Dr. Aklank Jain
Associate Professor and Ramanujan fellow
Centre for Animal Sciences
School of Basic and Applied Sciences
Central University of Punjab
Bathinda- 151 001
Email Id: aklankjain@gmail.com
Phone: + 91-9878109140,9816427691

Academic Qualification:

Degree	Organization	Year	Subject
Ph.D.	Jamia Millia Islamia, New Delhi and All India Institute of Medical Sciences, New Delhi	2005	Biosciences
M.Sc.	Jamia Hamdard, New Delhi	2000	Biochemistry

Experience:

Organization	Title	Year
Center for Biochemistry and Microbial Sciences	Assistant Professor	July 2015-December 2015
Department of Biotechnology and Bioinformatics, Jaypee University of Information Technology (UGC approved under section 2f) Waknaghat,Solan (HP)	Associate Professor	August 2012-June 2015
Indian Institute of Toxicological Research, Lucknow	Ramanujan Fellow	June 2012-August 2012
The University of Texas at Austin, Texas, USA	Postdoc Fellow	March 2011 - June 2012
MD Anderson Cancer Center, Houston, Texas, USA	Postdoc Fellow	June 2012-Feb 2011
Oncology Institute of Southern Switzerland, Bellinzona	Postdoc Fellow	February 2005 - March 2007

Switzerland		

Teaching Assignments:

1. **No. of Students Guided/ongoing:**
    1. M.Tech. 5
    2. M.Pharm. 1
    3. Ph.D. 2 (ongoing)

Research Projects:

S. No	Title of Project	Funding Agency	Grant Received	As PI or Co PI
1.	The Molecular Mechanisms of DNA Damage and Repair Induced by non-B DNA structures in Cancer	Department of Science and Technology	Yes (~83 lacks) 2012-2017	**PI**
2.	Elucidating the role of potential miRNAs in the pathogenesis of Head and Neck Cancer.	Department of Biotechnology	for Three years (2016-2019), 24.90 lacks	**PI**
3.	Identification of circulating microRNAs as novel noninvasive biomarkers for early detection of lung cancer	ICMR	For three years, Yet to receive fund 32.70 lacks	**PI**
4	Development of vitamin receptor mediated endocytosis based biotin-irinotecan conjugates as selective and safer colon tumor targeting agents	Department of Biotechnology	24.19 lacks (2015-2018)	**Co-PI**

Professional Recognition /Awards/Scholarship:

Awards	Organization	Year

Associate Editor	International Journal of Molecular Biology	2013 onwards
Ramanujan Fellowship	DST, India	June 2012- June 2017
Invited speaker	FASEB Helicase Meeting	Aug. 2011
Senior Research Fellowship	CSIR, India	2003
International Travel Grant	CSIR, India	2002
Junior Research Fellowship	ICMR, India	2001
NET	CSIR-UGC	1999

Area specializations/Research Interest:

Currently, numerous tumor-specific molecular alterations have been identified in blood but none of the tested markers so far had sufficiently achieved the required characteristics for the diagnosis of cancer. Our lab research interest is to understand their function in cancer and to determine whether they may become therapeutic targets in the future.

In this regard, we are targeting the diseases from the three fronts.

My first approach is to detect and characterize non-coding RNA molecules in patients blood specifically miRNAs and long non-coding RNAs (lncRNAs). Recent advances in whole genome transcriptome analysis have enabled the identification of numerous members of a novel class of non-coding RNAs, which play important roles in a wide range of biological processes and whose deregulation causes human disease, including cancer. For this purpose, we conducted miRNAs profiling in lung cancer patients and observed significant differential expression of some miRNAs in patients samples compared to healthy control. We have also observed the altered expression of miRNAs in patients undergoing chemo and radiotherapy treatments. Further, we found that these miRNAs regulate the pathways involved in lung cancer pathogenesis.

Similarly, we have observed the differential expression of *MALAT1, GAS5, HOTAIR, BANCR, MEG3* and *PVT1* lncRNAs in lung cancer patients compared to match healthy control. Studies are underway to evaluate the role of long non-coding RNAs in the pathogenesis of lung cancer.

Our second approach is to investigate why some populations are more prone to lung cancer. Considerable amount of data suggest that reduced DNA repair capacity may play vital role in cancer development. Inherited polymorphisms of DNA repair

genes may contribute to inter individual variations in the DNA repair capacities and hence can make some individual more susceptible to cancer. To investigate this, we are evaluating the contribution of ERCC2, hMLH1, XPA and XPC gene polymorphism on the risk of lung cancer patients compared to age- and gender-matched healthy controls samples populations.

Our third approach for finding the biomarkers is through proteomics methods. In order to identify secretory proteins associated with lung cancer, we are using 2D gel electrophoresis, and the differentially expressed proteins were identified by MALDI-TOF and subsequently by western blot. 2D gel comparison and MALDI-TOF revealed several differentially expressed proteins in lung cancer patients compared to healthy control.

I believe that knowledge obtained from these studies would help in gaining insight into the cause and future therapies for cancer.

