

Jérôme Rihon

 jrihon |  +32 123 45 78 90 |  jeromerihon@gmail.com |  jérôme-rihon |
 0000-0002-9207-1556 |  Thatstreet 1, 1111 SomeCity, Belgium

PhD candidate in Molecular Modeling, Free and Open-Source Software enthusiast, toolmaker

About me

Currently a PhD candidate on the topic of modified nucleic acids by means of *in silico* research. I use computational chemistry to characterise nucleosides and perform simulations to understand their structural dynamics. I program to optimise research methodologies. Coming from a pharmaceutical background, I bring the best of both worlds.

I am interested in writing performant libraries for chem- and bioinformatics tools, targetting developers as my audience. Open to academic and industry positions.

Professional and Education

PhD in Pharmaceutical Sciences

2020 - Present

 KU LEUVEN

Rega Institute for Medical Research, Catholic University of Leuven, Leuven

BE

- Thesis: *Molecular modeling tools to improve and expand computational research on synthetic nucleic acids* (Supervisors : prof.dr. E. Lescrinier, prof.dr. V.B. Pinheiro)
- Researching the fundamentals of (xenobiotic) nucleic acids through computational chemistry and molecular modeling
- Software development to facilitate computational research on nucleic acids
- Teaching assistant in the Biopharmaceutical Analysis practical courses

Keywords : Molecular Dynamics, Computational Chemistry, Python, Rust, Linux, Shell, Linear Algebra

Master of Drug Design and Development (*cum laude*)

2018 - 2020

 KU LEUVEN

Catholic University of Leuven, Leuven

BE

- Thesis: *Development of an allergophore to predict and analyse cross-reactivity in corticosteroid-mediated drug allergy* (Supervisor : prof.dr. E. Lescrinier)

Keywords : Molecular Dynamics, Linux, Shell, Molecular Docking

Bachelors of Pharmaceutical Sciences

2013 - 2018

 KU LEUVEN

Catholic University of Leuven, Leuven

BE

Projects

- **Ducque : the Mechanical Nucleic Acid Architect.** Build virtual 3D models of synthetic and natural nucleic acids. Used to design and predict duplex structures through a rigorous *in silico* methodology. Provides interface for users to implement custom chemistries. Written in Python3. Sole developer of the tool. [jrihon/Ducque](#)
- **Pucke.rs : A CLI tool to generate conformational landscapes for peptides, fivering and sixring systems.** Part of a full *in silico* pipeline to design and predict nucleic acid structures. Written in Rust. Sole developer of the tool. (Manuscript in submission)
- **Pucke.py : A library to generate conformational landscapes, calculate puckering coordinates and geometric properties.** Part of a full *in silico* pipeline to design and predict nucleic acid structures. Extends pucke.rs with additional functions. Backend in Rust, wrapped with Python3. Sole developer of the tool. (Manuscript in submission)
- **Mutineer : an extensible NeoVim tool to (un)comment in your desired programming language.** Simplify (un)commenting by a keystroke. [jrihon/mutineer.lua](#)
- **Solve Rosalind Bioinformatics problems in Rust.** Solved 20 problems to acquire Doctoral School course credits, on topics outside of my research. [Rosalind Challenge](#)

Competencies

Informatics

Python (Software development, figures, scripting)



Shell (Scripting, sysadmin)



LaTeX (Manuscripts, presentations)



Rust (Software development)



Typst (PhD thesis, this CV)



Lua (NeoVim plugins)



Languages

Dutch (native)



English



French



Software knowledge

- **Operating System** : I main [GNU/Linux](#) on all machines, but am comfortable on Windows and MacOS.
- **Scientific Software** : [ORCA](#) for quantum mechanics applications, [AMBER MD](#) for atomistic simulations of biomolecular systems.
- **Graphic Design** : Proficient in [InkScape](#) for vectorised figures. [Matplotlib](#) for all generated graphs.
- **Dev. Environment** : [NeoVim](#) for programming and general text manipulation purposes. [Tmux](#) to keep track of multiple projects. [Git](#) for version control.

