Rauf Ahmad Najar
Postdoctoral Research Fellow
Department of Biochemistry and Molecular Biology
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Educational Qualifications

Ph.D. (2017)	Panjab University, Chandigarh
Thesis Title	Cellular and molecular evaluation of aberrant hepatic DNA methylation by folate modulation and ageing
M.Sc Biotechnology (2006-2008)	Bangalore University, Bangalore-560004(India).
B.Sc (2003-2006)	University of Kashmir, Srinagar -190006 (India).

Research Experience

Nov 2010-Oct 2012 (2 Years)	Worked as Junior Research Fellowship (JRF) DST, at CSIR-Indian Institute of Integrative Medicine, Jammu on "Influence of exogenous folate and aging on the expression of folate metabolizing proteins and hepatic DNA methylation: Implications in pathobiology of the hepatocarcinogenesis"
Nov 2012- Sept 2014 (1Years and 11 months)	Worked as Senior Research Fellowship (SRF) DBT, at CSIR-Indian Institute of Integrative Medicine, Jammu on "Influence of exogenous folate and aging on the expression of folate metabolizing proteins and hepatic DNA methylation: Implications in pathobiology of the hepatocarcinogenesis"
Oct-2014-Sept-2017 (3 Years)	Working as Senior Research Fellowship (SRF) CSIR, at CSIR-Indian Institute of Integrative Medicine, Jammu on "Association of folate modulation and aging on hepatic DNA methylation for the evaluation of aberrant epigenetic mechanism in precancerous and cancerous models."

Honors and Awards

1. Qualified National Eligibility Test (NET) for Lectureship in Life Sciences conducted by Council of Scientific and Industrial Research (CSIR), India 2009.
2. Awarded Junior Research Fellowship (JRF) by DST, New Delhi, India from Nov. 2010 to Oct. 2012.
3. Awarded Senior Research Fellowship (SRF) by DST, New Delhi, India from Nov. 2012 to Sept. 2014.
4. Awarded Senior Research Fellowship (SRF) by CSIR, New Delhi, India from Oct. 2014 to till date.
5. Life Member of Association of Basic Medical Science (ABMS), India.

Summary of Ph.D work

The epigenetic hepatic model of folate deficiency/supplementation was developed, where folate deficiency with age leads to several fold decrease in serum and liver tissue folate levels through the decreased uptake of folic acid reflected by decreased kinetic parameter V_{max}. At the molecular level, decreased transport efficiency of the folate transporters with folate deficiency and age can be attributed to down regulation of ABCG2 and up regulation RFC, which was found to be regulated by promoter hypomethylation of ABCG2 and promoter hypermethylation of RFC (***Mol Nutr Food Res ; 60:1501-13).*** Insights into the methylation aspect in the present study revealed that the combined effect of folate deficiency and age decreases the methylation index reflected by the SAM/SAH ratio, which leads to decreased global methylation and also increased expression methyltransferases. Further, folate deficiency with age commences towards the up regulation of proto-oncogenes (cyclin E, C-Jun and C-myc) which were found to be regulated by promoter hypomethylation. The selected tumour suppressor genes (p53, p15ink4b and p16ink4a) in the hepatic tissue under folate deficient conditions and age decrease the expression at both transcript and protein levels which was observed to be regulated by promoter hypermethylation. Thus, folate deficiency with age confers selective

hepatocellular epigenetic imprints through DNA methylation. (***J. Nutritional Biochemistry, under review).*** The FD in an in-vitro model of liver cancer cell line Hep3b resulted in aberrations of folate transporters and DNA methyltransferases and these modulations sensed by mTORC1 and lead to autophagy ***(IUBMB Life, under review).***

Publications

1. **Najar RA**, Wani NA, Bhat JA, Dar NJ, Rahat B, Gupta AP, Kaur J, Kaur J, Hamid A. Modulation of dietary folate with age confers selective hepatocellular epigenetic imprints through DNA methylation **J Nutr Biochem.** 2017 Nov 2;53:121-132

2. **Najar RA**, Rahat B, Hussain A, Thakur S, Kaur J, Kaur J, Hamid A. Gene specific epigenetic regulation of hepatic folate transport system is responsible for perturbed cellular folate status during aging and exogenous modulation. **Mol Nutr Food Res**. 2016 Jun; 60:1501-13.

