

Ph.D. Supervisor: C.S.I. Dr. Habil. Vlad Cojocaru

Admission exam topics (for the PhD position with governmental fellowship):

1. The principles governing the structures of biomolecules (proteins, nucleic acids, lipids, carbohydrates)
2. Experimental and theoretical methods for determining the structures of biomolecules
3. Genome organization
4. Stages of gene regulation
5. Basic concepts in Linux and programming
6. Basic concepts in Molecular Modeling

Bibliography:

- Stryer, L., et al. (2019): *Biochemistry*. 9th Edition
- Sanger, W. (1984): *Principles of Nucleic Acids Structure*. Springer Verlag.
- Stigliano A.F. (2020): *Biomolecular Interfaces*. Springer Verlag
- Leach, A. R. (2001): *Molecular Modeling: Principles and Applications*. (2nd or 3rd edition)
- Schlick, T. (2013): *Molecular Modeling and Simulation: An Interdisciplinary Guide*
- Mistelli, T. (2020): The Self-Organizing Genome: Principles of Genome Architecture and Function. *Cell* 183(1):28-45 (<https://doi.org/10.1016/j.cell.2020.09.014>)
- Lambert SA et al (2018): The Human Transcription Factors (<https://doi.org/10.1016/j.cell.2018.01.029>)
- Zaret KS (2020). Pioneer Transcription Factors Initiating Gene Network Changes (<https://doi.org/10.1146/annurev-genet-030220-015007>)

Recommended software tutorials:

VMD (<https://www.ks.uiuc.edu/Research/vmd/>)

Amber (www.ambermd.org)

Haddock (<https://www.bonvinlab.org/software/>)

Chimera (<https://www.cgl.ucsf.edu/chimera/>)

Pymol (<https://github.com/schrodinger/pymol-open-source>)