

TEXAS STATE VITA

I. ACADEMIC/PROFESSIONAL BACKGROUND

A. Name: HONG-GU KANG

Title: ASSOCIATE PROFESSOR

B. Educational Background

<i>Degree</i>	<i>Year</i>	<i>University</i>	<i>Major</i>	<i>Thesis/Dissertation</i>
Postdoc	2000-2011	Cornell University	Molecular Plant-Microbe Interaction	
Ph. D.	1994-2000	University of California, Los Angeles	Plant Molecular Biology	Characterization of <i>Arabidopsis</i> Dof transcription factors, a novel zinc finger protein family in plants
M.S.	1992-1994	Seoul National University	Agricultural Chemistry	Translational enhancement of maize <i>10kZ</i> in transgenic tobacco by the leader sequence of TMV
B.S.	1988-1992	Seoul National University	Agricultural Chemistry	Promoter sequence of soybean <i>Glycinin</i> gene regulates seed-specific expression in transgenic tobacco. graduated <i>cum laude</i>

C. University Experience

<i>Position</i>	<i>University</i>	<i>Dates</i>
Assistant Professor	Texas State University	2012 - 2017
Associate Professor	Texas State University	2017 - present

D. Relevant Professional Experience

<i>Position</i>	<i>Entity</i>	<i>Date</i>
Core Doctoral Faculty in Aquatic Biology	Texas State University-San Marcos	2012 - present

E. Other Professional Credentials

F. Honor Societies

II. TEACHING

A. Teaching Honors and Awards:

B. Courses Taught:

<i>Course Number (Dates taught)</i>	<i>Course Title</i>
BIO4480/5480 (Every Fall from 2012 to 2017, 2021-present)	Cytology and Microtechnique
BIO4441/5441 (Every Spring from 2013 to 2020, 2022 - present)	Cell Physiology
BIO7361C (Every Fall from 2017 to 2019)	Advanced Genomics and Bioinformatics
BIO4377/5377 (Every Fall from 2018 to 2019)	Genome informatics
BIO5110 (2020 – present)	Seminar in Biology
BIO7102 (2020 – present)	Seminar in Aquatic Resources

C. GRADUATE THESES/DISSERTATIONS OR EXIT COMMITTEES***Advisees to PhD***

Student	Matriculation Date	Graduation Date	Thesis Title
Yogendra Bordiya	Jan 2015	Dec 2017	Epigenetic regulation of the defense gene induction in <i>Arabidopsis thaliana</i> in response to <i>Pseudomonas syringae</i> MED9, a mediator complex component, and its interacting protein MORC1 balance growth and defense in <i>Arabidopsis</i> Nuclear tRNA-derived RNA fragments (tRFs) trigger immunity in <i>Arabidopsis</i> and potentially function as a mobile signal in systemic acquired resistance
Ji-Chul Nam	Mar 2016	Dec 2020	
Dinesh Pujara	Dec 2020	May 2024	
Padam S. Bhatt	Apr 2023		
Lokendra Acharya (co-chair) Thilakshi Abeywickrama Bhavya Doddavarapu			

PhD Student Committees

Student/Advisor	Thesis Title	Graduation Date
Thilanka Jayaweera/ Dharmasiri	Functions of IBR5 gene in plant growth and development (Incomplete)	Aug 2016
Praveen Kumar Kathare/ Dharmasiri	Functional Characterization of <i>Saur</i> genes in plant growth and	Aug 2015

	development	
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Advisees to MS degree

Student	Date MS	Thesis Title
April Bonnard	Aug 2016	Histone variant H2A.Z substitution mediated by the SWR1-like complex is a novel transcriptional regulatory mechanism controlling defense genes and immunity in plants
Oluwadamilare Afolabi	Dec 2020	Identification of transcriptome dynamic patterns and their cognate cis-elements in defense genes in Arabidopsis
Samantha Lopez	Nov 2023	Non-thesis
Tanzila Kamal Choity	Apr 2025	Development of a Transgenic System for Overexpressing tRNA-Derived Small RNAs to Enhance Resistance in Plants
Udayangani Jayasekara Mudiyanse		