3. Rahat B, **Najar RA**, Hamid A, Bagga R, Kaur J. The role of aberrant methylation of trophoblastic stem cell origin in the pathogenesis and diagnosis of placental disorders. **Prenat Diagn.** 2016 Nov 24. doi: 10.1002/pd.4974

4. Rahat B, Hamid A, **Najar RA**, Bagga R, Kaur J. Epigenetic mechanisms regulate placental c-myc and hTERT in normal and pathological pregnancies; c-myc as a novel fetal DNA epigenetic marker for pre-eclampsia. **Mol Hum Reprod**. 2014 Oct; 20(10).

5. Thakur S, Rahat B, Hamid A, **Najar RA**, Kaur J. Identification of regulatory mechanisms of intestinal folate transport in condition of folate deficiency. **J Nutr Biochem**. 2015 Oct; 26(10):1084-94.

6. Bhat J A, Ahmad M, Dar N J, Hussain A, **Najar R A**, Sharma S, Mintoo M J, Mondhe D.M, Adhami V M, Shah B A, Caplash N, Hamid A. Novel HDAC inhibitor SBAK-GHA: potential therapuetic molecule for lymophocytic leukaemia. **Cancer Research.** (2017): 1376-1376.

7. Wani NA, Thakur S, **Najar RA**, Nada R, Khanduja KL, Kaur J. Mechanistic insights of intestinal absorption and renal conservation of folate in chronic alcoholism, Alcohol. 2013 Mar;47(2):121-30.

8. Lone MI, Nazam N, Hussain A, Singh SK, Dar AH, **Najar RA**, Al-Qahtani MH, Ahmad W.Genotoxicity and immunotoxic effects of 1,2-dichloroethane in Wistar rats. **J Environ Sci Health C Environ Carcinog Ecotoxicol Rev.** 2016 Jul; 34(3):169-186.

9. Qazi AK, Hussain A, Hamid A, Qurishi Y, Majeed R, Ahmad M, **Najar RA**, Bhat JA, Singh SK, Zargar MA, Ali S, Saxena AK. Recent development in targeting PI3K-Akt-mTOR signaling for anticancer therapeutic strategies. **Anticancer Agents Med Chem**. 2013 Dec;13(10).

10. Majeed R, Hamid A, Qurishi Y, Qazi AK, Hussain A, Ahmad M, **Najar RA,** Bhat JA, Singh SK and Saxena AK. Therapeutic Targeting of Cancer Cell Metabolism: Role of Metabolic Enzymes, Oncogenes and Tumor Suppressor Genes. **Journal of Cancer Science and Therapy** 08/2012; 4(9):281-291.

11. Ahmad M, Hamid A, Hussain A, Majeed R, Qurishi Y, Bhat JA, **Najar RA**, Qazi AK, Zargar MA, Singh SK, Saxena AK. Understanding histone deacetylases in the cancer development and treatment: an epigenetic perspective of cancer chemotherapy. **DNA Cell Biol. 2012** Oct; 31 Suppl 1:S62-7.

12. **Najar RA**, Dar NJ, Hussain A, Bhat JA, Hamid A. Folate as epigenetic modifier influences mTORC1 mediated liver cancer cell autophagic growth **(Communicated in IUBMB life).**

Conferences presented/ attended

1. **Najar RA**, Bhat JA, Dar NJ, Kaur J, Kaur J, Hamid A. Aberrant regulation of folate transporters during ageing and exogenous modulation may attribute to hepatic cancerous phenotype at 3RD International conference on recent Trends and Advancements in Engineering and Technology held on (17-18 Nov. 2016) Organised by SMVDU.

2. Bhat J A, Ahmad M, Dar N J, Hussain A, **Najar R A**, Sharma S, Mintoo M J, Mondhe D M, Adhami V M, Shah B A, Caplash N, Hamid A. "Novel HDAC Inhibitor SBAK-GHA: Potential Therapeutic Molecule for Lymphocytic Leukaemia" at AACR Annual Meeting 2017, with the theme of "Research Propelling Cancer Prevention and Cures," held on (1-5 April 2017) at Walter Washington Convention Centre Washington, DC, USA.

