Ashwini Kumar Sharma, PhD

Computational Biology Scientist

Health Data Science Unit, Heidelberg University & German Cancer Research Center (DKFZ)

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Personal

- **Date of birth -** 16th January, 1989 (Age: 31 years)
- **Nationality/Passport -** Indian
- **Work Visa -** European Union Blue Card
- **Current address -** Kirchstr. 76, Dossenheim - 69221, Germany

https://ashwini-kr-sharma.github.io https://orcid.org/0000-0001-7883-7888 linkedin.com/in/ashwinkr

Education

2011-2016 **DOCTORAL RESEARCH**
Grade - 1.1, magna cum laude
Advisors: Prof. Dr. Rainer König and Prof. Dr. Peter Lichter
German Cancer Research Center (DKFZ), Heidelberg, Germany
Hans Knöll Institute (HKI), Jena, Germany

Projects

- **Doctoral thesis -** Computational analysis of metabolic reprogramming in tumors (https://doi.org/10.11588/heidok.00020332)
- **Collaborative projects -** Involved in 5 different collaborations with experimental groups in the following topics - immunotherapy, drug mode of action, biomarker discovery and non-coding RNA (see publications)

2009-2011 **MASTERS IN GENOMICS**
Grade:79.70%, Ranked 1st class
Madurai Kamraj University, Madurai, India

Projects

- **Master's thesis -** Structure based rational design of a peptide inhibitor against *HIF1α-HRE* binding and its structural studies. **Advisor: Prof. Ramachandran Murugesan**
- **Summer internship -** Expression, purification, crystallization and *in-silico* modeling of the *FadD9* protein from *Mycobacterium tuberculosis*. **Advisor: Dr. Rajan Sankarnarayanan** at the *Center for Cellular and Molecular Biology, Hyderabad, India*

2006-2009 **BACHELORS IN BIOTECHNOLOGY**
Grade:9.34/10, Ranked 1st class
Vellore Institute of Technology, Vellore, India

Experience

2016 - now **POSTDOCTORAL RESEARCH**
Mentors: Dr. Carl Herrmann, Dr. Frank Westermann
Health Data Science Unit, University Hospital Heidelberg, Germany
Institute of Pharmacy and Molecular Biotechnology and BioQuant, University Heidelberg, Germany
Division of Neuroblastoma Genomics, German Cancer Research Center (DKFZ), Heidelberg, Germany

Projects

- Identification of epigenetic subtypes in neuroblastoma through integrative (epi-)genomic analyses
- Elucidating the developmental origins of neuroblastomas through single-cell genomic analyses
- Modelling bayesian networks of epigenetic regulation across human tissues
- Computational phenotyping of signalling, transcription factors, metabolic pathways *etc* across tumors
- Screening for genes involved in redox homeostasis using chemical probes in the yeast mutant collection

Computational Biology Skills

https://github.com/ashwini-kr-sharma

- **Next generation sequencing data analysis -**RNAseq, Methylation array, CHIPseq, ATACseq, HiC, high-throughput screening *etc*
- **Single cell transcriptomics analysis -** QC process, cell type identification, trajectory inference, transcriptional activity *etc*
- **Reutilization of big -omic datasets -** generated by consortiums like TCGA, GTeX, ENCODE, BLUEPRINT, DepMap *etc*
- **Multi -omic data integration -** Biological pathway analysis, Biomarker discovery, Pattern recognition, Data visualization *etc*
- **Machine Learning -** Classification and Feature selection (using R packages like caret, glmnet *etc*)
- **Reproducible research -** Git, Rmarkdown, Plotly, ShinyApps, Snakemake, Docker
- **Coding/Tools -** R statistical programming, Bash, Bioconductor

Publications

https://goo.gl/tvIoC2

PROVISIONALLY ACCEPTED

1. Gartlgruber, M, **Sharma, AK** , Quintero, A, Dreidax, D, Jansky, S, Park, Y, Gogolin, S, Meder, J, Doncevic D, Saary P, Toprak, UH, Ishaque, N, Afanasyeva, E, Koster, J, Versteeg R, Grünewald, TGP, Jones, DTW, Pfister, SM, Henrich, K, Nes, Jv, Herrmann, C, Westermann, F. *Super enhancers define regulatory subtypes and cell identity in neuroblastoma.* **Accepted in Nature Cancer** (2020)

2. Emanuel Schwarz, *[alphabetical order starts]* Dag Alnæs, Ole A. Andreassen, Han Cao, Junfang Chen, Franziska Degenhardt, Dominic Dwyer, Roland Eils, Jeanette Erdmann, Carl Herrmann, Martin Hofmann-Apitius, Tobias Kaufmann, Nikolaos Koutsouleris, Alpha T. Kodamullil, Adyasha Khuntia, Maria L. Munoz-Venegas, Markus M. Nöthen, Riya Paul, Andres Quintero, Heribert Schunkert, **Ashwini Sharma**, Heike Tost, Lars T. Westlye, Youcheng Zhang *[alphabetical order ends]* Andreas Meyer-Lindenberg *Identifying multimodal signatures underlying the somatic comorbidity of psychosis: the COMMITMENT roadmap.* **Accepted in Molecular Psychiatry** (2020)

UNDER FAVOURABLE REVISION

3. Jansky, S, **Sharma, AK** , Körber V, Toprak, UH, Gartlgruber, M, Greco, A, Quintero, A, Chomsky, E, Henrich, K, Tanay, A, Herrmann, C, Höfer, T, Westermann, F. *Developmental programs in childhood neuroblastoma.* **Under 2nd round of revision in Nature Genetics** (2020)

