YOOSIK KIM

Associate professor
Department of Chemical and Biomolecular Engineering
Korea Advanced Institute of Science and Technology
291 Daehak-ro, Yuseung-gu
Daejeon, 34141 Republic of Korea
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EDUCATION

Princeton University, Princeton, NJ *09/2006-11/2011*
Doctor of Philosophy - Department of Chemical and Biological Engineering
Master of Arts - Department of Chemical and Biological Engineering

Dartmouth College, Hanover, NH *09/2002-06/2006*
Bachelor of Engineering - Chemical Engineering
Bachelor of Arts – Engineering Sciences modified with Chemistry, Summa Cum Laude

EMPLOYMENT AND PROFESSIONAL EXPERIENCE

Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea *01/2016-present*
Associate Professor – Department of Chemical and Biomolecular Engineering
Assistant Professor – Department of Chemical and Biomolecular Engineering

Institute for Basic Science, Seoul, Republic of Korea *12/2014-12/2015*
Postdoctoral researcher – Center for RNA Research

Seoul National University, Seoul, Republic of Korea *10/2011-11/2014*
Postdoctoral researcher - School of Biological Sciences

RESEARCH EXPERIENCE

Seoul National University/Institute for Basic Science, Seoul, Republic of Korea *10/2011 – 12/2015*
Postdoctoral Research – Advisor: Dr. V. Narry Kim
Investigated the cellular function of innate immune response protein PKR in uninfected cells. Analyzed PKR activation in the mammalian cell cycle and identified cellular double-stranded RNAs consisting of repeat elements as a class of PKR activators during mitosis.

Princeton University, Princeton, NJ *01/2007-10/2011*
Doctoral Research – Advisor: Dr. Stanislav Y. Shvartsman
Analyzed substrate competitive effects in MAPK signaling cascade using quantitative imaging and mathematical modeling during terminal patterning of the *Drosophila* embryo. Investigated how the competition among MAPK substrates affects the activation status of the enzyme and its ability to distribute its activity among substrates.

Thayer School of Engineering, Dartmouth College, Hanover, NH *09/2005-03/2006*
Bachelor of Engineering Design Project – Advisor: Dr. Lee R. Lynd
Design and evaluate the feasibility of implementing an anaerobic digestion system at McNamara Dairy.

Dartmouth College, Hanover, NH *09/2004-06/2005*
Presidential Scholar Research – Advisor: Dr. Dean E. Wilcox
Characterized different resin-linked dithiocarbamate complexes that can be used as *in vivo* sensors of nitrogen monoxide in animals.

HONORS AND AWARDS

- Member of Young Korean Academy of Science and Technology (Y-KAST) *2025*
- Young Scientist Award (Presidential Award) *2024*
- Excellence in teaching, Outstanding Faculty Awards in Commemoration of the 53rd Founding Anniversary, KAIST *2024*
- Best Teaching Award, Department of Chemical and Biomolecular Engineering, KAIST *2023*
- The Korean Society for Biotechnology and Bioengineering Young Scientist Research Award *2020*
- RNA Society Travel Award *2016*
- Korean Society for Molecular and Cellular Biology Poster Award *2014*
- TJ Park Postdoctoral Fellowship, TJ Park Foundation POSCO *2012-2013*
- The Genetics Society of America Poster Award *2011*
  First Prize in the 52nd Annual *Drosophila* Conference
- Wallace Memorial Honorific Fellowship, Princeton University *2010*
- Wu Prize for Excellence, Princeton University *2010*
- William R. Schowalter Travel Award, Princeton University *2008, 2010, 2011*
- Donald W. Collier '44 Fellowship, Princeton University *2006*
- The Thayer School Faculty Award for Academic Excellence, Dartmouth College *2006*
- Presidential Scholar Assistantship, Dartmouth College *2006*
- Rufus Choate Scholar, Dartmouth College *2005*
- The Leon Burr Richardson Chemistry Prize, Dartmouth College *2003*

