

## PROF. EVANDRO FERRADA

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### SUMMARY

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### SELECTED PUBLICATIONS

- 2024            **Ferrada, E.** et al. "Experimental and computational interpretation of novel pathogenic mutations of the Creatine Transporter (SLC6A8)". *Journal of Molecular Biology*, 436(2), 168383 (2024).
- 2022            **Ferrada, E.** and Superti-Furga, G. "A structure and evolutionary-based classification of solute carriers". *iScience*, 25(10), 1-16 (2022).
- 2021            **Ferrada, E.** "Quantifying the mutational robustness of protein-coding genes from large-scale mutagenesis data". *Journal of Molecular Evolution*, 89, 357-369 (2021).
- 2019            **Ferrada, E.** "The site-specific amino acid preferences of homologous proteins depend on sequence divergence" *Genome biology and evolution*, 11(1), 121-135 (2019).
- 2014            **Ferrada, E.** "The amino acid alphabet and the architecture of the protein sequence-structure map. I. Binary alphabets." *PLoS Computational Biology*, 10.12: e1003946, (2014).
- 2011            Hayden, E., **Ferrada, E.** and Wagner, A. "Cryptic genetic variation promotes rapid evolutionary adaptation in an RNA enzyme". *Nature* 474: 92-95, (2011).
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### FULL LIST OF PUBLICATIONS

- 1                **Ferrada, E.**, Arancibia, V., Loeb, B., Norambuena, E., Oleazar, C. and Huidobro-Toro, J.P. "Stoichiometry and condi-

tional stability constants of Cu(II) or Zn(II) clioquinol complexes; implications for Alzheimer's and Huntington's disease therapy", *NeuroToxicology* 28(3):445-449, 2007.

- 2       **Ferrada, E.** and Melo, F. "Non-bonded terms extrapolated from non-local knowledge-based energy functions improve error detection in near native protein structure models", *Protein Science* 16(7):1410-1421, 2007.
- 3       **Ferrada, E.**, Vergara, I.A. and Melo, F. "A Knowledge-based potential with an accurate description of local interactions improves discrimination between native and near-native protein conformations", *Cell Biochemistry and Biophysics* 49(2):111-124, 2007.
- 4       Vergara, I.A., Norambuena, T., **Ferrada, E.**, Slater, A.W. and Melo, F. "StAR: a web tool for the statistical analysis of ROC curves". *BMC Bioinformatics* 9:205, 2008.
- 5       **Ferrada, E.** and Wagner, A. "Protein robustness promotes evolutionary innovations on large evolutionary time scales". *Proc. R. Soc. B* 275(1643):1595-1602, 2008.
- 6       **Ferrada, E.** and Melo, F. "Effective knowledge-based potentials". *Protein Science* 18:1469-1485, 2009.
- 7       **Ferrada, E.** and Wagner, A. "Evolutionary innovations and the organization of protein functions in genotype space". *PLoS ONE* 5:e14172, 2010.
- 8       Hayden, E., **Ferrada, E.** and Wagner, A. "Cryptic genetic variation promotes rapid evolutionary adaptation in an RNA enzyme". *Nature* 474: 92-95, 2011.
- 9       **Ferrada, E.** and Wagner, A. "A comparison of the genotype-phenotype maps for RNA and proteins". *Biophysical J.* 102:1916-1925, 2012.
- 10       Sabath, N., **Ferrada, E.**, Barve, A., and Wagner, A. "Growth temperature and genome size in bacteria are negatively correlated, suggesting genomic streamlining during thermal adaptation". *Genome Biology and Evolution.* 5: 966-977, 2013.
- 11       Hayden, E. J., Bratulic, S., Koenig, I., **Ferrada, E.** and Wagner, A. "The effects of stabilizing and directional selection on phenotypic and genotypic variation in a population of RNA enzymes." *Journal of Molecular Evolution*, 1-8, 2013.

