Liver Physiol*. 2020 Mar 1;318(3): G439-G450. [PMID: 31961718; PMCID: [PMC7099489](#)]
44. Sadhukhan R, Leung JWC, Garg S, Krager KJ, Savenka AV, Basnakian AG, **Pathak R***. Fractionated radiation suppresses Kruppel-like factor 2 pathway to a greater extent than by single exposure to the same total dose. *Sci Rep*. 2020 May 7;10(1):7734. [PMID: 32382091; PMCID: [PMC7206069](#)]
45. Ewing LE, Skinner CM, **Pathak R**, Yee EU, Krager K, Gurley PC, Melnyk S, Boerma M, Hauer-Jensen M, Koturbash I. Dietary Methionine Supplementation Exacerbates Gastrointestinal Toxicity in a Mouse Model of Abdominal Irradiation. *Int J Radiat Oncol Biol Phys*. 2021 Feb 1; 109(2):581-593. [PMID: 33002540; PMCID: [PMC7855316](#)]

2021

46. Sadhukhan R, Majumdar D, Garg S, Landes RD, McHargue V, Pawar SA, Chowdhury P, Griffin RJ, Narayanasamy G, Boerma M, Dobretsov M, Hauer-Jensen M, **Pathak R***. Simultaneous exposure to chronic irradiation and simulated microgravity differentially alters immune cell phenotype in mouse thymus and spleen. *Life Sci Space Res (Amst)*. 2021 Feb; 28:66-73 [PMID: 33612181; PMCID: [PMC7900614](#)]
47. Binz RL, Sadhukhan R, Miousse IR, Garg S, Koturbash I, Zhou D, Hauer-Jensen M, **Pathak R***. Dietary methionine deficiency enhances genetic instability in murine immune cells. *Int J Mol Sci*. 2021 Feb 27;22(5):2378 [PMID: 33673497; PMCID: [PMC7956689](#)]
48. Wang J, Garg S, Landes RD, Liu L, Fu Q, Seng J, Boerma M, Thrall K, Hauer-Jensen M, **Pathak R***. Differential recovery of small intestinal segments after partial-body irradiation in non-human primates. *Radiat Res*. 2021 May 27. doi: 10.1667/RADE-20-00272.1 [PMID: 34043805; PMCID: [PMC8440418](#)]
49. Jun SR, Boerma M, Udaondo Z, Richardson S, Thrall KD, Miousse IR, Seng J, **Pathak R**, Hauer-Jensen M. Plasma metabolomics in a nonhuman primate model of abdominal radiation exposure. *Metabolites*. 2021 Aug 13;11(8):540 [PMID: 34436481; PMCID: [PMC8398377](#)]
50. Nemecek-Bakk AS, Sridharan V, Landes RD, Singh P, Cao M, Seawright JW, Liu X, Zheng G, Dominic P, **Pathak R**, Boerma M. Mitigation of late cardiovascular effects of oxygen ion radiation by γ -tocotrienol in a mouse model. *Life Sci Space Res (Amst)*. 2021 Nov; 31:43-50 [PMID: 34689949; PMCID: [PMC8548672](#)]
51. Corken A, Ghosh SP, Du R, Boerma M, Ware J, **Pathak R***. Platelet glycoprotein Iba provides radiation protection. *Radiother Oncol*. 2021 Dec 28; 167:143-148 [PMID: 34971661; PMCID: [PMC8934272](#)]
52. Poudel H, Sanford K, Szwedko PK, **Pathak R***, Ghosh A. Synthetic matrices for intestinal organoid culture: Implications for better performance. *ACS Omega*. 2021 Dec; 25; 7(1):38-47. [PMID: 35036676; PMCID: [PMC8756583](#)]

2022

53. Richardson KK, Ling W, Krager K, Fu Q, Byrum SD, **Pathak R**, Aykin-Burns N, Kim HN. Ionizing radiation activates mitochondrial function in osteoclasts and causes bone loss in young adult male mice. *Int J Mol Sci*. 2022 Jan 8; 23(2):675. [PMID: 35054859; PMCID: [PMC8775597](#)]
54. Ewing LE, Biju PG, **Pathak R**, Melnyk S, Hauer-Jensen M, Koturbash I. Methods for induction and assessment of intestinal permeability in rodent models of radiation injury. *Methods Cell Biol*. 2022; 168:235-247. [PMID: 35366985]
55. Binz RL and **Pathak R***. Molecular cytogenetics reveals mosaicism in human umbilical vein endothelial cells. *Genes (Basel)*. 2022 Jun 3; 13(6):1012. [PMID: 35741774; PMCID: [PMC9222953](#)]
56. Ewing LE, **Pathak R**, Landes RD, Skinner CM, Binz R, Young SG, Riklon S, Stahr S, Su J, Boerma M, McElfish PA, Hauer-Jensen M, Koturbash I. Cytogenetic and epigenetic aberrations in peripheral lymphocytes of Northwest Arkansas Marshallese. *Int J Radiat Biol*. 2022 Aug 8; 1-17. [PMID: 35939319]
57. Larrey EK, **Pathak R***. Radiation-induced intestinal normal tissue toxicity: Implications for altered proteome profile. *Genes (Basel)*. 2022 Nov 2;13(11):2006. [PMID: 36360243; PMCID: [PMC9689954](#)]
58. Simmons P, Trujillo M, McElroy T, Binz R, **Pathak R**, Allen AR. Evaluating the effects of low-dose simulated galactic cosmic rays on murine hippocampal-dependent cognitive performance. *Front Neurosci*. 2022 Dec 6; 16:90863. [PMID: 36561122; PMCID: [PMC9765097](#)]

BOOK CHAPTER:

1. **Pathak R*** and Prasanna PGS. **2014**, Premature Chromosome Condensation in Human Resting Peripheral Blood Lymphocytes without Mitogen Stimulation for Chromosome Aberration Analysis Using Specific Whole Chromosome DNA Hybridization Probes. *Methods Mol Biol*. vol. 1105, 171-181, 2nd Eds. Springer (A product of Humana Press)

EDITORIALS:

1. **Pathak R*** and M. Hauer-Jensen. **2015**, Potential use of dietary antioxidant to prevent radiation-induced genomic instability. *MOJ Bioequivalence & Bioavailability*, 1(1):00002. (Corresponding author) (<http://medcraveonline.com/MOJBB/MOJBB-01-00002.pdf>)
2. **Pathak R*** and M. Hauer-Jensen. **2015**, Particle Beam may have Higher Effectiveness in Treating Chemo-resistant Cancers than Low-LET Photon Beam Therapy, *Research and Reviews: Journal of Pharmacy and Pharmaceutical Sciences*, 4(2) 1-2. [PMID: 26779544; PMCID: [PMC4712956](#)]

POSTER IN INTERNATIONAL CONFERENCE:

2004

1. **Pathak R**, Sarma AK, Semwal M, Dey SK, and Bhattacharyya NP. **2004**, High LET radiation induced chromosomal aberrations, micronuclei formation and apoptosis in

Chinese hamster V79 cells. *Indian Journal of Radiation Research: International Conference on Recent Trends in Radiation Biology*, **1**, RD-6.

