

# SUCKJOON JUN

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Professor, Department of Physics

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## EDUCATION AND TRAINING

Pusan National University (Korea)	Physics	B.Sc	1993-1997
Iowa State University (USA)	Physics	M.Sc	1997-1999
Simon Fraser University (Canada)	Physics	Ph.D.	1999-2004
AMOLF (the Netherlands)	Biophysics	Postdoctoral	2004-2006
Necker Hospital (France)	Evolution	Postdoctoral	2006-2007

## EMPLOYMENT HISTORY

Bauer Fellow (junior group leader)	Harvard University	09/2007 - 08/2012 (5 years)
Assistant Professor	UC San Diego	09/2012 - 06/2017 (4 years 9 months)
Associate Professor (with tenure)	UC San Diego	07/2017 - 06/2021 (4 years)
Professor	UC San Diego	07/2021 - present

## HONORS AND AWARDS

2005	Nominee for the Canadian Association of Graduate Studies Thesis Awards, Simon Fraser University
2005	Runner-Up for NSERC (Canada) Doctoral Prizes
2005	The Dean of Graduate Studies Convocation Medal in the Faculty of Science, Simon Fraser University
2005-2007	NSERC (Canada) post-doctoral fellowship
2007-2009	Marie-Curie Incoming International Post-doctoral Fellowship (declined in favor of the Bauer Fellowship at Harvard University)
2013-2016	Allen Distinguished Investigator Award, the Paul G. Allen Family Foundation (cohort of 7 in the US)
2013-2017	Pew Scholars Award, the Pew Charitable Trusts (cohort of 22 in the US)
2013-2018	CAREER Award, National Science Foundation (NSF)
2015-2019	Scialog Fellow, Research Corporation for Science Advancement/Gordon & Betty Moore Foundation (as a team with Prof. Laura Lackner, Northwestern University)
2019-2020	Lattimer Award, UCSD
2022	Michael and Kate Bárány Award, Biophysical Society (list of awardees in this <a href="#">link</a> )
2025-2026	Pivot Fellow, The Simons Foundation

## KEY PUBLICATIONS [GOOGLE SCHOLAR PROFILE - [LINK](#)]

1. Ryan Thiermann\*, Jin Yang\*, Taylor Rytlewski, Aniket Zodage, Farshad Abdollah-Nia, Fangzhou Xiao, John T. Sauls, Sarah Cox, Zulfar Ghulam-Jelani, Victoria Castillo, James R. Williamson, Jue D. Wang\*\*, **SJ\*\***.  
Decoupling of global metabolic flux and proteome in bacteria. (under review, *Science*, 2024)
2. Ziyuan Ren\*, Henrik Weyer\*, Laeschkir Würthner, Dongyang Li, Cindy Sou, Daniel Villarreal, Erwin Frey\*\*, **SJ\*\***.  
Robust and resource-optimal dynamic pattern formation of Min proteins in vivo to physiological perturbations.  
*Nature Physics* (provisionally accepted, 2024; also invited for *Research Briefings* by *Nature*); <https://www.biorxiv.org/content/10.1101/2023.08.15.553443v1>).
3. **[first experimental test of our initiation model in PRX Life]**  
Thias Boesen\*, Godefroid Charbon\*, Haochen Fu\*, Cara Jensen, Michael Sandler, **SJ\*\***, and Anders Lobner-Olesen\*\*.  
Dispensability of Extrinsic DnaA Regulators in *Escherichia coli* Cell-Cycle Control.  
*Proc. Nat. Acad. Sci. USA*, doi:10.1073/pnas.2322772121 (2024)
4. **[predictive and mechanistic modeling of replication initiation based on protein counting]**  
Haochen Fu, Fangzhou Xiao, **Suckjoon Jun**.  
Bacterial Replication Initiation as Precision Control by Protein Counting,  
*PRX Life* 1, 013011 (2023); see Viewpoint by Physics Magazine (<https://physics.aps.org/articles/v16/143>).

