Shakir Suleimanov

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github.com/SuleimanovShakir

GitHub • ResearchGate • Document repository • LinkedIn • Webpage • Telegram

Research interests: Bulk and single-cell transcriptomics • Immunology • Cancer study

Education

Sep 2023 - present
MSc degree in Life Science
Skoltech, Skolkovo, GPA: A in A-F system
Main courses: Bioinformatics, Biostatistics, Omics Data Analysis, Python, Immunology, Data Science, Network Science (Graph theory)

2017 - 2023
Specialist degree in Medicine with First class Honours
Sechenov University, Faculty of Medicine, GPA: 5.00/5.00
Main courses: Molecular and cell biology, biochemistry, physiology, medical statistics

Sep 2023 - May 2024
Bioinformatics
Institute for Bioinformatics, Moscow
Main courses: Bioinformatics, Bash and CLI, Python, Statistics and R, Machine Learning, Discrete mathematics and algorithms in bioinformatics

Sep 2022 - Jan 2023
Biostatistics and medical data analysis
Institute for Bioinformatics, Moscow
Main courses: Biostatistics, R programming

Selected research experience

Oct 2024 - Dec 2024
IBCh RAS, Advisor: Dmitriy Chudakov, Daniil Lukianov
Study of CD4+ T-cell subsets distribution in antigen-activated PBMC-derived CD4+ T-cells
- GEX and TCR library preprocessing
- Cell type annotation with label transfer,vertical integration with reference dataset, DEG identification
- Paired scTCR-seq and scRNA-seq of atherosclerotic T cells data analysis

Jun 2024 - Oct 2024 (maintain and update key features at present)
MiLaboratory, Advisor: Mikhail Myshkin
Development of automated pipeline for quality control of immune repertoire sequencing (RepSeq) kit's
- Python script for running MiXCR and output processing
- R script for results visualization
- LATEX script for PDF report generation
- Integration of all components in one Jupyter Notebook

Aug 2024 - present
Laboratory of immune engineering (Sechenov University), Advisor: Sennikov Sergei V.
Study of the transcriptional activity of immunoregulatory genes in immune cells during activation of 2 types of TNF receptors in normal conditions and in rheumatoid arthritis using scRNA-seq (CITE-seq)
- GEX and ADT library preprocessing
- Count matrices pre-processing (filtration, normalization, batch correction, modality integration)
- Manual and automated cell type annotation, DGA, geneset enrichment, compositional analysis

Feb 2024 - Jul 2024
Bioinformatics Institute, Advisor: Maxim Kholmatov (EMBL)
Investigation of Empty Droplets detection in SUMseq (GitHub)

- Writing core functions for quality check, plotting, statistical analysis for benchmarking in R
- Running emptyDroplets on raw data
- Analysis of correlation between log probabilities of emptyDroplets with the sample coverage

Nov 2022 - Jan 2023

Bioinformatics Institute, Advisor: Bakin Evgeny

Identification of genes associated with immune response using open database ImmuneSpace (GitHub)

- Exploratory analysis of vaccination dataset and data cleaning and filtration
- Identification of DEGs using pairwise-comparisons with Mann-Whitney test

2021 - 2023

Laboratory of Clinical Smart Nanotechnologies, Advisor: Vlasova Irina I., Kosheleva Nastasya V.

Study of functional activity of human macrophages and effect of MSC secretome on their polarization

- Human PBMC isolation, differentiation and polarization
- Analysis of functional activity with chemiluminescence, expression of markers with flow cytometry, phagocytic activity with fluorescence and confocal microscopy
- All statistical data analysis and fluorescence image processing

Skills

scRNA-seq analysis
- Raw data processing (*cellranger*)
- *Scanpy, Seurat, Bioconductor, omicsverse*
- Multimodal analysis: CITE-seq and scTCR-seq
- Pre-processing pipelines, vertical and horizontal integration
- DGA and pseudobulk analysis, geneset enrichment, compositional analysis, trajectory inference