2006

2. **Pathak R**, Sarma AK, Dey SK, and Bhattacharyya NP. **2006**, Response to high LET radiation ^{12}C (LET, 295 keV/ μm) in M5 cells, a radio resistant cell strain derived from Chinese hamster V79 cells. *Application of radiotracers in chemical, environmental and biological sciences*, **2**, 265-267.
3. **Pathak R**, Dey SK, Sarma AK, and Khuda-Bukhsh AR. **2006**, Correlation of cell survival and nuclear damages in Chinese hamster cells after exposure to heavy ion irradiation. *Indian Journal of radiation research*, **3**, 201 (Abs. No. 74).

2009

4. **Pathak R**, Ramakumar A, Subramanian U, and Prasanna PGS. Analysis of chromosomal aberrations involving human chromosome 1 and 2 in interphase- and metaphase-spreads after ^{60}Co γ -irradiation. 55th Annual Meeting of the Radiation Research Society. October 4-7, 2009 (Savannah, GA).

2010

5. **Pathak R**, Barber T, Shakhov A, Feinstein E, and Singh VK. Modulation of NF- κ B and cytokine expression by radio-protective TLR agonists in hematopoietic cells. 56th Annual Meeting of the Radiation Research Society, September 25-29, 2010 (Maui, HI).

2011

6. **Pathak R**, Pawar SA, Gupta P, Fu Q, Berbée M, Biju P, Garg S, Kumar KS, Hendrickson H, and Hauer-Jensen M. Characterization of transgenic Gfrp knock-in mice: Implications for BH4 in modulation of radiation response. 14th International Congress of Radiation Research, August 28 – September 1, 2011 (Warsaw, Poland).
7. Pawar SA, **Pathak R**, Wang J, Sterneck E, and Hauer-Jensen M. Role of the Transcription Factor C/EBP delta In Ionizing Radiation Response. 14th International Congress of Radiation Research, August 28 – September 1, 2011 (Warsaw, Poland)
8. Pawar SA, **Pathak R**, Wang J, Sterneck E, and Hauer-Jensen M. Role of the transcription factor C/EBP delta in ionizing radiation response. ABI Fall Research Symposium, September 21, 2011 (Little Rock, AR)

2012

9. **Pathak R**, Shao L, Chafekar S, Ponnappan U, Zhou D, and Hauer-Jensen M. Inhibitory kappa B kinase- β regulates endothelial thrombomodulin in an NF- κ B-independent manner. 58th Annual Meeting of the Radiation Research Society, September 30 – October 3, 2012 (San Juan, PR).
10. Garg S, Wang W, Krager KJ, **Pathak R**, Aykin-Burns N, Hendrickson H, and Hauer-Jensen M. Tetrahydrobiopterin: Regulator of endothelial nitric oxide synthase in radiation-induced injury. 58th Annual Meeting of the Radiation Research Society, USA September 30 – October 3, 2012 (San Juan, PR).
11. Chakraborty K, **Pathak R**, Hieber K, Kumar KS, Hauer-Jensen M, and Ghosh SP. Combined effect of gamma-tocotrienol and statin as radio-protectants. 58th Annual Meeting of the Radiation Research Society, September 30 – October 3, 2012 (San Juan, PR).

12. **Pathak R**, Krager KJ, Pawar SA, Gupta P, Fu Q, Berbée M, Biju P, Garg S, Wang W, Hendrickson H, Hauer-Jensen M, and Aykin-Burns N. De novo biosynthesis of BH4 is critical in protecting against ionizing radiation-induced injury. 58th Annual Meeting of the Radiation Research Society, September 30 – October 3, 2012 (San Juan, PR).
13. Krager KJ, **Pathak R**, Pawar SA, Gupta P, Fu Q, Berbée M, Biju P, Garg S, Wang W, Hendrickson H, Hauer-Jensen M, and Aykin-Burns N. *De novo* biosynthesis of tetrahydrobiopterin is critical in protecting against ionizing radiation. Society for Free Radical Biology and Medicine Meeting, November 14-18, 2012 (San Diego, CA).

2013

14. Gupta P, **Pathak R**, Hubbard M, Hauer-Jensen M, and Hendrickson H. The BiopterinMetabolome – Unlocking the mysteries of ionizing radiation injury. The Association of Biomolecular Resource Facilities, March 2-5, 2013 (Palm Spring, CA).
15. **Pathak R**, Shao L, Garg S, Ghosh SP, Zhou D, and Hauer-Jensen M. Thrombomodulin plays a critical role in vitamin E analog Gamma Tocotrienol (GT3)- mediated G-CSF induction, granulopoiesis and radiation protection *in vivo*. 59th Annual Meeting of the Radiation Research Society, September 15-19, 2013 (New Orleans, LA).
16. Wang W, Garg S, Schmid HA, **Pathak R**, Shao L, Feng W, Zhou D, and Hauer-Jensen M. Effect of SOM230 on cell cycle regulation in cultured intestinal epithelial (IEC-6) cells. 59th Annual Meeting of the Radiation Research Society, September 15-19, 2013 (New Orleans, LA).

