

Jae Kyoung Kim

CONTACT INFORMATION

Department of Mathematical Science
KAIST
291 Daehak-ro Yuseong-gu Daejeon 34141 Korea
Phone: 82-42-350-2736
E-mail: jaekkim@kaist.ac.kr
<http://mathsci.kaist.ac.kr/~jaekkim>

EDUCATION

University of Michigan, Ann Arbor, Michigan, USA
Ph.D. Applied and Interdisciplinary Mathematics, Sep. 2008–Aug. 2013
• Advisors: Daniel Forger, Victoria Booth
• Dissertation: Mathematical Modeling and Analysis of Cellular Clocks (Sumner B. Myers Prize)
Seoul National University, Seoul, Republic of Korea
Bachelor of Mathematics Education, 2001 – 2005 (Summa Cum Laude)

ACADEMIC APPOINTMENT

Department of Mathematical Science, KAIST, Daejeon, Korea
Associate Professor. 2018–Present (tenured: 2022), Assistant Professor. 2015–2018
Biomedical Mathematics Group, IBS, Daejeon, Korea
Chief Investigator. 2021–Present
Young Korean Academy of Science and Technology, Korea
Member. 2019–Present
Korea Institute for Advanced Study, Korea
Associate Member. 2018–Present
Department of Mathematics, University of Michigan, Ann Arbor, Michigan, USA
Visiting Scholar. 2019–2020
Mathematical Biosciences Institute, The Ohio State University, Columbus, OH, USA
Postdoctoral Fellow. 2013–2015

HONORS AND AWARDS

2026 KAIST Innovation Award	KAIST
2025 Scientist of the Year Award	Korea Science Journalists Association
2025 KAIST Global Research Cooperation Awards	KAIST
2025 Special award in the Technology Value Creation	KAIST
2024 & 2023 Innovation Award	MEDITEK
2023 KAIST Global Research Cooperation Awards	KAIST
2023 Citation from the Minister Ministry of Science and ICT	Ministry of Science and ICT
2021 1st Choi Seok-jeong Award (Minister Award)	Ministry of Science and ICT
2019 J. Shelton Horsley Research Award	Virginia Academy of Science
2017 1st KSIAM Young Researcher Award	KSIAM
2017 & 2019 Best Teaching Award	College of Natural Sciences, KAIST
2017 EWon Assistant Professorship for Outstanding Junior Faculty	KAIST
2016 30 Young Leading Scientists of Korea	POSTECH & Dong-A Ilbo
2015 Sangsan Prize for Young Mathematicians	The Korean Mathematical Society
2015 TJ Park Science Fellowship	POSCO TJ Park Foundation
2013 Sumner B. Myers Prize for the best math Ph.D. thesis	University of Michigan
2012 Department of Mathematics Outstanding Teaching Award	University of Michigan

110. Bang SY, Awan A, Lim D, Hwang S, Koo B, **Kim JK***, Jung KY*, Delayed Circadian Rhythm in Restless Legs Syndrome and Its Association with Symptom Severity: An Actigraphy-Based Study, *Journal of Biological Rhythms* (Accepted)
109. YM Song, S Jeon, A Cho, S Chung, Y Ahn, S Suh*, **Kim JK***, Individual and occupational predictors of sleep intervention response among shift-working firefighters, *Journal of Behavioral and Cognitive Therapy* (Accepted).
108. Chae SJ, Kim JI, Jo H, Song YM, Jeon S, Moon SY, Lee JH, Oh S, Chung S, **Kim JK***, Kim JH*, A Machine Learning-based Screening Tool for classifying Post-traumatic Stress Disorder in Firefighters: Firefighter Latent Risk Evaluation (FLARE), *BMC Psychiatry* (Accepted)
107. Cawiding OR, Kim D, Joo EY*, **Kim JK***, A Scalable Framework for Population-Level Precision Health: Insights from Sleep Disorders, *Sleep Medicine* (2026)
106. Lim D, Kim J, Kim JH, **Kim JK***, Initial Condition Decision to Ensure Reliable Circadian Phase Estimation with Shorter-Term Wearable Data, *J. Biol. Rhythms* (2026)
105. Gavina BL, Lee T, Cawiding O, Choi S, Choi S, Kim S*, **Kim JK***, Optimizing oral contraceptive timing: Morning intake reduces doses and enhances efficacy, *PLoS Comput. Biol.* (2026)
104. M Lim, S Kim, S Jeon, EM Jeong, **Kim JK**, S Chung, Machine learning approached a 14-item shortened version of the Positive and Negative Sleep Appraisal Measure (PANSAM-14) *Sleep and Breathing* (2026)
103. G Hwang, H Jo, **Kim JK**, Data-Driven Inference of Coupling Functions in Oscillatory Systems via Physics-Informed Neural Networks, *Physics Review Research* (2026) .
102. Kim H, Rishad AF, Spinicci K, **Kim JK**, A fully automated, data-driven approach for dimensionality reduction and clustering in single-cell RNA-seq analysis, *Comput. Methods Programs Biomed. Update* (2026)
101. Jo H*, Josic K*, **Kim JK***, Neural network-based parameter estimation for non-autonomous differential equations with discontinuous signals, *SIAM J. Appl. Math.* (2026)
100. Cawiding OR, Song YM, **Kim JK**, A reframed landscape of causal emergence, *Patterns* (2026)
99. Lim D, Moon S, Song YM, Kim M, Kim J, Kim K, Cho BK, **Kim JK**, Toward single-cell control: noise-robust perfect adaptation in biomolecular systems, *Nature Communications* (2025)
98. Vu NAT, Song YM, Kim SK, Yun H, Lee S, **Kim JK**, Chae JW, Beyond the Michaelis-Menten: Evaluation of a tQSSA-Based IVIVE Approach for Predicting In Vivo Intrinsic Clearance From Hepatocyte Assays, *CPT: Pharmacometrics & Systems Pharmacology* (2025)
97. Jeong EM, Chung CY, **Kim JK**, How cells tame noise while maintaining ultrasensitive transcriptional responses, *PLOS Computational Biology* (2025)
96. OR Cawiding, H Bae, JH Kim, EY Joo, **Kim JK**, Simplified and accurate Approach to Sleep Disorder Prediction Using Body Composition Metrics: A Development and Validation Study, *Sleep* (2025)
95. M Lim, J Wangwattanakool, S Hong, S Jeon, **Kim JK**, Validating the Insomnia Severity Index and its 3-item shortened version among cancer patients: A Machine Learning Approach, *Sleep Med. Res.* (2025).
94. K Lee, D Lim, **Kim JK**, More than just slowing: bimodal vigilance dynamics in sleep deprivation, *Sleep* (2025)
93. D Lim, KT Ko, H Hong, H Lee, B Choi, W Chang, S Choi, **Kim JK**, A history-dependent approach for accurate initial condition estimation in epidemic models, *PLOS Computational Biology* (2025)
92. J Lee, YM Song, H Yun, S Choi, **Kim JK**, Beyond Michaelis-Menten: A Modified Enzyme Kinetics Equation Improves Drug Metabolism Prediction in Bottom-Up PBPK Modeling, *European Journal of Pharmaceutical Sciences* (2025)