MS Student Committees

Student (Advisor)	Thesis Title	Graduation Date
Yuting Hou (Dharmasiri)	Characterization of <i>PIC7</i> gene functions in Arabidopsis hormone response	Dec 2012
Peter Shepherd	Non-thesis	Dec 2013
D. Raymond (Dharmasiri)	Characterization of a major facilitator superfamily transporter protein in Arabidopsis	Dec 2015
P. Ghimire (Dharmasiri)	Characterization of IBR5 interacting protein, ARA2 in Arabidopsis auxin response	Dec 2015
Swathi Lakshmi	Non-thesis	Apr 2016
Priyanka Kodangi	Non-thesis	Apr 2016
Danielle Wilson	Non-thesis	May 2016
Eric M. Garza	Non-thesis	May 2016
Elia R. Lopez (Dharmasiri)	Characterization of IBR5-ROP GTPase (ROP2/ROP6) interactions in plant auxin response	Aug 2016
Lisa Maria Hanson (Westerlund)	Gender Differences in Student Attitudes Towards Science In Secondary School Classrooms With Resident Scientists	Nov 2016
Nick Siepert (Dharmasiri)	Characterization of The Ibr5-Pad1 Interaction in Arabidopsis Auxin Response	Nov 2017
William Wilson	Non-thesis	Jun 2018
Idrees Ahmad (Dharmasiri)	Interaction of IBR5 and small GTP-binding proteins in growth and development of Arabidopsis	Apr 2019
Tim Cioffi (Dharmasiri)	The role of IBR5 in regulating plant auxin response through the SCF-TIR1 complex	Apr 2019

Daniel Vizcaino	Non-thesis	Apr 2019
Rohit Katti (Dharmasiri)	The role of IBR5-AtNRPD4 interaction in plant growth and development	Apr 2019
Mahbubur Rahman (Valles)	Automation of luminescence quantitation for high-throughput plant phenotyping using image processing and deep learning	Nov 2021
Sam McKann (Weigum)	Non-thesis	Nov 2021
Israel Arellano (Dharmasiri)	IBR5 mediated localization of TIR1 in plant auxin response	Nov 2021
Musa Mannan (Kim)	In vitro detection of tRNA fragments using an inkjet-printed graphene electrochemical aptasensor	May 2023
Andrew C Rodela (Dharmasiri)	The role of calcium and calmodulin in auxin induced cell expansion in Arabidopsis	Jul 2023
Alireza Sargordi (Kim)	Printed silver heaters for on-chip isothermal amplifications	Nov 2023
Wasi Shadman (Kim)	<i>In vitro</i> detection of single-stranded DNA using a screen-printed carbon electrochemical biosensor	Jun 2024
Emran Hossain Sajib (Dharmasiri)	The Role of IBR5 in Auxin Mediated Protein Degradation in Arabidopsis	Jun 2024
Heshini Navodya Weerakkody (Dharmasiri)	The Role of PIC5 in PIF4 mediated hypocotyl elongation in Arabidopsis	Nov 2024
Daniel Gatalica (Pedrozo)	Non-thesis	Dec 2024
Shreyas Inamdar (Kim)	Additively manufactured thin-film heater for continuous-flow isothermal amplification in microfluidic systems	Jun 2025
Evan Ortiz (McLean)	Mapping spaceflight microbial corrosion with SEM, robust protocols applied to SPX-21 and SPX-29	Aug 2025

D. COURSES PREPARED AND CURRICULUM DEVELOPMENT

- BIO7361C (2016) Advanced Bioinformatics
- BIO4377/5377 (2017) Genome informatics
- BIO4360 (2023) Molecular Biology

E. FUNDED EXTERNAL TEACHING GRANTS AND CONTRACTS

F. PENDING EXTERNAL TEACHING GRANTS AND CONTRACTS

G. SUBMITTED, BUT NOT FUNDED, EXTERNAL TEACHING GRANTS AND CONTRACTS

- NSF-IOS (2022; co-PI: Byoung-Hee You, Texas State) Defense-phenomics in

Arabidopsis and its integration with genomic resources

- NSF-PFI-RP (2023; co-PI: Vijay Joshi, Texas A&M): Unraveling the therapeutic potential of transfer RNA-derived chromatin-associated RNAs for controlling crop plant diseases
- NSF-IOS (2025; co-PI: Byoung-Hee You, Texas State) High-Throughput Genome-Wide Resistance Analysis in Arabidopsis: Empowering Genomic Resources for Plant Science