3. **Najar RA**, HussainA, Bhat JA, Dar NJ, kaur J, Kaur J, Hamid A. Ageing and exogenous folate modulation leads to aberrant regulation of folate transporters attributing towards hepatic cancerous phenotype. at International conference on "Emerging Trends in Biomedical Research in the New-Millennium "held on (29-30 Nov 2016) Organised by Deptt. of Biochemistry, Government Medical College Jammu in association with Indian Academy of Biomedical Sciences.

4. Dar NJ, Bhat JA, **Najar RA**, Hamid A, Ahmad M. Attenuation of Mitochondrial Dysfunction and Oxidative Stress by Withanolidesin Glutamate- Induced Excitotoxicity at 6th International conference on "Mitochondria in Health and Disease" held on 10-11 Feb, 2017 at Jawaharlal Nehru University, New Delhi, India.

5. Bhat J A, Ahmad M , Dar N J, Hussain A , **Najar R A**, Sharma S, Mondhe D M, Shah B A, Caplash N, Hamid A, Novel HDAC inhibitor and Potential Therapeutic Molecule for Lymphocytic Leukaemia". at International conference on "Emerging Trends in Biomedical Research in the New-Millennium "held on (29-30 Nov 2016) Organised by dep. of Biochemistry, Government Medical College Jammu in association with Indian Academy of Biomedical Sciences.

6. Bhat J A, Ahmad M , Dar N J, Hussain A , **Najar R A**, Caplash N, Hamid A, "Novel HDAC inhibitor SBAK-GHA: Hope for lymphocytic Leukaemia". at 3RD International conference on recent Trends and Advancements in Engineering and Technology held on (17-18 Nov2016) Organised by SMVDU.

7. International Symposium on Biotechnological Advances inCancer Biology (Feb,13 2012) at SMVDU, Katra.

8. Participated in the Symposium on Bioethics, Biosafety and IPR held on (20, Feb 2008) by Dep. Of Biosciences of T.John Group of Institutions, Bangalore.

9. Participated in Bio-Rujivith, A National level symposium on life Sciences held on (26-27 Mar 2007) at Garden City College, Bangalore.

10. National Symposium on Innovations in Biotechnology; Entrepreneurial Opportunities and IPR held on (23-25Oct, 2007) at Jnanajyothi Auditorium Central College Campus, Bangalore.

11. Participated in one day Seminar on Frontier areas in Biological Sciences held on 16, Oct 2006, at Oxford College of Sciences, Bangalore.

12. Attended IISC Centenary lecture by David Baltimore "Role of Micro RNA's" at Indian Institute of Science Bangalore.

Technical Skills

In Vitro cell culture based techniques
Cell culture, Isolation of DNA, RNA and protein from cells. Confocal microscopy.
Enzymology and enzyme kinetics
Enzyme kinetics, preparation of membrane vesicles from intestine and Liver. Determination of K_m and V_{max}.
Molecular biology techniques
Isolation and electrophoretic analysis of DNA and RNA, PCR, Reverse Transcriptase-PCR, Real time PCR, Methylation studies (High Resolution melting) by Real-Time PCR. Chromatin immunoprecipitation (ChIP), Primers designing for HRM and PCR, Blast search etc.
Proteomics techniques
SDS-PAGE, PAGE, Western blotting, Immunofluorescence, Confocal Microscopy and Immunohistopathology etc.
In vivo based techniques
Animal dosing (Oral, Intraperitoneal, Abdominal, Intrvenous), Isolation of DNA, RNA and proteins from tissues, Histopathology and Imunohistochemistry.
Epigentetic techniques
Methylation studies by MS-HRM (High Resolution Melting Analysis) using Real Time PCR.
Chromatographic techniques
Mass Spectrophotometry by LC-MS
Computation: Knowledge of Windows, Graphpad Prism, ImageJ, SlideWrite, ChemBio Draw and MS Office.

References

1. **Dr. Maayan Salton**
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   Department of Biochemistry and Molecular Biology,
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