

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
- **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](https://www.linkedin.com/in/ashwinkr)

Education

Nov, 2011 -
Feb, 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)

May, 2009 -
Apr, 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*

May, 2006 -
Apr, 2009

BACHELORS IN BIOTECHNOLOGY

Grade:9.34/10, Ranked 1st class

Vellore Institute of Technology, Vellore, India

Experience

Sep, 2016 -
April, 2021

POSTDOCTORAL RESEARCH

Mentors: Dr. Carl Herrmann, Dr. Frank Westermann, Dr. Steeve Boulant

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

Center for Integrative Infectious Disease Research (CIID), University Hospital 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
- Single cell RNA sequencing analysis of intestinal organoids
- 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/tvloC2>

FORTHCOMING

1. 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*. **Accepted in Nature Genetics** (2020)
2. Carlos Ramirez Alvarez, **Sharma, AK**, Carmon Kee, Leonie Thomas, Steeve Boulant, Carl Herrmann. *SPINT2 controls SARS-CoV-2 viral infection and is associated to disease severity* **bioRxiv** (2021).
3. Elena A. Afanasyeva, Moritz Gartlgruber, Tatsiana Ryl, Gregor Mönke, Bieke Decaestecker, Geertrui Denecker, Andres Florez, Alica Torkov, Daniel Dreidax, Carl Herrmann, Umut Toprak, Konstantin Okonechnikov, Sara Ek, **Ashwini Sharma**, Vitaliya Sagulenko, Frank Speleman, Kai-Oliver Henrich, Frank Westermann. *Kalirin-RAC controls nucleokinetic migration in ADRN-type neuroblastoma* **Accepted in Life Science Alliance** (2021)

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)

AVAILABLE ONLINE

5. 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, Grünwald, TGP, Jones, DTW, Pfister, SM, Henrich, K, Nes, Jv, Herrmann, C, Westermann, F. *Super enhancers define regulatory subtypes and cell identity in neuroblastoma*. **Nature Cancer** (2020)
6. Emanuel Schwarz, 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, Andreas Meyer-Lindenberg *Identifying multimodal signatures underlying the somatic comorbidity of psychosis: the COMMITMENT roadmap*. **Molecular Psychiatry** (2020)
7. 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)
8. 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)
9. **Sharma, AK**, Eils, R., König, R. *Copy number alterations in enzyme-coding and cancer-causing genes reprogram tumor metabolism*. **Cancer Research** (2016)
10. 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- κ B signaling and cell cycle progression through downregulation of TRADD and CCNE1 in breast cancer*. **Molecular Oncology** (2015)
11. 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)
12. 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)
13. **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** - Business proficiency
- **German** - Beginner proficiency