91. M Boyett, P Li, Y Xiang, H Zhang, **Kim JK**, A D'Souza, Circadian determinants of heart rhythm and arrhythmias, *Journal of Molecular and Cellular Cardiology* (2025)
90. S Jeon, EM Jeong, YR Bang, J Ahn, S Yoo, AG Harvey, **Kim JK***, S Chung, Validation of the Korean version of the Sleep-Related Behaviours Questionnaire (SRBQ) among the general population, *Behavioral Sleep Medicine* (2025)
89. Li P, Lee S, Choi KY, Rubin JE*, **Kim JK***, Cardiogenic and Chronobiological Mechanisms in Seizure-Induced Sinus Arrhythmias, *PLoS Comp Biol* (2025).
88. HJ Jang, YM Song, JS Jeon, HW Y, SK Kim, **Kim JK**, Optimizing enzyme inhibition analysis: precise estimation with a single inhibitor concentration, *Nature Communications* (2025)
87. H Kim, IS Park, JE Park, JK Kim, M Seo, **Kim JK**, scICE: enhancing clustering reliability and efficiency of scRNA-seq data with multi-cluster label consistency evaluation, *Nature Communications* (2025)
86. Cawiding OR, Jeon S, Tubera-Panes D, de los Reyes V AA, **Kim JK**. Disentangling climates dual role in dengue dynamics: a multi-region causal analysis study, *Science Advances* (2025)
85. Koseska A, **Kim JK**, Outside-in regulation of cellular clocks *Nature Physics* (2025)
84. Hong H, Moon S, Hirono Y, **Kim JK**. Topological Criterion for Robust Perfect Adaptation of Reaction Fluxes in Biological Networks. *iScience* (2025)
83. Song YM, Choi SJ, Lim DJ, Wijaya RH, Jang HJ, Park HR, Joo EY*, **Kim JK***, A Digital, Real-Time, History-Based Sleep-Management Tool to Enhance Alertness, *Sleep* (2025)
82. Cawiding OR, Jo H, Jeon S, Ardi FR, **Kim JK***, Chung S*, Cancer-related Dysfunctional Beliefs and Attitude about Sleep-6 (C-DBAS-6): A practical and accurate shortened version using XGBoost and SymScore. *Sleep and Biological Rhythms* (2025)
81. Song YM, Lee K, **Kim JK**, Validity of the total QSSA in stochastic biochemical reaction networks (*KSIAM J*) (2025)
80. Lim D, Choi SJ, Song YM, Park HR, Joo EY*, **Kim JK***, Enhanced Circadian Phase Tracking: A 5 Hour DLMO Sampling Protocol Using Wearable Data, *J Biological Rhythms* (2025)
79. Chae SJ, Shin S, Lee S, **Kim JK**, From Homogeneity to Heterogeneity: Refining stochastic simulations of gene regulation, *Computational and Structural Biotechnology Journal* (2025)
78. Cawiding OR, Lee S, Jo H, Kim S, Suh SY, Joo EY, Chung S, **Kim JK**, Machine Learning Accuracy Meets Transparency in a Symbolic Regression-Based Clinical Score Generator: Development and Validation Study, *Computers in Biology and Medicine* (2025)
77. EM Jeong, **Kim JK**, Less is More: Machine Learning-Based Shortened Sleep Questionnaires for Efficient Clinical Practice, *Sleep Medicine Research* (2025)
76. Lim D, Jeong J, Song YM, Lee HJ*, **Kim JK***, Accurate Prediction of Mood Episodes in Mood Disorder Patients Using Sleep and Circadian Rhythm Features from Wearables, *NPJ Digital Medicine* (2024)
75. Hong H, Eom E, LEE H, Chio S, Chio B, **Kim JK**, Overcoming Bias in Estimating Epidemiological Parameters: A Bayesian Approach with Realistic History-Dependent Disease Spread Dynamic, *Nature Communications* (2024)
74. Song YM, Kim JK, What's driving rhythmic gene expression: Sleep or the clock ?, *Cell Systems* (2024)
73. Otobe Y, Jeong EM, Ito S, Fukada Y*, **Kim JK***, Yoshitane H*, Phosphorylation of DNA-binding domains of CLOCK-BMAL1 complex is essential for mammalian circadian clockwork, *PNAS* (2024)
72. Shin S, Chae SJ, Lee S, **Kim JK**, Beyond homogeneity: Assessing the validity of the Michaelis-Menten rate law in spatially heterogeneous Environments, *PLoS Comp Biol* (2024)
71. Jo HT, Jeon HJ, Ahn J, Jeon S*, **Kim JK***, Chung S*, Dysfunctional Beliefs and Attitudes about Sleep-6 (DBAS-6): Data-driven Shortened Version from a Machine Learning Approach, *Sleep Medicine* (2024)

70. Jo H, Lim M, Jeon HJ, Ahn J, Jeon S, **Kim JK***, Chung S*, Jo H, Lim M, Jeon HJ, Ahn J, Jeon S, Kim JK*, Chung S*, Data-driven Shortened Insomnia Severity Index: A Machine Learning Approach *Sleep and Breathing* (2024)
69. Byun JH, Jeon HS, Yun HW, **Kim JK**, Validity Conditions of Approximations for a Target-Mediated Drug Disposition Model: A Novel First-Order Approximation and Its Comparison to Other Approximations *PLoS Comp Biol* (2024)
68. Kim H, Chang W, Chae SJ, Park JE, Seo M, **Kim JK**, scLENS: Data-driven signal detection for unbiased scRNA-seq data analysis *Nature Communications* (2024)
67. Song YM, Jeong J, Reyes AV, Cho CH, Yeom JW, Lee T, Lee JB, Lee HJ, **Kim JK**, Causal Dynamics of Sleep, Circadian Rhythm, and Mood in Major Depression and Bipolar Disorder Patients: Insights from Longitudinal Wearable Device Data *Lancet eBiomedicine* (2024)
66. Jeong EM, **Kim JK**, Robust Ultrasensitive Transcriptional Switch in Noisy Cellular Environments *NPJ Systems Biol Application* (2024)
65. Li P, **Kim JK**, Central and peripheral clocks synergistically enhance circadian robustness, flexibility and performance of cardiac pacemaking *PLoS Comp Biol* (2024)
64. Chae S, Kim DW, Igoshin OA, Lee S, **Kim JK**, Beyond microtubule: Cellular environment at the endoplasmic reticulum attracts proteins to the nucleus, essential for nuclear transport *iScience* (2024)
63. Song YM, Campbell S, Shiao L, **Kim JK***, Ott W*, Noisy delay denoises biochemical oscillators *Physical Review Letters* (2024)
62. Jo H, Hong H, Hwang HJ, Chang W, **Kim JK**, Density Physics-Informed Neural Network identifies sources of cell heterogeneity in signal transduction under antibiotic stress, *Cell Patterns* (2024)
61. Hong H, Cortez MJ, Cheng YY, Kim HJ, Choi B, Josic K, **Kim JK**, Inferring delays in partially observed gene regulatory networks, *Bioinformatics* (2023)
60. Lee MP, Hoang K, Park S, Song YM, Joo EY, Chang W, Kim JH, **Kim JK**, Imputing Missing Sleep Data from Wearables with Neural Networks in Real-World Settings, *Sleep* (2023)
59. Ha S, Choi SJ, Lee S, Wijaya RH, Kim JH, Joo EY, **Kim JK**, A machine learning-based simple questionnaire for predicting the risk of sleep disorders, *Journal of Medical Internet Research* (2023)
58. Park SH, Ha S, **Kim JK**, A general model-based causal inference overcomes the curse of synchrony and indirect effect, *Nature Communications* (2023)
57. YM Song, SJ Choi, SH Park, SJ Lee, EY Joo, **Kim JK**, A real-time, personalized sleep intervention using mathematical modelling and wearable devices, *Sleep* (2023)
56. Chae SJ, Kim DW, Lee S, Kim JK, Spatially coordinated collective phosphorylation filters spatiotemporal noises for precise circadian timekeeping, *iScience*(2023)
55. Hernandez BS, Vincent P, Johnston M, **Kim JK**, A framework for deriving analytic steady states of biochemical reaction networks, *PLOS Comp Biol* (2023)
54. Hong HH, Hernandez BS, Kim J,**Kim JK**, Computational translation framework identifies biochemical reaction networks with special topologies and their long-term dynamics, *SIAM Applied Math* (2023)
53. Vu Thi NA, Song YM, Tran Thi Q, Yum HY, Kim SK⁺, Chae JW⁺, Kim JK⁺, Beyond the Michaelis-Menten: Accurate Prediction of Drug Interactions through Cytochrome P450 Induction, *Clinical Pharmacology & Therapeutics* (2022) (Cover Article)
52. Kim DW, Byun JM, Lee JK, **Kim JK**⁺, Koh Y⁺, Chemotherapy delivery time affects anti-lymphoma treatment outcome in a sex-dependent manner, *JCI Insight* (2022)
51. Abe YO, Yoshitane H, Kim DW, Koebis M, Aiba A, **Kim JK**⁺, Fukada Y⁺, Rhythmic transcription of Bmal1 stabilizes the circadian timekeeping system in mammals *Nature Communications* (2022)
50. Ryu HJ, Kang WH, Kim T, **Kim JK**, Shin KH, Chae JW, Yun HY, A compatibility evaluation