2014

17. **Pathak R**, Ghosh SP, and Hauer-Jensen M. Vitamin E analogue gamma tocotrienol (GT3) suppresses radiation-induced cytogenetic damage in mice. 60th Annual International Meeting of the Radiation Research Society, September 21-24, 2014 (Las Vegas, NV).
18. Shao L, **Pathak R**, Feng W, Chang J, Wang J, Boerma M, Hart B, Zhou D and Hauer-Jensen M. Inhibition of TGF- β activation by small molecular IPW-5371 may protect against radiation-induced intestinal and hematopoietic injury. 60th Annual International Meeting of the Radiation Research Society, September 21-24, 2014 (Las Vegas, NV).
19. Garg S, Wang W, **Pathak R**, and Hauer-Jensen M. Radiation-induced intestinal barrier dysfunction in mouse: Role of endothelial nitric oxide synthase. 60th Annual International Meeting of the Radiation Research Society, September 21-24, 2014 (Las Vegas, NV).
20. Shao L, Li H, Feng W, Chang J, Lou Y, **Pathak R**, Hauer-Jensen M, Meng A, and Zhou D. Mitigation of total body irradiation-induced long-term bone marrow injury and genomic instability via induction of senescent hematopoietic stem cells and expansion of normal hematopoietic stem cells. 60th Annual International Meeting of the Radiation Research Society, September 21-24, 2014 (Las Vegas, NV).

2015

21. **Pathak R**, Bachri A, Brown J, Ghosh SP, Koturbash I, Boerma M, Hauer-Jensen M. The effect of ionizing radiation on genomic instability under microgravity with or without GT3 pre-treatment 23rd Annual Arkansas Space Grant Symposium, 10th April, 2015 (Hot Springs, AR).

22. **Pathak R**, Bachri A, Ghosh SP, Koturbash I, Boerma M, Hauer-Jensen M. Does GT3 modulate ionizing radiation- and/or microgravity-induced genomic instability? 61st Annual International Meeting of the Radiation Research Society, September 19 – 22, 2015 (Weston, FL).
23. Krager KJ, **Pathak R**, Fu Q, Hauer-Jensen M, Aykin-Burns N. The Role of Tetrahydrobiopterin (BH4) Bioavailability in Radiation-induced Skin Injury. The Society for Redox Biology and Medicine's (SFRBM) 22nd Annual Meeting, November, 18 – 21, 2015 (Boston, MA).
24. Miousse IR, Prior S, Nzabarushimana E, **Pathak R**, Shao L, Chang J, Allen AR, Latendresse JR, Boerma M, Hauer-Jensen M, Nelson GA, Koturbash I. Short- and Long-Term Effects of Exposure to Low Doses of High-LET Radiation in the Mouse Lung. Southeast Regional IDeA Conference, November 11 – 13, 2015 (Biloxi, MS).

2016

25. **Pathak R**, Bachri A, Ghosh SP, Koturbash I, Boerma M, Hauer-Jensen M. GT3 suppresses ionizing radiation- and/or microgravity-induced genomic instability: Possible role of RAD50. Human Research Program Investigators' Workshop, Galveston Island Convention Center, February 8-11, 2016 (Galveston, TX).
26. **Pathak R**, Bachri A, Koturbash I, Nelson GA, Boerma M, Hauer-Jensen M. Effect of microgravity on radiation-induced endothelial cell damage. 6th Biennial IDeA Symposium of Biomedical Research Excellence, Wardman Park Marriott Hotel, June 26-28, 2016 (Washington DC).
27. **Pathak R**, Bachri A, Koturbash I, Nelson GA, Boerma M, Hauer-Jensen M. Microgravity exacerbates radiation-induced endothelial cell damage. 62nd Annual Radiation Research Society Meeting in Waikoloa, Hawaii, October 16-19, 2016 (Waikoloa, HI)
28. Miousse IR, **Pathak R**, Garg S, Skinner CM, Melnyk SB, Hendrickson H, Landes R, Tackett AJ, Hauer-Jensen M, and Koturbash I. Potentiation of the acute radiation-induced gastrointestinal toxicity by methionine dietary supplementation. South Central Chapter of Society of Toxicology Annual Meeting, October 27 & 28, 2016 (Little Rock, AR).
29. Skinner CM, Miousse IR, **Pathak R**, Garg S, Melnyk SB, Hendrickson H, Cheema AK, Sridharan V, Tackett AJ, Boerma M, Hauer-Jensen M, and Koturbash I. Role of the alterations in one-carbon metabolism in epigenetic and physiological effects of exposure to densely ionizing radiation. South Central Chapter of Society of Toxicology Annual Meeting, October 27 & 28, 2016 (Little Rock, AR).
30. Pidaparathi K, Shwana I, Bachri A, Nelson GA, Boerma M, Hauer-Jensen M, **Pathak R**. Microgravity differentially modulates the expression of radiation-induced endothelial dysfunction markers. South Central Chapter of Society of Toxicology Annual Meeting, October 27 & 28, 2016 (Little Rock, AR).

2017

31. **Pathak R**, Ghosh SP, Zhou D, Boerma M, and Hauer-Jensen M. The Vitamin E Analog Gamma Tocotrienol (GT3) and Statins Synergistically Up-regulate Endothelial Thrombomodulin (TM): Potential strategy of reducing the risk of cardiovascular