PROFESSIONAL AFFILIATIONS & ACTIVITIES

Associate Editor for the *Korean Journal of Chemical Engineering* (2021-present)
Editorial Board Member for *Molecules and Cells* (2021-present)
Editorial Board Member for *BMC Biomedical Engineering* (2018-present)
Guest Editor for *Frontiers in Molecular Biosciences* (2021-2022)
Organizing Committee for the RNA division of *The Korea Society for Molecular and Cellular Biology* (2019-present)
Organizing Committee for the *Asia RNA Club* (2024-present)
Organizing Committee for *The Korean Society for Molecular and Cellular Biology* (2024)
Organizing Committee for *The Korean Society for Biotechnology and Bioengineering* (2020, 2022-2024)
Asian RNA Research Ambassadors for The RNA Society of the USA (2023)

RESEARCH INTEREST

- Double-stranded RNAs and RNA immunity
- RNA-protein interactions and signal transduction
- Development and analysis of transcriptome (mRNA-seq, small RNA-seq, ribosome footprinting, novel high-throughput approaches to identify noncoding RNAs)
- Identification and investigation of long noncoding RNAs
- Drug resistance in cancer

PUBLICATIONS

Summary
Total number of publications: 67
As a (co-)first or (co-)corresponding author: 52
Total number of citations: 3,363
Google Scholar h-index: 30
Google Scholar i10-index: 49

***Co-first authors; #Co-corresponding authors**

67) Ha Y-J, Han YB, Kim K-S, Jeong W-J, Hyon JY, **Kim Y**, Lee YJ. (2026). Mitochondrial RNA-Type I interferon axis in Sjögren's Disease: Molecular Mechanisms and Translational Implications. *Int J Mol Sci* **27**, 7295.

66) Sohn J*, Jeon M*, Lee S, Lim J, Ham S, Park J, Lee J, Jung Y, Lee GY, Min H, Kang E, Jang Y, Kong Y, **Kim Y#**, Lee SJV#. (2026). Phenylalanyl-tRNA synthetase balances longevity and immunity by downregulating endogenous mitochondrial double-stranded RNAs. *Mol Cell* **86**, 2373, 2389.

- Cover Article
- Previewed by Ozaki H, Sasaki N, Kitajima S. (2026). An aminoacyl-tRNA synthetase governs dsRNA-mediated trade-off between longevity and innate immunity. *Mol Cell* **86**, 2237-2239.

65) Jeon M, **Kim Y**. Analysis of endogenously expressed double-stranded RNAs. In J. Yoon (Ed). *RNA Labeling: Methods and Protocols* (In press)

64) Jeon J and **Kim Y**. (2025). Toward unraveling molecular grammars for dsRNA-binding proteins: substrate recognition to binding mechanisms. *BMB Rep* **58**, 451-466.

63) Ku D*, Kim H*, Lim J, Song J, Yoon J, Jun L, Min S-J, Cho R, Lee N, Hur K, Park J-E, Lee LP, Hong J, **Kim Y#**, Park HG#. (2025). Self-modulating therapeutic platform using engineered miRNA-responsive oligonucleotides. *Nano Converg* **12**, 32.

62) Ku D, Yang Y, **Kim Y**. (2025). RNA-associated nuclear condensates: Where the nucleus keeps its RNAs in check. *Mol Cells* **48**, 100240.

61) Lim J*, Jung HD*, Park SY, Jeon M, Kim DS, Cho R, Han D, Ryu HS#, **Kim Y#**, Kim HU#. (2025). Genome-scale knockout simulation and clustering analysis of drug-resistant breast cancer cells reveal drug sensitization targets. *Proc Natl Acad Sci U S A* **122**, e2425384122.

60) Chung J*, Lee Y*, Yoon J, **Kim Y**. (2025). Deciphering the multifaceted role of double-stranded RNA sensor protein kinase R: pathophysiological function beyond the antiviral response. *RNA Biol* **22**, 1-14.

59) Lee M, Jeon J, **Kim Y**. (2025). Global translational regulation by Prkra: Is PKR no longer needed? *Mol Cell* **85**, 1889-1891.