- between the physiologically based pharmacokinetic (PBPK) model and the compartmental PK model using the lumping method with real cases, *Frontiers in Pharmacology* (2022)
49. Lee J, Ha S, Ahmed O, Cho IK, Lee D, Kim K, Kang S, Lee S, Suh S, Chung S, **Kim JK**, Validation of a Korean version of the Metacognitions Questionnaire-Inomnia (MCQ-I) and development of shortened versions of the rating scale: a random forest approach, *Sleep Medicine* (2022)
 48. H, Noh JY, Lee H, Choi S, Choi B, **Kim JK**⁺, Shin EC⁺, Modeling Incorporating the Severity-Reducing Long-term Immunity: Higher Viral Transmission Paradoxically Reduces Severe COVID-19 During Endemic Transition *Immune Networks* (2022)
 47. Tyson JJ, Csikasz-Nagy A, Gonze D, **Kim JK**, Santos S, Wolf J, Time-keeping and decision-making in living cells: Part II, *Interface Focus*(2022)
 46. Tyson JJ, Csikasz-Nagy A, Gonze D, **Kim JK**, Santos S, Wolf J, Time-keeping and decision-making in living cells: Part I, *Interface Focus* (2022)
 45. Jeong EM, Song YM, **Kim JK**, Combined multiple transcriptional repression mechanisms generate ultrasensitivity and oscillations *Interface Focus* (2022)
 44. Kim DW, Hong H, **Kim JK**, Systematic inference identifies a major source of heterogeneity in cell signaling dynamics: the rate-limiting step number, *Science Advances* (2022)
 43. Jeong EM, Kwon M, Cho E, Lee SH, Kim EY⁺, **Kim JK**⁺, Systematic modeling-driven experiments identify distinct molecular clockworks underlying hierarchically organized pacemaker neurons, *PNAS* (2022)
 42. Paya ML, Kim DW, Somers DE, **Kim JK**⁺, Foo M⁺, Modeling of Plant Circadian Clock for Characterizing Hypocotyl Growth under Different Light Quality Conditions, *in silico Plant* (2022)
 41. Song YM, Hong H, **Kim JK**, Universally valid reduction of multiscale stochastic biochemical systems using simple non-elementary propensities, *PLoS Comput. Biol.* (2021)
 40. Hong J, Choi SJ, Park SH, Hong H, Booth V, Joo EY⁺, **Kim JK**⁺, Personalized sleep-wake patterns aligned with circadian rhythm relieve daytime sleepiness, *iScience* (2021)
 39. Tyler J, Forger DB, **Kim JK**⁺, Inferring causality in biological oscillators, *Bioinformatics* (2021)
 38. Cortez MJ, Hong H, Choi B⁺, **Kim JK**⁺, Josic K⁺, Hierarchical Bayesian models for inference in biochemical reactions with delays, *Bioinformatics* (2021)
 37. Hong H, Kim JS, Ali M, Sontag ED, **Kim JK**, Derivation of stationary distributions of biochemical reaction networks via structure transformation, *Communication Biology* (2021)
 36. Bolsiusa YG, Zurbriggen MD, **Kim JK**, Kasa MJ, Meerloa P, Aton SJ, Havekesa R, The role of clock genes in sleep, stress and memory, *Biochemical Pharmacology* (2021)
 35. MA EY*, Kim JW*, Lee Y, Cho SW, Kim H, **Kim JK**, Combined unsupervised supervised machine learning for phenotyping complex diseases with its application to obstructive sleep apnea, *Scientific Reports* (2021)
 34. Beesley S*, Kim DW*, DAlessandro M, Jin Y, Lee K, Joo H, Young Y, Tomko R, **Kim JK**⁺, Lee C⁺, Wake-sleep cycles are severely disrupted by diseases affecting cytoplasmic homeostasis, *PNAS* (2020) (Editor's choice of Sci Trans Med)
 33. **Kim JK**⁺, Tyson JJ, Misuse of the Michaelis-Menten rate law for protein-interaction networks and its remedy, *PLoS Comput Biol* (2020)
 32. Kim DW, Eder Z⁺, **Kim JK**⁺, Wearable technology and systems modeling for personalized chronotherapy, *Curr Opin Syst Biol* (2020)
 31. C Nguyen, **Kim JK**, SK Han, Robust and Tunable Toggle Switches with Interlocked Positive Feedback Loops, *J Korean Phys Soc* (2020)
 30. Back HM, Yun HY, Kim SK⁺, **Kim JK**⁺, Beyond the Michaelis-Menten: Prediction of in vivo clearance for drugs with low K_M , *Clin. Transl. Sci.* (2020)
 29. Masuda S, Narasimamurthy R, Yoshitane H, **Kim JK**, Fukada Y, Virshup DM, Mutation of a

