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Department of Pathology & Laboratory Medicine

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EDUCATION

Ph.D, Applied Mathematics, University of Minnesota, Oct 2006 [Advisor: Hans G. Othmer]

M.S, Applied Mathematics, University of Minnesota, Nov 2003 [Advisor: Hans G. Othmer]

B.S, Korea University, Seoul, Republic of Korea, May, 1997

EMPLOYMENT

Visiting Professor [Sep, 2024 - Aug, 2025] *Brown University Medical School (Sabbatical leave)*

Professor [2020 - present] *Konkuk University, Mathematics, South Korea*

Associate Professor [2015 - 2019] *Konkuk University, Mathematics, South Korea*

Visiting Professor [Jan- Aug, 2017] *Mathematical Biosciences Institute (Sabbatical leave)*

Department chair [July 2015 - Dec 2016] *Konkuk University, Mathematics, South Korea*

Assistant Professor [2012 - 2014] *Konkuk University, Mathematics, South Korea*

Assistant (tenure-track) Professor [2009 - 2013] *University of Michigan, Mathematics, USA*

Postdoctoral Fellow [2006 - 2009] *Mathematical Biosciences Institute, OSU, USA*

Lecturer [2008] *Ohio State University, Mathematics, USA*

EDITORIAL BOARD

1. Editor, Journal of Theoretical Biology [2023 July - present]

2. Executive Editor, Mathematical Biosciences and Engineering [2024 Mar - present]

3. Associate Editor: Mathematical Biosciences and Engineering [2016 Sep - 2024 Feb]

4. Associate Editor: Frontiers in Cell and Developmental Biology and Oncology [2015 - present]

5. Associate Editor: KSIAM journal [2023 Feb - present]

SCIENTIFIC VISIT

Visiting Scholar (Sabbatical leave) [Sep 2024 - Aug 2025] *Legorreta Cancer Center, Brown University, USA*

Visiting Scholar [Aug, 2024] *Faculty of Advanced Life Science, Hokkaido University, Japan*

Visiting Scholar [Feb, 2024] *Mathematics, Ryukoku University, Japan*

Visiting Scholar [Dec, 2023] *Mathematics, Ryukoku University, Japan*

Visiting Scholar [July, 2023] *Legorreta Cancer Center, Brown University, USA*

Visiting Scholar [July-Aug, 2023] *Department of Mathematics, Ohio State University, USA*

Visiting Scholar [May, 2019] *McGovern Medical School, Univ of Texas-Health, Houston, TX, USA*

Visiting Scholar [May, 2019] *School of Mathematics, Univ of Minnesota, Minneapolis, MN, USA*

Visiting Scholar [Jan, 2019] *School of Mathematical Sciences, Univ of Adelaide, Australia*
 Visiting Scholar [Jan, 2019] *School of Mathematics and Statistics, University of Sydney, Australia*
 Visiting Scholar [Sep, 2018] *Medical School, Kumamoto University Hospital, Japan*
 Visiting Scholar [Sep, 2018] *Medical School, Kyushu University Hospital, Japan*
 Visiting Scholar [July-Oct, 2018] *Mathematical Biosciences Institute, Ohio State University, USA*
 Visiting Scholar (Sabbatical leave) [Jan-Aug, 2017] *Mathematical Biosciences Institute, USA*
 Visiting Scholar [Oct, 2016] *Institute of Industrial Science, University of Tokyo, Japan*
 Visiting Scholar [July, 2016] *Mathematical Biosciences Institute, Ohio State University, USA*
 Visiting Scholar [May, 2016] *Medical School, University of Tokyo, Japan*
 Visiting Scholar [Mar, 2016] *Medical School, University of Tokyo, Japan*
 Visiting Scholar [Feb, 2016] *Medical School, University of Tokyo, Japan*
 Visiting Scholar [Oct, 2015] *Medical School, University of Tokyo, Japan*
 Visiting Scholar [Aug, 2015] *Medical School, Kyoto University, Japan*
 Visiting Scholar [Aug, 2015] *Medical School, University of Tokyo, Japan*
 Visiting Scholar [Apr, 2015] *Mathematical Biosciences Institute, Ohio State University, USA*
 Visiting Scholar [Jan, 2015] *School of Mathematics and Statistics, University of Sydney, Australia*
 Visiting Scholar [Nov, 2014] *Medical School, University of Tokyo, Japan*
 Visiting Scholar [Aug, 2014] *Mathematical Biosciences Institute, Ohio State University, USA*
 Visiting Scholar [July, 2014] *Medical School, University of Tokyo, Japan*
 Visiting Scholar [Jan-Feb, 2014] *Mathematical Biosciences Institute, Ohio State University, USA*
 Visiting Scholar [2013 - 2014] *Department of Mathematics, Ohio State University, USA*
 Visiting Scholar [Aug 2012] *University of Dundee, UK*
 Visiting Scholar [July 2012] *Department of Mathematics, University of Minnesota, USA*
 Visiting Scholar [2009 - 2010] *Mathematical Biosciences Institute, Ohio State University, USA*

PUBLICATIONS

*co-first authors, [†]corresponding author

Published/accepted

1. Donggu Lee, Sunju Oh, Sean Lawler, and **Yangjin Kim**[†], *Bistable dynamics of TAN-NK cells in tumor growth and control of radiotherapy-induced neutropenia in lung cancer treatment*, Mathematical Biosciences and Engineering, 22(4): 744-809, Mar 04, 2025.
2. Donggu Lee, Aurelio A. de los Reyes V, **Yangjin Kim**[†], *Optimal strategies of oncolytic virus-bortezomib therapy via the apoptotic, necroptotic, and oncolysis signaling network*, Mathematical Biosciences and Engineering, 21(3): 3876-3909, Feb 23, 2024. [doi: 10.3934/mbe.2024173] [IF= 2.6].
3. **Yangjin Kim**[†], Junho Lee, Chaeyoung Lee, and Sean Lawler, *Role of senescent tumor cells in building a cytokine shield in the tumor microenvironment: mathematical modeling*, J Math Biol, 86(1), 14, Dec 13, 2023. [<https://doi.org/10.1007/s00285-022-01850-z>]
4. Aurelio A. de los Reyes V and **Yangjin Kim**[†], *Optimal regulation of tumour-associated neutrophils in cancer progression*, R. Soc. Open Sci., 9, 210705., Feb 02, 2022. [doi: 10.1098/rsos.210705] [IF= 2.963].
5. Junho Lee, Jin Su Kim, and **Yangjin Kim**[†], *Atorvastatin-mediated rescue of cancer-related cognitive changes in combined anticancer therapies*, PLoS Comput Biol, 17(10), e1009457, Oct 20, 2021. [doi: 10.1371/journal.pcbi.1009457] [IF=4.42; top 10%].

6. Jonggul Lee, Donggu Lee, **Yangjin Kim**[†], *Mathematical model of STAT signalling pathways in cancer development and optimal control approaches*, R. Soc. Open Sci. 8, 210594, 2021. [<https://doi.org/10.1098/rsos.210594>] [IF= 2.963].
7. Junho Lee, Donggu Lee, Sean Lawler, **Yangjin Kim**[†], *Role of neutrophil extracellular traps in regulation of lung cancer invasion and metastasis: Structural Insights from a Computational Model*, PLoS Comp Biol, 17(2), e1008257, Feb 17, 2021, [doi: 10.1371/journal.pcbi.1008257] [IF=4.42; top 10%].
8. Angelica P Aspirin, Aurelio A. de los Reyes V and **Yangjin Kim**[†], Polytherapeutic strategies with oncolytic virus-bortezomib and adjuvant NK cells in cancer treatment, J Roy Soc Interface, 18(174), 20200669, Jan 06, 2021. [IF=3.7]
9. **Yangjin Kim**[†], Donggu Lee, and Sean Lawler, *Collective invasion of glioma cells through OCT1 signalling and interaction with reactive astrocytes after surgery*, Phil. Trans. Roy. Soc. B, 375, 20190390, July 27, 2020. [IF 6.1; top 8.6%]
10. Eunok Jung, Aurelio A. de los Reyes V, Kurt Jan A. Pumares, and **Yangjin Kim**[†], *Strategies in regulating glioblastoma signaling pathways and anti-invasion therapy*, PLoS One, 14(4): e0215547, Apr 23, 2019 [IF=2.74]
11. **Yangjin Kim**, Junho Lee, Donggu Lee and Hans G. Othmer[†], *Synergistic Effects of Bortezomib-OV Therapy and Anti-Invasive Strategies in Glioblastoma: A Mathematical Model*, Cancers, 11(2), 215, Feb 13, 2019. [doi:10.3390/cancers11020215] [IF=6.1]
12. **Yangjin Kim**[†], Donggu Lee, Junho Lee, Seongwon Lee, Sean Lawler, *Role of tumor-associated neutrophils in regulation of tumor growth in lung cancer development: A mathematical model*, PLoS One, 14(1), e0211041, Jan 28, 2019. [IF=2.74]
13. **Yangjin Kim**[†], Hyunji Kang, Gibin Powathil, Hyeongi Kim, Dumitru Trucu, Wanho Lee, Sean Lawler, and Mark Chaplain, *Role of extracellular matrix and microenvironment in regulation of tumor growth and LAR-mediated invasion in glioblastoma*, PLoS One, 13(10), e0204865, Oct 4, 2018 [doi: 10.1371/journal.pone.0204865] [IF=2.74]
14. **Yangjin Kim**^{*}, Ji Young Yoo^{*}, Tae Jin Lee, Joseph Liu, Jianhua Yu, Michael A Caligiuri, Balveen Kaur[†], and Avner Friedman[†], *Complex Role of NK cells in regulation of oncolytic virus-bortezomib therapy*, Proc Natl Acad Sci USA, 115 (19), 4927-4932, May 8, 2018. [IF=9.674; top 10%] [doi: 10.1073/pnas.1715295115]
15. **Yangjin Kim**[†], Wanho Lee, Hyejin Jeon, Sookkyung Lim, Soyeon Roh, Donggu Lee, Junho Lee, and Sean Lawler, *The role of microenvironment in regulation of cell infiltration in glioblastoma*, Springer volume ‘Cell Movement: Modeling and Applications’, Editors: Stolarska, Magdalena, Tarfulea, Nicoleta E, 27-60, 2018. ISBN 978-3-319-96842-1
16. **Yangjin Kim**, Hyejin Jeon, and Hans Othmer[†], *The role of the tumor microenvironment in glioblastoma: A mathematical model*, IEEE Trans Biomed Eng (IF 2.347), 64(3), 519-527, March 2017. [doi: 10.1109/TBME.2016.2637828] (This paper was selected as a featured article) [IF=4.491]
17. Wanho Lee, Sookkyung Lim, and **Yangjin Kim**[†], *The role of myosin II in glioma invasion: A mathematical model*, PLoS One, 12(2), e0171312. Feb 06, 2017. [doi:10.1371/journal.pone.0171312, 2017] [IF=4.411]
18. Ji Sun Lim, Seongwon Lee, and **Yangjin Kim**[†], *Hopf bifurcation in a model of TGF- β in regulation of the Th 17 phenotype*, Discrete and Continuous Dynamical Systems-B, 21(10), 3575–3602, Dec 2016. [doi:10.3934/dcdsb.2016111]