- complications after long-term space mission. Human Research Program Investigators' Workshop, Galveston Island Convention Center, January 23-26, 2017 (Galveston, TX).
32. **Pathak R**, Bachri A, Ghosh SP, Koturbash I, Boerma M, Binz RL, Sawyer JR, and Hauer-Jensen M. The vitamin E analog gamma tocotrienol suppresses radiation-induced cytogenetic damage. Human Research Program Investigators' Workshop, Galveston Island Convention Center, January 23-26, 2017 (Galveston, TX).
 33. Skinner CM, Miousse IR, **Pathak R**, Garg S, Melnyk SB, Hendrickson H, Cheema AK, Sridharan V, Tackett AJ, Hauer-Jensen M, Boerma M, and Koturbash I. Role of the alteration in one-carbon metabolism in epigenetic and physiological effects of exposure to densely ionizing radiation. Human Research Program Investigators' Workshop, Galveston Island Convention Center, January 23-26, 2017 (Galveston, TX).
 34. Miousse IR, Prior S, Nzabarushimana E, **Pathak R**, Skinner CM, Kutanzi KR, Allen AR, Raber J, Tackett AJ, Hauer-Jensen M, Boerma M, Nelson GA, and Koturbash I. Densely ionizing radiation affects DNA methylation of selective LINE-1 elements. Human Research Program Investigators' Workshop, Galveston Island Convention Center, January 23-26, 2017 (Galveston, TX).
 35. Chowdhury P, **Pathak R**, Narayanasamy G, Griffin R, Hauer-Jensen M, Boerma M, Mehta R, Bachri A, Peterson T and Dobretsov M. Studies of the combined effects of radiation (acute and chronic) in ground based models of microgravity. NASA AMES RESEARCH CENTER, Moffet Field, San Jose, California, May 8, 2017.
 36. Chowdhury P, **Pathak R**, Narayanasamy G, Griffin R, Hauer-Jensen M, Boerma M, Mehta R, Bachri A, Peterson T and Dobretsov M. Combined effects of Radiation and Microgravity in Hind-limb suspended rats and development of a Chronic Radiation Facility. 25th Annual Arkansas Space Grant Symposium, Winthrop Rockefeller Center, Petit Jean Mountain , April 21, 2017.
 37. Chowdhury P, **Pathak R**, Narayanasamy G, Griffin R, Hauer-Jensen M, Boerma M, Mehta R, Bachri A, Peterson T and Dobretsov M. Development of a chronic irradiation and simulated microgravity facility. Experimental Biology meeting in Chicago, IL April 22-26, 2017.
 38. **Pathak R**, Fu Q, and Hauer-Jensen M. Different subtypes of somatostatin receptor exert distinct effects on cellular proliferation, radio-sensitivity, and radiation-induced genetic damage. 63rd Annual Radiation Research Society Meeting in Cancun, Mexico, October 15-18, 2017.
 39. Koturbash I, Miousse IR, Skinner CM, **Pathak R**, Garg S, Ewing L, Melnyk SB, Cheema AK, Sridharan V, Tackett AJ, Nelson GA, Hauer-Jensen M, and Boerma M. Role of the alterations in one-carbon metabolism in epigenetic and physiological effects of proton irradiation in the mouse gut. 63rd Annual Radiation Research Society Meeting in Cancun, Mexico, October 15-18, 2017.
 40. Ewing L, Miousse IR, **Pathak R**, Garg S, Skinner CM, Melnyk SB, Hendrickson H, Landes R, Tackett AJ, Lumen A, Hauer-Jensen M, and Koturbash I. Dietary methionine as a determinant of radiation-induced gastrointestinal toxicity. 63rd Annual Radiation Research Society Meeting in Cancun, Mexico, October 15-18, 2017.

41. Chowdhury P, Hauer-Jensen M, Bachri A, **Pathak R**. Simulated microgravity and modulation of radiation-induced endothelial cell dysfunction markers. 26th Annual Arkansas Space Grant Symposium, Winthrop Rockefeller Center, Petit Jean Mountain, April 20, 2018.
42. Sadhukhan R, Garg S, Pawar SA, Boerma M, Ware J, Hauer-Jensen M, and **Pathak R**. Kruppel-like factor 2 (KLF2): A novel radiation target is suppressed in the mouse intestine. Conference on Normal Tissue Radiation Effects and Countermeasures (CONTREC), a Winthrop Rockefeller Conference, May 17, 2018.
43. Sadhukhan R, Garg S, Pawar SA, Boerma M, Ware J, Hauer-Jensen M, and **Pathak R**. Shear-responsive Kruppel-like factor 2 (KLF2): A novel radiation target is suppressed in the mouse intestine. 7th Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE), Warman Park Marriot, Washington DC. June 24-26, 2018.
44. **Pathak R**, Sadhukhan R, Garg S, Pawar SA, Boerma M, Ware J, and Hauer-Jensen M. A novel radiation target, shear-responsive kruppel-like factor 2, is suppressed in the mouse intestine. 64th Annual Radiation Research Society Meeting in Historic Hilton Chicago, Chicago September 23-26, 2018.
45. Koturbash I, Miousse IR, Ewing L, Skinner C, **Pathak R**, Garg S, Griffin R, and Hauer-Jensen M. Methionine: from DNA to modulation of normal and cancerous tissue toxicity. 64th Annual Radiation Research Society Meeting in Historic Hilton Chicago, Chicago September 23-26, 2018.
46. Garg S, **Pathak R**, Sadhukhan R, Wang J, and Hauer-Jensen M. Gamma-tocotrienol restores mucosal barrier integrity in mice after total body irradiation. 64th Annual Radiation Research Society Meeting in Historic Hilton Chicago, Chicago September 23-26, 2018.
47. Banerjee S, Shah SK, Melnyk SB, **Pathak R**, Hauer-Jensen M, Pawar SA. Cebp^d is essential for gamma-tocotrienol-mediated protection against radiation-induced hematopoietic and intestinal injury. 64th Annual Radiation Research Society Meeting in Historic Hilton Chicago, Chicago September 23-26, 2018.
48. Ewing L, Lumen A, Miousse IR, Skinner CM, **Pathak R**, Hauer-Jensen M, and Koturbash I. Computational modelling of altered methionine absorption after ionizing radiation exposure. 64th Annual Radiation Research Society Meeting in Historic Hilton Chicago, Chicago September 23-26, 2018.
49. Sadhukhan R, Smith A, Garg S; Koturbash I, and **Pathak R**. Long-term methionine deprivation enhances persistent DNA damage and the expression of MRE11 in irradiated murine macrophage cells. Arkansas Association of Health-System Pharmacists, Holiday Inn Airport Conference Center, Little Rock, Annual Fall Seminar October 11-12, 2018.

2019

50. Chowdhury P, Wight P, **Pathak R**, MacLeod S, Carter A, Pettus N. PhUn Week at the University of Arkansas for Medical Sciences. Experimental Biology Meeting from April 6–9, 2019, Orlando, Florida.
51. Basnakian AG, Fite T, Savenka AV, **Pathak R**, Jang DS. DNases: an old suicidal machine of the cell and a new emerging target for universal mitigation of cell injury.

Proceedings of the 3rd World Congress on Cell Science and Molecular Biology May 14-17, 2019, Kuala-Lumpur, Malaysia.

