



## Manjari Kiran

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**RESEARCH INTEREST:** Cancer Genomics, Computational Systems Biology, Non-coding RNAs

### POSITIONS:

**Dec 2018 – Present:** Assistant Professor, Department of Systems and Computational Biology, School of Life Sciences, University of Hyderabad

**July 2016 – Nov 2018:** Department of Defense Postdoctoral Award Fellow, Department of Biochemistry and Molecular Genetics, University of Virginia, Charlottesville

**September 2014 – June 2016:** Research Associate, Department of Biochemistry and Molecular Genetics, University of Virginia, Charlottesville

### EDUCATION:

**Jan 2009 to Sep 2014:** Ph.D. in Computational Biology from Centre for DNA Fingerprinting and Diagnostics, Manipal University, Hyderabad, India.

**2006-2008:** Masters in Bioinformatics from Banaras Hindu University (BHU), India

**2003-2006:** Bachelors in Zoology (Hons.) with Botany and Chemistry from BHU, India

### ACADEMIC ACHIEVEMENTS (in chronological order):

**SERB Research International Experience Fellowship 2022:** A six months fellowship to work with Dr. Douglas Phansteil, the University of North Carolina, funded by the Department of Science and Technology, Government of India.

**New Horizons Travel Grant 2018:** A travel award given to selected postdocs from the University of Virginia to explore new areas in research, scholarship, and career development.

**Best Poster Award 2017:** Best poster for presenting my postdoc work at the Department of Biochemistry and Molecular Genetics Annual Retreat, School of Medicine, University of Virginia.

**Travel Award, 2017:** RNA Society of North Carolina to attend and present work in the symposium on

RNA Biology XII: RNA Tool and Target, the University of North Carolina at Chapel Hill.

**DoD Postdoctoral Training Award, 2016:** 2 years Postdoctoral training award in prostate cancer from Department of Defense Congressionally Directed Medical Research Programs (DoD-CDMRP), U.S. Army Medical Research and Materiel Command (MCMR-CD). USA. Proposal Number: PC151085

**Travel Grant, 2013:** Centre for DNA Fingerprinting and Diagnostics to attend and present my work in the ISMB/ECCB 2013, Berlin, Germany.

**CSIR Research Fellowship, 2008:** Council of Scientific and Industrial Research (CSIR), Govt. of India for pursuing research as a Ph.D. student in India.

## MEMBERSHIPS

International Society for Computational Biology (ISCB): Lifetime Member since Feb 2022.

## PUBLICATIONS (in chronological order):

**Papers with University of Hyderabad Affiliation are highlighted in green**

**numbers H-index: 12 [Google Scholar Link](#)**

Journal Articles: 22

**22.** Chandramohan, Nithya., **Kiran, Manjari.**, Nagarajaram, Hampapathalu Adimurthy., (2021), Comparative analysis of Pure Hubs and Pure Bottlenecks in Human Protein-protein Interaction Networks, bioRxiv, Cold Spring Harbor Laboratory. (*Manuscript under revision*)

**21.** Namwanje, Maria., Bisunke, Bijay., Rousselle, Thomas V., Lamanilao, Gene G., Sunder, Venkatadri S., Patterson, Elizabeth C., Kuscu, Canan., Kuscu, Cem., Maluf, Daniel., **Kiran, Manjari.**, (2021) , Rapamycin Alternatively Modifies Mitochondrial Dynamics in Dendritic Cells to Reduce Kidney Ischemic Reperfusion Injury , *International Journal of Molecular Sciences*, Multidisciplinary Digital Publishing Institute,22,10,5386.

**20.** Kuscu, Canan., **Kiran, Manjari.**, Mohammed, Akram., Kuscu, Cem., Satpathy, Sarthak., Wolen, Aaron., Bardhi, Elissa., Bajwa, Amandeep., Eason, James D., Maluf, Daniel., (2021) , Integrative Analyses of Circulating Small RNAs and Kidney Graft Transcriptome in Transplant Glomerulopathy, *International Journal of Molecular Sciences*, Multidisciplinary Digital Publishing Institute,22,12,6218.

