

Sufyan Suleman

Postdoctoral Researcher

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Current position

Postdoctoral Researcher, Department of Biomedicine, Aarhus University Aarhus, Denmark · 2024-09 - Present

Shared genetic architecture and biological mechanisms of obesity and ADHD.

- Polygenic risk scoring for ADHD and BMI using SBayesRC with 98 functional annotations in UK Biobank (~500,000 individuals)
- PheWAS pipeline across 1,434 ICD-10 phecodes
- Bidirectional Mendelian randomisation between BMI and ADHD
- Integrative genomics for shared biological pathways
- CellProfiler-derived adipose tissue imaging feature integration (137 donors)

Affiliate Scientist, NNF Center for Genomic Mechanisms of Disease, Broad Institute of MIT and Harvard
Cambridge, MA, USA · 2024-09 - Present

Education

PhD, Statistical Genetics / Genomic Physiology, Translational Metabolic Research Novo Nordisk Foundation Center for Basic Metabolic Research, University of Copenhagen · Copenhagen, Denmark · 2021-06 - 2024-11

Thesis: Genetics of insulin sensitivity and implications for T2D, obesity, and cardiovascular disease

Funding: Novo Nordisk Foundation, co-funded by the Danish Independent Research Fund (DFF)

MSc, Protein Science and Biotechnology (major: Biochemistry) University of Oulu · Oulu, Finland · 2014 - 2017

Thesis: Functional annotation of prostate cancer risk variants identifies RGS17 as a disease susceptibility gene

BSc (Hons), Biotechnology Govt. College University Lahore · Lahore, Pakistan · 2006 - 2010

Research experience

Visiting Researcher, Steno Diabetes Center Copenhagen Copenhagen, Denmark · 2024-04 - 2024-05

- Studied diabetic complications using proteomics and genomics data

PhD Researcher, Novo Nordisk Foundation Center for Basic Metabolic Research, University of Copenhagen Copenhagen, Denmark · 2021-06 - 2024-11

- GWAS of 21 insulin sensitivity indices across ~5,000 Danish individuals (Inter99, Holbæk)
- Developed three genetic risk scores for insulin resistance subtypes
- Validated genetic risk scores in the Holbæk paediatric cohort
- MAGIC consortium contribution (Nature Genetics, 2023)
- SpiroMeta consortium: 120 age-stratified GWAS analyses
- Co-applicant on grants to NNF, DDEA, and DFF
- GDPR data access applications for UK Biobank and Generation Scotland

Research Assistant, Novo Nordisk Foundation Center for Basic Metabolic Research, University of Copenhagen Copenhagen, Denmark · 2019-09 - 2021-06

- GWAS of insulin resistance phenotypes
- Data preparation and QC pipelines on the Centre's HPC (Porus, later Esrum) and Computerome

Research Assistant, Wei lab (cancer functional genomics), Biocenter Oulu / Oulu University Hospital Oulu, Finland · 2017-01 - 2019-08

- Prostate and breast cancer susceptibility locus functional genomics

- ChIP-seq, RNA-seq, CRISPR-Cas9
- Credited roles per paper: Cell (2018) assisted/performed experiments; Nature Communications (2018) performed experiments (SNPs-seq); Cancer Research (2018) methodology development, statistical/computational analysis, manuscript writing

Research Assistant, Vainio lab (developmental biology), Biocenter Oulu / Oulu University Hospital Oulu, Finland · 2018-06 - 2019-08

- Regulatory genomics of type 1 diabetes and developmental biology
- Performed the Trisk 95/Triadin promoter luciferase reporter study for the Scientific Reports (2020) skin-glucose-biomarker paper
- Contributed to the lab's broader stem-cell and genome-editing biosensor research programme

Quality Control Inspector, Popular Chemical Works Ltd Lahore, Pakistan · 2010-09 - 2013-04

- Pharmaceutical GMP QC: microbiological and chemical testing of raw and finished drugs
- Regulatory documentation and data entry

Publications

2026

- Unraveling the Genetic Basis of Glycogen Storage Diseases through Exome Sequencing: A Study in Pediatric Patients, *Molecular Syndromology* · DOI

2025

- Exploring the genetic intersection between obesity-associated genetic variants and insulin sensitivity indices, *Scientific Reports* · DOI

2024

- Adult-based Genetic Risk Scores for Insulin Resistance Associate With Cardiometabolic Traits in Children and Adolescents, *The Journal of Clinical Endocrinology & Metabolism* · DOI
- Genetic Underpinnings of Fasting and Oral Glucose-stimulated Based Insulin Sensitivity Indices, *The Journal of Clinical Endocrinology & Metabolism* · DOI

2023

- Genome-wide association study and functional characterization identifies candidate genes for insulin-stimulated glucose uptake, *Nature Genetics* · DOI
- Identification of novel homozygous variants in FOXE3 and AP4M1 underlying congenital syndromic anophthalmia and microphthalmia, *The Journal of Gene Medicine* · DOI

2022

- A novel nonsense variant in EXOC8 underlies a neurodevelopmental disorder, *Neurogenetics* · DOI
- Whole exome sequencing identified a novel splice donor site variant in interleukin 2 receptor alpha chain, *Immunogenetics* · DOI

2020

- Trisk 95 as a novel skin mirror for normal and diabetic systemic glucose level, *Scientific Reports* · DOI

2018

- A Large-Scale, Exome-Wide Association Study of Han Chinese Women Identifies Three Novel Loci Predisposing to Breast Cancer, *Cancer Research* · DOI
- Biology and Clinical Implications of the 19q13 Aggressive Prostate Cancer Susceptibility Locus, *Cell* · DOI
- High-throughput screening of prostate cancer risk loci by single nucleotide polymorphisms sequencing, *Nature Communications* · DOI