- 12 **Ferrada, E.** "The amino acid alphabet and the architecture of the protein sequence-structure map. I. Binary alphabets." *PLoS Computational Biology*, 10.12: e1003946, 2014.
- 13 Taskinen, B., **Ferrada, E.**, and Fowler, D. M. "Early emergence of negative regulation of the tyrosine kinase Src by the C-terminal Src kinase." *Journal of Biological Chemistry*, 292(45), 18518-18529, (2017).
- 14 **Ferrada, E.** "Gene Families, Epistasis and the Amino Acid Preferences of Protein Homologs." *Evolutionary Bioinformatics* 15 (2019): 1176934319870485.
- 15 \*Banguera-Hinestroza, \***Ferrada, E.**, Sawall, Y., and Flot, J. F. "Computational Characterization of the mtORF of Pocilloporid Corals: Insights into Protein Structure and Function in Stylophora Lineages from Contrasting Environments. " *Genes*, 10(5), 324 (2019). (\* shared first authorship).
- 16 **Ferrada, E.** "The site-specific amino acid preferences of homologous proteins depend on sequence divergence" *Genome biology and evolution*, 11(1), 121-135 (2019).
- 17 **Ferrada, E.** "Quantifying the mutational robustness of protein-coding genes from large-scale mutagenesis data". *Journal of Molecular Evolution*, 89, 357-369 (2021).
- 18 Fuentes, M. and **Ferrada, E.** "Mathematical models of diversification and innovation in biology". *International Journal of Modern Physics B* ( 2022).
- 19 **Ferrada, E.** and Superti-Furga, G. "A structure and evolutionary-based classification of solute carriers". *iScience*, 25(10), 1-16 (2022).
- 20 Polesel, M., Ingles-Prieto, A., Christodoulaki, E., **Ferrada, E.** et al. "Functional characterization of SLC39 family members ZIP5 and ZIP10 in overexpressing HEK293 cells reveals selective copper transport activity". *BioMetals*, 25(10), 1-16 (2023).
- 21 Ng, A., ... **Ferrada, E.**, et al., "Discovery of molecular glue degraders via isogenic morphological profiling" *ACS Chemical Biology*, 18(12), 2464-2473 (2023).
- 22 Fuenzalida, M., ..., **Ferrada, E.**, et al. "Using an embryo specific promoter to modify iron distribution pattern in Arabidopsis". *Plant Science*, 339, 111931 (2024).

- 23 Huang, J., ..., **Ferrada, E.**, et al. "ProteoMutaMetrics: machine learning approaches for solute carrier family 6 mutation pathogenicity prediction". *RSC Advances*, 14(19), 13083-13094 (2024).
- 24 **Ferrada, E.** et al. "Experimental and computational interpretation of novel pathogenic mutations of the Creatine Transporter (SLC6A8)". *Journal of Molecular Biology*, 436(2), 168383 (2024).
- 25 Offensperger, F., ..., **Ferrada, E.** et al. "AI/ML-enabled ligandability maps advance fragment-based drug discovery and reveal principles of small-molecule protein interactions." *Science*, 384(6694), eadk5864 (2024).
- 26 Wang, W. A., Garofoli, A., **Ferrada, E.**, Klimek, C., Steurer, B., Ingles-Prieto, A., ... & Superti-Furga, G. Human genetic variants in SLC39A8 impact uptake and steady-state metal levels within the cell. *Life Science Alliance*, 8(4) (2025).
- 27 Goldmann, U., Wiedmer, T., Garofoli, A., Sedlyarov, V., Bichler, M., Haladik, B., **Ferrada, E.**,... & Superti-Furga, G. (2025). Data-and knowledge-derived functional landscape of human solute carriers. *Molecular Systems Biology*, 21(6), 599-631 (2025).
- 28 Wang, W. A., \***Ferrada, E.**, Klimek, C., Osthusenrich, T., MacNamara, A., Wiedmer, T., & Superti-Furga, G. (2025). Large-scale experimental assessment of variant effects on the structure and function of the citrate transporter SLC13A5. *Science Advances*, 11(26), eadx3011 (2025).  
\*Co-corresponding, co-first authorship.
- 29 **Ferrada, E.** An algorithmic constraint at the transition to complex life. *Proceedings of the National Academy of Sciences*, 122(17), e2505484122 (2025).

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## OTHER PUBLICATIONS

- 30 **Ferrada, E.** "Scientific Utopias: The Eclosion Event". *Nature* (2023).

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## GRANTS

- 2024–2025 (PI) Proyecto INIC-UV: "*The impact of insertions and deletions on the evolution of new molecular pheno-*

- types and human diseases.*” (PI: Evandro Ferrada).
- 2020–2022 (PI) Proyecto para la Colaboración Internacional. REDES, Conicyt: ***”Functional innovations under energy constraints and the evolution of animal diapause*”**. (PI: Evandro Ferrada; Co-PI: Andrea Calixto; Foreign Co-PI: Peter Stadler, University of Leipzig, Germany).
- 2021–2025 (Co-PI) FONDECYT Regular: ***”Mechanistic insights into innovation and diversification processes*”**. (PI: Miguel Fuentes, Instituto de Sistemas Complejos de Valparaíso (ISCV)).
- 2020–2023 (Co-PI) FONDECYT Regular: ***”The emergence of ecologies through metabolic cooperation and recursive organization*”**. (PI: Pablo Marquet. P.Universidad Católica de Chile).