- PER2 phosphodegron perturbs the circadian phosphoswitch, *PNAS* (2020).
28. Zou X, DW Kim, Gotoh T, Liu J, **Kim JK**, Finkielstein CV, A systems biology approach identifies hidden regulatory connections between the circadian and cell-cycle checkpoints, *Front. Physiol.* (2020)
 27. Choi B, Cheng YY, Cinar S, Ott W, Bennett MR, Josic K⁺, **Kim JK**⁺, Bayesian inference of distributed time delay in transcriptional and translational regulation, *Bioinformatics* (2020)
 26. **Kim JK**⁺,*, Chen Y*, Hirning A, Alnahhas R, Josic K⁺, Bennett MR⁺. Long-range temporal coordination of gene expression in spatially extended synthetic microbial consortia, *Nature Chem Biol* (2019)
 25. Ali K*, **Kim JK***, Jan M, Khan H, Khan I, Shen M, Park J, Lim CJ, Hussain S, Baek D, Wang K, Chung W, Vicente R, Lee SY, Gong Z, Kim WY, Bressan RA, Pardo JM, Yun DJ, Rheostatic control of ABA signaling through HOS15-mediated OST1 degradation, *Molecular Plant* (2019)
 24. Choi B, Cheng YY, Cinar S, Ott W, Bennett MR, Josic K⁺, **Kim JK**⁺, Bayesian inference of distributed time delay in transcriptional and translational regulation, *Bioinformatics* (2019)
 23. Kim DW, Chang C⁺, Chen X, Doran A, Gaudreault F, Wager T, DeMarco GJ, **Kim JK**⁺, Systems approach reveals photosensitivity and PER2 level as determinants of clock modulator efficacy, *Mol Syst Biol* (2019; Cover article)
 22. Jo H, Kim Y, **Kim JK**, Foo M, Somers DE, Kim P, Waveforms of Molecular Oscillations Reveal Circadian Timekeeping Mechanisms, *Communications Biol* (2018)
 21. Liu J, Zou X, Gotoh T, Brown AM, Jiang L, **Kim JK**, Finkielstein CV, Distinct control of PERIOD2 degradation and circadian rhythms by the oncoprotein MDM2, *Science Signaling* (2018)
 20. Bellman J*, **Kim JK***, Lim S, Hong C, Modeling reveals a key mechanism for light-dependent phase shifts of Neurospora circadian rhythms, *Biophys J* (2018)
 19. Narasimamurthy R, Hunt S, Lu Y, Fustin JM, Partch CL, Okamura H, Partch CL, Forger DB, **Kim JK**, Virshup DM, CK1 protein kinases prime the PER2 circadian phosphoswitch, *PNAS* (2018)
 18. Choi B, Rempala G, **Kim JK**, Beyond Michaelis-Menten: Accurate and efficient estimation of enzyme kinetic parameters, *Scientific Report* (2017)
 17. DAlessandro M*, Beesley S*, **Kim JK***, Jones Z, Chen R, Vera D, Kyle K, Pagano M, Nowakowski R, Lee C, Stability of the circadian system requires a robust degradation of PERIOD, *Current Biol* (2017)
 16. **Kim JK**⁺, Rempala G⁺, Kang H⁺, Reduction for stochastic reaction network with multi-scale conservation, *SIAM Multiscale Model Simul* (2017)
 15. **Kim JK**⁺, Sontag E⁺, Reduction of Multiscale Stochastic Biochemical Reaction Networks using Exact Moment Derivation, *PLoS Comput Biol* (2017)
 14. Gotoh T*, **Kim JK***⁺, Liu J, Vila-Caballer M, Stauffer PE, Tyson JJ, Finkielstein C⁺, A systems-driven experimental approach reveals the complex regulatory distribution of p53 by circadian factors, *PNAS* (2016)
 13. **Kim JK**, Protein sequestration versus Hill-type repression in circadian clock models, *IET Syst Biol* (2016)
 12. DAlessandro M, Beesley S, **Kim JK**, Chen R, Abich E, Cheng W, Yi P, Takahashi JS, Lee C, A tunable artificial circadian clock in clock-defective mice, *Nature Commun* (2015)
 11. **Kim JK**⁺, Josic K⁺, Bennett MR⁺, The relationship between deterministic and stochastic quasi-steady state approximation, *BMC Syst Biol* (2015)
 10. Zhou M*, **Kim JK***, Ling Eng GW, Forger DB, Virshup DM, A Period2 Phosphoswitch Regulates and Temperature Compensates Circadian Period *Molecular Cell* (2015)
 9. Chen Y*, **Kim JK***, Hirning A, Josic K, Bennett MR, Emergent genetic oscillations in a synthetic microbial consortium. *Science* (2015)
 8. **Kim JK**, Josic K, Bennett MR, The Validity of Quasi-Steady-State Approximations in Discrete

Stochastic Simulations, *Biophys J* (2014)

7. **Kim JK**⁺, Kilpatrick Z, Bennett MR, Josić K⁺, Molecular mechanisms that regulate the coupled period of the mammalian circadian clock, *Biophys J* (2014) (*Featured article of journal*)
6. Goriki A, Hatanaka F, Myung J, **Kim JK**, Yoritaka T, Tanoue S, Abe T, et. al.. A novel protein, CHRONO, functions as a core component of the mammalian circadian clock, *PLoS Biol* (2014)
5. **Kim JK**, Forger DB, Marconi M, Wood D, Doran A, Wager TT, Chang C, Walton K, Modeling and validating chronic pharmacological manipulation of circadian rhythms, *CPT Pharmacometrics Syst Pharmacol* (2013)
4. **Kim JK**, Jackson T, Mechanisms that enhance sustainability of p53 pulses, *PLoS ONE*, (2013)
3. **Kim JK**, Forger DB, A mechanism for robust circadian timekeeping via stoichiometric balance, *Mole Syst Biol* (2012) (*Recommended reading by F1000*)
2. **Kim JK**, Forger DB, On the Existence and Uniqueness of Biological Clock Models Matching Experimental Data, *SIAM J APPL MATH* (2012)

In Preparation

18. T Kim, J Cha, H Jeon, H Yun, D Lim, **Kim JK**^{*}, Exact formula of the total quasi-steady state approximation in competitive target-mediated drug disposition (Submitted).
17. M Lim, S Yun, M Lee, EM Jeong, S Jeon, **Kim JK**^{*}, S Chung^{*}, Validation of the Korean Version of the Counterfactual Thinking for Negative Events Scale (CTNES) and Data-Driven Development of the Shortened CTNES-6 (Submitted).
16. H Jeon, W Jung, H Yun, S Lee, **Kim JK**^{*}, JW Chae^{*}, JH Byun^{*}, Clinical trial data-based evaluation of a novel target-mediated drug disposition approximation model (Submitted).
15. Bang SY, Awan A, Lim D, Hwang S, Koo B, **Kim JK**^{*}, Jung KY^{*}, Delayed Circadian Rhythm in Restless Legs Syndrome and Its Association with Symptom Severity: An Actigraphy-Based Study (Submitted).
14. Awan A, Jeong EM, Hong S, Ahn J, Jeon S, **Kim JK**^{*}, Chung S^{*}, Machine learning-based development of a shortened six-item version of the fear of progression questionnaire short form (FoP-Q-6) among patients with cancer (Submitted).
13. Jeong Y, Kim HM, Kim H, **Kim JK**^{*}, Park J^{*}, stLENS identifies unbiased complex spatial patterns in spatial transcriptomics data (Submitted).
12. Cawiding OR, Kim D, Joo EY, **Kim JK**, A Scalable Framework for Population-Level Precision Health: Insights from Sleep Disorders (Submitted).
11. JH Byun, I Park, **Kim JK**, Fractional Target-Mediated Drug Disposition Model: Quasi Steady-State Approximation and Its Validity Condition (Submitted).
10. LN Lau, JH Cho, SJ Chae, UG Kim, **Kim JK**, IL Yeo, Immune-Metabolic Regulation of Early Osseointegration: Insights from Untargeted RNA Sequencing (Submitted)
9. S Lee, SJ Chae, IH Jang, JH Kim, **Kim JK**, TD Kim, Stress-induced self recognition by Natural Killer cells does not require HLA Class I (Submitted)
8. BL Gavina, T Lee, O Cawiding, S Choi, S Choi, S Kim, **Kim JK**, Optimizing oral contraceptive timing: Morning intake reduces doses and enhances efficacy (In revision).
7. S Park, DW Kim, H Kim, J Byun, S Chong, SW Song, YH Kim, YH Cho, SH Hong, CK Hong, JH Kim, S Lee, **Kim JK**, JM Lee, Effect of tumor resection time-of-day on overall survival of patients with glioblastoma multiforme and a circadian-regulated tumor microenvironment: an observational cohort study (Submitted).
6. SJ Chae, JI Kim, H Jo, YM Song, S Jeon, SY Moon, JH Lee, S Oh, S Chung, **Kim JK**, JH Kim, Identifying risk factors of PTSD among a nationwide cohort of firefighters using a machine learning algorithm (Submitted).
5. J. Kim, D Lim, JH Kim, **Kim JK**, Initial Condition Decision to Ensure Reliable Circadian Phase

Estimation with Shorter-Term Wearable (In revision).