58) Ha Y-J*, Choi YS*, Choi SR, Yoon J, Ku D, **Kim Y**, Kang EH, Kim K-S, Jeong W-J, Hyon JY, Cha S, Lee YJ. (2025). Association of mitochondrial RNA expression levels in saliva and plasma with interferon signature gene expression and disease activity in patients with Sjögren's disease. *RMD Open* **11**, e005166.

57) Yoon J*, Jang D*, Kim M-C, Paek J, Miller R, Veronese B, Alvarado R, Thatayatikom A, **Kim Y#**, Cha S#. (2025). Diminished SUV3 expression and its functional implications in the IFN-enriched monocyte subset of childhood Sjögren's disease. *Rheumatology* **64**, 4393-4403.

56) Ku D, Yang Y, Park Y, Jang D, Lee N, Lee Y-k, Lee K, Lee J, Han YB, Jang S, Choi SR, Ha Y-J, Choi YS, Jeong W-J, Lee YJ, Lee KJ, Cha S#, **Kim Y#**. (2025). SLIRP amplifies antiviral signaling via positive feedback regulation and contributes to autoimmune diseases. *Cell Rep* **44**, 115588.

55) Lim J*, Lee N*, Ju S*, Kim J, Mun S, Jeon M, Lee Y-k, Lee S-H, Ku J, Kim S, Kim J-S#, **Kim Y#** (2025). Cellular dsRNA interactome captured by K1 antibody reveals the regulatory map of exogenous RNA sensing. *Commun Biol* **8**, 389.

54) Park JW*, Jeon J*, **Kim Y#**, Jeon MH#. (2025). Double-Stranded RNA-Based Method for Diagnosing Severe Fever with Thrombocytopenia. *J Clin Med* **14**, 105.

53) Tan S, Kim S, **Kim Y**. (2024). Targeting mitochondrial RNAs enhances the efficacy of the DNA-demethylating agents. *Sci Rep* **14**, 30767.

52) Na H, Koo BI, Park JC, Lim J, **Kim Y**, Chung HJ, Nam YS. (2024). Live-cell Imaging of MicroRNA Expression via Photoinduced Electron Transfer Controlled by Catalytic Hairpin Assembly. *Adv Healthc Mater* **13**, e2401483

51) Kim S*, Tan S*, Ku J, Widowati TA, Ku D, Lee K, You K, **Kim Y**. (2024). RNA 5-Methylcytosine Marks Mitochondrial Double-stranded RNAs for Degradation and Cytosolic Release. *Mol Cell* **84**, 2935-2948.

- Featured as a "Spotlight" article in *Trends in Biochemical Sciences.* Recazens E and Jourdain AA. (2024). Cytosine methylation flags mitochondrial RNA for degradation. *Trends Biochem Sci.* Aug 23:S0968-0004(24)00188-9.

50) Lee K*, Ku J*, Ku D, **Kim Y**. (2024). Inverted *Alu* Repeats: Friends or Foes in Human Transcriptome *Exp Mol Med* **56**, 1250-1262.

49) Ku J*, Lee K*, Ku D, Kim S, Lee J, Bang H, Kim N, Do H, Lee H, Lim C, Han J, Lee Y-s#, **Kim Y#**. (2024). Alternative Polyadenylation Determines the Functional Landscape of Inverted Alu Repeats. *Mol Cell* **84**, 1062-1077.

- Featured as a *Meet-the-author* article in *Molecular Cell* (Volume 84, Issue 6)

48) Yoon J*, Kim S*, Lee M#, **Kim Y#**. (2023). Mitochondrial Nucleic Acids in Innate Immunity and Beyond. *Exp Mol Med* **55**, 2508-2518.

47) Song Y*, Lee Y-k*, Lee Y*, Hwang W-T, Lee J, Park S, Park N, Song H, Kim H, Lee KG, Kim I-D#, **Kim Y#**, Im SG#. (2023). Anti-viral, Anti-bacterial, but Non-cytotoxic Nanocoating for Reusable Face Mask with High Filtration, Breathability, and Robustness in Humid Environment. *Chem Eng J* **470**, 144224.