19. Shinji Nakaoka, Sota Kuwahara, Changhyeong Lee, Hyejin Jeon, Junho Lee, Yasuhiro Takeuchi, and **Yangjin Kim**[†], *Chronic inflammation in the epidermis: A mathematical model*, Appl. Sci. 6(9), 252, Sep 2016 doi:10.3390/app6090252. [IF=1.726]
20. Hyun Geun Lee and **Yangjin Kim**[†], *The role of the microenvironment in regulation of CSPG-driven invasive and non-invasive tumor growth in glioblastoma*, Japan J. Indust. Appl. Math. 32 (3) , 771–805 (Oct 2015). [DOI 10.1007/s13160-015-0188-2]
21. Hyun Geun Lee, **Yangjin Kim**, and Junseok Kim[†], *Mathematical model and its fast numerical method for the tumor growth*, Math Bios Eng, 12 (6), 1173–1187, Dec 2015.
22. **Yangjin Kim** and Hans Othmer[†], *Hybrid models of cell and tissue dynamics in tumor growth*, Math Bios Eng, 12 (6), 1141–1156, Dec 2015.
23. Aurelio A. de los Reyes V, Eunok Jung, and **Yangjin Kim**, *Optimal control strategies of eradicating invisible glioblastoma cells after conventional surgery*, J Roy Soc Interface, 12 (106), 20141392, (May 6, 2015). [doi: 10.1098/rsif.2014.1392.] [IF=3.917]
24. **Yangjin Kim**[†], Gibin Powathil, Hyunji Kang, Dumitru Trucu, Hyeongi Kim, Sean Lawler, and Mark Chaplain, *Strategies of eradicating glioma cells: A multi-scale mathematical model with miR-451-AMPK-mTOR control*, PLoS One, 10(1), e0114370, (Jan 28, 2015). [DOI: 10.1371/journal.pone.0114370, 2015] [IF=3.234]
25. **Yangjin Kim**[†], Hyunji Kang, and Sean Lawler, *The Role of the miR-451-AMPK Signaling Pathway in Regulation of Cell Migration and Proliferation in Glioblastoma*, in ‘Mathematical Models of Tumor-Immune System Dynamics’, Springer Proceedings in Mathematics & Statistics, Springer, New York, NY, 107, 125-155, (Oct 18, 2014) ISBN 978-1-4939-1792-1 / 2194-1009.
26. **Yangjin Kim**[†], Hyungeun Lee, Nina Dmitrieva, Balveen Kaur, Junseok Kim, and Avner Friedman, *Choindroitinase ABC I-mediated enhancement of oncolytic virus spread and anti-tumor efficacy: A mathematical model*, PLoS One, 9(7), e102499 (July 21, 2014). [DOI 10.1371/journal.pone.0102499]. [IF=3.234]
27. Seongwon Lee, Hyung Ju Hwang, **Yangjin Kim**[†], *Modeling the role of TGF- β in regulation of the Th17 phenotype in the LPS-driven immune system*, Bull Math Biol., 76 (5), 1045-1080 (May, 2014) [DOI 10.1007/s11538-014-9946-6].
28. Heinz Schättler[†], **Yangjin Kim**, Urszula Ledzewicz, Aurelio A. de los Reyes V, and Eunok Jung, *On the control of cell migration and proliferation in glioblastoma*, proceeding of the 52nd IEEE Conference on Decision and Control, 978-1-4673-5716-6/13, 1810-1815 (Dec, 2013)
29. **Yangjin Kim**[†], Seongwon Lee, You-Sun Kim, Yoon-Keun Kim, Yong Song Gho, Hyung Ju Hwang, Sean Lawler, *Regulation of Th1/Th2 cells in asthma development: A mathematical model*, Math. Bios. Eng., 10(4), 1095–1133, (Aug, 2013).
30. **Yangjin Kim** and Hans Othmer[†], *A hybrid model of tumor-stromal interactions in breast cancer*, Bull Math Biol, 75, 1304–1350 (Aug, 2013) [DOI 10.1007/s11538-012-9787-0]
31. **Yangjin Kim**[†] and Soyeon Roh *A hybrid model for cell proliferation and migration in glioblastoma*, Discrete and Continuous Dynamical Systems-B, 18 (4), 969-1015 (June 2013).
32. **Yangjin Kim**[†] and Khalid Boushaba, *Regulation of Tumor Dormancy and Role of Microenvironment: A Mathematical Model*, Adv. Exp. Med. Biol., 734, 237-259 (2013).
33. **Yangjin Kim**, *Regulation of cell proliferation and migration in glioblastoma: New therapeutic approach*, Frontiers in Oncology, 3, 53 (Mar 2013). doi: 10.3389/fonc.2013.00053 [JCR IF(2019) 4.848]

34. **Yangjin Kim**, Soyeon Roh, Sean Lawler, and Avner Friedman[†], *miR451 and AMPK mutual antagonism in glioma cells migration and proliferation*, PLoS One, 6(12), e28293, (Dec 20, 2011). [doi:10.1371/journal.pone.0028293] [IF=3.234]
35. Marisa Eisenberg, **Yangjin Kim**, Ruth Li, William E. Ackerman, Douglas A. Kniss, and Avner Friedman[†], *Modeling the effects of myoferlin on tumor cell invasion*, Proc Natl Acad Sci USA, 108(50), 20078-83, (Dec 13, 2011) [IF=9.674]
36. **Yangjin Kim**[†] and Khalid Boushaba, *An enzyme kinetics model of tumor dormancy, regulation of secondary metastases*, Discrete and Continuous Dynamical Systems-S, 4(6), 1465-1498 (Dec, 2011).
37. Baltazar D. Aguda, **Yangjin Kim**, Hong Sug Kim, Avner Friedman, and Howard Fine[†], *Qualitative network modeling of the MYC-p53 control system of cell proliferation and differentiation*, Biophysical Journal, 101(9), 2082-2091 (Nov, 2011). [IF=3.972] (This paper was selected as a featured article)
38. **Yangjin Kim**, Magdalena Stolarska, and Hans G. Othmer[†], *The Role of The Microenvironment in Tumor Growth and Invasion*, Progress in Biophysics and Molecular Biology, 106, 353-379 (Aug, 2011). [IF(2011)=4.00]
39. Avner Friedman[†] and **Yangjin Kim**, *Tumor cells proliferation and migration under the influence of their microenvironment*, Mathematical Biosciences and Engineering, 8(2), 373-385 (2011).
40. **Yangjin Kim**[†] and Sookkyung Lim, *The role of the microenvironment in tumor invasion*, 2009 Proceedings of the Fourth SIAM Conference on Mathematics for Industry (MI09), 84-92 (2010).
41. **Yangjin Kim**[†], Julie Wallace, Fu Li, Michael Ostrowski and Avner Friedman, *Transformed epithelial cells and fibroblasts/myofibroblasts interaction in breast tumor: a mathematical model and experiments*, J Math Biol, 61(3), 401-421 (2010)
42. **Yangjin Kim**[†] and Avner Friedman, *Interaction of tumor with its microenvironment : A Mathematical Model*, Bull.Math.Biol., 72(5), 1029-1068 (2010)
43. **Yangjin Kim**[†], Sean Lawler, Michal O. Nowicki, E. Antonio Chiocca, and Avner Friedman, *A mathematical model for pattern formation of glioma cells outside the tumor spheroid core*, J. Theo. Biol., 260, 359-371 (2009)
44. Magdalena Stolarska, **Yangjin Kim**, and Hans G. Othmer[†], *Multiscale models of cell and tissue dynamics*, Phil. Trans. Roy. Soc. A, 367, 3525-3553 (2009) [IF(2015)=2.43]
45. Baltazar D. Aguda, **Yangjin Kim**, Melissa G. Piper-Hunter, Avner Friedman[†], and Clay B. Marsh[†], *MicroRNA Regulation of a Cancer Network: Consequences of the Feedback Loops Involving miR-17-92, E2F, and Myc*, Proc Natl Acad Sci, 105(50), 19678-19683 (2008) [IF=9.674]
46. **Yangjin Kim**, Magdalena Stolarska, and Hans G. Othmer[†], *A hybrid model for tumor spheroid growth in vitro I: Theoretical development and early results*, Math. Models Methods in Appl Scis, 17, 1773-1798 (2007) [IF(2014)=3.094 (1.2%)]
47. Ph.D thesis (advisor : Hans G. Othmer) : **Yangjin Kim**, *Mathematical modeling of cell movement and tumor spheroid growth in vitro*, Oct., 2006.

