

# Seok Joo Chae

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| CONTACT INFORMATION | Department of Bioengineering,<br>Rice University<br>6100 Main St. Houston, Texas, USA  | <i>E-mail:</i> seokjoo@rice.edu<br><i>Web:</i> <a href="http://sjchae1207.github.io">http://sjchae1207.github.io</a> |
| APPOINTMENTS        | <b>Rice University</b> , Houston, Texas, United States<br>Postdoctoral Associate in Igoshin group  | Sep. 2024 – Present  |
| EDUCATION           | <b>KAIST</b> , Daejeon, Republic of Korea<br>Ph.D. in Mathematical Sciences<br>Advisor: Jae Kyoung Kim ( <a href="mailto:jaekkim@kaist.ac.kr">jaekkim@kaist.ac.kr</a> )  | Mar. 2017 – Aug. 2024  |
|                     | <b>KAIST</b> , Daejeon, Republic of Korea<br>B.S. in Mathematical Sciences with <i>Summa Cum Laude</i>   | Mar. 2013 – Feb. 2017  |
|                     | <b>Hansung Science High School</b> , Seoul, Republic of Korea  | Mar. 2011 – Feb. 2013  |
| RESEARCH INTERESTS  | Spatiotemporal dynamics, AI-driven data analysis, Circadian rhythms, Immunotherapy modeling, single-cell RNA sequencing  |  |
| PAPERS              | †: (co-)1st author, *: (co-)corresponding author.<br>One can enter the article web page by clicking the underlined title of a paper.   |  |
|                     | <ol style="list-style-type: none"><li>1. <b>Seok Joo Chae</b>†, Seolah Shin, Kangmin Lee, Seunggyu Lee*, and Jae Kyoung Kim*, <u>From Homogeneity to Heterogeneity: Refining Stochastic Simulations of Gene Regulation</u>, <i>Computational and Structural Biotechnology Journal</i>, 2025</li><li>2. Sunyoung Lee†, <b>Seok Joo Chae</b>†, In-Hwan Jang, Se-Chan Oh, Seok-Min Kim, Soo Yun Lee, Ji Hyun Kim, Jesang Ko, Hang J. Kim, Jae Kyoung Kim*, Tae-Don Kim*, <u>B7H6 is the predominant activating ligand driving natural killer cell-mediated killing in patients with liquid tumours: evidence from clinical, in silico, in vitro, and in vivo studies</u> <i>eBioMedicine</i>, 2024</li><li>3. Seolah Shin†, <b>Seok Joo Chae</b>†, Seunggyu Lee*, and Jae Kyoung Kim*, <u>Beyond homogeneity: Assessing the validity of the Michaelis–Menten rate law in spatially heterogeneous environments</u>, <i>PLoS Computational Biology</i>, 2024</li><li>4. Hyun Kim†, Won Chang, <b>Seok Joo Chae</b>, Jong-Eun Park, Minseok Seo, and Jae Kyoung Kim*, <u>scLENS: Data-driven signal detection for unbiased scRNA-seq data analysis</u>, <i>Nature Communications</i>, 2024</li><li>5. <b>Seok Joo Chae</b>†, Dae Wook Kim, Oleg A. Igoshin, Seunggyu Lee, and Jae Kyoung Kim*, <u>Beyond microtubules: The cellular environment at the endoplasmic reticulum attracts proteins to the nucleus</u>, <i>iScience</i>, 2024</li><li>6. <b>Seok Joo Chae</b>†, Dae Wook Kim, Seunggyu Lee, and Jae Kyoung Kim*, <u>Spatially coordinated collective phosphorylation filters spatiotemporal noises for precise circadian timekeeping</u>, <i>iScience</i>, 2023</li><li>7. Leonid A. Bunimovich†, Chi-Jen Wang, <b>Seok Joo Chae</b>, and Benjamin Z. Webb, <u>Uncovering Hierarchical Structure in Social Networks Using Isospectral Reductions</u>, <i>2018 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)</i>, 2018</li></ol> |  |

IN REVISION/  
IN PREPARATION

1. **Seok Joo Chae**†, Jon DeBonis†, Oleg A. Igoshin\*, Understanding the Dynamics of Molecular Glue Induced Degradation with Mathematical Model (In preparation)
2. Sunyoung Lee†, **Seok Joo Chae**†, In-Hwan Jang, Jae Kyoung Kim\*, Tae-Don Kim\*, Stress-induced self recognition by Natural Killer cells does not require HLA Class I (Under review).
3. **Seok Joo Chae**†, Johanna Inhyang Kim†, Hyeontae Jo, Yun Min Song, Saebom Jeon, Sun-Young Moon, Ji-Hye Lee, Sohee Oh, Seockhoon Chung, Jae Kyoung Kim\*, Jeong-Hyun Kim\*, A Machine Learning-Based Screening Tool for Predicting PTSD in Firefighters: Firefighter Latent Risk Evaluation (FLARE) (Under Review).
4. Le Na Lau, Jun-Ho Cho, **Seok Joo Chae**, Ung-Gyu Kim, Jae Kyoung Kim, In-Sung Luke Yeo\*, Immune-Metabolic Regulation of Early Osseointegration: Insights from Untargeted RNA Sequencing (Under Review).

