SANDEEP KUMAR SINGH, PHD

I investigate genetic variants driving complex diseases, with a focus on psychiatric genomics, cancer genetics, and immune disorders. Using GWAS, statistical genetics, and bioinformatics, I explore gene-environment interactions and key modifiers like age, sex, and ancestry. By integrating machine learning and functional annotation, I translate genomic insights into precision medicine.

RESEARCH AND TEACHING EXPERIENCE

Present | 2024 (Sep)

Freelancer-Lucknow

Lucknow, UP, India

- Training working professionals in data sciene and bioinformatics field
- Creating pipe lines to perform post-GWAS approaches

2024 (July) | 2023 (Aug)

Postdoctoral Fellow-Aarhus University

Aarhus, Denmark

- Conducted large-scale cross-disorder GWAS using iPSYCH samples to investigate shared genetic architecture between ASD and depression.
- Developed and optimized bioinformatics pipelines for GWAS and postGWAS approaches
- Mentored medical students in medical genetics through study cafe sessions.

2023 (July) | 2021 (Aug)

Associate Product Manager-OdinSchool

Hyderabad, TL, India

- Trained professionals in data science, machine learning, and taught Python, R, statistics, EDA, Plotly DASH, Git, and GitHub.
- Developed curriculum, projects, and assessments, integrating real-world datasets.

2021 (July) | 2018 (June)

Research Scientist-GenTox Research and Development

Lucknow, UP, India

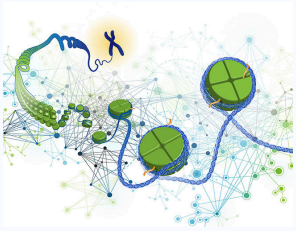
- Applied computational approaches to assess the functional relevance of disease-associated genetic markers in cervical cancer and rheumatoid arthritis.
- Supervised medical research theses, focusing on statistical analysis in clinical studies.
- Taught Bioinformatics, Immunology, Genetics, Statistics, and R, integrating research-driven insights into education.

2018 (April) | 2017 (May)

Postdoctoral Researcher-The Ohio State University

Columbus, OH, USA

- Conducted a survival GWAS on leukemia patients post-transplantation, identifying key genetic variants.
- Led multiple projects, including MHC region GWAS, analysis of soluble ST2 levels in acute GvHD and established a protocol for X chromosome analysis.



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CONTACT

ssing023@fiu.edu

sansin5982@gmail.com

s_singh5982

github.com/Sandeep

LinkedIn.com/Sandeep

+91 7007629474

LANGUAGE SKILLS

- R
- RMarkdown
- R Shiny
- Python
- UNIX
- Git
- Plotly DASH
- AWK

2016 (Dec) | 2015 (May)

Postdoctoral Associate-Florida International University

Miami, FL, USA

- Conducted functional genomics analysis of HLA region polymorphisms associated with disease susceptibility as a volunteer on OPT.
- Performed both wet and dry lab research, including cell culture, RNA extraction, and gene expression analysis.
- Functionally annotated ~283,000 polymorphisms in the HLA region using R, ANNOVAR, and HaploReg.

2014 (July) | 2010 (Aug)

Graduate Assistant-Florida International University

Miami, FL, USA

- Led a PhD research project investigating gender- and age-specific risk factors for childhood acute lymphoblastic leukemia (ALL) using a case-only study design.
- Conducted genetic association studies on lung and breast cancer, focusing on the HLA region through a candidate gene approach.

EDUCATION

2015 | 2010

PhD, Public Health-Florida International University

Miami, FL, USA

- Dissertation: A Case-only Genome-wide Association Study of Gender- and Age-Specific Risk Markers for Childhood Leukemia (View Thesis)

2009 | 2007

MPH-Western Kentucky University

Bowling Green, KY, USA

2005 | 2003

MSc, Biotechnology-Allahabad Agricultural Institute

Allahabad, UP, India

2003 | 2000

BSc, Biology-Lucknow Christian College, University of Lucknow

Lucknow, UP, India

PUBLICATIONS

2022

Singh SK. The analysis of a subset of HLA region associations in type 1 diabetes and multiple sclerosis suggests the involvement mechanisms other than antigen presentation in the pathogenesis.-Informatics in Medicine Unlocked (LINK)

2021

Dixit A, Singh AV, Singh CV, Yadav R, **Singh SK.** Knowledge and Attitude towards COVID-19 among Healthcare Workers of A Tertiary Care Hospital in India.-International Journal of Pharmaceuticals Sciences Review and Research (LINK)

2021

Singh CV, Gautam AK, Dixit A, Singh AV, **Singh SK.** A randomized prospective study to compare the efficacy and safety of budesonide plus formoterol and tiotropium plus formoterol in patients having mild to moderate chronic obstructive pulmonary disease.-International Journal of Basic & Clinical Pharmacology (LINK)

Genomic Data Analysis
GWAS, RNA-Seq, ChIP-seq

Tools and Software
PLINK, RICOPILI, LDSC, GCTA, ASSET, LDAK, MiXer, MAGMA, FUMA, bcftools, samtools, bedtools, GATK, VEP, ANNOVAR, IGV, Enrichr, Github, etc.

