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GoogleScholar Profile

Yuliya Burankova

bioinformatician, molecular biologist
hamster-lover

Research and Work Experience

Term project and Summer internship   **Mar 2022 — Present**
Supervisor – Erik Zhivkoplias, PhD student at SRC Stockholm, Sweden
Research project "Age in gene regulatory networks (GRNs)" (GitHub):
- found gene interaction preferences for genes with similar age holds in human and mouse GRNs (TRRUST v2) using protein ages, GenOrigin DB gene ages, and phylostratigraphy approach
- explored correlation between gene connectivity and biological process labels (GO) using gene clustering

Junior researcher, Protein engineering laboratory   **Nov 2017 – Feb 2021**
Supervisor Dr. Aliaksei Yantsevich. Institute of Bioorganic Chemistry, NASB, Minsk, Belarus
Research project: "Terminal deoxynucleotidyl transferase (TdT) modification for *de novo* DNA synthesis":
- assembled TdT expression vector suitable for future changes in the protein sequence
- optimised the TdT expression conditions in E. coli, obtained a purified enzyme

Master thesis "Microbial cholesterol oxidases (ChOx) substrate specificity screening":
- defined 19 steroid substrates oxidation kinetics by ChOx from Cellulomonas sp. and *P. aeruginosa*
- built a phylogenetic tree of bacterial ChOxs, revealed amino acids for further structure targeted modification

Other:
- wrote 3 successful research proposals for grants, all of which were subsequently funded
- improved methods of gene synthesis: performed oligo synthesis, PCA, mass spectrometry, data analysis

Belarusian State Medical University, Minsk, Belarus.   **Nov 2013 – May 2017**
Supervisor – Dr. Vladislav Khrustalev
Bachelor thesis "*Vaccinium uliginosum* leaves extract technology design for type 2 diabetes treatment":
- investigated leaves flavonoids binding with aldose reductase using molecular docking
- developed an extraction methodology that maximised extracted flavonoids from the leaves

Chemistry and biology teacher — university entrance state exam preparation courses.

Pharmacist, Pharmacy RUE "Belfarmacia". Minsk, Belarus   **Mar 2017 – Apr 2019**

Education

Bioinformatics for Biologists program. Bioinformatics Institute, St.Petersburg, Russia   **Sep 2021 – Jun 2022**
Graduated with excellence, top 3%.
Courses: NGS data analysis, Data analysis in R, Python, ML, Discrete maths, Bioinformatic methods, Molecular evolution and Phylogenetics.

Master of Science in Chemistry   **Sep 2017 – Jun 2018**
Graduate School of the National Academy of Sciences of Belarus (NASB), Minsk, Belarus
Courses: Organic compounds structure and reactivity, Modern problems of chemistry.

Specialist in Pharmacy. Belarusian State Medical University, Minsk, Belarus   **Sep 2012 – Jun 2017**
GPA 3.79 out of 4, top 15%. Student representative, Member of Students' Scientific society.

Projects (undertaken during Bioinformatics for Biologists program)   **Nov 2021 – May 2022**

Vagus — FASTQC-like FASTQ quality analyzer tool (Python, GitHub, in group of 4 people):
- added console input parser (typer), html report creation (Jinja2), logging, documentation.
- coordinated the work of a group of 4 people.

ML Telegram Bot for Blindness Detection (**ML Telegram Bot for Blindness Detection**, GitHub, in group of 2 people):
- designed ML model (used DenseNet201), made EDA for APTOS 2019 dataset.

Skills

Programming	**Python:** NumPy, Pandas, NetworkX, scikit-learn, matplotlib, seaborn, PyTest, Poetry, Django. **R:** tidyverse (ggplot2, dplyr, tidyr, etc.), GOSemSim, ggtree, kernlab, car. **Git**, **Bash**, **Jupyter**, **R Markdown, LaTeX**.
Bioinformatics	**NGS data analysis:** FastQC, SAMtools, Trimmomatic, IGV genome browser, SPAdes assembler, RepeatModeller, WoLF PSORT, HMMER. **Sequence alignment and homologs search**: BLAST, Clustal, JalView. **Databases**: NCBI, PDB, PubMed, PubChem, Swiss-Prot and UniProt, Gene Ontology. **Molecular modelling and visualisation**: AutoDock, UCSF Chimera, PyMol, Gromacs.
Laboratory skills	Genetic engineering, Protein expression, UV/Vis spectroscopy, bottom-up proteomics, HPLC.
Soft skills	Experience leading groups of people toward collective targets and goals. Technical writing. Task management.
Languages	**English** (fluent), **Russian** (native).

Additional education

NGSchool2022: Machine Learning in Computational Biology. Jabłonna, **Poland**	**15-23 Sep, 2022**
MITx 6.431x Probability – **The Science of Uncertainty and Data** – *online course* via Edx	**Aug, 2021**
Introduction to Linux – *online course* from Bioinformatics Institute via Stepik	**Feb 2021**
Computer simulation in chemistry – *online course* via Stepik	**May 2020**
Deep Learning School – *online course.* Basics from Moscow Institute of Physics and Technology	**Feb 2020**
Python: **Programming** and **Basics and Applications** – *online course* via Stepik	**Jul, 2019**
Fundamentals of statistics – *online course* from Bioinformatics Institute via Stepik	**Feb, 2019**

Awards and Honours

1. The Belarusian Republican Foundation for Fundamental Research (BRFFR) **grants for young scientists in 2019** (accepted) and **2021** (*declined*). Acceptance rate below 9%.
2. Government **Award** (2017) and **Scholarship** (2020) for **research achievements**.
3. **Winner** (2015, 2017) and **three diplomas** (2014, 2016) **for the best research** at the Belarusian Republican Contests of students Scientific Works.
4. **Five diplomas, 1st to 3rd degree**, for the **best oral presentation** at the annual International scientific and practical conference for students and young scientists "Actual problems of modern medicine and pharmacy" in 2014-2017.

Publications and Conferences

1. **Burankova Y.P.** , Zhivkoplias E. Age patterns in gene regulatory networks [in print], **2022**.
2. Shchur V.V., **Burankova Y.P.** et al. 5'-DMT-protected double-stranded DNA: Synthesis and competence to enzymatic reactions. Analytical Biochemistry, 617, 114115, **2021**. Link
3. Shchur, V.V., **Burankova, Y.P.** et al. Programmed assembly of long DNA synthons: design, mechanism, and online monitoring. Applied microbiology and biotechnology**,** 103, 9103-9117, **2019**. Link
4. **Burankova, Y.P.**, Khrustalev V.V. Molecular docking of Vaccinium uliginosum flavonoids with the human aldose reductase [in Russian]. BSMU students in medical science and health care in Belarus**,** 133-136, **2015**. Link

    … and **4** more publications, **3** oral and **2** poster presentations.