5. **[Cell-size control trilogy 3: mechanistic explanation of the adder principle]**  
F. Si, G. Le Treut, JT Sauls, S Vadia, PA Levin, **S. Jun**  
“Mechanistic origin of cell-size control and homeostasis in bacteria”  
*Current Biology* 28, 1760-1770 (2019) [[online & PDF](#)][[Google Scholar](#)][[UCSD News](#)]
6. **[extensive review of the field surveying over 1000 papers]**  
**Suckjoon Jun**, Fangwei Si, Rami Pugatch, Mathew Scott  
Fundamental Principles in Bacterial Physiology - History, Recent progress, and the Future with Focus on Cell Size Control: A Review.  
*Reports on Progress in Physics*, 81 056601 (2018) [[online](#)][[PDF](#)][[Google Scholar](#)]
7. **[Cell-size control trilogy 2: explanation of the origin of the cell-size law by Maaloe in 1958]**  
Fangwei Si\*, Dongyang Li\*, Sarah E. Cox, John T. Sauls, Omid Azizi, Cindy Sou, Amy B. Schwartz, Michael J. Erickstad, Yonggun Jun, Xintian Li, **Suckjoon Jun**  
Invariance of the initiation mass and predictability of cell size in *Escherichia coli*.  
*Current Biology* 27, 1278–1287 (2017) [[online & PDF](#)][[commentary](#)][[Google Scholar](#)]
8. **[Cell-size control trilogy 1: reported the adder principle]**  
Sattar Taheri-Araghi\*, Serena Bradde\*, Norbert Hill, Petra A. Levin, Johan Paulsson, Massimo Vergassola\*\*, **SJ\*\***  
Cell size control and homeostasis in bacteria.  
*Current Biology* 25, 385-391 (2015)  
[\[online\]](#) [[PDF+extended SI](#)] [[Google Scholar](#)] [[extensive news coverage](#)]
9. Ariel Amir, Farinaz Babaeipour, Dustin McIntosh, David R. Nelson & **Suckjoon Jun**  
Bending forces plastically deform growing bacterial cell walls.  
*Proc. Nat. Acad. Sci. USA* (2014)  
[\[open access full article\]](#) [[Google Scholar](#)] [[N&V, Nature Physics](#)]
10. **[Experimental test of the entropy model of the bacterial chromosome]**  
J. Pelletier, K. Harvorsen, B.-Y. Ha, R. Paparcone, S. Sandler, C. Woldringh, W. Wong\* & **S. Jun\***  
Physical manipulation of the *Escherichia coli* chromosome reveals its soft nature.  
*Proc. Nat. Acad. Sci. Plus*, 109(40), E2649-E2656 (2012)  
[\[open access full article\]](#) [[PNAS highlight](#)] [[Nature Methods highlight](#)] [[Google Scholar](#)]
11. **[The mother machine paper]**  
P. Wang, L. Robert, J. Pelletier, W. Dang, F. Taddei, A. Wright, **S. Jun\***  
Robust growth of *Escherichia coli*.  
*Current Biology* 20, 1099-1103 (2010)  
[\[online\]](#) [[PDF](#)] [[F1000](#)] [[Google Scholar](#)] [[Small Things Considered](#)]  
[\[The Scientist Top 7 Biology\]](#) [[The Scientist Top 7 Biochemistry](#)]
12. **[The entropy model of chromosome segregation, Part II]**  
**Suckjoon Jun\*** and Andrew Wright\*  
Entropy as the driver of chromosome segregation.  
*Nature Reviews Microbiology* 8, 600-607 (2010)  
Note: this is a peer-reviewed article under the “Opinions” section of the journal, containing significant original results.  
[\[online\]](#) [[PDF](#)] [[Small Things Considered](#)] [[Google Scholar](#)]
13. **[The entropy model of chromosome segregation, Part I]**  
**Suckjoon Jun\*** and Bela Mulder  
Entropy-driven spatial organization of highly confined polymers: Lessons for the bacterial chromosome.  
*Proc. Nat. Acad. Sci. USA* 103, 12388 (2006)  
[\[online\]](#) [[F1000](#)] [[JCB highlight](#)] [[Google Scholar](#)]

