Răzvan V. Chereji

CONTACT

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SUMMARY

- Theoretical physicist, using statistical mechanics to model biological systems. My research focuses on DNA packaging, chromatin organization, and gene regulation.
- Invited author of a book chapter; invited keynote speaker at international conference in Canada; invited speaker at a summer school in Argentina; presented talks and posters at many conferences and seminars.
- Author of >20 peer-reviewed articles (most of them as first or co-first author), more than 650 citations (see my Google Scholar profile).
- Reviewer for many prestigious journals, such as Science, Nature, Biophysical Journal, Molecular Cell, Nucleic Acids Research, Genome Research.
- Awarded for research, reviewing, and teaching; multiple medals and prizes at international and national Physics Olympiads (see Awards section below).
- Intermediate programmer in Python, R, MATLAB; I have written custom-made scripts for all data analyses that were required in my research.
- I have collaborated with 15 laboratories, including collaborations initiated by me, independently of my advisors.

EDUCATION

National Institutes of Health (NIH), Bethesda, MD, U.S.A.

Research Fellow **2016–present**

Visiting Fellow **2013–2016**

- Advisor: Dr. David J. Clark
- Institute: National Institute of Child Health and Human Development (NICHD)

Rutgers, The State University of New Jersey, Piscataway, NJ, U.S.A.

Ph.D. in Physics **2007–2013**

- Dissertation: "Statistical Mechanics of Nucleosomes"
- Advisor: Prof. Alexandre V. Morozov
- Cumulative GPA: 3.90 / 4

Babeş-Bolyai University, Cluj-Napoca, CJ, Romania

B.Eng. **2002–2007**

- Thesis: "Differential Geometry in General Relativity and Yang-Mills Theory"
- Advisor: Prof. Emil Vinţeler
- Graduated as valedictorian; Thesis GPA: 10 / 10; Cumulative GPA: 9.83 / 10

AWARDS

Fellows Award for Research Excellence (FARE award), NIH	**2017, 2018**
"Outstanding Contribution in Reviewing" award from Genomics, Elsevier	**2017**
Richard J. Plano Outstanding Teaching Assistant Award, Rutgers University	**2009**
Silver Medal at the International Physics Olympiad, Indonesia	**2002**
Excellency Diploma awarded by the President of Romania	**2001, 2002**
Bronze Medal at "Tuymaada" International Olympiad, Russia	**2001**
First Prize at Romanian National Physics Olympiad	**1999, 2000, 2002**

PUBLICATIONS

23. Ocampo J*, **Chereji RV***, Eriksson PR, Clark DJ – Contrasting roles of the RSC and ISW1/CHD1 chromatin remodelers in RNA polymerase II elongation and termination, Genome Res. (2019), doi: 10.1101/gr.242032.118

22. Hamdani O, Dhillon N, Hsieh T-HS, Fujita T, Ocampo J, Kirkland JG, Lawrimore J, Kobayashi TJ, Friedman B, Fulton D, Wu KY, **Chereji RV**, Oki M, Bloom K, Clark DJ, Rando OJ, Kamakaka RT - Transfer RNA Genes Affect Chromosome Architecture and Function via Local Effects, Mol. Cell. Biol. (2019), doi: 10.1128/MCB.00432-18

21. Chang HW, Valieva ME, Safina A, **Chereji RV**, Wang J, Kulaeva OI, Morozov AV, Kirpichnikov MP, Feofanov AV, Gurova K, Studitsky VM – Mechanism of FACT Removal from Transcribed Genes by Anti-Cancer Drugs Curaxins, Science Advances 4 (11), eaav2131 (2018).

20. Mehta GD, Ball DA, Eriksson PR, **Chereji RV**, Clark DJ, McNally JG, Karpova TS - Single-Molecule Analysis Reveals Linked Cycles Of RSC Chromatin Remodeling and Ace1p Transcription Factor Binding in Yeast, Mol. Cell 72 (5), 875-887.e9 (2018).

19. Rawal Y*, **Chereji RV***, Qiu H, Ananthakrishnan S., Chhabi G., Clark DJ, Hinnebusch AG – SWI/SNF and RSC cooperate to reposition and evict promoter nucleosomes at highly expressed genes in yeast, Genes Dev. 32 (9-10), 695-710 (2018).

18. Ouda R, Sarai N, Nehru V, Patel MC, Debrosse M, Bachu M, **Chereji RV**, Eriksson PR, Clark DJ, Ozato K - SPT6 interacts with NSD2 and facilitates interferon-induced transcription, FEBS Lett. 592(10), 1681-1692 (2018).