2017

- Abstract 1280: Functional characterization of prostate cancer risk loci by SNPs-seq and STARR-seq, *Cancer Research* · DOI
- Combined immunotherapy for advanced prostate cancer: Empowering the T cell army, *Asian journal of urology* · DOI

Manuscripts in preparation

- Unraveling shared genetics and biological mechanisms of ADHD and obesity (First author, 2026)
- Unraveling shared biological mechanisms of depression and body mass index (Contributing author, 2025)

Talks

- Unravelling the shared genetics and biological mechanisms of ADHD and obesity, ESHG Annual Meeting 2025, 2025 (Oral presentation)
- Heritability, genetic and phenotypic correlations of surrogate measures of insulin sensitivity and their association with metabolic traits, Metabolism Day, University of Copenhagen, 2023 (Presentation)
- Shared genetics of ADHD and obesity, World Congress of Psychiatric Genetics, Glasgow, 2026 (Upcoming presentation)

Software

- **InsuSensCalc**, Sole developer · CRAN · Insulin sensitivity indices calculator
- **HealthMarkers**, Sole developer · CRAN · Clinical and metabolic biomarker calculation toolkit
- **IsletCalc**, Sole developer · CRAN / Zenodo · Insulin release, glucagon release, and glucagon resistance indices, complementing InsuSensCalc's insulin-sensitivity focus
- **MungeSumstats**, Contributor · CRAN / Bioconductor · GWAS summary statistics standardisation

Teaching

- **Integrative Post-GWAS Methods**, Course developer and lead instructor · Aarhus University PhD catalogue · 2024-present
- **CDISC with R**, Course developer and instructor · Open course · in development; teaching begins late September 2026
- **Basic Statistics for Researchers**, Author and instructor · Open educational resource · 2026
- **Getting Started with R**, Author and instructor · Open educational resource · 2026
- **Platform Trial Data Management**, Author · Demonstration project and teaching resource · 2026-present
- **Danish Diabetes Academy R courses**, Teaching assistant · Danish Diabetes Academy · 2022
- **Study Café sessions**, Instructor · Aarhus University · 2024-present
- Supervised 4 Bachelor (medicine) students, Aarhus University, 2024-present

Consortia

- **MAGIC**, Contributor (GWAS and meta-analysis, ~20,000-25,000 Danish participants) · 2021-2023 · Published in Nature Genetics, 2023
- **SpiroMeta**, Contributor · 2023-2025 · Age-stratified GWAS of lung function traits; 120 analyses across 5 age bands x 8 cohorts x 3 phenotypes; in preparation

Awards & memberships

- Competitive PhD Fellowship, Novo Nordisk Foundation Center for Basic Metabolic Research, co-funded by DFF, 2021-2024
- Co-applicant on successful research funding, Novo Nordisk Foundation, Danish Diabetes and Endocrine Academy, Danish Independent Research Fund, 2021-2024
- European Society of Human Genetics (ESHG), since 2023

Certifications & training

- Good Clinical Practice (GCP), NIDA Clinical Trials Network, 2026
- GDPR and UK Biobank Data Protection (4 modules), UK Biobank, 2026
- GDPR and Data Protection Rules, Aarhus University, 2025
- GDPR and Research Data Management, University of Copenhagen, 2024
- Using Animals in Research - Carrying out procedures, European directive for animal handling
- Introduction to Statistical Analysis of GWAS, University of Surrey / ESHG, 2022
- Computational Systems Biology for Complex Human Disease, Wellcome Connecting Science, 2021
- Basic Statistics for PhD Students, University of Copenhagen, 2022
- Reproducible Research in R - Advanced Workshop, Danish Diabetes Academy, 2022
- Intermediate R course, Danish Diabetes Academy, 2021
- Basal Cardio-Metabolic PhD Course, Danish Cardiovascular / Diabetes Academy, 2022
- DDA Summer School on Diabetes and Metabolism, Danish Diabetes Academy, 2022

- Python Tsunami - Introduction to Python Programming, University of Copenhagen, 2021
- Git and GitHub for Researchers, University of Copenhagen, 2021

Skills

programming

R, Python, Bash

genetics tools

PLINK, GCTA, LDSC, SBayesRC, MAGMA, FUMA, FLAMES, METAL, ASSET, MiXeR, LAVA, FINEMAP, PoPS, scDRS, MungeSumstats, PRSice, METASOFT, SNPTEST, EPACTS, RVTEST, GCTB, SOLAR, KING

statistics

Linear and logistic regression, Mixed-effects regression, Generalised linear models, Fixed and random-effects meta-analysis, Heritability estimation, Genetic and phenotypic correlation, Polygenic risk scoring, Bidirectional Mendelian randomisation, Drug-target Mendelian randomisation, PheWAS, Machine-learning classification and feature selection, Model calibration and discrimination evaluation

data resources

UK Biobank, Generation Scotland, Inter99, Holbæk, iPSYCH, PGC (Psychiatric Genomics Consortium), GIANT, Open Targets Genetics

infrastructure

Snakemake, targets, testthat, Quarto, renv, Git / GitHub, GenomeDK HPC (Aarhus), Computerome, Esrum

laboratory

ChIP-seq and RNA-seq, CRISPR-Cas9 genome editing, Molecular cloning and luciferase reporter assays, Cell culture and transfection, In vivo mouse model work, Imaging (confocal microscopy, flow cytometry), qPCR and Western blotting, Pharmaceutical GMP QC testing

Languages

English (Fluent) · Danish (Conversational) · Urdu (Native)