

## Seok Joo Chae

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### CONTACT INFORMATION

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Biomedical Mathematics Group, IBS  
55 Expo-ro, Yuseong-gu, Daejeon 34126 Korea

### EDUCATION

**KAIST**, Daejeon, Republic of Korea  
Ph.D. in Mathematical Sciences, Mar. 2017 – Aug. 2024 (expected)  
Advisor: Jae Kyoung Kim (jaekkim@kaist.ac.kr)  
  
**KAIST**, Daejeon, Republic of Korea  
B.S. in Mathematical Sciences with *Summa Cum Laude*, Mar. 2013 – Feb. 2017  
  
**Hansung Science High School**, Seoul, Republic of Korea  
Mar. 2011 – Feb. 2013

### RESEARCH INTERESTS

Spatiotemporal systems, Model reduction, Circadian rhythms, Immunotherapy, single-cell RNA sequencing

### PAPERS

- †: (co-)1st author, \*: (co-)corresponding author.  
One can enter the article web page by clicking the underlined title of a paper.
1. Hyun Kim†, Won Chang, **Seok Joo Chae**, Jong-Eun Park, Minseok Seo, and Jae Kyoung Kim\*, scLENS: Data-driven signal detection for unbiased scRNA-seq data analysis, *Nature Communications*, 2024
  2. **Seok Joo Chae**†, Dae Wook Kim, Oleg A. Igoshin, Seunggyu Lee, and Jae Kyoung Kim\*, Beyond microtubules: The cellular environment at the endoplasmic reticulum attracts proteins to the nucleus, *iScience*, 2024
  3. **Seok Joo Chae**†, Dae Wook Kim, Seunggyu Lee, and Jae Kyoung Kim\*, Spatially coordinated collective phosphorylation filters spatiotemporal noises for precise circadian timekeeping, *iScience*, 2023
  4. Leonid A. Bunimovich†, Chi-Jen Wang, **Seok Joo Chae**, and Benjamin Z. Webb Uncovering Hierarchical Structure in Social Networks Using Isospectral Reductions, *2018 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, 2018

### IN REVISION/ IN PREPARATION

1. Seolah Shin†, **Seok Joo Chae**†, Seunggyu Lee\*, and Jae Kyoung Kim\*, Model reduction in Reaction-diffusion systems (In minor revision for *PLoS Computational Biology*)
2. Sunyoung Lee†, **Seok Joo Chae**†, 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\*, NK killing activity is determined by activator-driven gating. (Under review in *Science Advances*)
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\*, Predicting the risk of PTSD among a nationwide cohort of firefighters using a machine learning algorithm. (In preparation).

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
	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	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	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
TEACHING EXPERIENCE	<b>High school Research Program (URP) (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> Host zoom links of sessions for Asia time zone.	Online
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