19. Saha, Shekhar., **Kiran, Manjari.**, Kuscu, Canan., Chatrath, Ajay., Wotton, David., Mayo, Marty W., Dutta, Anindya., (2020) , Long noncoding RNA DRAIC inhibits prostate cancer progression by interacting with IKK to inhibit NF- $\kappa$ B activation, *Cancer Research*, American Association for Cancer Research,80,5,950-963.

**18.** Chatrath, Ajay., Przanowska, Roza., Kiran, Shashi., Su, Zhangli., Saha, Shekhar., Wilson, Briana., Tsunematsu, Takaaki., Ahn, Ji-Hye., Lee, Kyung Yong., Paulsen, Teresa., (2020) , The pan-cancer landscape of prognostic germline variants in 10,582 patients, *Genome Medicine*, BioMed Central,12,1,1-18.

17. Kiran, Shashi., **Kiran, Manjari.**, Ramakrishna, Gayatri., (2020) , Sirtuin 7 Promotes Mesenchymal to Epithelial Transition by  $\beta$ -Catenin Redistribution and Stabilization , *Frontiers in oncology*, Frontiers,10,,740.
16. Chakrabarti, Sankha S., Sunder, Venkatadri S., Kaur, Upinder., Bala, Sapna., Sharma, Priyanka., **Kiran, Manjari.**, Rawal, Ravindra K., Chakrabarti, Sasanka., (2020) , Identifying the mechanisms of  $\alpha$ -synuclein-mediated cytotoxicity in Parkinson's disease: new insights from a bioinformatics-based approach , *Future Neurology*, Future Medicine Ltd London, UK,15,3,FNL49.
15. Kuscu, C., **Kiran, M.**, Wolen, A., Kuscu, C., Bajwa, A., Eason, J., Maluf, D., Akalin, E., Mas, V., (2020) , Transcriptomic Profiling of Paired Serum and Biopsy Samples from FSGS Patients , *AMERICAN JOURNAL OF TRANSPLANTATION*, WILEY 111 RIVER ST, HOBOKEN 07030-5774, NJ USA,20,,643-643.
14. Lande, Kashmiri., Gupta, Jitesh., Ranjan, Ravi., **Kiran, Manjari.**, Torres Solis, Luis Fernando., Solís Herrera, Arturo., Aliev, Gjumrakch., Karnati, Roy., (2020) , Exosomes: insights from retinoblastoma and other eye cancers , *International Journal of Molecular Sciences*, Multidisciplinary Digital Publishing Institute,21,19,7055.
13. **Kiran, Manjari.**, Chatrath, Ajay., Tang, Xiwei., Keenan, Daniel Macrae., Dutta, Anindya., (2019) , A prognostic signature for lower grade gliomas based on expression of long non-coding RNAs , *Molecular neurobiology*, Springer US,56,7,4786-4798.
12. Chatrath, Ajay., **Kiran, Manjari.**, Kumar, Pankaj., Ratan, Aakrosh., Dutta, Anindya., (2019) , The germline variants rs61757955 and rs34988193 are predictive of survival in lower grade glioma patients , *Molecular Cancer Research*, American Association for Cancer Research,17,5,1075-1086.
11. Kuscu, Canan., Kumar, Pankaj., **Kiran, Manjari.**, Su, Zhangli., Malik, Asrar., Dutta, Anindya., (2018) , tRNA fragments (tRFs) guide Ago to regulate gene expression post-transcriptionally in a Dicer-independent manner , *Rna*, Cold Spring Harbor Lab,24,8,1093-1105.
10. Reon, Brian J., Karia, Bruno Takao Real., **Kiran, Manjari.**, Dutta, Anindya., (2018) , LINC00152 promotes invasion through a 3'-hairpin structure and associates with prognosis in glioblastoma , *Molecular Cancer Research*, American Association for Cancer Research,16,10,1470-1482.
9. Cichewicz, Magdalena A., **Kiran, Manjari.**, Przanowska, Róża K., Sobierajska, Ewelina., Shibata, Yoshiyuki., Dutta, Anindya., (2018) , MUNC, an enhancer RNA upstream from the MYOD gene, induces a subgroup of myogenic transcripts in trans independently of MyoD , *Molecular and cellular biology*, American Society for Microbiology 1752 N St., NW, Washington, DC,38,20,e00655-17.
8. Dutta, Anindya., Kumar, Pankaj., **Kiran, Manjari.**, Kuscu, Canan., (2016) , Transfer RNA Fragments (tRFs): a Novel Class of Non-micro Short RNAs that Uses Ago1, 3 and 4 to Repress Specific Target RNAs Through 5' Seed Sequences , *The FASEB Journal*, The Federation of American Societies for Experimental Biology,30,,1054.5-1054.5.