Submitted/in revision:

1. Yoshihiro Otani*, **Yangjin Kim***, Junho Lee, Ji Young Yoo, Samantha Chao, Jessica Swanner, Toshihiko Shimizu, Cole T Lewis, Jin Muk Kang, Sara A Murphy, Josue Pineda, Kimberly Rivera Caraballo, Bridgitte E Palacios, Bangxing Hong, E Antonio Chiocca, Hiroshi Nakashima, Sean E Lawler, Yeshavanth Banasavadi-Siddegowda, John Heiss, Yuanqing Yan, Abhinav K Jain, Arif O Harmanci, Scott D. Olson, Guangsheng Pei, Zhongming Zhao, Avner Friedman[†], Balveen Kaur[†], Activated NOTCH induced monocyte recruitment suppresses anti-tumor immunity with virotherapy, *Nature Immunology* (IF: 20), 2021, submitted.

In preparation :

1. Donggu Lee, Hyeongchul Kim, Junho Lee, and **Yangjin Kim**[†], *The role of bone marrow mesenchymal stem cells in regulation of Dox-induced CRCC in brain*, in preparation.
2. Haneol Cho, Junho Lee, and **Yangjin Kim**[†], *Neutrophil-assisted tumor growth and invasion in white matter*. in preparation.
3. Junho Lee, Donggu Lee, Aurelio A. de los Reyes V and **Yangjin Kim**[†], *Optimal control of TZB-induced cancer-related cognitive changes and tumor growth in anti-cancer treatment*, in preparation, 2021.
4. **Yangjin Kim**[†], Donggu Lee, Junho Lee, and Sean Lawler, *Role of tumor-associated neutrophils and neutrophil elastase in regulation of lung cancer growth and growth patterns*, in revision, 2021.
5. Chaeyoung Lee, Junho Lee, and **Yangjin Kim**[†], *Role of macrophages in regulation of cytokine shield against tumor growth*, in preparation, 2021.
6. Hideki Murakawa and Yangjin Kim[†], *The role of microenvironment and cell-cell adhesion in pattern formation and implications in breast cancer: A mathematical model*. in preparation.
7. Hyeonggi Kim, Chaeok Yun, Yangjin Kim, and Jinsu Kim[†], *Efficacy of relaxin and antibody on spreading of oncolytic virus and overall tumor cell killing in mAb-Ad3-RLX OV therapy: Mathematical model*, in preparation.

INVITED TALKS

(Countries (16) visited: USA, UK, Canada, Brazil, Republic of Korea, Japan, China, Taiwan, Australia, Philippine, Poland, France, Germany, Israel, Italy, Spain)

Public Lecture :

1. *Mathematical modeling in biological systems: the fundamental mechanism of chemobrain, asthma, tumor growth II*, Myeongshin Woman's High School, Kyunggi-do, Republic of Korea [May 20 , 2024]
2. *Mathematical modeling in biological systems: the fundamental mechanism of chemobrain, asthma, tumor growth I*, Myeongshin Woman's High School, Kyunggi-do, Republic of Korea [May 13 , 2024]
3. *Population theory and mathematical modeling of tumor growth*, Jeonbuk Science High School, Iksan, Jeonbuk-do, Republic of Korea [Dec 18 , 2023]
4. *Mathematics and cancer: the role of neutrophils in cancer dynamics*, Myeongshin Woman's High School, Kyunggi-do, Republic of Korea [Nov 22 , 2023]
5. *Population Dynamics: How to overcome the low birthrate?*, Myeongshin Woman's High School, Kyunggi-do, Republic of Korea [Nov 08 , 2023]

6. *Mathematical Biology: Integration of Life science, Medicine, and Mathematics II* , Myeongshin Woman's High School, Kyunggi-do, Republic of Korea [Oct 24 , 2022]
7. *Mathematical Biology: Integration of Life science, Medicine, and Mathematics I* , Myeongshin Woman's High School, Kyunggi-do, Republic of Korea [Oct 17 , 2022]
8. *Science education: The role of mathematics in developing AI algorithm*, Science lecture, Gwangdong High School, Kyunggi-do, Republic of Korea [July 11 , 2022]
9. *Science education: AI and mathematics*, Science lecture, Gwangdong High School, Kyunggi-do, Republic of Korea [Dec 03, 2021]
10. *Application of mathematics*, Science lecture, Daewang elementary school, Seoul, Republic of Korea [Oct 20, 2021]
11. *Science education: Mathematical Medicine*, Science lecture, Gwangdong High School, Kyunggi-do, Republic of Korea [Nov 06, 2020]
12. *Application of mathematics: Cancer dynamics*, Science lecture, Daewang elementary school, Seoul, Republic of Korea [August 04, 2020]
13. *Revolution in medicine: application of mathematics*, (Virtual) Friday Science Concert (National Research Foundation), Incheon, Republic of Korea [May 22, 2020]
14. *Synergy Effect when Mathematics meets medicine*, Myeogil Woman's High School, Seoul, Republic of Korea [December 2, 2019]
15. *Biomathematics and medicine: how to integrate mathematics in medicine?*, Science lecture hall, Kyunggi High School, Seoul, Republic of Korea [August 31, 2019]
16. *Mathematical Biology: mathematical modeling of tumor growth*, Science lecture, Gwangdong High School, Kyunggi-do, Republic of Korea [July 11, 2019]
17. *Application of mathematics: Cancer dynamics and mathematical modeling*, Science lecture, Eujungbu-shi, Kyunggi-do, Republic of Korea [June 1, 2019]
18. *How to overcome cancer?: application of mathematics*, Saturday Science Concert (National Research Foundation), Seoul, Republic of Korea [April 6, 2019]

Conferences/Workshops :

1. (coming) "Role of biomechanics in regulation of tumor-NK-neutrophils interactions in lung cancer: multi-scale approach", 2025 annual meeting of Society for Mathematical Biology, Edmonton Convention Center, Edmonton, Canada [July 13-18, 2025]
2. (coming) "Mathematical modeling of glioma cell migration on blood vessels via Cl⁻ channel-mediated cell deformation and biophysical interaction with astrocytes", 2025 annual meeting of Society for Mathematical Biology, Edmonton Convention Center, Edmonton, Canada [July 13-18, 2025]
3. (coming) (Plenary talk) The annual international conference on Mathematical Methods and Models in Biosciences (BIOMATH 2025), Bulgarian Academy of Sciences, Institute of Mathematics and Informatics (IMI) and Institute of Mechanics, Sofia, Bulgaria [June 15 - 20, 2025 (th)]
4. (cancelled) Workshop on 'Mathematical Modelling of Cancer Treatments, Resistance, Optimization', The Fields Institute, Toronto, Canada [September 16 - 20, 2024 (th)]