46) Yoon J*, Ku D*, Lee M, Lee N, Im SG, **Kim Y**. (2023). Resveratrol attenuates the mitochondrial RNA-mediated cellular response to immunogenic stress. *Int J Mol Sci* **24**, 7403.

45) Aldonza MBD*, Cha J*, Yong I, Ku J, Sinitcyn P, Lee D, Cho R, Delos Reyes RD, Kim D, Kim S, Kang M, Ku Y, Park G, Sung H-J, Ryu HS, Cho S, Kim TM, Kim P#, Cho J-Y#, **Kim Y#**. (2023). Widespread multi-targeted therapy resistance via drug-induced secretome fucosylation. *eLife* **12**, e75191.

44) Lee K*, O'Neill KM*, Ku J, Shvartsman SY, **Kim Y**. (2023). Patterning potential of the terminal system in the *Drosophila* embryo. *Korean J Chem Eng* **40**, 436-444.

43) Kim S*, Yoon J*, Lee K, **Kim Y**. (2023). Analysis of mitochondrial double-stranded RNAs in human cells. *STAR Protoc* **4**, 102007.

42) Yoon J*, Lee M*, Ali AA, Oh YR, Choi YS, Kim S, Lee N, Jang SG, Park S, Chung J-H, Kwok S-K, Hyon JY, Cha S#, Lee YJ#, Im SG#, **Kim Y#**. (2022). Mitochondrial double-stranded RNAs as a pivotal mediator in the pathogenesis of Sjogren's syndrome. *Mol Ther Nucleic Acids* **30**, 257-269.

- Selected as a cover article

41) Kim S*, Lee K*, Choi YS, Ku J, Kim H, Kharbash R, Yoon J, Lee YS, Kim J-H, Lee YJ#, **Kim Y#**. (2022). Mitochondrial double-stranded RNAs govern the stress response in chondrocytes to promote osteoarthritis development. *Cell Rep* **40**, 111178.

40) Kang M*, Kharbash R*, Byun JM*, Jeon J*, Ali AA, Ku D, Yoon J, Ku Y, Sohn J, Lee S-JV, Shin D-Y, Koh Y, Yoon S-S, Hong J#, **Kim Y#**. (2022). Double-stranded RNA induction as a potential dynamic biomarker for DNA-demethylating agents. *Mol Ther Nucleic Acids* **29**, 370-383.

39) Jee H#, Park E, Hur K, Kang M, **Kim Y#**. (2022). High-intensity Aerobic Exercise Suppresses Cancer Growth by Regulating Skeletal Muscle-derived Oncogenes and Tumor Suppressors. *Front Mol Biosci* **9**, 818470.

38) Park S*, Ku J*, Lee S-M, Hwang H, Lee N, Kim H, Yoon K-J, **Kim Y#**, Choi SQ#. (2022). Potential toxicity of inorganic ions in particulate matter: Ion permeation in lung and disruption of cell metabolism. *Sci. Total Environ* **824**, 153818.

37) Na H, Kang B-H, Ku J, **Kim Y**, Jeong K-H. (2021). On-chip Paper Electrophoresis for Ultrafast Screening for Infectious Diseases. *Biochip J* **15**, 305-311.

36) Shin S-B, Kim D-H, Kim D-E, Aldonza MBD, **Kim Y**, Yim H. (2021). Dual Targeting of EGFR with PLK1 Exerts Therapeutic Synergism in Taxane-Resistant Lung Adenocarcinoma by Suppressing ABC Transporters. *Cancers* **13**, 4413.

35) Thatayatikom A, Jun I, Bhattacharyya I, Berg K, Lee YJ, **Kim Y**, Adewumi A, Zhang W, Thatayatikom S, Shah A, Beal C, Modica R, Elder ME, Cha S. (2021). The diagnostic performance of early Sjögren's syndrome autoantibodies in juvenile Sjögren's syndrome: The University of Florida Pediatric Cohort Study. *Front immunol* **12**, 2373.