52. Sadhukhan R, Majumdar D, Garg S, Pawar S, Chowdhury P, Griffin RG, Narayanasamy G, Dobretsov M, Hauer-Jensen M, **Pathak R**. Simultaneous exposure to chronic irradiation and simulated microgravity alter immune cells phenotype in thymus and spleen of mice. 65th Annual Radiation Research Society Meeting in Westin Gaslamp Hotel in San Diego, CA on November 3-6, 2019.
53. Wang J, Garg S, Landes RD, Fu Q, Seng J, Thrall K, Hauer-Jensen M, **Pathak R**. The jejunum recovers slower than distal portions of the small intestine after partial body irradiation in non-human primates. 65th Annual Radiation Research Society Meeting in Westin Gaslamp Hotel in San Diego, CA on November 3-6, 2019.
54. Garg S, **Pathak R**, Fu Q, Wang J, Hauer Jensen M. Markers of endothelial dysfunction, coagulation and intestinal proliferation index in a GI-specific acute radiation syndrome model in non-human primate. 65th Annual Radiation Research Society Meeting in Westin Gaslamp Hotel in San Diego, CA on November 3-6, 2019.

2020

55. Garg S and **Pathak R**. KLF2 haploinsufficiency enhances markers of intestinal injury after total-body irradiation. 66th Virtual Annual Radiation Research Society Meeting in Hawaii on October 18-21, 2020.
56. Sadhukhan R, Leung JWC, Garg S, Krager KJ, Savenka AV, Basnakian AG. **Pathak R**. Fractionated radiation suppresses Kruppel-like factor 2 pathway to a greater extent than by single exposure to the same total dose. 66th Virtual Annual Radiation Research Society Meeting in Hawaii on October 18-21, 2020.
57. Garg S, Corken A, Ghosh SP, Ware J, **Pathak R**. Platelet glycoprotein Iba modulates radiation-induced intestinal injury. 66th Virtual Annual Radiation Research Society Meeting in Hawaii on October 18-21, 2020.

2021

58. Hamzah R, Corken A, Ware J, Ghosh SP, **Pathak R**. Platelet glycoprotein Iba modulates radiation toxicity via platelet microparticles. 67th Virtual Annual Radiation Research Society Meeting in San Juan, Puerto Rico, October 3-5, 2021.
59. **Pathak R**. Somatostatin receptor (SSTR) subtypes 2 or 3 overexpression promotes oncogenic phenotypes and radioresistance. 67th Virtual Annual Radiation Research Society Meeting in San Juan, Puerto Rico, October 3-5, 2021.
60. Majumdar D, Pietras EM, **Pathak R**, Pawar SA. C/ebp delta-deficiency promotes radiation-induced genomic instability and may predispose to myelodysplasia. 67th Virtual Annual Radiation Research Society Meeting in San Juan, Puerto Rico, October 3-5, 2021.
61. Nukala U, Singh A, Manian R, Shrimali S, Shrum SA, Thakkar S, Kiaei M, Breen PJ, Aykin-Burns N, Tong W, **Pathak R**, Compadre CM. Understanding the differences among the Vitamin E tocopherols, and their implications in developing effective radioprotectors. 67th Virtual Annual Radiation Research Society Meeting in San Juan, Puerto Rico, October 3-5, 2021.

2022

62. Reyesa Y, Barbieria M, **Pathak R**, Sevilac MD, Adhikary A, Wnuk SF. Studies of amino and azido derivatives of sesquiterpene lactones and their potential augmentation for radiation damage to cancerous cells. ACS Conference in San Diego, CA, March 20-24, 2022.
63. Ewing L, **Pathak R**, Landes R, Binz RL, Skinner C, Young S, Riklon S, Stahr S, Su J, Boerma M, McElfish P, Hauer-Jensen M, Koturbash I. Cytogenetic and epigenetic aberrations in peripheral lymphocytes of Northwest Arkansas Marshallese. 68th Annual Radiation Research Society Meeting in Waikoloa Village, Hawaii, October 16-21, 2022.
64. Larrey EK, Byrum SD, **Pathak R**. Proteomics analysis reveals overexpression of somatostatin receptor-2 or -3 modulates pathways contribute to cancer progression. 68th Annual Radiation Research Society Meeting in Waikoloa Village, Hawaii, October 16-21, 2022.
65. Hamzah R, Ware J, **Pathak R**. Platelet glycoprotein Iba regulates radiation-induced platelet activation. 68th Annual Radiation Research Society Meeting in Waikoloa Village, Hawaii, October 16-21, 2022.
66. Larrey EK, Reyes Y, Adhikary A, Wnuk SF, **Pathak R**. Synergistic suppression of human breast cancer cells by combination of gamma tocotrienol and azido parthenolide. 68th Annual Radiation Research Society Meeting in Waikoloa Village, Hawaii, October 16-21, 2022.

INVITED TALK:

1. University of Arkansas for Medical Sciences, College of Pharmacy Seminar Lecture Series. **Mechanisms of Radiation Protection by the Vitamin E Analog γ -Tocotrienol**, April 1, 2016.
2. Arkansas Space Grant Consortium, AR NASA-EPSCoR Conference, Hot Springs; Hotel Hot Springs and Spa. **Role of the Vitamin E Analog γ -Tocotrienol (GT3) in Modulating Ionizing Radiation-Induced Cytogenetic Damage**, April 16, 2016.
3. University of Arkansas for Medical Sciences, Physiology and Biophysics Seminar Lecture Series. **Thrombomodulin: Mechanisms of action, regulation, and role in radiation protection**. December 1, 2016.
4. The Conference on Normal Tissue Radiation Effects and Countermeasures (CONTREC), Winthrop Rockefeller Center, Petit Jean Mountain. **Kruppel-like factor 2 (KLF2): A novel radiation target is suppressed in the mouse intestine**. May 14-17, 2018.
5. PhUn Day, organized by the UAMS Center for Diversity Affairs and the Department of Physiology and Biophysics in the UAMS College of Medicine as part of the American Physiological Society's national Physiology Understanding (PhUn) Week program for nearly three dozen students in ninth through 12th grades from Little Rock Central High School. **Radiation biology**. November 8, 2018.
6. University of Arkansas for Medical Sciences, Pharmacology and Toxicology seminar series. **KLF2: A Novel Target in Mitigating Radiation Toxicity**. April 4, 2019.
7. University of Arkansas at Little Rock, Chemistry Department seminar series. **KLF2: A novel therapeutic target for counteracting radiation damage**. September 6, 2019.