4. EM Jeong, H Kim, S Jeon, **Kim JK**, S Chung, The Dysfunctional Self-Focus Attributes Scale-7 (DSAS-7): A Machine Learning-Based Development of a Shortened Version of the DSAS (In revision).

3. GI Shin, JY Cha, D Lim, A Alimzhan, G Ahn, SY Jeong, MG Ji, SY Lee, MG Kim, J Kim, **Kim JK**, WY Kim, GIGANTEA gates TOR-mediated meristem activation to control plant diurnal root growth, Under Review in *Science*.

2. SY Jeong, DW Kim, S Ha, G Ahn, GI Shin, CC Nguyen, JY Cha, **Kim JK**, WY Kim, Unraveling strong circadian rhythms: synergy in protein degradation and synthesis (Submitted).

BOOK CHAPTERS **Kim JK** Tick, Tock, Circadian Clocks. In: Kraikivski P. (eds) *Case Studies in Systems Biology* Springer (2021)

Hong H, Choi, B, **Kim JK**, Beyond the Michaelis-Menten: Bayesian Inference for Enzyme Kinetic Analysis. In Quentin Vanhaelen (Ed.) *Computational Methods for Estimating the Kinetic Parameters of Biological Systems*, Springer US (2021)

PATENT

2025 Enzyme Inhibition Analysis Method (10-2024-0139208)

2025 Symbolic regression-based clinical score generator (10-2024-0139201)

2024 Algorithm for signal analysis of single cell RNA sequencing (10-2024-0019028)

2023 Personalized sleep pattern providing system (10-2023-0088588)

2023 Apparatus and method for predicting risk of sleep disorders using machine learning based questionnaires (10-2023-0036139)

2023 Method for predicting the cytotoxicity of NK cells (10-2023-0005004)

2020 Health wearable device-based program providing personalized sleep-wake patterns (10-2020-0154795)

GRANT

2021-2026 Biomedical Mathematics Group, IBS (PI), \$5,000,000

2020-2024 Inference of dynamic networks from timeseries big data in biological systems, Samsung STF Foundation (PI), \$900,000

2018-2023 Development of Next Generation Anticancer Immune Cell Therapy using Gene Editing, Creative Allied Project (Collaborator), \$250,000

2018 Computational phenotyping for precision medicine of Sleep Apnea, End Run Project (PI), \$50,000

2017-2020 The molecular circadian clock as a causal mediator of sleep-regulated neurophysiology and cognition, Human Frontier Science Program Young Investigator Award (Co-PI), \$1,350,000

2017-2020 The reverse engineering algorithm based on convergence cross mapping and machine learning, Ewon Fellowship (PI), \$60,000

2016-2021 Investigation of circadian clocks and their interactions with cancer by the development of theory for reduction of stochastic systems and mathematical modeling, Korea National Research Foundation Young Investigator Grant (PI), \$550,000

2016-2019 Mathematical modeling for a new drug development regulating circadian rhythms, Pfizer Inc, Boston (PI), \$100,000

2016-2018 Simplification and mathematical modeling of stochastic biochemical networks, TJ Park Science Fellowship (PI), \$70,000

2015-2016 KAIST Industrial Mathematics Ignition Program, National Institute for Mathematical Sciences (collaborator), \$350,000

EDITORIAL WORK

	Editorial Board Member of SIAM Review	2025-present
	Editorial Board Member of PLoS Comp Biol	2025-present
	Editorial Board Member of CSIAM Transaction on Life Sciences	2024-present
	Chief Editor of Current Opinion in Systems Biology	2024-present
	Editorial Board Member of CSIAM Transaction on Life Sciences	2024-present
	Editorial Board Member of NPJ Biological Time and Sleep	2023-present
	Editorial Board Member of J Theoretical Biology	2023-present
	Editorial Board Member of NPJ Systems Biology and Its Applications	2023-present
	Editorial Board Member of Mathematical Biosciences	2023-present
	Editorial Board Member of Current Opinion in Systems Biology	2022-2024
	Editorial Board Member of J of Biological Rhythms	2020-present
	Editorial Board Member of PLoS ONE (Biophysics)	2018-present
	Guest Associate Editor of PLoS Computational Biology	2014, 2018
REFEREING WORK	Cell; PNAS; Sci Adv; Nature Communication; Nucleic Acids Research; eLife; PNAS; Cell Reports; NPJ Syst Biol; J Biological Rhythms; Seminars in Cell and Developmental Biology; Scientific Reports; Physical Review Letters; Physical Review E; Physica D; J Theo Biol; PLoS Comp Biol; Biophys J; BMC Syst Biol; J of Biol Phys; IEEE Trans. Biomed. Circuits Syst; J Chemical Physics; Mathematical Biosciences; Bull Math Biol Phys Biol; IET Syst Biol; PLoS One; Automatica; Discrete and Continuous Dynamical Systems; Nonlinear Dynamics	
ORGANIZATION	2024 SMB Sattelite Workshop on Recent advances in methods for mathematical biology, Daejeon 2024 SIAM LS Annual Meeting, Portland, USA 2023 HFSP Alumni Workshop, Daejeon, Korea 2023 ICIAM Satellite Workshop, Daejeon, Korea 2023 KSIAM-NIMS Workshop for Biomathematics, Jeju, Korea 2022 KSIAM-NIMS Workshop for Biomathematics, Yeosu, Korea 2022 KSIAM Spring Meeting, Daejeon, Korea 2022 SIAM LS Mini-symposium: Biological Oscillations, Pittsburgh, USA 2021 KSIAM Annual Meeting, Pusan, Korea 2021 Society of Mathematical Biology Annual Meeting (Local committee), UC Irvine, USA 2020 MBI Workshop on Mathematical and Computational Methods in Biology, Columbus, USA 2019 International Conference of Systems Biology, Okinawa, Japan 2019 ICIAM Mini-Symposium: CJK-SIAMs joint mini-symposium on Mathematical Biology, Valencia, Spain 2018 KSIAM Annual Meeting Mini-Symposium: Analysis for biology data: from molecules to populations, Jeju, Korea 2018 A3 Foresight Program Joint Workshop, Mathematics of Biology, Fluid Dynamics and Material Sciences, Gangneung, Korea 2018 ECMTB Mini-symposium: Multi-scale modeling and simulations of stochastic systems, Lisbon, Portugal 2018 A3 International Workshop for Mathematical and Life Sciences, Hiroshima, Japan 2017 A3-NIMS Joint Workshop on Mathematical Biology, Daejeon, Korea 2016 A3 Workshop on Interdisciplinary Research Connecting Mathematics and Biology, Pecking, China 2015 SMB Annual Meeting Mini-symposium: Approximation and simulation of multiscale stochastic system, Atlanta, USA.	
MEMBERSHIP AND SERVICE	Nomination Committee of SMB	2025-
	Nomination Committee of SIAM DS	2023
	Public Outreach Committee of Society for Research on Biological Rhythms	2021–2023
	Nomination Committee of SIAM LS	2020, 2022