INVITED TALKS (100+++ since 2007 as a group leader; listed for the past three years)

2025

10/2025      Rockefeller University, NYC (TBC)

05/2025 EITech, China  
05/2025 Westlake University, China  
05/2025 Microbial Physiology and Community Workshop: Cell Growth, DNA Replication, Nucleoid Segregation, and Cell Division, Shenzhen, China  
03/2025 Cell size & growth seminars (<https://researchseminars.org/seminar/size-and-growth>)

## 2024

11/2024 University of Tokyo, Tokyo, Japan  
11/2024 The 12th 3R+3C International Symposium, Fukuoka, Japan  
10/2024 [to be rescheduled] *Biology seminar, Washington University, St Louis*  
07/2024 Physics, La Sapienza, Univ. Rome, Italy  
06/2024 Physics, Vrije Universiteit, Amsterdam, the Netherlands  
06/2024 Biology, University of Freiburg, Germany  
06/2024 Biology, ETH, Zurich, Switzerland  
06/2024 Human Technopole, Milan, Italy  
06/2024 “Deciphering complex energy landscapes and kinetic networks from single molecules to cells workshop Emergent Simplicity in Biophysical Dynamics”, Dijon, France  
06/2024 [postponed] Telluride workshop Emergent Simplicity in Biophysical Dynamics, Telluride, CO  
05/2024 APS DBIO Biological Physics & Physical Biology Seminar  
(<https://sites.google.com/view/bppb-seminar>)  
03/2024 American Physical Society March meeting, Minneapolis, MN  
02/2024 Economic Principles in Cell Physiology Forum, <https://principlescellphysiology.org/>

## 2023

12/2023 Annual meeting of the Molecular Biology Society of Japan, Kobe, Japan  
11/2023 SMBE meeting on Mechanisms of Cellular Evolution, Arizona State University  
10/2023 Research Frontiers in Biomathematics seminar, Biomathematics Department, UCLA  
10/2023 Living Histories, Division of Biological Physics, American Physical Society  
09/2023 Physics Colloquium, University of British Columbia, Vancouver, Canada  
09/2023 Physics Colloquium, Simon Fraser University, Burnaby, Canada  
09/2023 Biophysics Seminar, Arizona State University  
07/2023 Three seminars, the Cavendish Lab, University of Cambridge, UK  
06/2023 Guest Speaker, Quantitative Biosciences Munich Retreat, Germany  
06/2023 University of Toronto at Mississauga, ON, Canada  
06/2023 Canadian Association of Physicists (CAP) Congress Symposium, Fredericton, New Brunswick, Canada  
03/2023 March Meeting, American Physical Society, Las Vegas

**FUNDING:** Over 10M USD since 2012

## COLLABORATORS

- Archaea biology - Sonja Albers (University of Freiburg, Germany)
- Bacterial DNA replication
  - Tsutomu Katayama & Shogo Ozaki (Kyushu University, Japan)
  - Anders Lobner-Olesen (University of Copenhagen, Denmark)
- Bacterial Cell Physiology
  - Terence Hwa (UCSD)
  - Petra A. Levin (Washington U. St Louis)
  - Jade Wang (Univ. Wisconsin-Madison)
- Whole-cell simulations - Markus Covert (Stanford) & Eran Agmon (UConn)
- Stimulated Raman Spectroscopy - Seungeun Oh (UCSD)
- Yeast mitochondria - Laura Lackner (Northwestern University) & Lena Koslover (UCSD)
- Protein dynamic pattern formation - Erwin Frey (LMU, Munich) & Judy Kim (UCSD)