8. The 35th Annual Meeting of the American Society for Gravitational and Space Research. **Alteration of immune cells phenotype in thymus and spleen of mice after combined exposure to chronic irradiation and microgravity.** Sheraton Denver Downtown in Denver, CO. November 20 to 23, 2019.
9. Seminar at the Armed Forces Radiobiology Research Institute (AFRRI). **Molecular signatures of radiation for cytogenetic biodosimetry, assessing the immune risks following chronic irradiation, and mitigating endothelial dysfunction.** Bethesda, MD, October 23, 2020.
10. Hematology/oncology research and publication meeting at UAMS. **Radiation Therapy Side Effects: Normal Tissue Toxicity.** Little Rock, AR, April 9, 2021.
11. 28th Annual ASGC Symposium. **Simultaneous exposure to chronic irradiation and simulated microgravity differentially alters immune cells phenotype in the lymphoid tissues.** Little Rock, AR, April 15, 2021.
12. Cancer Institute Grand Rounds. **KLF2: A common target to protect normal tissues while sensitizing cancer cells to radiation.** Little Rock, AR, April 21, 2021.
13. International Virtual Conference on Radiation Biology & Bio-nanotechnology. **KLF2: A common target for protecting the normal tissues and sensitizing the cancer cells to radiation.** Chettinad Academy of Research and Education, Kelambakkam, Tamil Nadu 603103, India, April 01, 2022.
14. 68th Annual Radiation Research Society Meeting. **Radiation countermeasure by targeting endothelial mevalonate pathway.** Waikoloa Village, Hawaii, October 16-21, 2022.

RESEARCH SUPPORT:

ONGOING

1. 2U19AI067773-16 (Pathak, PI) 05/01/2021 – 04/30/2022 1.20 Calendar
 NIH \$152,000
Enhancing vascular endothelial function with GGTi to mitigate gastrointestinal and cardiovascular radiation toxicity

The goal of this study is to establish the efficacy of geranylgeranyl transferase inhibitor (GGTi), a mevalonate pathway inhibitor that specifically blocks protein prenylation, in mitigating gastrointestinal and cardiovascular radiation toxicity by protecting the endothelial cells from radiation damage and provide insight into the mechanism of action of GGTi as a radiation mitigator.

List of the specific aims:

Aim 1. Identify the dose of GGTi that offers maximum mitigation against acute radiation toxicity.

Aim 2. Determine whether the effects of GGTi on delayed gastrointestinal and cardiovascular toxicity are KLF2-dependent.

Role on project: PI

Effort: 10%

Contact: Michael A. Klein (mak67@columbia.edu) 154 Haven Avenue, 2nd Floor, New York, NY 10032

2. 80NSSC21M0323 (Pathak, PI) 08/15/2021 – 07/31/2024 1.80 Calendar
NASA \$750,000

Preventing immune system dysregulation during deep-space missions by Tocoflexol, a modified isomer of vitamin E

The goal of this study is to develop innovative strategies that protect the immune system to ensure the in-mission health and performance of crewmembers. Because it is not feasible to perform human deep-space-flight experiments and collect lymphoid organs to assess immune dysregulation, we will use our ground-based facility at UAMS to model chronic irradiation (CIR) and simulated microgravity (SMG) concurrently in mice to understand their effects on the immune system. Additionally, we will test the efficacy of Tocoflexol, a modified form of tocotrienol with higher bioavailability, for mitigating space-induced immune dysregulation in the primary and secondary lymphoid organs compared to the natural isomers of tocotrienol.

List of the specific aims:

Aim 1. Characterize immune dysregulation after exposure to SMG or CIR alone and in combination.

Aim 2. Determine the efficacy of Tocoflexol in mitigating immune dysregulation after coexposure to SMG and CIR.

Role on project: PI

Effort: 15%

Contact: Jeppie R. Compton Project Manager, NASA EPSCOR agency-epscor@mail.nasa.gov
1-877-677-2123

3. P20 GM109005 (Boerma, PI) 08/17/2020 – 05/31/2025 1.20 Calendar
NIGMS \$11,000,000

COBRE Center for Studies of Host Response to Cancer Therapy, Phase 2

The goal of this program is to build a self-sustaining research center that is focused on identifying mechanisms by which cancer treatment adversely affects normal (non-cancer) tissues and developing novel strategies for early identification and intervention on cancer therapy side effects.

Role on project: Co-I

Effort: 10%

Contact: Grants Management Specialist Lisa Hilard hildredl@nigms.nih.gov 301-594-3913

4. U01 AI170039 (Pathak, PI) 08/01/2022 – 07/31/2027 2.40 Calendar
NIAID/NIH \$3,390,697

Platelet in radiation-induced immune dysregulation

This proposal is to study the role of platelets in immune dysregulation and organ injury in accidental whole body radiation exposure.

Role on project: PI

Effort: 20%

COMPLETED

1. NNX15AK32A Pathak (PI) 12/1/2015-01/31/2017
Arkansas Space Grant Consortium Research Infrastructure Development Grant
Effects of microgravity and GT3 on proton-induced genomic instability in endothelial cells
The goal of this project is to determine the combined effects of radiation and microgravity on endothelial cells' genomic instability and the role of vitamin E analog, gamma tocotrienol, in suppressing the adverse effects.
Role: Principal Investigator
% Effort: 1

2. NNX15AR71H Pathak (PI) 07/01/2019-05/31/2020
Arkansas Space Grant Consortium
Studies of Endothelial Dysfunction under Simulated Space Environment
Role: Principal Investigator

3. NNX15AR71H Pathak (PI) 07/01/2018-08/03/2019
Arkansas Space Grant Consortium
Studies of Endothelial Dysfunction under Simulated Space Environment
Role: Principal Investigator

4. NNX13AB29A Pathak (PI) 12/1/2014-10/17/2015
Arkansas Space Grant Consortium Research Infrastructure Development Grant
Effect of microgravity and GT3 on radiation-induced genomic instability in endothelial cells
The goal of this project is to determine the effects of radiation and microgravity on endothelial cells' genomic instability and the role of vitamin E analog, gamma tocotrienol, in suppressing the adverse effects.
Role: Principal Investigator
% Effort: 1

5. RE03701/NCC 9-58 95 Boerma (PI) 06/1/2014-5/31/2017
National Space Biomedical Research Institute (NSBRI)
Center for Research on Cardiac and Vascular Effects of Space Radiation
The goal of this Center is to characterize the risks of and identify interventions that can prevent or mitigate cardiovascular injury resulting from exposure to space radiation.
Role: Collaborator
% Effort: 10

6. P20 GM103429 Bachri (PI) 05/1/2015-12/30/2017
INBRE Research Development Grant NIH/NIGMS
The Effect of High-LET Radiation on Genomic Instability under Microgravity

This study is a grant provided by the Arkansas INBRE (Cornett, PI) to gain an understanding of the effects of space radiation and microgravity on endothelial cells; to identify molecular targets for reducing the risk of radiation induced cardiovascular disease.