Applied Mathematics Committee of Korean Mathematical Society	2018–present
International Exchange Committee of KSIAM	2018–present
Board member of Population Approach Group in Korea	2016–present
Board Member of Korea Society for Industrial and Applied Mathematics	2016–2019
Member of Korean Mathematical Society	2015–present
Member of Society of Mathematical Biology	2014–present
Member of Society for Research on Biological Rhythms	2012–present
Member of Society for Industrial and Applied Mathematics	2009–present

MENTORING

Postdoctoral Fellow and Senior Researcher (current position)

Aurelio A. de los Reyes V (Associate Prof. UP Diliman)
 Bryan S. Hernandez (Assistant Prof. UP Diliman)
 Hyeontae Jo (Assistant Prof. Ajou U)
 Pan Li (Research Scientists, Zhejiang University)
 Brenda Lyn Abad Gavina (Assistant Prof. Maritime Academy of Asia and the Pacific)
 Hyun Kim (Assistant Prof. Kyung Hee U)
 Shigo Gibo (Assistant Prof. , Kyushu U)

Current: Gyuyoung Hwang, Jinwoo Hyun, Chitaranjan Mahapatra, Yunmin Song

Ph.D. Student (current position)

Dae Wook Kim (Assistant Prof. KAIST)
 Euimin Jung (Assistant Prof. Inha U)
 Seokjoo Choe (Assistant Prof. Soonsil U)
 Hyukpyo Hong (Van Vleck Postdoctoral Fellow and Assistant Prof, U Wisconsin)
 Yumin Song (Postdoctoral Fellow, IBS)

Current: Dongjoo Lim, Olive Cawiding, Hyungjoon Jang

Master Student (current position)

Tyczynska Malgorzata Anna (Moffit Cancetr Center, FL, USA)

Current: Awan Aqsa, Myna Lim, Kangmin Lee, Sejoon Ann, Hyunji Jeong

Undergraduat Student (current position)

Seho Park (U Wisconsin, Madison), Seokmin Ha (MIT), Minki Lee (U Michigan, Ann Arbor), Kien Hoang (ETH), Reinatt Hansel Wijaya (ETH), Seokhwan Moon (Wisconsin Madison), Joo Hyun Kim (KAIST), Hyeongjun Jang (KAST)

INVITED TALKS

2026	Asian Chronobiology Forum (June)	Dajeon, Korea
	Biennial Society for Research on Biological Rhythms Meeting (May)	Florida, USA
	National Institute for Theory and Mathematics in Biology Workshop (May)	Chicago, USA
2025	Asia Pacific Cardiovascular Pharamcology Annual Scientific Meeting (Dec)	Seoul, Korea
	Korean Society of Sleep Medicine (Dec)	Seoul, Korea
	Korean Association for Genome Editing Annual Meeting (Plenary, Dec)	Daejeon, Korea
	The Korea-China-Japan Conference on Pharmacognosy (Plenary, Nov)	Seoul, Korea
	National Institute of Mathematical Sciences Colloquium (Oct)	Daejeon, Korea
	ReaDiNet 2025 (Oct)	Hokkaido, Japan
	U of New South Wales Mathematics Seminar (Oct)	Sydney, Australia
	U Sydney Mathematics Seminar (Oct)	Sydney, Australia
	U Witwatersranda Special Lecture invited by Embassy of Korea (Oct)	Johannesburg, South Africa
	U Pretoria Special Lecture invited by Embassy of Korea (Oct)	Pretoria, South Africa

2024	Stellenbosch U Special Lecture invited by Embassy of Korea (Oct)	Stellenbosch, South Africa
	Biotechnology Colloquium, Yonsei U	Seoul, Korea
	ICIAM Workshop	Hanoi, Vietnam
	World Sleep Congress	Singapore
	Pharmacology Colloquium, Yonsei U	Songdo,, Korea
	A3 Foresight Program on Computational and Applied Mathematics	Yenbin, China
	2025 SIAM Annual Meeting (Plenary)	Montreal, Canada
	2025 Gordon Research Conference on Chronobiology	Barcelona, Spain
	International Workshop on Systems Learning of Single Cells	Pecking, China
	Sleep 2025	Seattle, USA
	Applied Math Seminar, UW Seattle	Seattle, USA
	Mathematics Colloquium, Chonnam National U	Gwangju, Korea
	World Science Culture Forum	Daejeon, Korea
	The Chinese Society of Cell Biology Annual Meeting	Guangdong, China
	University of Science and Technology of China Biology Seminar	Guangdong, China
	Biology Colloquium, KAIST	Daejeon, Korea
	Bio and Brain Engineering Colloquium, KAIST	Daejeon, Korea
	Asian Forum on Chronobiology (AFC) Congress	New Delhi, India
	International Workshop on Mathematical Biology (Plenary)	Palawan, Philippine
	Korean Society of Sleep Medicine	Seoul, Korea
	The Korean Academy of Dental Sleep Medicine Annual Meeting	Seoul, Korea
	East Asia Molecular Biology	Busan, Korea
	KIAS-KU international workshop: Theoretical Challenges in Network Science	Seoul, Korea
	KPS Statistical Physics Division Monthly Meeting Seminar	Pohang, Korea
	ReaDiNet 2024	Jeju, Korea
	Ajou University Medical School Seminar	Suwon, Korea
	Korean Society for Depressive and Bipolar Disorder Annual Meeting	Seoul, Korea
	Monash U Sleep Seminar	Melbourne, Australia
	U Melbourne Mathematical Biology Seminar	Melbourne, Australia
	Matrix Workshop	Melbourne, Australia
	Sydney U Charles Peskin Center Seminar	Sydney, Australia
	ICMMA International Conference on "Self-organization in Life and Matter",	Tokyo, Japan
	A3 Mathematical Meeting,	Wuhan, China
	Chungnam National University Hospital Clinical Trials Center	Daejeon, Korea
	KADR-JADR Joint Symposium (Pleanary)	Seoul, Korea
	Q-bio Conference	Shenzhen, China
	Korean Sleep Research Society	Seoul, Korea
	Society of Mathematical Biology Annual Meeting (Plenary)	Seoul, Korea
	Mathbio2024 (Plenary)	Durban, South Afria
	SIAM LS 2024 Meeting (Mini Tutorial)	Portland, USA
	Washington State U Sleep Center Seminar	Spokane, USA
	Flatiron Institute Computational Mathematics Seminar	New York, USA
	U of Michigan, Ann Arbor Applied Math Seminar	Ann Arbor, USA
	Chungnam National Univ, Pharmacology Seminar	Daejeon, Korea
	Soong Sil U, School of Systems Biomedical Science Seminar	Seoul, Korea
	GIST Colloquium	Gwangju, Korea
	LMU Biology Seminar	Munich, Germany
	EMBL Workshop	Heidelberg, Germany
	Molecular Biomarkers of the Circadian Clock Workshop	Venice, Italia