5. *How can tumor-associated neutrophils control faster growth, aggressive infiltration, and metastasis in various cancers: emerging role of neutrophils and mathematical modeling* The joint meeting of KSMB and SMB, Konkuk University, Seoul, Republic of Korea [June 30 - July 5, 2024 (3rd)]
6. *Role of senescent tumor cells in building a cytokine shield in the tumor microenvironment: mathematical modeling and analysis*, 2023 ICIAM Conference, Waseda University, Tokyo, Japan [August 20-25, 2023 (24th)]
7. *Role of NOTCH signaling in macrophage-mediated transport of intracellular molecules in OV therapy*, 2023 ICIAM-satellite Workshop, IBS, Daejeon, Republic of Korea [August 16-18, 2023 (18th)]
8. *Activated NOTCH induced monocyte recruitment suppresses anti-tumor immunity with virotherapy*, 2023 SMB Conference, Ohio State University, Columbus, USA [July 16-21, 2023 (20th)]
9. *Role of senescent tumor cells in building a cytokine shield in the tumor microenvironment: mathematical modeling*, Workshop on ‘Dynamical Systems in the Life Sciences’ in honor of Avner Friedman’s 90th birthday, Ohio State University, Columbus, USA [July 13-15, 2023 (13th)]
10. *Dramatic rescue of cancer-related cognitive changes in combined anticancer therapies*, 2022 Global KMS International Conference, Korean Science Technology Center, Seoul, Republic of Korea [Oct 18-21, 2022 (19th)]
11. *Transport of NICD in cancer cells in an OV Therapy*, The 1st Workshop on Mathematical Biology & Bioinformatics, POSTECH, Republic of Korea [Sep 30- Oct 1, 2022 (30th)]
12. *Mathematical Modeling of tumor growth: OV Therapy*, 2022 ECMTB-SMB joint Conference, Heidelberg, Germany [Sep 19-23, 2022 (23th)]
13. *Collective migration of glioma cells through signaling in the presence and absence of reactive astrocytes and stem cells after surgery*, 2021 KSIAM Spring Conference, Gangneung TopsTen Hotel, Gangneung, Republic of Korea [June 25-27, 2021 (26th)]
14. (Keynote) *Mathematical modeling of tumor growth and signaling network, and development of anti-cancer drugs and therapeutic strategies: From experiments to realization in math models*, 2020 PAGK Annual Meeting, Iksan, Republic of Korea [Nov 27, 2020]
15. (Plenary talk) *Mathematics and biology in future: How to overcome cancer*, (Virtual) Annual meeting of The Korean Society of Mathematical Education, Seoul, Republic of Korea [Aug 21-22, 2020 (21st)]
16. *How the surgery-induced transition of reactive astrocytes to stem cell-like phenotypes leads to recurrence of GBM by Cxcl5: hybrid multi-scale approaches*, SMB conference (eSMB2020), USA [August 17-20, 2020 (20th)]
17. *Cellular infiltration, intra- and inter-cellular signaling and cell mechanics in tumor biology: hybrid multi-scale approaches*, (Virtual) Workshop on Mathematical and Computational Methods in Biology, Mathematical Biosciences Institute, Columbus, OH, USA [May 5-8, 2020 (6th)]

18. *Role of NK cells and its signaling in regulation of OV-bortezomib combination therapy*, International immunology conference, Block 6 session on NK Cells and Innate Cells, Sejong University, Seoul, Republic of Korea [Oct 30-Nov 1, 2019 (31th)]
19. *Role of tumor microenvironment in regulation of tumor progression and anti-tumor strategies*, The 7th China-India-Japan-Korea International Conference on Mathematical Biology, Peking, China [Aug 23-27, 2019 (25th)]
20. *Mathematical model of tumor growth and anti-invasion strategies*, 2019 SMB conference, Montreal, Canada [July 21-26, 2019 (23rd)]
21. *Mathematical model of tumor growth and anti-invasion strategies*, CJK session on mathematical biology, 2019 ICIAM conference, Valencia, Spain [July 15-19, 2019 (18th)]
22. *Multi-scale model of glioblastoma invasion*, ICIAM conference, Valencia, Spain [July 15-19, 2019 (17th)]
23. *Overview: Recent advances in tumor growth modeling*, 2019 KSMB meeting, Seogwipo KAL hotel, Jeju, Republic of Korea [June 20-22, 2019 (21st)]
24. (Keynote lecture) *Mathematical models of tumor growth*, The 14th SIAM East Asian Section Conference (EASIAM), Wuhan University, Wuhan, China [June 13-16, 2019 (15th)]
25. *Role of microenvironment in regulation of tumor growth and invasion in glioblastoma and development of new therapeutic strategies: Multi-scale mathematical models*, Conference on multiscale mathematical modeling of biological phenomena (in honor of Hans Othmer's 75th birthday), Minneapolis, USA [May 20-22, 2019 (22nd)]
26. *Role of microenvironment in regulation of tumor growth*, 2019 A3 Workshop on Mathematical Life Science, Beijing University, Beijing, China [May 10-12, 2019 (11th)]
27. *The role of microenvironment in regulation of cell infiltration and bortezomib- OV therapy in glioblastoma*, The 5th joint workshop of A3 Foresight Program, Lakai Sandpine Hotel, Gangneung, Republic of Korea [October 18-20, 2018 (18th)]
28. *The role of microenvironment in regulation of cell infiltration and bortezomib-OV therapy in glioblastoma*, SIAM-LS meeting, Radisson Blue Minneapolis Hotel, Minneapolis, USA [August 6-9, 2018 (7th)]
29. *Complex Role of NK cells in regulation of OV-Bortezomib therapy*, 2018 Annual Meeting of the Society for Mathematical Biology & the Japanese Society for Mathematical Biology, University of Sydney, Sydney, Australia [July 8 - 12, 2018 (12th)]
30. *Role of extracellular matrix and microenvironment in regulation of tumor growth and LAR-mediated invasion in glioblastoma: A multi-scale mathematical model*, Virtual Tissues: Progress and Challenges in Multicellular Systems Biology, MATRIX, University of Melbourne, Creswick, Australia. [July 2 - 7, 2018 (4th)]
31. *The role of microenvironment in regulation of cell infiltration in glioblastoma*, 2018 International workshop on mathematical biology, Costabella tropical beach hotel buyoung, Mactan island Cebu, Philippines [January 7 - 10, 2018 (9th)]
32. *Mathematical models of tumor invasion and OV/immune therapy*, MIMS International Workshop on "Modeling and Numerical Analysis of Nonlinear Phenomena: Fluid Dynamics, Motion of Interfaces, and Cell Biology", Meiji University, Tokyo, Japan [Dec 6-8, 2017 (7th)]
33. *The role of the microenvironment in regulation of cell infiltration in glioblastoma*, Workshop on "Multiple scale analysis and modeling of collective migration in biological systems", ZIF Center for Interdisciplinary Research, University of Bielefeld, Germany [Oct. 9-14, 2017 (10th)]

34. *Mathematical modeling of tumor growth: hybrid approaches*, in a session “From cell to tissues: multiscala mathematical approaches in cancer biology”, 2017 Annual Meeting of the Society for Mathematical Biology University of Utah, Salt Lake City, UT, USA [July 17-20, 2017 (19th)]
35. *The role of microenvironment in regulation of cell infiltration in glioblastoma*, in a session “Mathematical models of cancer development and treatment”, 2017 Annual Meeting of the Society for Mathematical Biology University of Utah, Salt Lake City, UT, USA [July 17-20, 2017 (18th)]
36. *OV therapy for the invasive/non-invasive glioma and Bortezomib-induced synergetic effect on tumor killing*, in a session “Modeling Viruses to Defeat Cancer”, 2017 Annual Meeting of the Society for Mathematical Biology University of Utah, Salt Lake City, UT, USA [July 17-20, 2017 (17th)]
37. *The role of microenvironment in regulation of tumor growth*, International Conference for the 70th Anniversary of Korean Mathematical Society, Seoul National University, Republic of Korea [Sep 20-23, 2016 (22nd)]
38. *Interaction of gliomas with M1/M2 microglia: A mathematical model*, PDE analysis and modeling, GDRI ReaDiNet conference on “Reaction-Diffusion Network in Mathematics and Biomedicine”, Frejus, France [Sep 19-23, 2016 (19th)]
39. *Mathematical models of cancer development I*, 2016 Summer workshop and Intensive course in bio-medicine, Konkuk University, Seoul, Republic of Korea [Aug 22-26, 2016 (23rd)]
40. *Cancer Modeling: Examples*, 2016 Summer workshop and Intensive course in bio-medicine, Konkuk University, Seoul, Republic of Korea [Aug 22-26, 2016 (22nd)]
41. *Principles and Examples on Mathematical Modeling*, KSMB summer school, Chonnam University, Republic of Korea [Aug 16-18, 2016 (17th)]
42. *Interaction of gliomas with their micro-environment: A mathematical model*, 2016 Patterns and waves, Sapporo, Japan [Aug 1-5, 2016 (4th)]
43. *The Role of M1/M2 Microglia in Regulation of Cell Infiltration in Glioblastoma* in a mini-symposium “Mathematical Oncology”, 11th AIMS conference on Dynamical Systems, Differential Equations and Applications, Orlando, USA [July 1 - 5, 2016 (5th)]
44. *The Role of the Microenvironment in Regulation of CSPG-driven Tumor Growth: Invasive and Non-invasive Gliomas* in a mini-symposium “Emergence and Dynamics of Patterns in Nonlinear Partial Differential Equations from Mathematical Science”, 11th AIMS conference on Dynamical Systems, Differential Equations and Applications, Orlando, USA [July 1 - 5, 2016 (2nd)]
45. *The role of the microenvironment in regulation of glioma invasion and development of therapeutic strategies*, 2016 KSMB conference, Jeju Ramada Hamdeok Hotel, Jeju, Republic of Korea, [June 16 - 18, 2016 (17th)]
46. *The role of the microenvironment in regulation of cell infiltration in glioblastoma: Models & Experiments*, A3 Workshop on Interdisciplinary Research Connecting Mathematics and Biology BICMR, Peking University, China [April 22 - 24, 2016]
47. *The role of the microenvironment in regulation of cell infiltration in glioblastoma: Models & Experiments*, 2016 Workshop for Mathematical Biology: Recent Topics and Vision of Mathematical Biology in Korea Ramada Hamdeok hotel, Jeju Island, Republic of Korea [Feb 27 - 28, 2016 (28th)]