III. SCHOLARLY/CREATIVE

A. WORKS IN PRINT

1. Books

2. Articles

a. Refereed Journal Articles

- Inamdar S, Sargordi A, Choity TK, Emami A, Kim JY, **Kang HG**, and Kim N (2025) Additively manufactured electrothermal thin-film heaters for on-chip isothermal DNA amplification. *Sensors and Actuators: A. Physical*. Submitted
- Pujara DS, Choity TK, Bordiya Y, Magdaleno SM, and **Kang HG** (2025) Detection of tRNA-derived small RNAs in Arabidopsis thaliana via northern blotting: exploring potential biomarkers for phytohormone analysis. *Methods in Molecular Biology*. Revision submitted.
- Wasi Shadman W, Mannan M, Choity TK, Hwang S, Lee GH, **Kang HG**, and Kim N (2025) Electrochemical detection of tRNA-derived fragments (tRFs) based on multi-functionalized carbon surface. *Surfaces and Interfaces*. Revision submitted.
- Kim SI, Lyu H, Pujara DS, Bordiya Y, Bhatt PS, Mayorga J, Zogli PK, Kundu P, Chung H, Yan X, Zhang X, Kim J, Louis J, Yu Q, **Kang HG** (2025) A nuclear tRNA-derived fragment triggers immunity in Arabidopsis. *Communications Biology* 8(1), 533.
- Rahman M, Haque A, Pujara DS, Mayorga J, **Kang HG**, Valles D (2025) Automation of luminescence quantitation for high-throughput plant phenotyping using classical image processing and deep learning technique. *Principles of Data Science*. Accepted (Accepted two years ago. Publication delayed by publisher)
- Nam JC, Bhatt PS, Bonnard A, Pujara DS, **Kang HG** (2024) Arabidopsis MORC1 and MED9 interact to regulate defense gene expression and plant fitness. *Plant Pathology Journal* 40, 438–450.
- Nam JC, Bhatt PS, Kim SI, **Kang HG** (2023) Co-immunoprecipitation for assessing protein-protein interactions in Agrobacterium-mediated transient expression system in Nicotiana benthamiana. *Methods in Molecular Biology* 2690, 101–110.
- Kim SI, Bordiya Y, Nam JC, Mayorga J, and **Kang HG** (2021) High-throughput targeted transcriptional profiling of defense genes using RNA-mediated

