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## Kornel Labun



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**Website:** [kornellabun.com](http://kornellabun.com)  
**Github:** <https://github.com/JokingHero>  
**R code:** <https://github.com/valenlab/amplican>  
**Julia code:** <https://github.com/JokingHero/CHOPOFF.jl>

### EDUCATION

- 2015 - 2019      **PhD:** University of Bergen, Department of Informatics, Computational Biology Unit
- 2009 - 2014      **MSc. Eng.:** Silesian University of Technology, Faculty of Automatic Control, Electronics and Computer Science; **Biotechnology**, spec. **Bioinformatics**
- Awarded (2nd place) in Best Students' Scientific Circle of Bioinformatics Projects in 2011/2012 Competition.

### RESEARCH EXPERIENCE

- 2022 -              Researcher at University of Bergen
- **CHOPOFF** tool for off-target detection (10x speed and 100% precision, 96% code coverage)
  - Analysis of datasets and tool creation (GUIDE-seq, CRISPR etc.) for precision pediatrics and gene editing
  - RCP-seq (RNA, 80S and SSU sequencing) for mouse neuronal cells
  - <https://ribocrypt.org/> interactive visualization in genomics
- 2020 - 2022      Postdoctoral fellow (supervisor: Eivind Valen)
- Development of tools for off-target detection for genome editing with **CRISPR**, enabling precision medicine
  - Applying Oxford **Nanopore** technology for modification detection
  - Analyzing Ribo-seq and TCP-seq datasets for **metastasis** signature

- 2015 - 2019      PhD: "In silico design and analysis of gene editing experiments." (supervisor: Eivind Valen)
- Analysis of RNA-Seq, Ribo-Seq, Cage-Seq, ATACK-Seq, SMS-seq and other **\*-Seq** kind of datasets, as well as Oxford **Nanopore** sequencing data (noisy signal over time)
  - Development of pipelines and **tools** (ORFik, ampliCan, RareVariantVis, CHOPCHOP, tailfindR)
  - **Machine learning** related projects: prediction of polyA tail from nanopore data, prediction of repair profile after CRISPR edits
  - Teaching for courses: INF207 (**Social Network Theory**), INF109 (**Computer Programming for Science**), and **R Crash Course** for Molecular and Computational Biology Research School and NORBIS
- 2013 - 2014      "Spatial evolutionary games as a tool for modeling inter-population interactions". MSc dissertation (supervisor: Prof. Andrzej Świerniak)
- **Evolutionary game theory** in the cellular automaton to solve differential equations
- 2012 - 2013      "Seeking for the signature of radiosensitivity with the use of data on single nucleotide polymorphisms and the results of  $\gamma$ -H2AX test with the expressions of the chosen DNA repair genes." Eng project (supervisor: Prof. Joanna Polańska)

## SELECTED PUBLICATIONS

Equal contributions are underlined

### **CHOPCHOP v3: expanding the CRISPR web toolbox beyond genome editing.**

**Labun K**, Montague TG, Krause M, Torres Cleuren YN, Tjeldnes H, Valen E  
Nucleic acids research, 47(W1):W171–W174. (2019)

### **Accurate analysis of genuine CRISPR editing events with ampliCan.**

**Labun K**, Guo X, Chavez A, Church G, Gagnon JA, Valen E  
Genome Research, 29 (5) (2019)

### **Rapid genome editing by CRISPR-Cas9-POLD3 fusion.**

Reint G, Li Z, **Labun K**, ..., Valen E, Schmierer B, Varjosalo M, Taipale J, Haapaniemi E  
eLife 10.7554/eLife.75415 (2021)

### **tailfindr: alignment-free poly(A) length measurement for Oxford Nanopore RNA and DNA sequencing.**

Krause M, Niazi AM, **Labun K**, Torres Cleuren YN, Müller FS, Valen E  
RNA , 25(10):1229–1241. (2019)

### **ORFik: a comprehensive R toolkit for the analysis of translation**

Tjeldnes H, **Labun K**, Torres Cleuren YN, Chyżyńska K, Świrski M, Valen E  
BMC bioinformatics 22 (1), 1-16 (2021)

## WORK EXPERIENCE

- 2022 -            **Researcher** at University of Bergen.
- 2020 - 2022    **Postdoctoral fellow** at University of Bergen in the ValenLab.
- 2019 - 2020    **Senior Consultant** at Sonat Consulting AS - Machine learning/AI, data analysis, ETL/ELT and databases, DevOps, Agile/Lean, Google Cloud Platform/Microsoft Azure
- 2015 - 2019    **PhD candidate** at the University of Bergen in the ValenLab.
- 2014 - 2015    **Software engineer/data analyst** at “rspective” - front-end and back-end website development, machine learning solutions and data analysis, quality assessment, architectural design and deployment.
- Aug 2011       **Internship** at Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology Gliwice Branch, Department of Nuclear Medicine and Endocrine Oncology

## TEACHING EXPERIENCE

- May 2021       Organizer and teacher of **R Crash Course** for NORBIS
- May 2019       Organizer and teacher of R Crash Course for MCB research school
- Autumn 2018   Institute of Informatics/University of Bergen - Subject: INF207 (**Social Network Theory**), Teaching exercises on blackboard.
- Spring 2018    Institute of Informatics/University of Bergen - Subject: INF109 (**Computer Programming for Science**), Designing homework assignments and grading them.
- Nov 2017       Organizer and teacher of R Crash Course for MCB research school
- Spring 2017    Institute of Informatics/University of Bergen - Subject: INF109 (Computer Programming for Science), Designing homework assignments and grading them.
- Autumn 2016   Institute of Informatics/University of Bergen - Subject: INF207 (Social Network Theory), Teaching exercises on blackboard.

## ADDITIONAL INFORMATION

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|--------------------------|--|
| Programming languages    | <b>R, python, Julia</b> , JavaScript, Java (Android), Matlab + Simulink, LabView   |
| Frameworks               | <b>Bioconductor, tidyverse, Keras, TensorFlow (&amp; Lite), tidyverse, scikit-learn</b> , Node.js, AngularJS, Express, D3.js |
| Cloud                    | Google Cloud Platform, Microsoft Azure   |
| PaaS & SaaS integrations | Heroku, Openshift, Twilio, Nexmo, MailChimp Dropbox etc.   |
| Databases                | MongoDB, Redis, MySQL  |
| Containerization         | Docker, conda, renv, virtualenv  |
| Version control systems  | Git  |
| Other                    | Statistics, parallel computing with computational clusters, linux  |
| Languages                | Polish (native), English (fluent), Norwegian (basic)   |
| Memberships              | World Chess Federation, Bergen Judo Club, Bergen Grappling   |

## INTEREST AND ACTIVITIES

**chess**

**books**

**judo & jujitsu**

**watercolor**

**manga**

## SCIENTIFIC INTERESTS

**biostatistics**

**bioinformatics**

**design patterns**

**blockchain**

**machine learning**

Please contact me for my references.

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