17. **Chereji RV**†, Clark DJ† – Major determinants of nucleosome positioning, Biophys. J. 114 (10), 2279-2289 (2018).

16. Rawal Y*, **Chereji RV***, Valabhoju V, Qiu H, Ocampo J, Clark DJ, Hinnebusch AG – Gcn4 binding in coding regions can activate internal and canonical 5' promoters in yeast, Mol. Cell 70 (2), 297-311 (2018).

15. **Chereji RV***, Ramachandran S*, Bryson TD, Henikoff S – Precise genome-wide mapping of single nucleosomes and linkers in vivo, Genome Biol. 19, 19 (2018).

14. Johnson TA*, **Chereji RV***, Stavreva DA, Morris S, Hager GL, Clark DJ – Conventional and Pioneer Modes of Glucocorticoid Receptor Interaction with Enhancer Chromatin in vivo, Nucleic Acids Res. 46 (1), 203-214 (2018).

13. **Chereji RV***, Bharatula V*, Elfving N, Blomberg J, Larsson M, Morozov AV, Broach JR, Björklund S – Mediator binds to boundaries of chromosomally interacting do-

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mains and to proteins involved in DNA looping, RNA metabolism, chromatin remodeling, and actin assembly, Nucleic Acids Res. 45 (15), 8806-8821 (2017).

12. **Chereji RV***, Ocampo J*, Clark DJ – MNase-sensitive complexes in yeast: nucleosomes and non-histone barriers, Mol. Cell 65 (3), 565–577 (2017).

11. Ocampo J*, **Chereji RV***, Eriksson PR, Clark DJ – The ISW1 and CHD1 ATP-dependent chromatin remodelers compete to set nucleosome spacing in vivo, Nucleic Acids Res. 44 (10), 4625-4635 (2016).

10. Qiu H*, **Chereji RV***, Hu C, Cole HA, Rawal Y, Clark DJ, Hinnebusch AG – Genome-wide cooperation by HAT Gcn5, remodeler SWI/SNF, and chaperone Ydj1 in promoter nucleosome eviction and transcriptional activation, Genome Res. 26 (2), 211-225 (2016).

9. **Chereji RV***, Kan T-W*, Grudniewska MK, Romashchenko AV, Berezikov E, Zhimulev IF, Guryev V, Morozov AV, Moshkin YM – Genome-wide profiling of nucleosome sensitivity and chromatin accessibility in Drosophila melanogaster, Nucleic Acids Res. 44 (3): 1036-1051 (2016).

8. **Chereji RV**, Morozov AV – Functional roles of nucleosome stability and dynamics, Brief. Funct. Genomics 14 (1), 50-60 (2015).

7. Cole HA, Ocampo J, Iben JR, **Chereji RV**, Clark DJ – Transcription of Induced Genes in Yeast Correlates with Differential Loss of Histone H2A-H2B Dimers from Coding Regions, Nucleic Acids Res. 42 (20), 12512-12522 (2014).

6. Ganguli D*, **Chereji RV***, Iben JR, Cole HA, Clark DJ – RSC-dependent Constructive and Destructive Interference between Opposing Arrays of Phased Nucleosomes in Yeast, Genome Res. 24 (10), 1637-1649 (2014).

5. **Chereji RV**, Morozov AV – Ubiquitous nucleosome crowding and unwrapping in the yeast genome, Proc. Natl. Acad. Sci. USA 111 (14), 5236-5241 (2014).

4. Elfving N*, **Chereji RV***, Bharatula V, Björklund S, Morozov AV, Broach JR – A dynamic interplay of nucleosome and Msn2 binding regulates kinetics of gene activation and repression following stress, Nucleic Acids Res. 42 (9), 5468-5482 (2014).

3. Petrenko N, **Chereji RV**, McClean MN, Morozov AV, Broach JR – Noise and interlocking signaling pathways promote distinct transcription factor dynamics in response to different stresses, Mol. Biol. Cell 24 (12), 2045-2057 (2013).

2. **Chereji RV**, Morozov AV – Statistical mechanics of nucleosomes constrained by higher-order chromatin structure, J. Stat. Phys. 144 (2), 379-404 (2011).

1. **Chereji RV**, Tolkunov D, Locke G, Morozov AV – Statistical mechanics of nucleosome ordering by chromatin-structure-induced two-body interactions, Phys. Rev. E 83 (5), 050903 (2011).

SUBMITTED

1. **Chereji RV**, Bryson TD, Henikoff S – Quantitative MNase-seq accurately maps nucleosome occupancy levels, In revision.

*__These authors contributed equally__

2. **Chereji RV***, Eriksson PR*, Ocampo J*, Clark DJ – DNA accessibility is not the primary determinant of chromatin-mediated gene regulation, In revision.