Bioinformatics/Biostatistics
Hypothesis Testing, Correlation, Linear and Logistic Regression, Survival Analysis, Cluster Analysis, Multivariate Analysis, Linear Mixed Models, Exploratory Data Analysis, Machine Learning, Deep Learning, GenAI (Basics), Epidemiology

2019 **Singh SK** and Singh S. Breast Cancer: Current Knowledge and Future Perspective (Short Communication). Acta Scientific Womens Health (LINK)

2017 **Singh SK** and Dorak MT. Cancer Immunoprevention and Public Health.-Front Public Health (LINK)

2016 **Singh SK**, Lupo PJ, Scheurer ME, et.al. A childhood acute lymphoblastic leukemia genome-wide association study identifies novel sex-specific risk variants. Medicine (Baltimore) (LINK)

2014 **Singh SK**. Re: Association of polymorphism in cytochrome P450 2C9 with susceptibility to head and neck cancer and treatment outcome; Pragmatic use of Hardy-Weinberg equilibrium and statistical interaction analysis.- Applied & Translational Genomics (LINK)

2012 Kennedy AE, **Singh SK**, Dorak MT. Re: Genome-wide association study of classical Hodgkin lymphoma and Epstein - Barr virus status-defined subgroups (Scientific correspondence).-Journal of National Cancer Institue (LINK)

Singh SK, Singh Schidanand, Singh Atul. Post GWAS approaches: Making sense of statistical associations. (Working paper)

Singh SK. Unraveling the Role of Regulatory Elements in Genomic Architecture and Disease Susceptibility. (Working paper)

GRANTS AND AWARDS

2019 **Personal bursary from the European Federation of Immunogenetics (Euro 800)**

2019 **Awarded first prize for the Presentation in a genomics research at the First BiOmics Conference, India**

2015 | 2014 **Dissertation Year Fellowship from University Graduate School Florida International University ($8,300/term)**

2013 **Summer research award from MBRS RISE Biomedical Research Initiative, Florida International University for proposed grant on X chromosome polymorphisms in acute lymphoblastic leukemia risk and male disadvantage ($3000)**

I am passionate about education and believe that no topic is too complex when taught with empathy and innovative approaches. An effective teacher adapts to diverse learning styles, making even the most challenging concepts accessible and engaging.

2012 **Summer research award from MBRS RISE Biomedical Research Initiative, Florida International University for proposed grant on DDX3X gene polymorphisms and Genetic susceptibility to disadvantage childhood leukemia ($3000)**

SELECTED PRESENTATIONS

2019 **Singh SK**, Dorak MT. Longevity associated HLA class II region variants map to the B-cell-specific Super-enhancer XL9 at the 33rd EFI Conference.
Lisbon, Portugal

2019 **Singh SK**, Singh S, Kumar P. Functional annotation of Rheumatoid Arthritis associated loci identified by genome-wide association studies at the First BiOmics Conference.
Neemrana, RJ, India

2018 **Singh SK**, Dapprich J, Dorak MT, Functional annotation of the cluster of schizophrenia risk markers in the extended HLA class I region at the 32nd EFI Conference.
Venice, Italy

2018 **Singh SK**, McCauley JL, Dorak MT. Expression QTLs with opposing effects on HLA-DR and -DQ genes are associated with autoimmune disorders: Evidence for mixed isotype heterodimer formation at the 32nd EFI Conference.
Venice, Italy

2018 Ozbek U, **Singh SK**, Kennedy AE, et al. Exploration of very long-range linkage disequilibrium within the extended HLA region at the 32nd European Immunogenetic and Histocompatibility Conference.
Venice, Italy

2018 Sucheston-Campbell LE, **Singh SK**, Karaesman E, et al. Donor SNPs in IL1RL1, Strongly Correlated with Serum sST2 Concentration, Significantly Associate with Risk of Acute GvHD: Implications for Donor Selection at the BMT Tandem meeting.
Salt Lake City, Utah, USA