48. *How to model cancer progression?: different approaches and pros and cons*, 2016 Winter workshop and Intensive course in bio-medicine, Konkuk University, Seoul, Republic of Korea [Jan 18-22, 2016 (18th)]
49. *The role of the microenvironment in regulation of CSPG-driven tumor growth: invasive and non-invasive gliomas*, KSIAM conference, Pusan, Republic of Korea [Nov 20-22, 2015 (21st)]
50. *The role of the microenvironment in regulation of CSPG-driven tumor growth: invasive and non-invasive gliomas*, Mini-workshop on PDE models in mathematical biology, Yonsei University, Seoul, Republic of Korea [Nov 6, 2015]
51. *Role of microenvironment in regulation of tumor growth: signaling, adhesion, growth, direct migration*, International Conference on Mathematical Modeling and Applications 2015 'Self-Organization-Modeling and Analysis', Meiji University, Tokyo, Japan [Oct 26 - 29, 2015 (26th)]
52. *Role of microenvironment in regulation of tumor growth*, International workshop on intracranial tumors modeling, Bordeaux, France [Sep 21 - 22, 2015]
53. *The role of myosin II in regulation of glioma infiltration: a mathematical model*, 2015 Joint Meeting of The 5th China-Japan-Korea Colloquium on Mathematical Biology and The Japanese Society for Mathematical Biology, Doshisha University, Kyoto, Japan [Aug 26 - 29, 2015 (29th)]
54. *Mathematical models of the miR-451-AMPK-mTOR system and implications to cell proliferation and migration in glioblastoma*, Workshop on cancer research for resistance, National Cancer Center, Ilsan, Republic of Korea [Aug 13, 2015 (13th)]
55. *The role of chemotaxis and diffusion processes in tumor growth models*, 2015 KAIST CMC Mathematical Biology Conference on Cross-diffusion, chemotaxis, and related problems, KAIST, Daejeon, Republic of Korea [July 8 - 10, 2015 (July 09)]
56. *Multiscale models of cell proliferation and migration in glioblastoma*, International cancer workshop on "Computational and multiscale mathematical modelling of cancer growth and spread", International centre for mathematical sciences, Edinburgh, UK [June 22 - 26, 2015 (June 26)]
57. *Training mathematical biologists and future in mathematical biology in Korea*, Workshop on development of mathematical biology program in Korea, NIMS, Republic of Korea [May 12, 2015]
58. *Mathematical models of oncolytic virus therapy and characterization of the invasive and non-invasive glioma*, MBI cancer workshop 7: STEM CELLS, DEVELOPMENT, AND CANCER, Mathematical Biosciences Institute, Ohio State University, Columbus, OH, USA [April 13 - 17, 2015 (April 14)]
59. *Oncolytic virus spread and CSPG-driven tumor cell infiltration in glioblastoma*, BIRS Workshop 'Partial Differential Equations in Cancer Modelling', Banff, Canada [Feb 1 - 6, 2015 (Feb 3)]
60. *Mathematical modeling of tumor growth: an application to breast cancer and glioblastoma*, Seoul-Tokyo conference on "Applied Partial Differential Equations: Theory and Applications", KIAS, Seoul, Republic of Korea [Dec 13-14, 2014 (Dec 13)]
61. *The role of CSPG and astrocytes in regulation of glioma infiltration*, 2014 KSIAM conference, Jeju International Convention Center, Jeju, Republic of Korea [Nov 20-23, 2014 (Nov 22)]

62. *How to kill infiltrative glioma cells via HIF-miR-451-AMPK-mTOR-cell cycle signaling*, mini-symposium organized by Peter Kim, 2014 JSMB-SMB joint conference, Osaka, Japan [July 28 - Aug 1, 2014 (Aug 1)].
63. *Mathematical modeling of Choindroitinase ABC I-mediated enhancement of oncolytic virus spread and anti tumor efficacy*, mini-symposium organized by Heiko Enderling and Amina, 2014 JSMB-SMB joint conference, Osaka, Japan [July 28 - Aug 1, 2014 (July 29)].
64. *The role of myosin II in glioma invasion: Cell-ECM interactions*, mini-symposium organized by Yi Jiang, 2014 JSMB-SMB joint conference, Osaka, Japan [July 28 - Aug 1, 2014 (July 29)].
65. *Mathematical models of cell and tissue movement: application to tumor growth*, A mini-workshop in Mathematical biology, University of Tokyo, Japan [July 25, 2014].
66. *How to eradicate glioma cells: can a radical idea lead to a new therapeutic strategy?*, 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Madrid, Spain [July 07 - 11(8), 2014].
67. *Choindroitinase ABC-mediated enhancement of oncolytic virus spread and anti tumor efficacy: A mathematical model*, 2014 KSMB conference, Kyungbook University, Daegu, Republic of Korea [May 19-21(20), 2014].
68. *Choindroitinase ABC-mediated enhancement of oncolytic virus spread and anti tumor efficacy: A mathematical model*, 2014 NIMS Hot Topic workshop “Application of ecological and mathematical theory to cancer: new challenges”, National Institute for Mathematical Sciences (NIMS), Daejeon, Republic of Korea [May 12-15(12), 2014]. (Main organizer)
69. *The role of TGFbeta in regulation of Th1 and Th2 asthma development*, 2014 Spring KMS conference, Wonju University, Republic of Korea [April 24, 2014].
70. *Mathematical models of cell and tissue movement: application to tumor growth*, 2014 NIMS Hot Topic workshop “British Council Researchers Links Workshop on Soft Matter: Analysis, Applications and challenges”, National Institute for Mathematical Sciences (NIMS), Daejeon, Republic of Korea [March 19, 2014].
71. *Regulation of Th1 and Th2 cells in asthma development: A mathematical model*, 2013 KIAM conference, KAL Hotel, Jeju Island, Republic of Korea [Nov 22-24, 2013].
72. *Regulation of Th1 and Th2 cells in asthma development: A mathematical model*, 2013 KSMB annual conference, Jeju University, Jeju Island, Republic of Korea [Aug 21-23, 2013].
73. *A hybrid model of tumor-stromal interactions in breast cancer* in a session MS20: Hybrid modeling for biological systems organized by Benjamin Franz, 2013 SMB annual conference, Tempe, AZ, USA [June 10-13 (13), 2013].
74. *Choindroitinase ABC I-mediated enhancement of oncolytic virus spread and anti tumor efficacy: A mathematical model*, in a session MS33: Mathematical models of tumor growth and treatment organized by Urszula Ledzewicz and Avner Friedman, 2013 SMB annual conference, Tempe, AZ, USA [June 10-13 (10), 2013].
75. *A mathematical model of miR-451-AMPK-mTOR and cell cycle in glioblastoma*, in a session MS6: Hypothesis-based, data validated mathematical models of cancer organized by John Nagy and Yang Kuang, 2013 SMB annual conference, Tempe, AZ, USA [June 10-13 (10), 2013].
76. *Survival Switch in Glioblastoma: new therapeutic approach*, 2013 Hot Topics Workshop on Special Highlights on Mathematical Biology, National Institute for mathematical sciences (NIMS), Daejeon, Republic of Korea [June 3-5 (4), 2013].