34) Aldonza MBD, Delos Reyes RD, Kim YS, Ku J, Barsallo AM, Hong J-Y, Lee SK, Ryu HS, Park YK, Cho J-Y#, **Kim Y#**. (2021). Chemotherapy confers a conserved secondary tolerance to EGFR inhibition via AXL-mediated signaling bypass. *Sci Rep* **11**, 8016.

33) Song J, Kim S, Kim HY, Hur K, **Kim Y**, Park HG. (2021). A novel method to detect mutation in DNA by utilizing exponential amplification reaction triggered by the CRISPR-Cas9 system. *Nanoscale* **13**, 7193-7201.

32) Ku Y*, Park J-H*, Cho R*, Lee Y, Park H-M, Kim MA, Hur K, Byun SY, Liu J, Lee Y-s, Shum D, Shin D-Y, Koh Y, Cho J-Y, Yoon S-S, Hong J#, **Kim Y#**. (2021). Noncanonical immune response to the inhibition of DNA methylation by Staufen1 via stabilization of endogenous retrovirus RNAs. *Proc Natl Acad Sci U S A*. **118**, e2016289118.

31) Ryu DH, Ryu D, Baek YS, Cho H, Kim G, Kim YS, Lee Y, **Kim Y**, Ye JC, Min H-S, Park YK. (2021). DeepRegularizer: Rapid Resolution Enhancement of Tomographic Imaging using Deep Learning. *IEEE Trans Med Imaging* **40**, 1508-1518.

30) Ku J*, Kim R*, Kim D, Kim D, Song S, Lee K, Lee N, Kim MA, Yoon S-S, Kwon NH, Kim S, **Kim Y#**, Koh Y#. (2020). Single-cell analysis of *AIMP2* splice variants informs on drug sensitivity and prognosis in hematologic cancer. *Commun. Biol* **3**, 630.

29) Ku J*, Kim S, Park J, Kim T-S, Kharbash R, Shin E-C, Char K, **Kim Y#**, Li S#. (2020). Reactive Polymer Targeting dsRNA as universal virus detection platform with enhanced sensitivity. *Biomacromolecules* **21**, 2440-2454.

28) Ali AA*, Khabash R*, **Kim Y**. (2020). Chemo- and Biosensing Applications of Spiropyran and Its Derivatives – A Review. *Analytica Chimica Acta.* **1110**, 199-223.

- Selected as a cover article

27) Aldonza MBD, Ku J, Hong J-Y, Kim D, Yu SJ, Lee M-S, Prayogo MC, Tan S, Kim D, Han J, Lee SK, Im S, Ryu HS, **Kim Y**. (2020). Prior acquired resistance to paclitaxel relays diverse EGFR-targeted therapy persistence mechanisms. *Science Advances.* **6**, eaav7416.

26) Kim S and **Kim Y**. Biophysical and biochemical approaches in the analysis of Argonaute-microRNA complexes. In C. Joo and D. Rueda (Ed.). *Biophysics of RNA-Protein Interactions: A Mechanistic View* (pp. 167-188). New York, NY: Springer Nature.

25) Kim S, Ku Y, Ku J, **Kim Y**. (2019). Evidence of aberrant immune response by endogenous double-stranded RNAs: Attack from within. *BioEssays.* **41**, e1900023.

24) Kunkeaw N, Lee Y-S, Im WR, Jang JJ, Song M-J, Yang B, Park J-L, Kim S-Y, Ku Y, **Kim Y**, Kang S, Jo H-R, Jeong J-H, Lee H-S, Lee J-S, Kim H-P, Johnson BH, Kim I-H, Lee YS. (2019). Mechanism mediated by a noncoding RNA, nc886, in the cytotoxicity of a DNA reactive compound. *Proc Natl Acad Sci U S A*. **116**, 8289-8294.

23) Ali AA, Kang M, Kharbash R#, **Kim Y#**. (2019). Spiropyran as a potential molecular diagnostic tool for double-stranded RNA detection. *BMC Biomedical Engineering*. **1**, 6.