- oligonucleotide annealing, selection, and ligation with next-generation sequencing in Arabidopsis. *Methods in Molecular Biology* 2328, 227–252.
- Makhijaa G, Pujara D, Song IH, You BH, **Kang HG** (2020) Constructing an automation table for an image-based Arabidopsis resistance assay. *Engineering* 6, 495.
 - Koch A, **Kang HG**, Steinbrenner J, Dempsey DA, Klessig DF, Kogel KH (2017) MORC proteins: novel players in plant and animal health. *Frontiers in Plant Science* 8, 1720.
 - Bordiya Y, **Kang HG** (2017) Genome-wide analysis of chromatin accessibility in Arabidopsis infected with *Pseudomonas syringae*. *Methods in Molecular Biology* 1578, 263–272.
 - Bordiya Y, Zheng Y, Nam JC, Choi HW, Klessig DF, Fei Z, **Kang HG** (2016) *Pseudomonas* infection enhances Arabidopsis genomic accessibility to transposons that physically interact with MORC1. *Molecular Plant-Microbe Interaction* 29, 674–687.
 - DeFalco TA, Abdel-Hamid H, Marshall CB, Nam JC, **Kang HG**, Moeder W, Ikura M, Snedden WA, Yoshioka K (2016) An N-terminal calmodulin-binding site regulates cyclic nucleotide-gated ion channel 12 (AtCNGC12)-induced programmed cell death in Arabidopsis. *Plant Cell* 28, 1738–1751.
 - Lee JH, Oh CS, Moon JY, **Kang HG**, Park JM (2016) The endoplasmic reticulum protein BiP5 plays an essential role in the HRT-mediated hypersensitive response by modulating expression of HRT in *Nicotiana benthamiana*. *Molecular Plant Pathology* 17, 1382–1397.
 - Manosalva P, Manohar M, Nam JC, Kogel KH, **Kang HG**, Klessig D (2015) The GHKL ATPase MORC1 modulates species-specific plant immunity in Solanaceae. *Molecular Plant-Microbe Interaction* 28, 927–942.
 - Langen G, von Einem S, Koch A, Imani J, Pai SB, Manohar M, Ehlers K, Choi HW, Mang HG, Bordiya Y, **Kang HG**, Klessig DF, Kogel KH (2014) The CRT1 subfamily of MORC ATPases modulates disease resistance in barley to biotrophic and necrotrophic pathogens. *Plant Physiology* 164, 866–878.
 - **Kang HG***, Choi HW, von Einem S, Manosalva P, Ehlers K, Liu PP, Buxa V, Moreau M, Mang HG, Kachroo P, Kogel KH, Klessig DF* (2012) CRT1 is a nuclear-translocated MORC endonuclease that participates in multiple levels of plant immunity. *Nature Communications* 3, 1297 (*corresponding author).
 - Mang HG, Qian W, Zhu Y, Qian J, **Kang HG**, Klessig DF, Hua J (2012) ABA deficiency antagonizes high temperature inhibition of disease resistance through enhancing nuclear accumulation of R proteins SNC1 and RPS4. *Plant Cell* 24, 1271–1284.
 - Sekine KT, Kawakami S, Hase S, Kubota M, Ichinose Y, Shah J, **Kang HG**, Klessig DF, Takahashi H (2008) High level expression of a virus resistance gene, RCY1, confers extreme resistance to cucumber mosaic virus in Arabidopsis thaliana. *Molecular Plant-Microbe Interactions* 21, 1398–1407.
 - Lee HY, Bowen C, Popescu G, **Kang HG**, Ma S, Kato N, Dinesh-Kumar S, Snyder M, Popescu SC (2011) BTI1 and BTI2 reticulon-like proteins regulate intracellular trafficking and activity of the FLS2 immune receptor. *Plant Cell* 23, 3374–3391.

- **Kang HG**, Oh CS, Sato M, Katagiri F, Glazebrook J, Takahashi H, Martin G, Klessig DF (2010) Endosome-associated CRT1 functions early signaling in R (resistance) gene-mediated defense signaling. *Plant Cell* 22, 918–936.
- Park BS, Eo HJ, Jang IC, **Kang HG**, Song JT, Seo HS (2010) Ubiquitination of LHY by SINAT5 regulates flowering time and is inhibited by DET1. *Biochemical & Biophysical Research Communications* 398, 242–246.
- Baxter J, Moeder W, Urquhart W, Shahinas D, Chin K, Christendat D, **Kang HG**, Angelova M, Kato N, Yoshioka K (2008) Identification of a functionally essential amino acid for Arabidopsis cyclic nucleotide gated ion channels using the chimeric ATCNGC11/12 gene. *Plant Journal* 56, 457–469.
- Sekine KT, Kawakami S, Hase S, Kubota M, Ichinose Y, Shah J, **Kang HG**, Klessig DF, Takahashi H (2008) High level expression of a virus resistance gene, RCY1, confers extreme resistance to cucumber mosaic virus in Arabidopsis thaliana. *Molecular Plant-Microbe Interactions* 21, 1398–1407.
- **Kang HG**, Klessig DF (2008) The involvement of the Arabidopsis CRT1 ATPase family in disease resistance protein-mediated signaling. *Plant Signaling & Behavior* 3, 689–690.
- **Kang HG**, Kuhl J, Kachroo P, Klessig DF (2008) CRT1, an Arabidopsis ATPase that interacts with diverse resistance proteins and modulates disease resistance to turnip crinkle virus. *Cell Host & Microbe* 3, 48–57.
- **Kang HG**, Klessig DF (2008) The involvement of the Arabidopsis CRT1 ATPase family in disease resistance protein-mediated signaling. *Plant Signaling & Behavior* 3, 689–690.
- **Kang HG**, Kuhl J, Kachroo P, Klessig DF (2008) CRT1, an Arabidopsis ATPase that interacts with diverse resistance proteins and modulates disease resistance to turnip crinkle virus. *Cell Host & Microbe* 3, 48–57.
- Yoshioka K, Möder W, **Kang HG**, Kachroo P, Masmoud K, Berkowitz G, Klessig DF (2006) The chimeric Arabidopsis cyclic nucleotide-gated ion channel AtCNGC11/12 activates multiple pathogen resistance responses. *Plant Cell* 18, 747–763.
- Menke F*, **Kang HG** *, Chen Z, Park JM, Kumar D, Klessig DF (2005) Tobacco transcription factor NtWRKY1 is phosphorylated by MAP kinase SIPK and mediates HR-like cell death in tobacco. *Molecular Plant-Microbe Interactions* 18, 1027–1034. (*equal contribution)
- **Kang HG**, Klessig DF (2005) Salicylic acid inducible Arabidopsis CK2-like activity phosphorylates TGA2. *Plant Molecular Biology* 57, 541–557.
- Chandra-Shekara AC, Navarre D, Kachroo A, **Kang HG**, Klessig D, Kachroo P (2004) Signaling requirements and role of salicylic acid in HRT- and rrt-mediated resistance to turnip crinkle virus in Arabidopsis. *Plant Journal* 40, 647–659.
- **Kang HG** *, Foley R *, Onate L, Lin C, Singh KB (2003) Target genes for OBP3, a Dof transcription factor, include novel basic helix-loop-helix domain proteins inducible by salicylic acid. *Plant Journal* 35, 362–372. (*equal contribution)
- **Kang HG**, Singh KB (2000) Characterization of salicylic acid responsive Arabidopsis Dof domain proteins: overexpression of OBP3 leads to growth defects. *Plant Journal* 21, 329–340.