2018 Rizvi A, Karaesman E, Preus L, McCarthy PL, Pasquini M, Singh S, **Singh SK**, et al. Novel genetic associations with day +100 transplant related mortality after HLA-matched unrelated donor blood and marrow transplantation (DISCOVeRY-BMT) at the BMT Tandem meeting.
Salt Lake City, Utah, USA

2017 Singh S, **Singh SK**, Rizvi A, Karaesmen E, et al. Genetic variation in the MHC region increases risk of death to graft versus host disease in leukemia patients treated with an HLA-matched unrelated donor transplant at the 2nd Annual Divison of Pharmaceutics Scientific Retreat 2017.
Columbus, OH, USA

Github Notes/projects

Genomics

GWAS protocol

Statistics

Mendelian Randomization

T1D-MS project

2017 **Singh SK**, Kennedy AE, Dorak MT. Genetic Evidence for Cancer Immune Surveillance at the 31st EFI Conference.
Heidelberg/Mannheim, Germany

2017 Ozbek U, Kennedy AE, **Singh SK**, et al. SNPs correlating with Functional HLA region Epitopes and Supertypes Offer Insight into GWAS Associations at the 31st EFI Conference.
Heidelberg/Mannheim, Germany

2016 **Singh SK**, Lupo PJ, Scheurer ME, et al. Making Sense of Genetic Associations with Childhood Leukaemia Risk at the Childhood Cancer Conference 2016.
London, UK

2016 **Singh SK**, Chentoufi AA, McCauley JL, Dorak MT. Insights into type 1 diabetes and multiple sclerosis pathogenesis from common genetic associations at the 30th EFI Conference.
Kos Island, Greece

2016 **Singh SK**, Huang Y, Caobi A, Barbieri MA, Dorak MT. Functional annotations of common disease markers in immune regulatory genes at the 30th EFI Conference.
Kos Island, Greece

2015 Kennedy AE, Mustafi S, **Singh SK**, et al. A catalog of HLA region SNPs with functional annotations, disease associations and correlations with HLA types at the 41st Annual Meeting of the ASHI.
Savannah, GA, USA

2015 **Singh SK**, Lupo PJ, Scheurer ME, et al. Genome-wide association study of childhood acute lymphoblastic leukaemia risk with gender-specificity at the ESHG.
Glasgow, Scotland, United Kingdom

2015 **Singh SK**, Lupo PJ, Scheurer ME, et al. HLA region contributes to the gender differential in childhood leukaemia risk at the 29th EFI Conference.
Geneva, Switzerland

2014 **Singh SK** and Dorak MT. Alternative Explanations for HLA and Disease Associations at the 28th EFI Conference.
Stockholm, Sweden

2014 Oguz FS, Kekik C, **Singh SK**, et al. HLA and age-of-onset in childhood acute lymphoblastic leukaemia at the 28th EFI Conference.
Stockholm, Sweden

2013 Kennedy AE, **Singh SK**, Villalba K, Dorak MT. Analysis of HLA region polymorphisms associated with cancer at the 39th Annual Meeting of theASHI.
Chicago, IL, USA

2013 **Singh SK**, Ben Taleb Z, Kennedy AE, et al. Further exploration of HLA region associations with lung cancer risk at the 39th Annual Meeting of the ASHI.
Chicago, IL, USA

2012 Guyton D, Caobi A, **Singh SK**, Peyser M, Dorak MT. HLA region and lung cancer susceptibility: confirmation of BAT3/BAG6 association and functional replication at the 38th Annual Meeting of the ASHI.

San Juan, PR

2012 **Singh SK**, Saxena A, Das S, Dorak MT. NOTCH4 polymorphisms, functional assessment and associations with breast cancer susceptibility at the 38th Annual Meeting of the ASHI.

San Juan, PR

2012 Kennedy AE, **Singh SK**, Scheurer ME, Okcu MF, Dorak MT. Association of HLA-linked lymphoma risk markers with childhood acute lymphoblastic leukemia at the 38th Annual Meeting of the ASHI.

San Juan, PR

2011 Kennedy AE, **Singh SK**, Samikkannu M, Dorak MT. Correlations of complex disease-associated HLA region SNPs with HLA alleles at the 37th Annual Meeting of the ASHI.

New Orleans, LA, USA

SELECTED DATA SCIENCE WRITING

2020 **Implementing an Artificial Neural Network: A Step-by-Step Guide (LINK)**

2020 **Beautifulsoup: A step-by-step guide to Data Scraping with Python (LINK)**