22) Kim S, Kang M, **Kim Y**. (2019). Studying RNA interactors of protein kinase RNA-activated during the mammalian cell cycle. *J. Vis Exp.* **145**, e59215.

21) **Kim Y*#**, Park J*, Kim S*, Kim MA, Kang M-G, Kwak C, Kang M, Kim B, Rhee H-W, Kim VN#. (2018). PKR senses nuclear and mitochondrial signals by interacting with endogenous double-stranded RNAs. *Mol Cell* **71**, 1051-1063.

- Featured as "Research Highlight" in *Nature Chemical Biology*. Song Y. A new spot for PKR. *Nat Chem Biol.* 14, 989 (2018).

20) Son H, Ku J, **Kim Y**, Li S#, Char K#. (2018). Amine-reactive poly(pentafluorophenyl acrylate) brush platforms for cleaner protein purification. *Biomacromolecules* **19**, 951-961.

19) Jang J*, Kim MA*, **Kim Y**. (2017). Two faces of competition: target-mediated reverse signaling in microRNA and mitogen-activated protein kinase regulatory networks. *IET Syst Biol* **11**, 105-113.

18) Park J-E*, Yi H*, **Kim Y***, Chang H, Kim VN. (2016). Regulation of poly(A) tail and translation during the somatic cell cycle. *Mol Cell.* **62**, 462-471.

- Selected as a featured article of the issue

17) **Kim Y***, Yeo J*, Lee JH*, Cho J, Suh D, Kim J-S, Kim VN. (2014). Deletion of human *tarbp2* reveals cellular microRNA targets and cell cycle function of TRBP. *Cell Rep.* **9**, 1061-1074.

16) **Kim Y**, Lee JH, Park J-E, Cho J, Yi H, Kim VN. (2014). PKR is activated by cellular dsRNAs during mitosis and acts as a mitotic regulator. *Genes Dev*. **28**, 1310-1322.

- Featured as an "Editor's Choice" in *Science Signaling*. Gough NR. (2024). PKR, Not Just for Infected Cells. *Sci Signal.* **7**, ec180.

15) **Kim Y**, Iagovitina A, Ishihara K, Fitzgerald KM, Deplancke B, Papatsenko D, Shvartsman SY. (2013). Context-dependent transcriptional interpretation of mitogen activated protein kinase signaling in the *Drosophila* embryo. *Chaos*. **23**, 025105.

- Selected as a cover article

14) Cho J*, Chang H*, Kwon SC, Kim B, **Kim Y**, Choe J, Ha M, Kim YK, Kim VN. (2012). LIN28A Is a Suppressor of ER-Associated Translation in Embryonic Stem Cells. *Cell*. **151**, 765-777.

13) Grimm O*, Sanchez Zini V*, **Kim Y**, Casanova J, Shvartsman SY, Wieschaus E. (2012). Torso RTK controls Capicua degradation by changing its subcellular localization. *Development*. **139**, 3962-3968.

12) Helman A, Lim B, Andreu MJ, **Kim Y**, Shestkin T, Lu H, Jiménez G, Shvartsman SY, Paroush Z. (2012). RTK signaling modulates the Dorsal gradient. *Development*. **139**, 3032-3039.

11) **Kim Y** and Kim VN. (2012). MicroRNA Factory: RISC Assembly from Precursor MicroRNAs. *Mol Cell*. **46**, 384-386.

10) Kanodia JS, Liang H-L, **Kim Y**, Lim B, Zhan M, Lu H, Rushlow CA, Shvartsman SY. (2012). Pattern Formation by Graded and Uniform Signals in the Early *Drosophila* Embryo. *Biophys J.* **102**, 427-433.

9) Kanodia JS, **Kim Y**, Tomer R, Khan Z, Chung K, Storey JD, Lu H, Keller PJ, Shvartsman SY. (2011). A computational statistics approach for estimating the spatial range of morphogen gradients. *Development*. **138**, 4867-4874.