77. *Role of myoferlin in regulation of cancer invasion*, 2013 KSIAM spring conference, Yonsei University, Seoul, Korea [May 24-25 (24), 2013].
78. *A hybrid Model for cell proliferation and migration in Glioblastoma: microRNA (miR451) regulation of tumor invasion/growth*, 2013 Sydney Workshop on Mathematical Models of Tumor-Immune System Dynamics, Sydney, Australia [Jan 7-10, 2013]
79. *The role of biomechanics in the breast cancer cell migration: A mathematical model*, 2012 SMB conference, Knoxville, TN, USA [July 25-28, 2012]
80. *The role of biomechanics in the early development of breast cancer: A hybrid model*, 2012 SIAM annual meeting, Hyatt Regency Minneapolis, Minneapolis, MN, USA [July 9-13, 2012]
81. *Signal transduction pathways in the growth and invasion of glioblastoma: a mathematical model*, special session contributed to 80-th birthday of Avner Friedman, The 9th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, Florida, USA [July 1 - 5, 2012]
82. *The role of the microenvironment in tumor growth and dormancy*, 2012 KSMB meeting, Pusan University, Pusan, Republic of Korea [May 23, 2012]
83. *The role of the biomechanics and microenvironment in breast cancer invasion: a hybrid model*, 2012 KSIAM spring meeting, Ewha University, Seoul, Republic of Korea [May 19, 2012]
84. *Free boundary problems in the early development of breast cancer*, Free Boundary Problems in Biology, Mathematical Biosciences Institute, Ohio State University, Columbus, OH, USA [Nov 14-18, 2011]
85. *A mathematical model of glioma invasion*, SIAM conference on Analysis of Partial Differential Equations, San Diego, CA, USA [Nov 14-17, 2011]
86. *The Role of mechanics in glioma cell invasion*, 7th International Congress on Industrial and Applied Mathematics, Vancouver, BC, Canada [July 18-22, 2011]
87. *The role of the microenvironment in an early development of breast cancer: a hybrid (multi-scale) model*, ECMTB/SMB conference, Krakow, Poland [June 28 - July 2, 2011]
88. *The role of the microenvironment in tumor invasion: a mathematical model*, ECMTB/SMB conference, Krakow, Poland [June 28 - July 2, 2011]
89. *Mathematical model of glioma (brain tumor) invasion*, Workshop on PDE Models of Biological Process, National Tsing-Hua University, Hsinchu, Taiwan [December 13-17, 2010]
90. *A multi-scale mathematical model of tumor-microenvironment interactions*, 2010 AMS Fall Central Section Meeting, U of Notre Dame, IN, USA [November 5-7, 2010]
91. *Glioma invasion in vitro*, 2010 US-Korea Conference on Science, Technology and Entrepreneurship, Hyatt Regency Bellevue, Bellevue, WA, USA [August 11-15, 2010]
92. *What is Mathematical Biology? Is it useful in Biology?*, 2010 Students Mathematics Workshop, Hyatt Regency Bellevue, Bellevue, WA, USA [August 13, 2010]
93. *The role of cancer's microenvironment in drug resistance*, SMB annual conference, Federal University of Rio de Janeiro State, Rio de Janeiro, Brazil [July 26 - July 29, 2010]
94. *Role of microenvironment in cancer progression*, Organizer for a mini-symposium on "Tumor microenvironment: Influence on cancer progression", SIAM Conference on the Life Sciences (LS10), The David L. Lawrence Convention Center, Pittsburgh, PA, USA [July 12-15, 2010]

95. *A hybrid model of interaction between tumor cells and microenvironment*, 10th International Conference on Computational and Mathematical Methods in Science and Engineering, University of Wisconsin-Madison, WI, USA [May 24-26, 2010]
96. *Pattern formation in glioma invasion*, 2010 AMS Spring Central Section Meeting, Macalester College, St. Paul, MN, USA [April 10, 2010]
97. *Role of microenvironment in cancer progression : A mathematical model*, 2010 AMS Spring Central Section Meeting, Macalester College, St. Paul, MN, USA [April 11, 2010]
98. *Role of microenvironment in cancer progression : A multiscale approach*, Workshop: Mathematical Methods in Systems Biology, Tel Aviv University, Tel Aviv, Israel [Jan 4-7, 2010]
99. *Multiscale modeling of tumor growth*, Math Biol Workshop, Korea Advanced Institute of Science and Technology, Daejeon, South Korea [Dec 21, 2009]
100. *The role of microenvironment in glioma invasion: a mathematical model*, Joint Meeting of the KMS and AMS, Ewha Womans University, Seoul, South Korea [Dec 19, 2009]
101. *A hybrid model of interaction between tumor cells and microenvironment*, **Organizer** for a minisymposium on "Multiscale Modeling of Cancer Progression", International Conference on Mathematical Biology and 2009 Annual Meeting of The Society of Mathematical Biology, University of British Columbia, Vancouver, Canada [Jul 30, 2009]
102. *Glioma invasion and microenvironment : a multiscale approach*, MS52 State of the Art in Computational Modelling of Cancer - Part II of III, SIAM Conference on Computational Science and Engineering (CSE09), Miami Hilton Hotel, Miami, Florida, USA [Mar 3, 2009]
103. *Glioma invasion: how one can use a multi-scale model?*, 2008 annual meeting of Korean Society for Mathematical Biology (KSMB), Korea University, Seoul, South Korea [Oct 10, 2008]
104. **Co-organizer** : *A mathematical model of Brain tumor : pattern formation of glioma cells outside the tumor spheroid core*, 2008 Workshop for Young Researchers in Mathematical Biology (WYRMB), MBI, Ohio State University, Columbus, OH, USA [Sep 2, 2008]
105. *Transformed Epithelial Cells and Fibroblasts/Myofibroblasts Interaction in Breast Tumor: A Mathematical Model and Experiments*, **Organizer** for a mini-symposium on "Tumor microenvironment: Influence on cancer progression", 2008 SMB conference, Fields Institute, Toronto, Canada [Jul 30, 2008]
106. *Interaction of tumor with its microenvironment: A mathematical model*, 2008 World Congress of Nonlinear Analysis, Orlando, Florida, USA [Jul 2, 2008]
107. *A multi-scale model for avascular tumor growth*, AMS Central 2008 spring sectional meeting, Indiana University, Bloomington, IN, USA [Apr 5, 2008]
108. *Transformed Epithelial cells and fibroblasts/myofibroblasts interaction in Breast Tumor: A Mathematical Model and Experiments*, AMS SE 2008 spring sectional meeting, Louisiana State University, Baton Rouge, LA, USA [Mar 30, 2008]
109. *A hybrid model of tumor spheroid growth*, SIAM Conference on Mathematics for Industry: Challenges and Frontiers, Hyatt Regency, Philadelphia, PA, USA [Oct 9-11, 2007]

Educational lecture :

1. *Mathematics in chemobrain, asthma, and cancer*, Teacher Education Program, Korea University (Republic of Korea, Aug 8, 2024).

2. *Population dynamics and differential equations in mathematical biology*, Teacher Education Program, Korea University (Republic of Korea, Aug 6, 2023).
3. *Future of Math education : Application of Mathematics in real world: Mathematical medicine & machine learning*, Teacher Education Program, Korea University (Republic of Korea, Aug 8, 2022, online).
4. *Future of Math education : Mathematical modeling & machine learning in medicine*, Teacher Education Program, Korea University (Republic of Korea, July 26- Aug 13, 2021 (8th), online).
5. *Application of Mathematics: Mathematical medicine & machine learning*, Teacher Education Program, Korea University (Republic of Korea, Virtual program, August 14, 2020).
6. *Mathematical modeling of tumor growth*, Teacher Education Program, Korea Foundation for the Advancement of Science & Creativity (Republic of Korea, Konkuk University, July 17-19, 2018).
7. *Mathematical modeling of tumor growth and anti-cancer therapy*, Teacher Education Program, Korea Foundation for the Advancement of Science & Creativity (Republic of Korea, Konkuk University, Nov 16-17, 2017).

Colloquium/seminar talks :

University of Wisconsin-Milwaukee (USA, May 2, 2025), Moffitt Cancer Center (USA, Feb 20, 2025), University of Texas Health Science Center at Houston (USA, Jan 15, 2025), Brown University Medical School (USA, Dec 13, 2024), Pennsylvania State University (USA, Oct 29, 2024), Korea Institute of Radiological & Medical Sciences (KIRAMS) and Korea Cancer Center Hospital (Republic of Korea, Nov 28, 2023), Konkuk University (UP-KU; Republic of Korea, Dec 20, 2022), UNIST (Republic of Korea, Feb 09, 2021), Korea University (Republic of Korea, Nov 3, 2020), UNIST (Republic of Korea, Sep 24, 2020), UNIST (Republic of Korea, Mar 14, 2019), University of Adelaide (Australia, Jan 11, 2019), Konkuk University (Republic of Korea, Oct 13, 2018), Korea University (Republic of Korea, Feb 21-22, 2018), University of British Columbia (Canada, May 23, 2017), Mathematical Biosciences Institute (USA, May 1, 2017), Ohio State University (USA, April 13, 2017), Seoul National University Hospital (Republic of Korea, Nov 24, 2016), Seoul Metropolitan Office of Education (Republic of Korea, Nov 21,23, 2016), Korea University (Republic of Korea, Nov 4, 2016), National Cancer Center (Republic of Korea, Sep 12, 2016), A3 foresight program seminar (Republic of Korea, June 24, 2016), Konkuk University (Republic of Korea, Apr 7, 2016), Soongsil University (Republic of Korea, Nov 26, 2015), National Cancer Center (Republic of Korea, Oct 19, 2015), Kyoto University (Japan, Aug 28, 2015), Pharmicell (Republic of Korea, July 30, 2015), UNIST (Republic of Korea, July 27-28, 2015), Korea University (Republic of Korea, July 10, 2015), University of Sydney (Australia, Jan 16, 015), Yonsei University (Republic of Korea, Nov 26, 2014), Kangwon University (Republic of Korea, Nov 5, 2014), Korea University (Republic of Korea, Oct 31, 2014), RIKEN (Japan, Oct 24, 2014), Korea University (Republic of Korea, Oct 13, 2014), Korea University (Republic of Korea, Sep 19, 2014), Kyoto University (Shin Issii lab, Japan, July 31, 2014), Cancer research institute, Seoul National University (Republic of Korea; May 20, 2014), KAIST (Republic of Korea; May 19, 2014), UNIST (Republic of Korea; May 02, 2014), Inha University (Republic of Korea; April 17, 2014), Konkuk University (Mathematics, Republic of Korea; Apr 16, 2014), Konkuk University (Chemistry, Republic of Korea; Mar 13, 2014), NIMS (Republic of Korea; Feb 27, 2014), UNIST (Republic of Korea; Dec 6, 2013), Korea University (Republic of

