Carlos Vigil Vásquez

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Experience

- **Research Assistant - Molecular Design Lab** Hybrid
  Pontificia Universidad Católica de Chile; Santiago, Chile *July 2017 - December 2022*
  - Proposed and implemented a novel predictive model called SimSpread that combines network-based inference derived from social-studies with run-of-the-mill chemical similarity measures which resulted in a drug discovery predictive model that exceeded the predictive performance of state-of-the-art network-based inference predictive models.
  - Implemented and validated a drug-discovery pipeline based in the SimSpread predictive model that resulted in the identification of 4 novel compounds with antifungal activity for 8 clinically relevant fungi organism.
- **Research Assistant - Psychophysiology Lab** Remote
  Pontificia Universidad Católica de Chile; Santiago, Chile *January 2022 - December 2022*
  - Implemented a machine-learning predictive and statistical modelling pipeline of human psychological states that resulted in the identification of the effect of different contemplative practices into the subjects well-being as measured by 7 distinct well-being metrics.
- **Research Assistant - REFRACT** Hybrid
  Universidad Pablo de Olavide; Sevilla, Spain *September 2022 - December 2022*
  - Implemented a bioinformatics protocol for the search of protein homology using a three-step "search, detect, and enrich" model using a combination of structural and sequence aligners working in tandem to filter and enrich conservation signals that helped shed light on the homologous nature of repeat proteins related to the membrane and nuclear pore organization.

Education

- **B.S. Biochemistry** Santiago, Chile
  Pontificia Universidad Católica de Chile *2015 - 2022*
  - Licenciature grade 5.6/7.0 (3.1/4.0 in GPA scale)
  - Research thesis grade 7.0/7.0 (4.0/4.0 in GPA scale)
  - Graduated with 2 out of 3 votes of distinction

Publications

- **C. Vigil-Vásquez**, A. Schüller; *De novo* prediction of drug targets and candidates by chemical similarity-guided network-based inference. IJMS (2022). DOI:10.3390/ijms23179666
- **C. Vigil-Vásquez**, M. Jimenez-Socha, P. Ortiz-Bermudez, A. Schüller; Antifungal drug discovery by chemical similarity-guided network-based inference. *In preparation*.
- M. Villena-Gonzalez, P. Oyarzo, **C. Vigil-Vásquez**, F. Jaume, D. Cosmelli; Movement-based Contemplative Practices are associated with a positive impact on wellbeing due to the intentional cultivation of a specific profile of cognitive, emotional, and bodily self-awareness traits. *In preparation*.
- **C. Vigil-Vásquez**, C. Bellera, J. Gutierrez, D. Devos; Foldseek-fishing: Detecting remote structural similarity through ensemble bioinformatic tools. *In preparation*.

Presentations

- **Antifungal drug discovery by chemical similarity-guided network-based inference**: Chilean Bioinformatics Society (January, 2022)
- **DDTNBI: de novo target prediction using a social network-derived method**: International Society for Computational Biology/European Conference on Computational Biology (August, 2021)
- **A computational chemogenomics method for the prediction of off-target interactions with coagulation factor Xa**: European Hematology Association (August, 2020)
- **Limits and potential of in silico target prediction by chemical similarity**: International Society for Computational Biology-LA (October, 2018)

Skills

- **Human languages**: Spanish (native), English (TOEFL score 101 of 120)
- **Machine languages**: Julia, Python, LaTeX, Bash, SQL
- **Frameworks**: Graphs.jl, CUDA.jl, Plots.jl, Scikit-Learn, Pandas, NumPy, Matplotlib, Seaborn, NetworkX, Pingouin
- **Tools**: Git, GitHub, MySQL, SQLite
- **Platforms**: Linux, MacOS
- **Practical experience**: Cheminformatics, Drug discovery, Recommender systems, graph theory, statistical analysis, data visualization, REST API

Awards

- **Undergraduate Research Contest - Winter 2017**: "*In silico* prediction and prioritization of novel drug targets."
- **Undergraduate Research Contest - Summer 2020**: "Use of biochemical networks for the prediction of novel drugs for coagulation factor Xa."