7. **Kiran, M.**, Nagarajaram, HA., (2016) , Interaction and localization diversities of global and local hubs in human protein–protein interaction networks , *Molecular BioSystems*, Royal Society of Chemistry,12,9,2875-2882.
6. Shibata, Etsuko., **Kiran, Manjari.**, Shibata, Yoshiyuki., Singh, Samarendra., Kiran, Shashi., Dutta, Anindya., (2016) , Two subunits of human ORC are dispensable for DNA replication and proliferation , *Elife*, eLife Sciences Publications Limited,5,,e19084.
5. Kiran, Shashi., Anwar, Tarique., **Kiran, Manjari.**, Ramakrishna, Gayatri., (2015) , Sirtuin 7 in cell proliferation, stress and disease: Rise of the Seventh Sirtuin! , *Cellular signaling*, Pergamon,27,3,673-682.
4. Bashyam, Murali D., Chaudhary, Ajay K., **Kiran, Manjari.**, Nagarajaram, Hampapathalu A., Devi, Radha Rama., Ranganath, Prajnya., Dalal, Ashwin., Bashyam, Leena., Gupta, Neerja., Kabra, Madhulika., (2014) , Splice, insertion-deletion and nonsense mutations that perturb the phenylalanine hydroxylase transcript cause phenylketonuria in India , *Journal of Cellular Biochemistry* , 115,3,566-574.
3. Bashyam, Murali D., Chaudhary, Ajay K., **Kiran, Manjari.**, Reddy, Venkat., Nagarajaram, Hampapathalu A., Dalal, Ashwin., Bashyam, Leena., Suri, Deepti., Gupta, Anju., Gupta, Neerja., (2014) , Molecular analyses of novel ASAH1 mutations causing Farber lipogranulomatosis: analyses of exonic splicing enhancer inactivating mutation , *Clinical Genetics*, Blackwell Publishing Ltd Oxford, UK,86,6,530-538.
2. **Kiran, Manjari.**, Nagarajaram, Hampapathalu Adimurthy., (2013) , Global versus local hubs in human protein–protein interaction network , *Journal of Proteome Research*, American Chemical Society,12,12,5436-5446.
1. Bashyam, Murali D., Chaudhary, Ajay K., **Sinha, Manjari.**, Nagarajaram, HA., Devi, A Radha Rama., Bashyam, Leena., Reddy, E Chandrakanth., Dalal, Ashwin., (2012) , Molecular genetic analysis of MSUD from India reveals mutations causing altered protein truncation affecting the C-termini of E1 $\alpha$  and E1 $\beta$  , *Journal of Cellular Biochemistry*, Wiley Subscription Services, Inc., A Wiley Company Hoboken,113,10,3122-3132.

## TEACHING:

### Postgraduate Classes

- Computational Systems Biology: Network Biology (Winter Semester, 18 hours)
- Bioinformatics (Monsoon Semester, 60 hours)
- R programming (Winter Semester, 24 hours)
- Genomics: small RNA (Winter Semester, 18 hours)

### Ph.D. Course work

- Next Generation Sequencing
- Retrieving and analysis of public databases on genomes/proteins
- Studying the correlation of gene expression with relevant diseases expression; cancer etc.