8) **Kim Y**, Andreu MJ, Lim B, Chung K, Terayama M, Jiménez G, Berg CA, Lu H, Shvartsman SY. (2011). Gene Regulation by MAPK Substrate Competition. *Dev Cell*. **20**, 880-887.

7) **Kim Y**, Paroush Z, Nairz K, Hafen E, Jiménez G, Shvartsman SY. (2011). Substrate-dependent control of MAPK phosphorylation *in vivo*. *Mol Syst Biol.* **7**, 467.

6) Chung K*, **Kim Y***, Kanodia JS, Gong E, Shvartsman SY, Lu H. (2011). A microfluidic array for large-scale ordering and orientation of embryos. *Nat Methods.* **8**, 171-176.

- Selected as a cover article

5) Tipping M, **Kim Y**, Kyriakakis P, Tong M, Shvartsman SY, Veraksa A. (2010). β-arrestin Kurtz inhibits MAPK and Toll signalling in *Drosophila* development. *EMBO J.* **29**, 3222-3235.

4) Kavousanakis ME, Kanodia JS, **Kim Y**, Kevrekidis IG, Shvartsman SY. (2010). A compartmental model for the bicoid gradient. *Dev Biol.* **345**, 12-17.

3) **Kim Y**, Coppey M, Grossman R, Ajuria L, Jiménez G, Paroush Z, Shvartsman SY. (2010). MAPK Substrate Competition Integrates Patterning Signals in the *Drosophila* Embryo. *Curr Biol.* **20**, 446-451.

- Featured in Futurity

2) Kanodia JS, Rikhy R, **Kim Y**, Lund VK, DeLotto R, Lippincott-Schwartz J, Shvartsman SY. (2009). Dynamics of the Dorsal morphogen gradient. *Proc Natl Acad Sci USA.* **106**, 21707-21712.

1) Coppey M, Berezhkovskii AM, **Kim Y**, Boettiger AN, Shvartsman SY. (2007). Modeling the bicoid gradient: Diffusion and reversible nuclear trapping of a stable protein. *Dev Biol.* **312**, 623-630.

PATENTS

Summary
Domestic Patents: 9
International Patents: 10

Registered Patents

19) **Kim Y**, Park HG, Kim H, Cho R, Lim JA, Ku D. (2025). *Nucleic acid molecules capable of modulating target gene expression and uses thereof.* (Korea Patent No. 10-2897439). Korean Intellectual Property Office.

18) **Kim Y**, Kharbash R, Kim H, Kwon SY, Jang S, Chang Y. (2025). *Photopolymer Composition* (EU Patent No. 3733784). European Patent Office.

17) **Kim Y**, Kharbash R, Ali AA, Kang M. (2025). *Composition for detecting dsRNAs, comprising merocyanine compound and isomer thereof, and method for providing information for diagnosing cancer, by using dsRNA expression analysis.* (EU Patent No. 3753922). European Patent Office.

16) **Kim Y**, Kharbash R, Ali AA, Kang M. (2024). *Composition for detecting dsRNAs, comprising merocyanine compound and isomer thereof, and method for providing information for diagnosing cancer, by using dsRNA expression analysis.* (US Patent No. 12180537). United States Patent and Trademark Office.

15) Kim H, **Kim Y**, Kharbash R, Kwon SE, Chang Y, Jang S. (2024). *Dye compound and photopolymer composition* (US Patent No. 16976206). United States Patent and Trademark Office.

14) Kim Y, Jee, H. (2023). *Composition for inhibiting cancer cell containing genes derived from skeletal muscle expressed by high intensity aerobic exercise* (Korea Patent No. 102589866). Korean Intellectual Property Office.

13) Kim Y, Aldonza MB, Cha J, Yong I, Kim P, Cho J-Y. (2023). *Method for predicting drug resistance of cancer cells based on protein glycosylation* (Korea Patent No. 102523845). Korean Intellectual Property Office.

12) Kim H, **Kim Y**, Kharbash R, Kwon SE, Chang Y, Jang S. (2022). *Photopolymer Composition* (China Patent No. 111699221). China National Intellectual Property Administration.