IN PREPARATION

1. **Chereji RV** – The universality of nucleosome organization, from yeast to human, In preparation.

2. **Chereji RV** – Robust estimation of nucleosome spacing at the gene level, In preparation.

3. Clark S, **Chereji RV**, Lee P, Fields D, Clark DJ – Chromatin structure of dorsal root ganglia neurons and cortical glia, In preparation.

BOOK CHAPTERS

1. Beati P*, **Chereji RV***† – Use of *plot2DO* for creating 2D occupancy plots, Invited chapter in Methods in Molecular Biology, Submitted.

INVITED TALKS

Workshop, IMPaM CONICET-UBA Institute, Buenos Aires, Argentina	**Nov 2018**
Seminar, "Dr. Héctor N. Torres" Institute, Buenos Aires, Argentina	**Nov 2018**
Keynote Speaker at The 3rd International Conference on Molecular Biology & Nucleic Acids, Toronto, Canada	**Aug 2018**
Biowulf Seminar Series, NIH, Bethesda, MD	**Mar 2018**
Biophysical Society 62st Annual Meeting, San Francisco, CA	**Feb 2018**
13th Annual NICHD Fellows Meeting, Washington, DC	**May 2017**
Departmental Seminar, Physics Department, University of Minnesota, Minneapolis, MN	**Apr 2017**
Departmental Seminar, Department of Computational and Systems Biology, University of Pittsburgh, Pittsburgh, PA	**Dec 2016**
Departmental Seminar, Department of Biological Sciences, Carnegie Mellon University, Pittsburgh, PA	**Dec 2016**
Biophysics Seminar, Physics Department, University of Minnesota, Minneapolis, MN	**Nov 2016**
Chromatin-DECODE Seminar, NIH, Bethesda, MD	**Apr 2015**
APS March Meeting, San Antonio, TX (invited talk + contributed talk)	**Mar 2015**
BioMaPS Institute for Quantitative Biology Student Seminar, Rutgers University, Piscataway, NJ	**Sep 2013**
David Clark laboratory, NIH, Bethesda, MD	**Jun 2013**
Jun Song laboratory, UCSF, San Francisco, CA	**Jun 2013**

OTHER PRESENTATIONS

Biophysical Society 63rd Annual Meeting, Baltimore, MD (poster)	**Mar 2019**

*These authors contributed equally
†Corresponding author

PGD Monday AM Seminar, NIH, Bethesda, MD	**Dec 2018**
CSHL Epigenetics & Chromatin Meeting, Cold Spring Harbor, NY (poster)	**Sep 2018**
NICHD Scientific Retreat, NIH, Bethesda, MD (poster)	**Sep 2018**
PGD Monday AM Seminar, NIH, Bethesda, MD	**Jan 2018**
Workshop on Chromosome Biology, Bethesda, MD (contributed talk)	**Dec 2017**
Washington Area Yeast Club Meeting, Bethesda, MD (contributed talk)	**Nov 2017**
NICHD Scientific Retreat, NIH, Bethesda, MD (poster)	**Sep 2017**
CSHL Mechanisms of Eukaryotic Transcription Meeting, Cold Spring Harbor, NY (poster)	**Aug 2017**
APS March Meeting, New Orleans, LA (contributed talk)	**Mar 2017**
Biophysical Society 61st Annual Meeting, New Orleans, LA (poster)	**Feb 2017**
PGD Monday AM Seminar, NIH, Bethesda, MD	**Jan 2017**
NCI Symposium on Chromosome Biology, NIH, Bethesda, MD (poster)	**Nov 2016**
CSHL Epigenetics & Chromatin Meeting, Cold Spring Harbor, NY (poster)	**Sep 2016**
NICHD Scientific Retreat, NIH, Bethesda, MD (poster)	**Sep 2016**
12th Annual NICHD Fellows Meeting, Washington, DC (poster)	**Apr 2016**
APS March Meeting, Baltimore, MD (contributed talk)	**Mar 2016**
Biophysical Society 60th Annual Meeting, Los Angeles, CA (poster)	**Feb 2016**
PGD Monday AM Seminar, NIH, Bethesda, MD	**Jan 2016**
NIH Research Festival, NIH, Bethesda, MD (poster)	**Sep 2015**
34th Summer Symposium in Molecular Biology, Penn State University, State College, PA (poster)	**Jul 2015**
FASEB conference: Transcription, Chromatin, and Epigenetics, Palm Beach, FL (poster)	**Jun 2015**
11th Annual NICHD Fellows Meeting, Washington, DC (poster)	**May 2015**
PGD Monday AM Seminar, NIH, Bethesda, MD	**May 2015**
NCI Symposium on Chromosome Biology, NIH, Bethesda, MD (poster)	**Apr 2015**
Keystone Symposia: DNA Methylation / Epigenomics, Keystone, CO (poster)	**Mar 2015**
Biophysical Society 59th Annual Meeting, Baltimore, MD (poster)	**Feb 2015**
CSHL Epigenetics & Chromatin Meeting, Cold Spring Harbor, NY (poster)	**Sep 2014**
NICHD Scientific Retreat, NIH, Bethesda, MD (poster)	**Jun 2014**
PGD Monday AM Seminar, NIH, Bethesda, MD	**Jun 2014**
10th Annual NICHD Fellows Meeting, Washington, DC (poster)	**Apr 2014**
APS March Meeting, Denver, CO (contributed talk)	**Mar 2014**
Biophysical Society 58th Annual Meeting,	