2023	International Mathematical Biology Workshop (Plenary)	Bohol, Philippines
	NCTS Workshop on Mathematics of Living Systems	Taipei, Taiwan
	Symposium on Biological Physics	Busan, Korea
	Korean Society for Sleep Medicine Conference (Mini-Symposium)	Seoul, Korea
	Annual Meeting and International Conference of the KSPST	Seoul, Korea
	International Conference Korean Society for Molecular and Cellular Biology (Mini-Symposium)	Jeju, Korea
	Sleep Congress 2023 (Mini-Symposium)	Rio de Janeiro, Brazil
	International Conference on Systems Biology	Hartford, USA
	Duke-NUS Cancer Stem-Cell Biology Seminar	Singapore
	Seoul Nat Univ Math Edu Colloquium	Seoul, Korea
	Tokyo U Universal Biology Institute Seminar	Tokyo, Japan
	45th Annual Meeting of Japanese Society of Sleep Research	Yokohama, Japan
	DGIST New Biology Seminar	Daegu, Korea
	Ajou University Medical School Seminar	Suwon, Korea
	Universal Biology Institute Seminar, U of Tokyo	Tokyo, Japan
	ICIAM 2023 (Mini-symposium)	Tokyo, Japan
	SMB Annual Meeting (Mini-symposium)	Columbus, USA
	Dynamical Systems in Life Science Workshop	Columbus, USA
	Korean Sleep Research Society Annual Meeting	Seoul, Korea
	Philippines Math Society 50th Anniversary Meeting (Plenary)	Manila, Philippines
	SIAM LS (Mini-symposium)	Portland, USA
	Asian Sleep Research Society	Istanbul, Turkey
	KAIST Cognitive Neuroscience Colloquium	Daejeon, Korea
	Seoul Nat Univ Math Colloquium	Seoul, Korea
	Seoul Nat Univ Bioengineering Seminar	Seoul, Korea
	Korean Society for Computational Neuroscience Winter School	Korea
	e:Med online seminar series	online, Germany
2022	International Workshop on Non-equilibrium Phenomena in Physics and Biology	Gyuengju, Korea
	Global Research Network Seoul (Plenary)	Seoul, Korea
	Korean Society of Sleep Medicine Annual Meeting	Seoul, Korea
	Population Approach Group in Korea Annual Meeting	Seoul, Korea
	ICTP-KIAS School on Statistical Physics for Life Sciences	Seoul, Korea
	Hanyang U Math Colloquium	Seoul, Korea
	Global KMS International Conference	Seoul, Korea
	Korean Neuropsychiatric Association Annual Meeting (Plenary)	Gwangju, Korea
	Korean Society for Molecular and Cellular Biology Annual Meeting	Jeju, Korea
	UNIST Basic Science What & Why?	Ulsan, Korea
	NIMS Industrial Math Colloquium	Seoul, Korea
	European Biological Rhythms Society	Zurich, Switzerland
	Europe-Korea Conference on Science and Technology	Marseille, France
	World Sleep Congress (Minisymposium)	Rome, Italy
	World Sleep Congress (Minisymposium)	Rome, Italy
	Korean Sleep Research Society Annual Meeting	Seoul, Korea
	Samsung Electronics Seminar	Seoul, Korea
	Korea Institute of Oriental Medicine Seminar	Daejeon, Korea
	Ewha Women's U Medical School Seminar	Seoul, Korea
	SRBR Trainee Day	FL, USA
2021	Phamcast Inc. Seminar	Pusan, Korea

	KIAS Awardee Talk	Seoul, Korea
	Korean Society of Mathematical Biology Annual Meeting	Jeju, Korea
	Dept of Mathematics Seminar, Kyungpook National University	Daegu, Korea
	RIKEN Interdisciplinary Theoretical and Mathematical Sciences Program	Online
	Korean Society of Sleep Medicine	Seoul, Korea
	Samsung STF Annual Forum	Online
	Korean Society of Sleep Medicine	Online
	Dept of Mathematics Seminar, Pusan National University	Pusan, Korea
	Korean Academy of Sleep Medicine (Plenary)	Seoul, Korea
	Asia Pacific Center for Theoretical Physics Workshop	Gyeongju, Korea
	20th Human Frontier Sciences Program Awardees Meeting	Online
	KWMS The 16th International Conference (Public Lecture)	Online, Korea
	IBS Center for Cognition and Sociality Seminar	Daejeon, Korea
	SMB Annual Meeting, SIAM-SMB Special Session	Online, USA
	Global Symposium Sleeping Beauty, A93 Pacific Inc.	Seoul, Korea
	Korean Society for Brain and Neural Sciences Annual Meeting	Songdo, Korea
	U of Oxford Mathematical Biology Seminar	Online, UK
	Harvard Medical School Analytic and Modeling Unit Journal Club Seminar	Online, USA
	Korean Biological Rhythm Society Symposium	Online, Korea
2020	Korean Society of Sleep Medicine Annual Meeting	Seoul, Korea
	Cell Bio ASCB/EMBO meeting	Philadelphia, USA
	Mathematical Biology & Data Science Workshop	Daegu, Korea
	International symposium on mathematical oncology	Osaka, Japan
	The Korean Society of Clinical Neurophysiology Fall Meeting (Plenary)	Seoul, Korea
	Psychiatry seminar, Asan Medical Center	Seoul, Korea
	Harvard Medical School AMU seminar	Online
	U of Cincinnati Math Colloquium	Cincinnati, USA
	U of Michigan Applied Math Seminar	Ann Arbor, USA
2019	Vietnam Institute for Advanced Studies in Mathematics	Hanoi, Vietnam
	Center for Mathematical Modeling and Application	Tokyo, Japan
	9 European Chronobiology Summer School	Munich, Germany
	Virginia Tech Genetics, Bioinformatics, & Comp. Biology Seminar	Blacksburg, USA
	Rice U The Center for Theoretical Biological Physics Seminar	Houston, USA
	Houston U Applied Math Seminar	Houston, USA
	Rutgers U Applied Math Seminar	New Brunswick, USA
	ReaDiNet 2019 Conference	Nancy, France
	U of Michigan Biological Rhythms seminar	Ann Arbor, USA
	U of Cincinnati Applied Math seminar	Cincinnati, USA
	U of Michigan Quantitative Biology Seminar	Ann Arbor, USA
	Society of Mathematical Biology Annual Meeting	Montreal, Canada
	BIRS: Scaling Limits of Dynamical Processes on Random Graph	Oaxaca, Mexico
	Asan Medical Center Cancer Seminar	Seoul, Korea
	Global Breast Cancer Conference	Songdo, Korea
	KIAS Computational Science Colloquium	Seoul, Korea
	International Workshop on Mathematical Biology	Bohol, Philippine
2018	Seoul National U Medical Center Clinical Pharmacology Seminar	Seoul, Korea
	Korean Society of Sleep Medicine Annual Meeting	Seoul, Korea
	Korea University Mathematics Colloquium	Seoul, Korea
	Dankuk U Medical Center Neurology Ground	Chunan, Korea