11) Kim H, **Kim Y**, Kharbash R, Kwon SE, Chang Y, Jang S. (2022). *Photopolymer Composition* (Japan Patent No. 7061744). Japan Patent Office.

10) Kim H, **Kim Y**, Kharbash R, Kwon SE, Chang Y, Jang S. (2022). *Photopolymer Composition* (Japan Patent No. 7045027). Japan Patent Office.

9) Kim H, **Kim Y**, Kharbash R, Kwon SE, Chang Y, Jang S. (2022). *Dye compound and photopolymer composition* (China Patent No. 111406097). China National Intellectual Property Administration.

8) Kim H, **Kim Y**, Kharbash R, Kwon SE, Chang Y, Jang S. (2022). *Dye compound and photopolymer composition* (Japan Patent No. 7012975). Japan Patent Office.

7) **Kim Y**, Ali AA, Kharbash R, Kang M, Kim S. (2021). *Method for providing information on diagnosing cancer using analyzing dsRNA expression* (Korea Patent No. 10-2341059). Korean Intellectual Property Office.

6) Kim H, **Kim Y**, Kharbash R, Kwon SE, Chang Y, Jang S. (2021). *Dye compound and photopolymer composition* (US Patent No. 11084933). United States Patent and Trademark Office.

5) Kim H, **Kim Y**, Kharbash R, Kwon SE, Chang Y, Jang S. (2021). *Photopolymer Composition* (Korea Patent No. 10-2239212). Korean Intellectual Property Office

4) Kim H, **Kim Y**, Kharbash R, Kwon SE, Chang Y, Jang S. (2021). *Dye compound and photopolymer composition* (Korea Patent No. 10-2228538). Korean Intellectual Property Office.

3) Koh Y, **Kim Y**, Kwon N, Kim S. (2021). *Method for automated detection and quantification of AIMP2-DX2 signal through RNA silver in situ hybridization* (Korea Patent No. 10-2224910). Korean Intellectual Property Office.

2) Kim H, **Kim Y**, Kharbash R, Kwon SE, Chang Y, Jang S. (2021). *Dye compound and photopolymer composition* (Korea Patent No. 10-2157366). Korean Intellectual Property Office.

1) **Kim Y**, Ali AA, Kharbash R, Kang M. (2020). *Composition for detecting dsRNA comprising merocyanine, salts thereof, or isomer thereof* (Korea Patent No. 10-2122951). Korean Intellectual Property Office.

List of Ph.D. Students Supervised

1) Minjeong Kang (2021)
2) Jayung Ku (2023)
3) Sujin Kim (2023)
4) Yongsuk Ku (2023)
5) Yong-ki Lee (2024)
6) Jimin Yoon (2025)
7) JinA Lim (2025)
8) Doyoung Ku (2025)
9) Keonyong Lee (2026)

List of M.S. Students Supervised

1) MinA Kim (2018)
2) Jayoung Ku (2019)
3) Sujin Kim (2019)
4) Yongsuk Ku (2019)
5) Ahsan Ausaf Ali (2019)
6) Kyunghoon Hur (2020)
7) Yong-ki Lee (2020)
8) Ryeongeun Cho (2020)
9) Jimin Yoon (2021)
10) Namseok Lee (2021)
11) JinA Lim (2021)
12) Doyeong Ku (2022)
13) Keonyong Lee (2022)
14) Minji Kim (2023)
15) Seunghwan Son (2023)
16) Jaemin Jeon (2023)
17) Stephanie Tan (2023)
18) Moohyun Jeon (2023)
19) Namwook Kim (2024)
20) Hyukjun Chung (2025)
21) Yerim Lee (2025)

22) Soohwan Kim (2025)
23) Jiyoon Chung (2026)
24) Yewon Yang (2026)

List of Courses Taught

1) Engineering principles of biological systems
2) Bioinformatics
3) Introduction to metabolic engineering and synthetic biology
4) Process analysis and control
5) Molecular reaction engineering
6) Introduction to engineering biology (team teaching)
7) Synthetic biology of nucleic acids (team teaching)