Bulk RNA-seq
- Raw data processing (*STAR, hisat*)
- *DESeq2, DGA, GO enrichment*

Machine Learning
- Experience with linear and logistic regression, KNN, random forest
- Repo with homeworks (GitHub) and vaccination prediction project (GitHub)

Programming
- R: *ggplot2, dplyr, tidyverse, plotly, knitr, ggpubr*
- Python: *Pandas, NumPy, Seaborn, BioPython, scikit-learn, torch*
- Bash, Git, Slurm

Wet lab
- PBMC isolation, differentiation and polarization
- Fluorescence and confocal microscopy, flow cytometry, ELISA, chemiluminescence

Current work

Sep 2024 - present

Statistics and R course, Teaching assistant

Bioinformatics Institute

Aug 2023 - present

Junior research fellow

Laboratory of immune engineering, Sechenov University

Publications and Patents (ORCID 0000-0002-8951-9727)

2024

Suleimanov S., Efremov Y., Klyucherev T. et al, Radical-generating activity, phagocytosis and mechanical properties of four phenotypes of human macrophages, *Int. J. Mol. Sci.,* 2024, doi: 10.3390/ijms25031860

2023

Peshkova M., Korneev A*., **Suleimanov S*.** et al, MSCs' conditioned media cytokine and growth factor profiles and their impact on macrophage polarization, *Stem cell research & therapy*, 2023, doi: 10.21203/rs.3.rs-2182817/v1

2022

Irina I. Vlasova, **Shakir K. Suleimanov** et al, Redox-Activation of Neutrophils Induced by Pericardium Scaffolds, Int. J. Mol. Sci. 2022, 23, 15468, doi: 10.3390/ijms232415468

2022 Pazukhina E. … , **Suleimanov S.,** et al, Prevalence and risk factors of post-COVID-19 condition in adults and children at 6 and 12 months after hospital discharge: a prospective, cohort study in Moscow (StopCOVID), *BMC Med*, 2022, 20, 244, doi: 10.1186/s12916-022-02448-4

2021 Munblit D. … , **Suleimanov S.,** et al, Stop COVID Cohort: An Observational Study of 3480 Patients Admitted to the Sechenov University Hospital Network in Moscow City for Suspected Coronavirus Disease 2019 (COVID-19) Infection, *Clin Infect Dis*, 2021, 73, 1-11. Erratum in: Clin Infect Dis. 2021 Jun 26, doi: 10.1093/cid/ciaa1535

Patent, 2023 Irina I. Vlasova, **Shakir K. Suleimanov** et al, Method for single-walled carbon nanotubes cleaning, Rospatent, №2023103987/28(008724)

Selected conferences

Nov 2024 Multiomics single-cell analysis of gene signatures in immune cells upon activation of TNF receptors, *oral presentation*, **Sechenov International Biomedical Summit (SIBS 2024)**, Moscow, Russia

Oct 2024 Automatization of data analysis in the quality control process, *poster presentation*, **Industrial day 2024**, Moscow, Russia

Apr 2023 Redox activity and morphological features of activated human M1 and M2 macrophages, *oral presentation*, **Medical Spring 2023**, Moscow, Russia • 1st place winner

Awards and Honors

20-17, 22, 24 Winner of 3 government scholarship for excellent students

2022, 2023 Hackathon on bioinformatics and clinical oncology & Biostatistics hackathon

2022 Award of Sechenov University President for scientific achievements

2020 - 2023 Advanced academic scholarship for excellent academic and scientific achievements in Sechenov University

2020 - 2022 Winner of personal student grant ($5000) for scientific research ('UMNIK')

2016 Laureate of Russian Biology Olympiad

Teaching and Mentorship

2024 Teaching assistant, Statistics and R course, Bioinformatics Institute

2023 Lecture on Introduction to NGS, for 1st year MSc students at Sechenov University

2018 - 2020 Junior and Senior tutor at the Scientific Career's Center - mentored 4 students for 1 year