IN PREPARATION

4. **Sharma, AK** et.al, *Integrative modelling of directed networks of epigenetic regulation across human tissues.* **To be posted in bioRxiv shortly and sent for review** (2020)

5. **Sharma, AK** et.al, *SPINT2 regulates SARS CoV2 viral load by modulating TMPRSS2.* **To be posted in bioRxiv shortly and sent for review** (2020)

AVAILABLE ONLINE

6. Ansari, SS, **Sharma, AK**, Ali,D, Eibl, H, Soni, H, Tews, B, König, R, Berger, MR. *Induction of ER and mitochondrial stress by the alkylphosphocholine erufosine in oral squamous cell carcinoma cells.***Cell Death and Disease** (2018)

7. Ansari, S. S., **Sharma, AK**, Zepp, M., Ivanova, E., Bergmann, F., König, R., Berger, M. R. *Upregulation of cell cycle genes in head and neck cancer patients may be antagonized by erufosine's down regulation of cell cycle processes in OSCC cells.* **Oncotarget** (2017)

8. **Sharma, AK**, Eils, R., König, R. *Copy number alterations in enzyme-coding and cancer-causing genes reprogram tumor metabolism.* **Cancer Research** (2016)

9. Shukla K, **Sharma, AK**, Ward A, Will R, Hielscher T, Balwierz A, Breunig C, Münstermann E, König R, Keklikoglou I, Wiemann S. *MicroRNA-30c-2-3p negatively regulates NF-κB signaling and cell cycle progression through downregulation of TRADD and CCNE1 in breast cancer.* **Molecular Oncology** (2015)

10. Khandelwal N, Breinig M, Speck T, Michels T, Kreutzer C, Sorrentino A, **Sharma, AK**, Umansky L, Conrad H, Poschke I, Offringa R, König R, Bernhard H, Machlenkin A, Boutros M, Beckhove P *A high-throughput RNAi screen for detection of immune-checkpoint molecules that mediate tumor resistance to cytotoxic T lymphocytes.* **EMBO Molecular Medicine** (2015)

11. Ummanni R, Mannsperger HA, Sonntag J, Oswald M, **Sharma, AK**, König R, Korf U. *Evaluation of reverse phase protein array (RPPA) based pathway activation profiling in 84 non-small cell lung cancer (NSCLC) cell lines as platform for cancer proteomics and biomarker discovery.* **Biochimica et Biophysica Acta (BBA)-Proteins and Proteomics** (2014)

12. **Sharma, AK**, König,R. *Metabolic network modeling approaches for investigating the "hungry cancer".* **Seminars in Cancer Biology** (2013)

Awards

- Travel fellowship grant (2018)
  Spetses Summer School on Chromatin and Metabolism, from the ChroMe Network
- Helmholtz International Graduate School for Cancer Research Fellowship (2011-14)
  For pursuing doctoral training at DKFZ, Heidelberg
- CSIR-UGC-NET Junior Research Fellowship (2011) (declined)
  For pursuing doctoral training in India, presented by the Government of India
- Maveeran Sundaralingam Endowment Scholarship (2009-10)
  For securing highest grades during the master's program
- ABLE-BEST 2010 entrepreneurship competition winners (2010)
  2nd best team in India for the project proposal - Nano beads-based diagnostic for the detection of Tetanus neurotoxin using FRET
- Merit Endowment Award - (2007-08) and (2008-09)
  For excellent academic performance during the bachelor's program

Invited talks

- Targeting Cancer Cell Proliferation and Metabolism Networks, Mathematical Biosciences Institute (MBI), Ohio State University, USA (2015) - *Linear proximity of cancer causing and metabolic genes in the genome does it drive metabolic reprogramming via somatic copy number changes?*
- Computational Life Sciences Workshop, Bayer AG, Berlin, Germany (2015) - *Do copy number coalterations of proximal enzyme coding and cancer causing genes drive metabolic reprogramming in tumors?*
- ABLE Bioinvest 2010 (Indian biotech industry conference), Ahmedabad, India (2010) - *Kit based detection of Tetanus Neurotoxin*

Teaching and Supervision

1) Research supervisor *Lab internship/Bachelor thesis/Master thesis*
- B.Sc/M.Sc Molecular Biotechnology program, Heidelberg University. (2013-19)
- International Exchange Student (2018)
Practical training provided - R programming, genomic data analysis and metabolic network modeling
Research topics supervised - role of miRNA's in cancer metabolism, alteration of epigenetic modulators across tumors, epigenetic network modeling, quantifying signalling TF activity and metabolism in tumors

2) Development of course materials: Introduction to Data Analysis (2018), Bayesian networks (2017)

3) Tutoring and Training: Genomic Data Analysis (2018-19), "Learn by doing -" Computational biology projects (2018 - 20)

4) Examination evaluator Bioinformatics course for students in B.Sc Molecular Biotechnology program, Heidelberg University. (2014) *Involved in correcting class test papers and discussion of solutions*

Academic responsibility

I have served as (co-)/reviewer for research articles submitted in scientific journals like -
PLOS Computational Biology, BMC Systems Biology, NAR: Genomics and Bioinformatics and Scientific Reports

Languages

- **English -** Native proficiency
- **Hindi -** Native proficiency
- **Nepali -** Native proficiency
- **Bengali -** Highly proficient in speaking
- **German -** Beginner level proficiency