## RESEARCH TRAINING/MENTORING:

### Graduate students:

Anubha Dey (August 2019 – present)  
Amardeep Lokhande (August 2021 – present)  
Shirshanaya Roy (January 2022 – present)

### Master's thesis supervisor:

Shyam Sundar Venkatadari (August 2019 – May 2020)  
Sarthak Satpathy (August 2020 – May 2021)  
Surabhi Srikavya (August 2020 – May 2021)  
Gayathri R (August 2021 – May 2022)  
Koushiki Basu (August 2022 – May 2023)  
Arunima Chaudhary (August 2022 – May 2023)

### Project Staff:

Haneesh Jindal (January 2021 – present)

### KVPY Scholars:

Jeevan Gochhayat (May 2019 – June 2019)

**Summer trainees:** 4 summer trainees

### Thesis doctoral committee member:

Nisha (August 2019 – present)  
Department of Systems and Computational Biology (Supervisor: Dr. Vivek)  
Keerthana Choudari (January 2020 – present)  
Department of Systems and Computational Biology (Supervisor: Dr. Pramod Rajaram)  
Angeo Saji (August 2021 – present)  
Department of Systems and Computational Biology (Supervisor: Dr. Vivek)  
Md Zainul Ali (August 2020 – present)  
Department of Biotechnology and Bioinformatics ((Supervisor: Dr. Pankaj Dholaniya)  
Ravi Ranjan Kumar (August 2019 – present)  
Department of Animal Sciences (Supervisor: Dr. Raja Ram Mohan Roy)  
Krishan Kumar (August 2019 – present)  
Department of Plant Sciences (Supervisor: Dr. Radheshyam Mourya)  
Tanisha (August 2019 – present)  
Department of Biochemistry

## GRANTS:

### Current

#### Early Career Grant

Department of Science and Technology - Science and Engineering Research Board

Role: PI (2020-2022), Rs 25.66 Lakhs

*Integrative approach to characterize human long non-coding RNAs*

Summary: We aim to develop a stand-alone tool for identifying and characterizing known and novel long non-coding RNAs from RNASeq data.

#### University of Hyderabad – Research Call 2

Institute of Eminence

Role: PI (2021-2023), Rs 22 Lakhs

*A multi-omics and multi-label approach to predict genetic interactions in cancer*

Summary: This project involves developing a multi-class model to predict synthetic lethal and viable gene pairs in cancer patients utilizing patients' multi-omics and survival data.

#### DBT-BTISNET

Department of Biotechnology

Role: Co-PI (2021-2026), Rs 179.4 Lakhs

Coordinator: Prof. H. A. Nagarajaram, School of Life Sciences

*DBT-Centre for Microbial Informatics at the University of Hyderabad*

Summary: This is a center for microbial informatics in India with the objectives of cataloging microbial species of Indian origin, connecting scientists, training manpower, and developing pipelines and tools for microbial informatics.

#### DBT-National Network Project

Department of Biotechnology

Role: PI (2021-2026), Rs 68.6 (approved by the task force, not yet funded)

*A novel computational approach to generate genome-based barcode intended to catalog Indian microbial species*

Summary: A collaborative project that intends to generate genome-based barcodes of microbial species of Indian origin. My group will identify and select genes and regions for barcode generations.

### Completed

#### Start-up Grant

University Grant Commission

Role: PI (2020-2021), Rs 8

*Identification of gender-specific prognostic genes in 27 human cancers*

Summary: We developed a framework to identify sex-biased prognostic genes and prognostic models using interaction-term in cox-regression in 9 non-sex-specific cancers.

## Research Statement

The overarching goal of my research is to understand the disparity in cancer patients' survival and treatment due to sex, age, and ethnicity. Another emerging goal of the lab is to characterize different types of non-coding RNAs and decipher the role of associated RNA modifications.

### *Sex disparity in cancer patients' survival* (supported by UGC startup grant)

Sex bias in cancer occurrence, progression, and survival has been known from epidemiological and population studies. Hormonal and behavioral differences are attributed as significant reasons behind these disparities. The mechanisms of sex differences in cancer remain elusive. Human males and females are different at all levels of regulation. The process of sexual differentiation involves genetic and epigenetic mechanisms and sex hormones. Hence, the role of sex hormone actions cannot account for all sex differences in cancer, and acute hormone-independent cancer mechanisms remain fully unraveled. The major focus previously had been on the difference in cancer incidents from the population perspective. However, none of the studies discuss the effect of disparity on the prognosis of the disease. An appropriate method to identify these sex-biased prognosis genes would help us better understand the disease, disparity mechanisms, and drug response. We are developing a framework to identify sex-biased prognostic genes and sex-biased prognostic models for non-sex-specific cancers.