- **Kang HG**, Fang Y, Singh KB (1999) A glucocorticoid-inducible transcription system causes severe growth defects in Arabidopsis and induces defense-related genes. *Plant Journal* 20, 127–133.
- **Kang HG**, Park JW, Kim CH, Lim JY, Choi YD (1995) Translational enhancement by the leader of tobacco mosaic virus and soybean glycinin gene in transgenic tobacco plants. *Agricultural Chemistry & Biotechnology* 38, 224–231.
- Kang MH, **Kang HG**, Lee MG, Park SS, Lee HJ, Chae Y, Choi YD (1993) Molecular cloning of cytochrome P-450 oxidase gene in peppermint (*Mentha piperita*). *Molecules & Cells* 3, 283–288.
- Kim CH, **Kang HG**, Choi YD (1993) Interaction of nuclear factor with the 5' upstream region of soybean glycinin gene. *Molecules & Cells* 3, 165–170.
- Park JW, Kim CH, **Kang HG**, Choi YD (1992) Promoter sequence of soybean glycinin gene regulates seed-specific expression in transgenic tobacco. *Molecules & Cells* 2, 297–302.

b. Non-refereed Journal Articles

3. *Conference Proceedings:*

a. Refereed Conference Proceedings:

b. Non-refereed

4. *Abstracts:*

5. *Reports:*

6. *Book reviews*

7. *Other:*

B. Works not in print

1. *Papers Presented at Professional Meeting*

- July 2025, A nuclear tRNA-derived fragment triggers immunity in Arabidopsis. *Annual meeting of the American Society of Plant Biologists*, Milwaukee, WI
- July 2023, A nuclear tRNA-derived fragment triggers immunity in Arabidopsis. *19th International Congress on Molecular Plant-Microbe Interactions*. Providence, RI
- July 2022, Developing a high-throughput system for resistance analysis. *Annual meeting of the American Society of Plant Biologists*, Portland, OR.
- July 2019, A DCL1-generated tRNA-derived small RNA is a potential positive regulator in plant immunity. *18th International Congress on Molecular Plant-Microbe Interactions*. Glasgow, Scotland