Korea; Sep 27, 2013), National cancer center (Republic of Korea; Aug 08, 2013), Kyunghee University (Republic of Korea; May 23, 2013), Seoul National University Hospital (Republic of Korea; Apr 25, 2013), Yonsei University (Republic of Korea; Apr 23, 2013), Hanyang University (Republic of Korea; Apr 2, 2013), Korea University (Republic of Korea; Mar 2013), Yonsei University (Republic of Korea; Nov, 2012), Inha University (Republic of Korea, Nov 2012), Seonggyungwan University (Republic of Korea; Oct 2012), Konkuk University (Republic of Korea; May 2012), Korea University (Republic of Korea; May 2012), Konkuk University (Republic of Korea; Apr 2012), Korea University (Republic of Korea; Mar 2012), Konkuk University (Republic of Korea; Mar 2012), Chungnam University (Republic of Korea, Nov 2011), Konkuk University (Republic of Korea; Nov 2011), University of Michigan (USA, Nov 2011), Wayne State University (USA, Oct 2011), UNIST (Republic of Korea; Dec 2010), University of Michigan-Ann Arbor (USA, Oct 2010), University of Michigan (USA, Sep 2010), Cleveland State University (USA, Mar 2010), University of Windsor (Canada, Mar 2010), Oakland University (USA, Jan 2010), University of Michigan (USA, Jan 2010), Konkuk University (Republic of Korea; Dec 2009), UNIST (Republic of Korea; Dec 2009), Korea University (Republic of Korea; Dec 2009), POSTECH (Republic of Korea; Dec 2009), University of Michigan (USA, Nov 2009), University of Cincinnati (USA, Nov 2009), Case Western Reserve University (USA, Feb 2009), University of Michigan (USA, Feb 2009), University of California-San Diego (USA, Feb 2009), University of Delaware (USA, Jan 2009), Ohio State University (USA, Nov 2008), Worcester Polytechnic Institute (USA, Nov 2008), Korea University (Republic of Korea; Oct 2008), Ohio State University (USA, Oct 2008), Mathematical Biosciences Institute (USA, Jul 2008), POSTECH (Republic of Korea; Apr 2008), Konkuk University (Republic of Korea; Apr 2008), Fields Institute (USA, Aug 2008), Ohio State University (USA, Nov 2007), Mathematical Biosciences Institute (USA, Oct 2007), Mathematical Biosciences Institute (USA, Nov 2006), University of Minnesota (USA, Jul 2006), University of British Columbia (Canada; Jan 2006), University of Minnesota (USA, Jan 2006), Winona State University (USA, Oct 2004), University of Minnesota (USA, Jul 2004), University of Minnesota (USA, Apr 2004), University of Minnesota (USA, Jun 2003), University of Minnesota (USA, Oct 2002),

FELLOWSHIPS & (Grant) AWARDS

1. Research Grant Award entitled '*Development of anti-cancer therapeutic strategies using STING signaling, dexamethasone, and immune control in combination therapy (OV, brachytherapy, immunotherapy)*', Basic Science Research Program, National Research Foundation of Korea, Ministry of Science and ICT, Republic of Korea [May 2024; 5 years] (1,524,005,000 KRW \sim 1.2 million USD)
2. R&E Program award entitled '*Role of Synergistic effects of bortezomib-oncolytic virus therapy in anti-cancer therapy*', Ministry of Education, Seoul Science High School, Republic of Korea [Mar 2023; 10 months] (6,500,000 KRW)
3. R&E Program award entitled '*Role of cancer stem cells in regulation of cognitive changes in cancer patients*', Ministry of Education, Seoul Science High School, Republic of Korea [Mar 2022; 10 months] (6,500,000 KRW)
4. R&E Program award entitled '*Role of aging tumor microenvironment in regulation of cytokine defense*', Ministry of Education, Seoul Science High School, Republic of Korea [Mar 2021; 10 months] (6,500,000 KRW)
5. Research Grant Award entitled '*Immune-mediated NICD- and NET-mediated metastasis in combination cancer therapies, and normalization of chemobrain/alopecia*', Basic Science Research Program, National Research Foundation of Korea, Ministry of Science and ICT, Republic of Korea [Mar 2021; 3 years] (359,331,000 KRW)

6. R&E Program award entitled '*Role of microenvironment in regulation of metastasis of circulating cancer cells*', Ministry of Education, Seoul Science High School, Republic of Korea [Mar 2020; 10 months] (6,500,000 KRW)
7. Global Network Grant Award entitled '*Development of hybrid multi-scale mathematical model of post-surgery tumor growth and cellular immune signal networks, and new design of anti-cancer strategies*', Basic Science Research Program, National Research Foundation of Korea, Ministry of Science and ICT, Republic of Korea [July 2020; 8 months] (18,000,000 KRW)
8. Research Grant Award (co-PI) entitled 'Game Panel 2018' [Sep 2018 - Mar 2019]
9. Research Grant Award entitled '*Drug delivery strategies to overcome the blood-brain barrier and development of anti-cancer combination therapy through the tumor-immune interaction system in TME: Mathematical modeling and theory*', Basic Science Research Program, National Research Foundation of Korea, Ministry of Science and ICT, Republic of Korea [Mar 2018; 3 years] (300,000,000 KRW)
10. R&E Program award entitled '*Development of anti-cancer strategies in glioblastoma*', Ministry of Education, Seoul Science High School, Republic of Korea [Mar 2016; 10 months] (6,500,000 KRW)
11. Research Grant Award entitled '*Dynamics of bortezomib-induced ER stress in NF κ B-Bcl-2-BAX signaling and development of bortezomib/chemo/radio therapeutic strategies in multiple myeloma, head and neck cancer, and glioblastoma: Mathematical models*', Basic Science Research Program (General), National Research Foundation of Korea, Ministry of Education, Republic of Korea [Nov 2015; 3 years] (150,000,000 KRW)
12. Industry-Mathematics Grant Award (Co-PI) entitled '*Mathematics in Biosciences and Medicine*', National Institute for Mathematical Sciences, Republic of Korea [June 2015; 18 months] (120,000,000 KRW)
13. Internal grants: Faculty Research Grant Award, Konkuk University, Republic of Korea: [May 2016 (10,000,000 KRW); May 2015 (25,000,000 KRW); Dec 2014 (25,000,000 KRW); May 2014 (25,000,000 KRW); May 2013 (18,000,000 KRW); Mar 2012 (15,000,000 KRW)].
14. Research grant award entitled '*Development of mathematical models for cell migration based on Acto-myosin dynamics*', National Institute for Mathematical Sciences, Ministry of Education, Republic of Korea [May , 2014; 9 month] (30,000,000 KRW)
15. SMB WOC award for 2014 NIMS Hot Topics workshop (cancer workshop) [May, 2014] (\$5,000)
16. Research Grant Award entitled '*The role of the microenvironment in cancer (breast, glioblastoma, lung) progression and development of anti-cancer drugs: Mathematical models*', Basic Science Research Program (Young Researcher), National Research Foundation of Korea, Ministry of Education, Republic of Korea [Sep 2012; 3 years] (150,000,000 KRW)
17. Faculty Rackham Replacement Research Grant award, '*The role of biomechanics in the early development of breast cancer and glioblastoma*', U of Michigan [Dec 2011; 3 years] (\$15,000)
18. Faculty Research Initiation & Seed Grant award, U of Michigan '*Multi-scale Models of the Role of the Microenvironment in Tumor Growth and Invasion*', [Mar, 2011; 5 years] (\$6,000).
19. Special Research Grant, U of Michigan [Jan, 2010]
20. Faculty (Tenure Track) Professional Development Grant Award, U of Michigan [Nov, 2010; 1 year]
21. SMB grant award for 2010 SIAM Great Lake Conference (Mathematical Biology, numerical PDEs), [Apr 2010] (\$2000)

22. SIAM conference grant award for 2010 SIAM Great Lake Conference (Mathematical Biology, numerical PDEs), [Apr 2010] (\$3550)
23. Rackham Faculty Research Grants Award ‘*The role of the tumor microenvironment in the progression of breast and brain cancer*’, U of Michigan-Ann Arbor [Mar, 2010] (\$3,000)
24. NSF Postdoc Fellowship Award, Mathematical Biosciences Institute, Ohio State University, OH [Oct 2006-Aug 2009; 3 years]
25. Graduate assistantship, University of Minnesota

PROFESSIONAL ACTIVITIES

Academic Board

- Board of Directors of the Korean Society for Mathematical Biology (KSMB) [Jan 2019-present]
- Board of Directors of the Korean Society for Industrial and Applied Mathematics (KSIAM) [Jan 2019- Dec 2020]
- ICIAM 2023 preparation committee in Republic of Korea, KSIAM, 2016.