### *Genetic interactions in cancers* (supported by UoH IoE Research Call 2 grant)

Over the last decade, clinicians have started implementing targeted therapy approaches that selectively target cancerous cells while sparing normal cells. Synthetic lethality (SL) and synthetic viability (SV) are the two most important genetic interactions (GI) known in the targeted therapy approach. Synthetic Lethality is a GI, where inhibiting either of the genes does not affect the cancer cell survival, but inhibiting both genes leads to a lethal phenotype. In synthetic viability, inhibiting one of the genes makes the cancer cell sick, but inhibition of the other gene rescues the effect of the mutation and promotes cell viability. Many experimental approaches have been employed to successfully identify genetic interactions. Most of these approaches are time-consuming, laborious, and expensive. The computational tools for SL prediction involve statistical models and machine-learning approaches. Almost all the machine learning tools are binary classifiers and involve the identification of only SL pairs. There are limited methods and no machine learning tool to identify synthetic viable gene pairs. Most importantly, there are limited numbers of properties known that best describe and differentiate a GI from the other. To our knowledge, there is no multi-classifier to predict whether a pair is SL, SV, or NOT a genetic interaction.

## Teaching Statement

I believe in learning by doing approach. I aim to inculcate computational and bioinformatics approaches in the students' thinking process. I will acquaint students with in silico approaches to tackling their biological questions. My teaching strategy mostly involves an interaction-based problem-solving approach after introductory courses. I will devote extra weekly time to receive feedback to improve my teaching skills as required. I am grateful to my teachers and mentors for instilling science and curiosity in me. I will pursue my teaching and mentoring responsibility with the same dedication.



## Invited talks/Resource person

1. Motivational Talk on “**Empowering women in STEM**” organized under DST Vigyan Jyoti scheme organized by Jawahar Navodaya School, Hyderabad, on 30th July 2022.
2. Talk on “**Recent trends in biological research**” organized by Regional Children Science Congress (RCSC), 21-23 Feb 2021.
3. International webinar on “**Coding beyond computers**” organized by Clevered, Hyderabad 10 Sep 2021
4. Two online hands-on sessions on R programming in two weeks international workshop on “**How to start Bioinformatics, data analysis for NGS**” organized by Nextgenhelper 14-31 Aug 2021
5. International workshop on “**R programming in Bioinformatics, structure and NGS analysis**” organized by Nextgenhelper 12-30 Dec 2021
6. National workshop on “**Recent trends in Bioinformatics**” at St. Francis College, Hyderabad, 18 Jan 2020
7. Synopsis lecture at Department of Biological Sciences, BITS Pilani, Hyderabad on “**Brief overview of Bioinformatic tools for NGS analysis and lncRNA as a promising biomarker for diagnosis and prognosis in cancers,**” 12, Mar 2020
8. Seminar on “**Aspects of Gene and Cellular Regulation**” at Institute of Mathematical Sciences, Chennai, 6-7 Jan 2020
9. Guest lecture on “**Bioinformatics: From sequence analysis to prognostic markers**” at Bhavan’s Vivekananda College of Science Humanities and Commerce, Hyderabad, 12 Aug 2020.
10. Talk on “**Statistics in Biology**” in Refresher course in Life Sciences, HRDC-UoH, 25 Nov 2020
11. Talk on “**Long non-coding RNAs based prognostic signature for Gliomas**” at BioQuest 2019

## Poster presentation

1. Poster presented at Young Investigator Meeting 2020 meeting during 14th -16th Feb 2020, Mahabalipuram, India.
2. Poster presented at TCGA 1st conference in India during 21st-22nd Sep 2019, IISER Pune.
3. Poster presented at TCGA legacy Cell symposium during 27th -29th Sep 2018 at Washington, USA.
4. Poster presented at Department of Biochemistry and Molecular Genetics Annual Retreat on 30th November, University of Virginia.
5. Poster presented at CSHL Genome Informatics Meeting during 1st Nov – 4th Nov 2017.
6. Poster presented at Symposium on RNA Biology XII: RNA Tool and Target during 19th-20th Oct 2017, at UNC-Chapel Hill.
7. Poster presented at ISMB/ECCB conference during 21st-23rd July 2013, at ICC Berlin, Germany.
8. Poster presented at Indo-French Bioinformatics Meetings on 23rd-25th March 2011, Hyderabad, India.