San Francisco, CA (poster) **Feb 2014**

APS March Meeting, Baltimore, MD (contributed talk) **Mar 2013**

Biophysical Society 57th Annual Meeting, Philadelphia, PA (poster) **Feb 2013**

108th Statistical Mechanics Conference,
Rutgers University, Piscataway, NJ (contributed talk) **Dec 2012**

The 8th Gotham-Metro Condensed Matter Meeting,
The New York Academy of Sciences, New York, NY (poster) **Nov 2012**

Biophysical Society Pennsylvania Network Meeting,
Lehigh University, Bethlehem, PA (poster) **Sep 2012**

PROFESSIONAL ACTIVITIES

Reviewer

- Independent:
  - Science
  - Nature Communications
  - Biophysical Journal
  - Nucleic Acids Research
  - Cell Reports
  - Epigenetics & Chromatin
  - Scientific Reports
  - Epigenetics
  - PLoS ONE
  - Genomics
  - BMC Molecular Biology
  - Journal of Biomolecular Structure & Dynamics
- Jointly with my advisor: Nature, Molecular Cell, Genome Research

Service

- Biophysical Society 62nd Annual Meeting **2018**
  - Chair of the "Chromatin and the Nucleoid" session
- 3rd International Conference on Molecular Biology & Nucleic Acids **2018**
  - Chair of the "Carcinogenesis, Gene Targets and Pathways" session
- Member of the DDB Fellows' seminar committee **2015–present**
  - Chair **2016–2017**
  - Co-chair **2015–2016**
- Member of the Chromatin-DECODE seminar committee **2016–present**

Member

- American Physical Society, Biophysical Society

TEACHING EXPERIENCE

General Physics II **Summer 2012**
General Physics II **Summer 2010**
Extended Analytical Physics II **Spring 2010**
Extended Analytical Physics I **Fall 2009**
General Physics II **Summer 2009**
Extended Analytical Physics II **Spring 2009**
Extended Analytical Physics I **Fall 2008**

SCHOLARSHIPS

Graduate Assistantship, Rutgers University	**2010–2013**
Teaching Assistantship, Rutgers University	**2008–2010**
Excellence Fellowship, Rutgers University	**2007–2008**
University Merit Scholarship, Babeş-Bolyai University	**2002–2007**
Romanian Ministry of Education Scholarship	**2002–2007**
"Petrom" Scholarship, OMV Petrom S.A.	**2002–2007**

TEST SCORES

Ph.D. Candidacy Examination, overall percentage: **89.1%** (best score)	**Aug 2008**
GRE Subject: Physics, score: **990 / 990**	**Nov 2006**

TECHNICAL SKILLS

Programming/Scripting Languages

- Currently using: Python, R, MATLAB/Octave, Bash
- Used in the past: Basic, C, Fortran, FoxPro, Pascal

Genomic Data Analysis

- ATAC-seq, Chemical cleavage mapping, ChIP-exo, ChIP-seq, DNase-seq, FAIRE-seq, MNase-seq, NET-seq, RNA-seq

Other skills

- Intermediate Linux/UNIX skills, git
- LaTeX, Illustrator

REFERENCES

Alexandre V. Morozov (Ph.D. advisor)
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Director, Center for Quantitative Biology
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Steven Henikoff
Member, Fred Hutchinson Cancer Research Center
Investigator, Howard Hughes Medical Institute
Professor, University of Washington, School of Medicine

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Alan G. Hinnebusch
Chief, Section on Nutrient Control of Gene Expression
Program in Cellular Regulation and Metabolism,
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James R. Broach
Professor and Chair, Department of Biochemistry and Molecular Biology
Director, Penn State Hershey Institute for Personalized Medicine
Penn State College of Medicine
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