Other skills

Student Associations

- **LHC Plutonica** Secretary (2020-2021): Design template for annual magazine. Document and virtualise all activities.
- **LHC Plutonica** Treasurer (2019-2020): Doubled cashflow w.r.t. the previous fiscal year. Introduced online management of funds. Established LHC Plutonica as a factual association.
- **Hades** Vice President (2018-2019): Supportive role to the president of the association.
- **Farmaceutica** Faculty Bar Manager (2015-2017): Responsible for all bar events. Manage inventory, maintain communication with distributors. General upkeep.
- **Farmaceutica** Cantor (2016-2017): Head organiser and lead in all cantus events. Organised small events on student culture.

Teaching assignments

- **Teaching assistant:** Guide and supervise 3rd Bachelor Pharmaceutical Sciences students in the lab practicals of "Biopharmaceutical Analysis" (2020-Present, KU Leuven).
- **Supervisor** : Guide a master's student on the topic of nucleic acid *in silico* research (2022-2023, Rega Institute for Medical Research). Student continues as colleague PhD.
- **Tutor** : Tutor in Chemistry for students taking part in the medicine and dentistry entrance exam (2018-2020, Slaagsleutels in Leuven).

Publications

1. **Rihon J.**, Mattelaer C.-A., Montalvão R.W., Froeyen M., Pinheiro V.B. & Lescrinier E. (2024, Feb) "Structural insights into the morpholino nucleic acid/RNA duplex using the new XNA builder Ducque in a molecular modeling pipeline". *Nucleic Acids Research*. [10.1093/nar/gkae135](https://doi.org/10.1093/nar/gkae135)
2. **Rihon J.**, Reynders S., Pinheiro V.B. & Lescrinier E. (Manuscript in submission) "The pucker.rs toolkit to facilitate sampling the conformational space of biomolecular monomers".
3. Schofield P., Taylor A.I., **Rihon J.**♦, Martinez C.D.P., Zinn S., Mattelaer C.-A., Jackson J., Dhaliwal G., Schepers G., Herdewijn P., Lescrinier E., Christ D. & Holliger P. (2023, Jul) "Characterization of an HNA aptamer suggests a non-canonical G-quadruplex motif". *Nucleic Acids Research*. 51 (15), [10.1093/nar/gkad592](https://doi.org/10.1093/nar/gkad592)
4. Mattelaer C.-A., Mattelaer H.-P., **Rihon J.**, Froeyen M. & Lescrinier E. (2021, May) "Efficient and Accurate Potential Energy Surfaces of Puckering in Sugar-Modified Nucleosides". *Journal of Chemical Theory and Computation*. 17 (6), [10.1021/acs.jctc.1c00270](https://doi.org/10.1021/acs.jctc.1c00270)
5. Xu Y., Groaz E., **Rihon J.**, Herdewijn P. & Lescrinier E. (2023, Jul) "Synthesis, antiviral activity, and computational study of β -d-xylofuranosyl nucleoside phosphonates". *European Journal of Medicinal Chemistry*. [10.1016/j.ejmech.2023.115379](https://doi.org/10.1016/j.ejmech.2023.115379)
6. Depuydt A.-S., **Rihon J.**♦, Cheneval O., Vanmeert M., Schroeder C.I., Craik D.J., Lescrinier E., Peigneur S. & Tytgat J. (2021, Jun) "Cyclic Peptides as T-Type Calcium Channel Blockers: Characterization and Molecular Mapping of the Binding Site". *ACS Pharmacology and Translational Science*. 4 (4), [10.1021/acspstsci.1c00079](https://doi.org/10.1021/acspstsci.1c00079)
7. **Rihon J.** (2022, Sep) "Synthetic biology in action: beyond standard metabolism". *European Molecular Biology Organization (EMBO)*. [Download poster](#)

♦ joint first-author