Role: Mentor

% Effort: 0

7. MRE Award (Pathak, PI) 09/01/2020 – 08/31/2021 0.24 calendar
UAMS \$15,000

Improving Efficacy and Safety of Prostate Cancer Radiotherapy with Mevalonate Pathway Inhibitors
Radiation therapy (RT), a common modality in the treatment of stage III/IV prostate cancer, is associated with healthy intestinal tissue toxicity, termed as radiation enteropathy. Using a syngeneic orthotopic preclinical murine model of prostate cancer we seek to determine whether mevalonate pathway inhibitors can limit radiation enteropathy while enhancing radiotherapy-mediated control of tumor growth and metastasis.

List of the specific aims:

Aim 1. Define whether GGTi dually mitigates RE and prostate tumor growth and metastasis following RT

Role on project: PI

Effort: 2%

Contact: Ty Stephens (StephensTyroneD@uams.edu), Director of Cost Accounting, University of Arkansas for Medical Sciences, 4301 W. Markham St. Little Rock, AR 72205

8. Collaborative Research Grant (Ghosh, PI) 11/01/2020 – 04/30/2021 0.24 calendar
NIGMS/Arkansas INBRE \$16,000

Novel synthetic gel for organoid culture

Organoids recapitulate many features of real organs, making them not only a powerful tool for studying organ growth, development, differentiation, and function, but helps in minimizing the costs and time constraints associated with animal studies. Our studies will help to develop a new synthetic thermoresponsive matrix for intestinal organoid culture and enable an *ex vivo* testing of the microenvironmental parameters that govern intestinal stem cell behaviour and intestinal organoid formation.

List of the specific aims:

Aim 1. Synthesis and characterization of natural-polymer-based thermoresponsive polymers.

Aim 2. Compare the efficacy of the synthetic matrix versus commercially available matrices in intestinal organoid growth

Role on project: Co-PI

Effort: 2%

Contact: Caroline Miller Robinson, INBRE Program Manager, University of Arkansas for Medical Sciences, 4301 W. Markham St. Little Rock, AR 72205

NNX15AR71H (Pathak) 07/01/2019 – 05/31/2020 0.24 calendar
NASA/Arkansas Space Grant Consortium \$14,000

Studies of Endothelial Dysfunction under Simulated Space Environment

This project uses a cell model to determine whether two major space factors, such as chronic irradiation and microgravity has synergistic effect on endothelial dysfunction.

Role on project: PI

Effort: 2%

9. P20 GM109005 (Hauer-Jensen, PI) 06/24/2015 – 07/31/2020 6.00 calendar
NIH/NIGMS \$176,730

Center for Studies of Host Response to Cancer Therapy

The objectives of the Center for Studies of Host Response to Cancer Therapy is to examine mechanisms of and prevention strategies for cancer-therapy-induced toxicity.

List of the specific aims:

Aim 1: Determine the role of mitochondrial ROS and its relation to BH4 metabolism during IR-induced skin toxicity.

Aim 2: Determine the role of BH4 bioavailability in IR-induced skin and mitochondrial toxicity through altered GFRP expression.

Aim 3: Determine whether increasing BH4 bioavailability and/or mitochondrial function via pharmacologic interventions mitigates adverse skin pathologies following IR exposure

Role: Project Leader for Project 1

Effort: 50%

Contact: Behrouz Davani, Program Director; Christy Leake, Contract manager, NIGMS, 45 Center Drive MSC 6200 Bethesda, MD 20892

10. BAA-BARDA-09-34 (Hauer-Jensen, PI) 09/26/2011-3/31/2017 1.20
calendar
NIH/BARDA \$16,000,000

Advanced Development of SOM230 as a Radiation Mitigator

This project is to perform studies in non-human primates and mechanistic studies in mouse models with the ultimate goal of obtaining FDA approval of SOM230 as a radiation mitigator.

Role: Collaborator

Effort: 10%

11. 5U54MD002329-12 (Koturbash; PI) 9/1/2018 – 8/31/2019 0.12 calendar
Arkansas Center for Health Disparities (ARCHD)/NIMHD Pilot Grant \$50,000

Novel molecular biomarkers of previous radiation exposure and radiation-induced health effects in Northwest Arkansas Marshallese.

In this study, we will investigate the genetic and epigenetic effects of exposure to ionizing radiation that are associated with cancer and metabolic syndrome development among the Marshallese population in Northwest Arkansas.

Role on project: Co-I

Effort: 1%

12. 1R01CA211963 (Zhou, PI) 04/01/2017 – 03/31/2022 0.72 Calendar
NIH/NCI \$1,748,193 (\$10,192.73)

Ionizing Radiation Induced Hematologic Malignancies

This project focuses on identifying novel cellular targets (e.g., senescent cells) that likely play a fundamental role in ionizing radiation (IR)-induced hematological malignancies (HMs).

Role on project: UAMS PI

Effort: 6%

13. 80NSSC19K0437 (Boerma, PI) 01/31/2020 – 03/31/2022 1.20 calendar
NASA \$178,902

γ -Tocotrienol as a countermeasure against high-energy charged particle-induced carcinogenesis

This project uses a mouse model to test whether the vitamin E analog γ -tocotrienol protects against carcinogenesis from exposure to low doses of galactic cosmic rays as will be encountered during missions in deep space.