Publications:

Publications: (Citations: 558; *h* - index: 13; i10 index: 16)

S. No.	Authors, title, journal, volume, page numbers	Impact Factor
1.	Khandelwal A., Bacolla A., Karen Vasquez KM and **Jain A.** Long Non-Coding RNA: A New Paradigm for Lung Cancer. **Molecular Carcrinogenesis, 54 (11), 1235-1251. 2015**	**4.8**
2.	Bacolla A., Temiz NA., Yi M., Ivanic J---- **Jain A.,** Vasquez KM. *et al.* Guanine holes represent prominent targets for mutation in cancer and inherited disease. **PLoS Genetics, 9(9),e1003816.** 2013.	**9.0**
3.	**Jain A.,** Bacolla, A., Vasquez KM. *et al.* DHX9 helicase involved in maintaining genomic stability in human cells. **Nucleic Acid Research**, **2013 Sep 17; 1-13.**	**9.3**
4.	Bacolla A, Wang G, **Jain A**, Chuzhanova NA, Cer RZ, Collins JR, Cooper DN, Bohr VA, Vasquez KM. Non-B DNA forming sequences and WRN deficiency independently increases the frequency of spontaneous base substitution in human cells. J Biol Chem. 2011 **Mar 25; 286(12):10017-26.**	**5.3**
5.	**Jain A**., Bacolla A, Chakraborty P, Grosse, F., Vasquez KM. Human DHX9 helicase unwinds triplex DNA structure. **Biochemistry. 2010 Aug. 24; 49(3):6992-9.**	**3.2**

6.	**Jain A**, Wang G, Vasquez KM. DNA Triple helices: biological consequences and therapeutic potential. **Biochimie.** 2008 Aug; 90(8):1117-30.	**3.8**
7.	Zhao J., Wang G., **Jain A.,** Vasquez KM. DNA repair proteins influence DNA structured –induced genomic instability. **Env. & Mol. Mut.** 2010; 51(7), 721-721.	**3.7**
8.	Cangemi R, Mensah A, Albertini V, **Jain A**, Mello-Grand M, Chiorino G, Catapano CV, Carbone GM. Reduced expression and tumor suppressor function of the ETS transcription factor ESE-3 in prostate cancer. **Oncogene.** 2008 May 1; 27(20):2877-85.	**7.4**
9.	Albertini V, **Jain A.**, Vignati S, Napoli S, Rinaldi A, Kwee I, Nur-e-Alam M, Bergant J, Bertoni F, Carbone GM, Rohr J, Catapano CV. Novel GC-rich DNA-binding compound produced by a genetically engineered mutant of the mithramycin producer strptomyces argillaceus exhibits improved transcriptional repressor activity : implication for cancer therapy. **Nucleic Acids Res.** 2006 Mar 29; 34(6):1721-34.	**9.3**
10.	**Jain A,** Akanchha S, Rajeswari MR. Stabilization of purine motif DNA triple helix by tetrapeptide from the binding domain of HMGB1 protein. **Biochimie** 2005 Aug; 87(8):781-90.	**3.8**
11.	**Jain A,** Ahmad F, Rajeswari MR. Structural studies on DNA triple helix formed by intronic GAA triplet repeat expansion in Friedreich's Ataxia. **Nucleosides Nucleotides Nucleic Acids.** 2003 May-Aug; 22(5-8):1517-9.	**1.2**
12.	Akanchha, **Jain A,** Rajeswari MR. Binding studies on peptide-oligonucleotide complex: intercalation of tryptophan in GC-rich region of c-myc gene. **Biochim Biophys Acta.** 2003 Jul 23; 1622(2):73-81.	**3.2**
13.	Rajeswari,M.R.,**Jain,A.,**Sharma,A.,Singh,D.,Jagannathan,N.R., Sharma,U.and Degonkar, M.N. Evaluation of skin tumors by magnetic resonance imaging. **Lab Invest.,** (2003)83 : 1279-1283.	**4.6**
14.	**Jain,A.,** Singh,D., Jagannathan, N.R., Sharma, U., and Degonkar, M.N. and Rajeswari, M.R. Detection of skin tumors by magnetic resonance imaging. **Trends Clin. Biochem. Lab. Medicine,** (2003)1: 508 -513.	**1.0**

15.	Sharma S, Kaur P, **Jain A,** Rajeswari MR, Gupta MN. A smart bioconjugates of chymyotrysin. **Biomacromolecules.** 2003 Mar-Apr; 4(2):330-6.	**5.32**
16.	**Jain A,** Rajeswari MR, Ahmed F. Formation and thermodynamic stability of intermolecular (R*R*Y) DNA triplex in GAA/TTC repeats associated with Friedreich's Ataxia. **J. Biomol Struct Dyn.** 2002 Feb;19(4):691-9.	**4.98**
17.	Rajeswari, M.R. and **Jain, A.** The High Mobility Group chromosomal proteins, HMGA1 as potential tumor markers, **Current Science.** (2002); 82:101-107.	**0.82**
18.	**Jain A,** Rajeswari MR. Preferential binding of quinolones to DNA with alternating G,C/A,T sequences : a spectroscopic study. **J. Biomol. Struct. Dyn.** (2002); 20, 291-299.	**4.98**
19.	Rajeswari, M.R., Singh, D., **Jain, A.** and Ray, R. Elevated levels of high mobility group chromosomal proteins, HMGA1, in murine skin carcinoma, **Cancer Letters.** (2001)173: 93-99.	**5.6**

Collaboration:

1. Dr. Andor Pivarcsi, Associate professor, Molecular Dermatology Research Group, Unit of Dermatology and Venereology, Department of Medicine, Karolinska Institutet, Stockholm, Sweden.

2. Dr Rajeev K Seam, MD, Head, Department of Radiotherapy**,** Regional Cancer Center Indira Gandhi Medical College Shimla.

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