Referee & Panel

- Journals: Bulletin of Mathematical Biology, Br. J of Cancer, Cancer Research, IEEE-Transactions on Biomedical Engineering, IMA-Mathematical Medicine & Biology, J. of Math Biol, J. of Theoretical Biology, J of Royal Society Interface, J. of Biological Dynamics, Molecular Pharmaceutics, Mathematical Biosciences, Mathematical Modeling of Natural Phenomena, Mathematical Biosciences and Engineering, PLoS Comp Biol, PLoS ONE, Discrete and Continuous Dynamical System Series-B, Math. Models Methods Appl. Sci (M3AS), Theoretical Biology and Medical Modelling, etc.
- Grants & directorship: Institute for Basic Science (Republic of Korea), National Research Foundation (Republic of Korea), Swiss National Science Foundation, Federal grants (USA)

Conference/workshop organizer

1. The 2024 joint annual meeting of Korean Society for Mathematical Biology and Society for Mathematical Biology, Konkuk University, Seoul, Republic of Korea [June 30 - July 5, 2024] (Chair (Co-chair); organizing committee) [<http://smb2024.org/index.asp>]
2. The 8th China-India-Japan-Korean international conference in Theoretical and Mathematical Biology, Sono Belle Jeju Resort, Jeju Island, Republic of Korea [June 27 - July 1, 2023] (Co-organizer) [<http://ksmb.org/conference/2/>]
3. 2016 Summer School in bio-medicine, Konkuk University, Seoul, Republic of Korea [Aug 22-26, 2016] (Co-organizer)
4. 2016 Winter workshop and Intensive course in bio-medicine, Konkuk University, Seoul, Republic of Korea [Jan 18-22, 2016] (Co-organizer)
5. 2014 NIMS Hot Topic workshop “Application of ecological and mathematical theory to cancer: new challenges”, National Institute for Mathematical Sciences (NIMS), Daejeon, South Korea [May 12-15, 2014]. (Main organizer)
6. SIAM Great Lake conference, University of Michigan [April 17, 2010] (Main organizer)
7. 2008 Workshop for Young Researchers in Mathematical Biology (WYRMB), MBI, Ohio State University, Columbus, OH, USA [September 2 - 4, 2008] (Co-organizer)
8. 2007 Workshop for Young Researchers in Mathematical Biology (WYRMB) MBI, Ohio State University, Columbus, OH, USA [September 11-14, 2007] (Co-organizer)

9. 2007 Workshop for Young Researchers in Mathematical Biology (WYRMB), MBI, Ohio State University, Columbus, OH, USA [March 12-15, 2007] (Co-organizer)

Scientific Committee

1. Joint conference of Asian Conference on Mathematical Biology and Annual Meeting of Japanese Society for Mathematical Biology (ACMB-JSMB2025), Kyoto Terrsa, Kyoto, Japan [July 7 - 11, 2025]

Organizer for mini-symposia at conferences

1. “Data-driven Integration of cellular processes in cell motility and cancer progression I, II” (two sessions), 2025 annual meeting of Society for Mathematical Biology, Edmonton Convention Center, Edmonton, Canada [July 13-18, 2025] (w/ Magda Stolarska (U of St. Thomas))
2. “Transformation and Integration of Data and Modeling in Medicine” (two sessions), Joint conference of Asian Conference on Mathematical Biology and Annual Meeting of Japanese Society for Mathematical Biology (ACMB-JSMB2025), Kyoto Terrsa, Kyoto, Japan [July 7 - 11, 2025] (w/ Sungrim Seirin-Lee (Kyoto University) and Naoki Honda (Nagoya University))
3. “Integration of cellular processes in cell motility and cancer progression I, II” (two sessions), 2023 annual meeting of Society for Mathematical Biology, Ohio Union, Ohio State University [July 16-21, 2023] (w/ Magda Stolarska (U of St. Thomas))
4. “Mathematical Biology”, 2023 annual meeting of Korean Society for Industrial and Applied Mathematics, Pyeonchang Alpensia Hotel & Resort [May 19-21, 2023] (w/ Eunjung Kim (KIST))
5. “A bridge over gaps between experiments and mathematical models in molecular biology and cancer”, 2022 annual meeting of Korean Society for Mathematical Biology, Yeosu Venezia Hotel & Resort [June 24-26, 2022]
6. “Mathematical Modelling and Machine Learning Methods for better understanding biological processes”, 2022 annual meeting of Korean Society for Mathematical Biology, Yeosu Venezia Hotel & Resort [June 24-26, 2022] (w/ Eunjung Kim (KIST))
7. “Mathematical Analysis and methods in the dynamics of biological systems: cancers and circadian clock I,II”, 2021 annual meeting of Korean Society for Mathematical Biology, Sono Bell Jeju Resort (converted to online form) [Aug 26-28, 2021] (w/ Jaekyung Kim (IBS & KAIST))
8. “Recent development in mathematical oncology in Asia and Austalia”, 2021 Annual meeting of SMB (virtual), June, 2021 (w/ Eunjung Kim (KIST)).
9. (Cancelled due to COVID-19) “MODELING MECHANOBIOLOGY OF TUMOR DEVELOPMENT AND TREATMENT”, 2020 WCCM, Palais des Congres, Paris, France [July 19-24, 2020] (w/ Kasia Rejniak (Moffitte Cancer Center))
10. “Cancer and cellular mechanism”, KSMB annual meeting, Seogwipo KAL hotel, Jeju, Republic of Korea [June 20-22, 2019]
11. “Recent Advances in Mathematical Biology”, KSIAM spring meeting, Yonsei University, Seoul, Republic of Korea [May 17-18, 2019]

12. “Mathematical biology”, KSIAM annual meeting, Jeju Island, Republic of Korea [Nov 2-4, 2018] (co-organizing with Dr. Changhyeong Lee (UNIST)).
13. “Mathematical models of cell motility and cancer progression in microenvironment: design, experiments, mathematical framework, and hypothesis test.”, 2018 SMB conference, Sydney, Australia [July 8-12, 2018] (co-organizing with prof. Hans Othmer (U of Minnesota)).
14. “Recent Advances in Mathematical Modeling in Health and Disease”, The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications Taipei, Taiwan [July 5 - 9, 2018] (co-organizing with profs. Yi Jiang (Georgia State U) and James Glazier (Indiana U)).
15. “Mathematical models of cell motility and cancer progression in microenvironment: design, experiments, mathematical framework, and hypothesis test”, 11th AIMS conference on Dynamical Systems, Differential Equations and Applications, Orlando, USA [July 1-5, 2016] (co-organizing with prof. Yi Jiang (Georgia State U))
16. “Dynamics of Tumor Growth and Therapeutic Strategies: Experiments and Mathematical Models”, 2016 KSMB conference, Jeju Ramada Hamdeok hotel, Jeju, Republic of Korea [June 16 - 18, 2016]
17. “Design, development, and analysis of mathematical models of biological systems”, 2016 KSMB conference, Jeonnam University, Gwangju, Republic of Korea [Sep 18 - 29, 2015]
18. “Mathematical modeling of biological systems: signaling network, cell motility, disease control, and cancer” 2015 Joint Meeting of JSMB and CJK Colloquium on Mathematical Biology, Doshisha University, Kyoto, Japan [June 26 - 29, 2015]
19. “Mathematical Modeling of Biological Systems: biology, design, analysis, simulation, and implications”, 2015 KSIAM conference, Sungkyungwan University, Republic of Korea [May 29 - 30, 2015]
20. “Mathematical models of cell migration, tumor growth and cancer dynamics”, mini-symposium, 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Madrid, Spain [July 07 - 11, 2014].
21. “Signaling networks, tumor growth, and cell movement: challenges and recent progress”, mini-symposium, 2014 KSMB annual conference, Kyungbook University, Daegu, Korea [June 19-21, 2014].
22. “Mathematical modeling in immune system and effect of time delay”, mini-symposium, 2013 KSMB annual conference, Jeju University, Jeju, Korea [Aug 21-23, 2013].
23. “Mathematical models of cancer and cancer therapy”, special sessions contributed to the 80-th birthday of Avner Friedman, The 9th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, Florida, USA [July 1 - 5, 2012]
24. “Tumor microenvironment: Influence on cancer progression”, SIAM Conference on the Life Sciences (LS10), The David L. Lawrence Convention Center, Pittsburgh, Pennsylvania [July 12-15, 2010]
25. “Multiscale Modeling of Cancer Progression”, International Conference on Mathematical Biology and 2009 Annual Meeting of The Society of Mathematical Biology, University of British Columbia, Vancouver, Canada [July 27-30, 2009]
26. “Tumor microenvironment: Influence on cancer progression”, 2008 SMB conference, Fields Institute, Toronto, Canada [July 30 - Aug 2, 2008]

Colloquium/seminar organizer

- Colloquium, Department of Mathematics, Konkuk University, Republic of Korea [Spring 2015, Fall 2015]
- Postdoc seminar, Mathematical Biosciences Institute, Ohio State U, USA [Fall 2008, Spring 2009]

Membership in Professional Organizations:

American Mathematical Society (AMS), Korean Mathematical Society (KMS), Society for Industrial and Applied Mathematics (SIAM), SIAM, Great Lakes Section (GLSIAM), Society for Mathematical Biology (SMB), Korean Society for Mathematical Biology (KSMB), Korean Society for Industrial and Applied Mathematics (KSIAM).