HONORS AND  
AWARDS

- 2022 Best Poster Award, Korean Biological Rhythm Society Symposium  
2021 Best Poster Award, Society for Mathematical Biology Annual Meeting  
2019 SMB Landahl Travel Grant, Society of Mathematical Biology  
2018 SMB Landahl Travel Grant, Society of Mathematical Biology  
2018 NIMS-Mathworks MATLAB Challenge, KSIAM  
2017 – 2020 TJ Park POSCO Science Fellowship  
2016 Best Poster Award, KAIST Undergraduate Research Program Workshop  
2016 35th National Undergraduate Mathematics Competition Bronze Prize, KMS  
2015-2017 KAIST Presidential Fellowship  
2014 Dean’s List Award, College of Natural Sciences, KAIST  
2014 33rd National Undergraduate Mathematics Competition Silver Prize, KMS  
2013 32nd National Undergraduate Mathematics Competition Gold Prize, KMS  
2013 – 2017 The National Scholarship for Science and Engineering (Full Tuition), KOSAF

Abbreviations

- KMS: Korean Mathematical Society  
KSIAM: Korean Society for Industrial and Applied Mathematics  
KOSAF: Korea Student Aid Foundation,

INVITED TALKS

- 2024 Josić Group Lab seminar, University of Houston, Houston, TX, USA  
2024 ACMS Applied Math Seminar, University of Notre Dame, Notre Dame, IN, USA  
2024 SMB Annual Meeting, Minisymposium, Seoul, Korea  
2024 Busan University Mathematical Biology Seminar, Busan, Korea  
2023 KSIAM Annual Meeting, Special session, Gwangju, Korea  
2023 The 8th CIJK International Conference on Mathematical and Theoretical Biology, Jeju, Korea  
2019 SMB Annual Meeting, Minisymposium, Montreal, Canada

CONTRIBUTED  
TALKS AND  
POSTERS

- 2025 ARPA-H ROGUE Site Visit, Poster, Pittsburgh, PA, USA  
2023 International Congress on Industrial and Applied Mathematics, Contributed Talk, Tokyo, Japan  
2023 Society for Mathematical Biology Annual Meeting, Contributed Talk, Columbus, OH, USA  
2023 International Conference on Systems Biology, Contributed Talk, Hartford, CT, USA  
2023 Korean Biological Rhythm Society Symposium, Poster, Daejeon, Korea  
2022 Society for Research on Biological Rhythms, Biennial Meeting Poster, Fernandina Beach, FL, USA  
2022 International Conference on Systems Biology, Contributed Talk, Berlin, Germany

2022 Korean Biological Rhythm Society Symposium, Poster, Daejeon, Korea  
 2021 Korea Society for Mathematical Biology Annual Meeting Poster, Jeju, Korea  
 2021 Korea Society for Industrial and Applied Mathematics Annual Meeting Poster, Busan, Korea  
 2021 Korea Society for Mathematical Biology Spring conference, Contributed talk, Virtual  
 2021 Society for Mathematical Biology Annual Meeting, Poster, Virtual  
 2021 Korea Society for Industrial and Applied Mathematics Spring conference, Poster, Virtual  
 2020 Korea Society for Industrial and Applied Mathematics Annual Meeting, Poster, Virtual  
 2020 Society for Mathematical Biology Annual Meeting, Poster, Virtual  
 2019 Society for Mathematical Biology Annual Meeting, Poster, Montreal, Canada  
 2018 Society for Mathematical biology Annual Meeting, Poster, Sydney, Australia  
 2018 Korea Society for Mathematical Biology Annual Meeting, Contributed Talk, Busan, Korea  
 2018 IMA Workshop on Ecological and Biological Systems, Poster, Minneapolis, MN, USA  
 2018 A3 International Workshop For Mathematical and Life Sciences, Poster, Hiroshima, Japan  
 2016 KAIST Undergraduate Research Program Workshop Daejeon, Korea

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| TEACHING EXPERIENCE | <b>High school Research Program (HRP) (Spring 2023)</b>    |        |
|                     | <i>Mentor</i>  | KAIST  |
|                     | <b>Undergraduate Research Program (URP) (Spring 2022)</b>  |        |
|                     | <i>Mentor</i>  | KAIST  |
|                     | <b>Calculus II (Fall 2018)</b>                             |        |
|                     | <i>Student Tutor</i>                                       | KAIST  |
|                     | <b>Numerical Linear Algebra (Fall 2017)</b>                |        |
|                     | <i>Teaching Assistant</i>                                  | KAIST  |
|                     | <b>Calculus II (Fall 2017)</b>                             |        |
|                     | <i>Teaching Assistant</i>                                  | KAIST  |
|                     | <b>Ordinary Differential Equations (Spring 2017)</b>       |        |
|                     | <i>Teaching Assistant</i>                                  | KAIST  |
|                     | <b>Statistics for Graduate Students (Spring 2017)</b>      |        |
|                     | <i>Teaching Assistant</i>                                  | KAIST  |
|                     | <b>Calculus I (Spring 2016)</b>                            |        |
|                     | <i>Student Tutor</i>                                       | KAIST  |
|                     | <b>Introduction to Programming (Spring 2015)</b>           |        |
|                     | <i>Student Tutor</i>                                       | KAIST  |
|                     | <b>Calculus II (Fall 2014)</b>                             |        |
|                     | <i>Student Tutor</i>                                       | KAIST  |
|                     | <b>Calculus I (Spring 2014)</b>                            |        |
|                     | <i>Student Tutor</i>                                       | KAIST  |
| SERVICE             | <b>June 13-17, 2021: Support Staff, SMB Annual Meeting</b> | Online |
|                     | Host zoom links of sessions for Asia time zone.            |        |