Role on project: Co-I

Effort: 10%

TEACHING RESPONSIBILITIES:

RESEARCH MENTORING

2013: Mentor, Summer Research Fellow: Dr. Abdel Bachri, Summer Fellowship, Arkansas IDeA Network of Biomedical Research Excellence (Arkansas INBRE)

2014 – 2015: Project Advisor, Students name: Ms. Joeline Brown and Mr. Hemant Kemkar, Arkansas Space Grant Consortium, Research Infrastructure Development Grant

2015 – 2017: Mentor, Arkansas IDeA Network of Biomedical Research Excellence (Arkansas INBRE) Research Development Grant, PI: Dr. Abdel Bachri

2016: Project Mentor, Student name: Ms. Kavya Pidaparathi, Arkansas Space Grant Consortium, Research Infrastructure Development Grant

2016 – 2017: Co-Advisor, Student name: Israa Shwana, Department of Applied Science, College of Science; University of Arkansas Little Rock

2017: Mentor, Summer Research Fellowship, Student name: Mr. Allen Smith

2017 — 2018: Mentor, Academic visitor from University of Missouri-Kansas City, Student name: Mr. Sarthak Garg (12/18/2017 — 01/18/2018)

2018: Mentor, Academic visitor from University of Central Arkansas, Student name: Ms. Maria Neal (07/01/2018 — 08/08/2018); Academic visitor from University of Arkansas at Little Rock, Student name: Ms. Victoria McHargue (05/20/2018 — 08/12/2018); and summer student from University of Arkansas for Medical Sciences, Student name: Mr. Allen Smith (06/20/2018 — 08/12/2018)

2017 — 2021: Mentoring Postdoc, Name: Dr. Ratan Sadhukhan (From 05/30/2017)

2021 — 2022: Co-Advisor MS student at UALR Chemistry Department. Mr. Cole Moore

2018 — Present: Mentoring Research Technician Name: Ms. Regina Lichti Binz (From 02/05/2018)

2021 — 2022: Mentoring Postdoc, Name: Dr. Rabab Hamzah

2021 — Present: Mentoring Graduate student, UALR/UAMS Bioinformatics Graduate Program; Name: Mr. Enoch Larrey

2022 — Present: Mentoring Graduate student, UAMS College of Pharmacy; Name: Ms. Katherine McGinness

CLASSROOM TEACHING

1997 – 1999: Part-time Lecturer in Biological Sciences, Maheshtala College, Maheshtala, Kolkata, India

2001 – 2003: Assistant Teacher in Biological Sciences, Alida Bagnar High School, South 24 Parganas, West Bengal, India

2007 – 2007: Assistant Professor, Department of Radiobiology, Manipal Life Sciences Center, Manipal University, Karnataka, India

2015 – Present: Instructor, Molecular Biology and Biotechnology, University of Arkansas for Medical Sciences Pharmacy curriculum, Little Rock, AR, USA

2017 – Present: Course coordinator, Radiation Biology, University of Arkansas for Medical Sciences, Graduate School Curriculum, Little Rock, AR, USA

2019 – Present: Course coordinator, Molecular Biology and Biotechnology, University of Arkansas for Medical Sciences, Pharmacy College, Little Rock, AR, USA

REVIEW SERVICE:

Associate Editor:

Research and Reviews: Journal of Pharmacy and Pharmaceutical Sciences (<https://www.rroj.com/editorialboard-pharmacy-and-pharmaceutical-sciences.php>).

MOJ Bioequivalence & Bioavailability

(<http://medcraveonline.com/MOJBB/editorial-board>)

Manuscript Reviewer:

Radiotherapy and Oncology; International Journal of Radiation oncology, Biology, Physics; Radiation Research; Human and Experimental Toxicology; International Journal of Radiation Biology; Mutagenesis; International Journal of Biotechnology Research; Plos One; Journal of Medicine and Medical Sciences; Journal of Nanomaterials; Toxins; Medicines; BMC Pharmacology and Toxicology; Molecules; MOJ Bioequivalence & Bioavailability; Technology in Cancer Research & Treatment; Scientific Reports

SELECTED REVIEW COMMITTEES AND FEDERAL/GOVERNMENT PANELS:

- 2018: NASA Space Biology Cell and Molecular Biology Panel, Adhoc member, Crystal City, VA office, Washington DC, June 18-19, 2018.
- 2020: Arkansas INBRE, Research Development Grants submitted by faculty from Arkansas colleges, UAMS, January 6, 2020
- 2021: TRI Career Development Scholars Program (KL2) Study Section, UAMS Translational Research Institute, April 23, 2021

MEDIA COVERAGE:

- https://urldefense.proofpoint.com/v2/url?u=https-3A_www.newsweek.com_american-2Dgovernment-2Dbuys-2Dnuclear-2Dradiation-2Ddrug-2Dnplate-2D1750644&d=DwMFaQ&c=27AKQ-AFTMvLXtgZ7shZqsfSXu-Fwzpqk4BoASshREk&r=4IGZk1Jd_dSffH4uuzrs1idlMH2QarwvEG61MR3T9HI&m=sJ8XnpBuuys-4GmHn_a1dqOvqLO9na99VVDtaheD22rHZB1YISUnl6lY_ISQKjUb&s=747GJP49gIQe_mzxT_jXHaE1ZZB0cl1N370qHYTC9FFg&e=
- <https://www.arkansasbusiness.com/tagged/Rupak+Pathak>
- <https://news.uams.edu/2022/08/24/uams-receives-3-4-million-to-study-radiation-injuries-caused-by-nuclear-accidents-and-bioterrorism/>
- <https://us10.campaign-archive.com/?e=&u=0a4c69453af9f2717a60657ae&id=2c00afee7d>
- http://www.magnoliareporter.com/news_and_business/regional_news/article_62fad268-294a-11ed-a589-bba8b1234ffa.html
- <https://arktimes.com/arkansas-blog/2022/08/24/new-radiation-injury-study-at-uams-gets-3-4-million>
- <https://www.armoneyandpolitics.com/uams-cancer-researcher-awarded-1-7-million-nih-grant-study-prevention-radiation-induced-cancer/>

PATENT:

U.S. Provisional Patent Application No. 63/354,299
 Entitled: Mitigation of Radiation Injury by Geranylgeranyl Transferase Inhibitors
 BioVentures ID No. 2022-34

Last updated on January 5, 2023