## Coordinator/Organizer

1. One-day " BioQuest " symposium organized by School of Life Sciences, University of Hyderabad.
2. Two days' workshop on "New Vistas in Drug Discovery" organized by University of Hyderabad and Centre for Modelling, Simulation and Dynamics from 16-18 Feb 2019.
3. Workshop on "Data Science using R" in CR Rao institute from 21-24 Dec 2019.
4. UGC-HRDC Refresher course in Life Sciences organized by University of Hyderabad from 16th to 28th November, 2020.
5. Skill Development program organized by School of Life Sciences, University of Hyderabad from 18-23 Dec 2019.

## SEMINARS/CONFERENCES/WORKSHOPS ATTENDED before joining University of Hyderabad

1. Three days Cell symposium on TCGA legacy from 27<sup>th</sup> Sep-29<sup>th</sup> Sep 2018, Washington, DC, USA.
2. Attended 4 days workshop on Variant Analysis from 27<sup>th</sup> Feb-2<sup>nd</sup> Mar 2018 at FAES, National Institutes of Health (2.8 CEUs, 28 Lecture Hours).
3. Attended CSHL Genome Informatics Meeting from 1st Nov – 4th Nov 2017.
4. Attended symposium on RNA Biology XII: RNA Tool and Target during 19th-20th Oct 2017 at UNC-Chapel Hill.
5. Attended 2 days of NCI RNA Biology 2017 meeting at NIH from April 24th - 25th, 2017.
6. Attended ISMB/ECCB 2013 conference from 21st-23rd July 2013 at ICC, Berlin, Germany.
7. One-day tutorial on Computational Mass Spectrometry-based Proteomics and Encode Data Access held on 20th July 2013 at ICC, Berlin, Germany.
8. One day special interest group meeting on Network Biology at ICC, Berlin, Germany.
9. International Conference on Biomolecular forms and functions: A celebration of 50 years of Ramachandran Map" from 8th to 11th January 2013 at Indian Institute of Science, Bangalore, India.
10. The fifth Indo-French Bioinformatics Meeting (IFBM) from 23rd to 25th March 2011 at Centre for DNA Fingerprinting and Diagnostics Hyderabad, India.
11. Workshop on Introduction to Mathematical Techniques in Life Sciences from 4th to 12th January 2011 at Indian Institute of Science, Bangalore, India.
12. A one-day workshop on topics in Quantitative Genetics & Genome Analysis" on August 28th, 2010, at the Centre of Cellular and Molecular Biology, Hyderabad.
13. Two days workshop on "Scientific Computing with Python"(SciPy) at EnhanceEdu, IIIT-Hyderabad, India, 9th- 10th February 2010.

14. The Eighth Asia Pacific Bioinformatics Conference, at Indian Institute of Science, Bangalore, India from 18th-21st January 2010.
15. National symposium on " Recent advances in toxicological studies: molecular and physiological aspects" NSTS 2008 at MMV, BHU from 27th-28th February 2008.
16. National level Workshop and Symposium in "Statistical methods in Computational biology" at MMV, Banaras Hindu University from 28th to 29th December 2007.
17. National level " Entrepreneurship Awareness Camp " sponsored by National Science and Technology Entrepreneurship Development Board (NSTEDB), Department of Science and Technology, Government of India, co-coordinated by IIP cell, IT, BHU.

## Others

1. Organized Department of Biochemistry and Molecular Genetics Postdoctoral Symposium in 2017 at the University of Virginia.
2. Completed 2 months Coursera online course with distinction in Writing in Science from Stanford University from Oct 12-Dec 12 , 2012.
3. Completed 2 months Coursera online course in Social Network Analysis from University of Michigan Oct 6-Dec 6, 2012.
4. Completed Sun Educational Service course in Sun Java Programming Language from Aptech, 2009.
5. Selected as convener/coordinator for a batch of 70 students during Bachelor of Science from 2004-2005.
6. Participant of Child's Rights based project in the district and state level Children's Science Congress in India, 2001.
7. Appointed as head girl representing the school for several activities from 1999-2000.