	SNU Medical School Precision Medicine Symposium	Seoul, Korea
	KAIST Physics Colloquium	Daejeon, Korea
	Asan Medical Center Breast Cancer Seminar	Seoul, Korea
	A3 Foresight Program Joint Workshop Mathematics of Biology, Fluid Dynamics and Material Sciences	Gangneung, Korea
	KIAS Quantitative Life Science Workshop	Seoul, Korea
	Korea Research Institute of Chemical Technology Seminar	Daejeon, Korea
	Japanese Biochemical Society Meeting	Kyoto, Japan
	International Conference of the Korean Society for Mole and Cell Biol	Seoul, Korea
	Seoul National Medical School Ground Round Special Lecture	Seoul, Korea
	Soon Chun Hyang University Hospital, Dept of Neurology Special Lecture	Chunan, Korea
	11th European Conference on Mathematical and Theoretical Biology	Lisbon, Portugal
	BIRS workshop: Math Approaches to Cell-Cell Communication	Banff, Canada
	18th World Congress of Basic and Clinical Pharmacology)	Kyoto, Japan
	Korea Sleep Research Society Conference	Seoul, Korea
	Korean Society of Mathematical Biology Annual Meeting (Public Lecture)	Busan, Korea
	KSIAM Spring Conference, Korea-Japan Math Bio Joint Session	Daejeon, Korea
	A3 International Workshop For Mathematical and Life Sciences	Hiroshima, Japan
	Society for Research on Biological Rhythms	Fernandina Beach, USA
	KAOS Public Lecture	Seoul, Korea
	Korea Math Society Spring Conference	Seoul, Korea
	Biomedical Science and Engineering Seminar, GIST	Gwangju, Korea
	Asian Sleep Society Conference	Seoul, Korea
	Ehwa Women's Univ Math Colloquium	Seoul, Korea
	Cognition, Sleep, Mood and Stress Distinguished Lecture	Seoul, Korea
	International Workshop on Mathematical Biology	Cebu, Philippines
2017	International SYMCYP workshop	Busan, Korea
	Korean Society for Clinical Pharmacology and Therapeutics Conference	Seoul, Korea
	Osaka Univ Biological Sciences Seminar	Osaka, Japan
	Asian Pharmacometric Conference	Kyoto, Japan
	KoreaBIOplus	Seoul, Korea
	International Conference on Mathematical Biology	Taipei, Taiwan
	Handong Univ Biology Seminar	Pohang, Korea
	Korea Research Institute of Bioscience and Biotechnology	Daejeon, Korea
	IMA Innovative Statistics and Machine Learning in Precision Medicine	Minneapolis, USA
	CMC conference: Nonlinear dynamics of many-body systems	Seoul, Korea
	18th International Conference on Systems Biology (Plenary Lecture)	Blacksburg, USA
	4th Industry Revolution Forum of the National Congress	Seoul, Korea
	Korean Sleep Research Society Conference	Seoul, Korea
	International Conference on Random Dynamical Systems	Wuhan, China
	Pharmacology Seminar, Chungnam University	Daejeon, Korea
	SIAM Conference on Applied Dynamics	Salt Lake City, USA
	Department of Chemistry Seminar, Chungang University	Seoul, Korea
	A3-NIMS Mathematical Biology Workshop	Daejeon, Korea
	Korea Mathematical Society Annual Meeting Public Lecture	Gwangju, Korea
	DGIST Brain & Cognitive Science Seminar	Daegu, Korea
	Department of Mathematics Seminar, Busan University	Busan, Korea
	Korea University Medical School Seminar	Seoul, Korea
	World Brain Awareness Week Public Lecture	Daejeon, Korea

2016	Humanity and Social Science Colloquium, KAIST	Daejeon, Korea
	Inje University Medical School Seminar	Busan, Korea
	Computational Neuroscience Winter School	Pohang, Korea
	Network Seminar, U of Houston	Houston, USA
	APCTP Workshop on Frontiers of Physics	Pohang, Korea
	System Synthetic Agricultural Engineering Workshop	Jinju, Korea
	Mathematics Colloquium, UNIST	Ulsan, Korea
	APCTP-ICTP joint workshop: quantitative life sciences	Pohang, Korea
	Brain & Cognitive Engineering Seminar, KAIST	Daejeon, Korea
	29th Conference of the International Society for Chronobiology	Suzhou, China
	International Conference for the 70th Anniversary of Korean Math Society	Seoul, Korea
	A3 Pharmacometrics Symposium	Daejeon, Korea
	Mathematics Colloquium, POSTEC	Pohang, Korea
	Mathematics Colloquium, Yeonsei Univ	Seoul, Korea
	Signature Seminar, DUKE-NUS Medical School	Singapore
	International Conference: Patterns and Waves	Hokkaido, Japan
	World Conference of Scientist and Engineers	Seoul, Korea
	Annual Computational Neuroscience Meeting (Featured oral)	Jeju, Korea
	Mathematics Colloquium, Chungnam Univ	Daejeon, Korea
	Biological Sciences Seminar, KAIST	Daejeon, Korea
	National Science Museum public lecture	Daejeon, Korea
	Industrial & Systems Engineering Colloquium, KAIST	Daejeon, Korea
	A3 Workshop on Interdisciplinary Research Connecting Math and Biology	Beijing, China
	Mathematics Colloquium, Ajou Univ	Suwan, Korea
	Mathematics Colloquium, Seoul Nat. Univ	Seoul, Korea
	Workshop for Mathematical Biology: Recent Topics and Vision (Plenary talk)	Jeju, Korea
	MBI workshop, Interplay of stochastic and deterministic dynamics	Columbus, OH
	Applied Mathematics Seminar, Ohio State Univ	Columbus, OH
2015	Sleep Seminar, Asan Medical Center	Seoul, Korea
	Inverse problem conference	Daejeon, Korea
	Young Computational Neuroscience Workshop	Seoul, Korea
	Joint workshop of China-Japan-Korea A3 Foresight Program	Xiamen, China
	Industrial & Applied Mathematics Seminar, Konkuk Univ	Seoul, Korea
	KSIAM Annual Meeting	Pusan, Korea
	Bioinfo 2015	Seoul, Korea
	Mathematics Colloquium, Inha University	Incheon, Korea
	APTCP seminar, Asia Pacific Center for Theoretical Physics	Pohang, Korea
	NIMS Colloquium, National Institute for Mathematical Sciences	Daejeon, Korea
	National Cancer Center Seminar	Ilsan, Korea
	Joint Meeting of JSMB and CJK Colloquium on Mathematical Biology	Kyoto, Japan
	Lorentz Center workshop: Human Circadian Rhythms	Leiden, Netherlands
	Society of Mathematical Biology Annual Meeting	Atlanta, GA, USA
	U of Utah Mathematics Colloquium	Salt Lake City, UT
2014	Boston Univ. Dynamical Systems Seminar Seminar	Boston, MT
	U of Utah Biological Mathematics Seminar	Salt Lake City, UT
	Florida State U. Biological Mathematics Seminar	Tallahassee, FL
	UNIST Mathematics Colloquium	Ulsan, Korea
	KAIST Applied Mathematics Seminar	Daejeon, Korea
	Konkuk U. Mathematical Biology Seminar	Seoul, Korea

	U of Michigan Mathematics Colloquium (Sumner B. Myers Prize Talk)	Ann Arbor, MI
	Ohio State U. Undergraduate Mathematical Biology Seminar	Columbus, OH
	Virginia Tech. Genetics Bioinformatics Computational Biology Seminar	Blacksburg, VA
2013	Rutgers U. Mathematical Physics Seminar	New Brunswick, NJ
2012	Complex Systems Advanced Academic Workshop	Ann Arbor, MI
	12th Experimental Chaos and Complexity Conference	Ann Arbor, MI
	RIKEN QBiC Seminar	Kobe, Japan