- March 2018, A targeted RNA-seq approach revealed that epigenetic components are involved in the induction dynamics of defense genes in Arabidopsis, *Annual Meeting of American Society of Plant Biologists-Southern Section*, New Orleans, LA (presented by Dinesh Pujara)
- June 2017, Transposable elements function as an enhancer for defense genes in response to pathogen infection in Arabidopsis. *The Annual Plant Biology Meeting*, Honolulu, HI
- July 2016, Pathogen infection and MORC1 affect chromatin accessibility of transposable elements and expression of their proximal genes in Arabidopsis. *17th International Congress on Molecular Plant-Microbe Interactions*. Portland, OR.
- Jul 2015, Arabidopsis MORC1/CRT1 Interacts with a Wide Range of Putative Chromatin-remodeling Factors. *Annual meeting of the American Society of Plant Biologists*. Minneapolis, MN.
- June 2014. Molecular clues to the function of CRT1/MORC1 ATPase family in plant immunity. *16th International Congress on Molecular Plant-Microbe Interactions*. Rhode Island, Greece.
- August 2013. Arabidopsis CRT1 dimerizes with itself and some of family members through the C-terminal domain carrying a coiled-coil motif. *Annual meeting of American Phytopathological Society*. Austin, TX.
- July 2013. Characterization of Arabidopsis CRT1 in plant immunity and genome stability. *Annual meeting of the American Society of Plant Biologists*. Providence, RI
- June 2013. Characterization of Arabidopsis CRT1 in plant immunity and genome stability. *International Conference on Arabidopsis Research*. Sydney, Australia
- March 2013. Arabidopsis CRT1, an endonuclease, participates in multiple levels of plant immunity. *The Southern Section Meeting of the American Society of Plant Biologists*. Little Rock, AR
- August 2012. CRT1 participates in multiple levels of plant immunity, is nuclear localized, and is a member of the MORC ATPase superfamily. *Annual meeting of the American Society of Plant Biologists*. Austin, TX.
- August 2011. The CRT1 family participates in multiple layers of resistance in plants to a wide range of pathogens. *Annual meeting of the American Society of Plant Biologists*. Minneapolis, MN.
- June 2010. Endosome-associated CRT1 functions early signaling in *R* (resistance) gene-mediated defense signaling. *21st International Conference on Arabidopsis Research*. Yokohama, Japan
- July 2009. CRT1, a new player in *R* gene-mediated immunity in plants. *14th International Congress on Molecular Plant-Microbe Interactions*. Quebec City, Canada
- June 2008. CRT1, an Arabidopsis ATPase that interacts with diverse resistance proteins and modulates disease resistance to turnip crinkle virus. *Annual meeting of the American Society of Plant Biologists*. Merida, Mexico.
- June 2007. Turnip crinkle virus resistance in Arabidopsis requires CRT1, a new member of the GHKL ATPase family. *18th International Conference on Arabidopsis Research*. Beijing, China.
- August 2006. A novel ATPase family in Arabidopsis is involved in regulating

- defense responses to pathogens. *Annual meeting of the American Society of Plant Biologists*. Boston, MA.
- June 2005. Transcription factor NtWRKY1 is phosphorylated by MAP kinase SIPK and mediates HR-like cell death in tobacco. *16th International Conference on Arabidopsis Research*. Madison, WI.
 - July 2004. SA-inducible *Arabidopsis* CK2-like activity phosphorylates TGA/OBF in *Arabidopsis*. *Annual meeting of the American Society of Plant Biologists*. Orlando, FL.
 - June 2002. SA-inducible CK2 activity may play a role in controlling the subcellular localization of TGA/OBP in *Arabidopsis*. *13th International Conference on Arabidopsis Research*. Seville, Spain.
 - June 1999. Characterization of *Arabidopsis* Dof transcription factors, a novel zinc finger protein family in plants. *10th International Conference on Arabidopsis Research*. Melbourne, Australia.
 - April 1999. Characterization of *Arabidopsis* Dof transcription factors, a novel zinc finger protein family in plants. *Current topics in plant biochemistry, physiology and molecular biology*. Columbia, MO.

2. Invited Talks, Lectures, and Presentations:

- Mar 2026, TBA, Syracuse University, NY
- May 2025, K(Ch)romatin-Associated Nuclear Guide RNA Functions as a Sequence-Specific Signaling Molecule, Seoul National University, Seoul, Korea
- May 2024, K(Ch)romatin-associated nuclear guide RNA in plant immunity and its potential impact on Agriculture, Yonsei University, Incheon, Korea
- May 2024, K(Ch)romatin-associated nuclear guide RNA in plant immunity and its potential impact on Agriculture, Korea Research Institute of Bioscience & BioTechnology, Taejeon, Korea
- May 2023, Chromatin-associated nuclear guide RNA in plant immunity and its potential impact on Agriculture, Seoul National University, Seoul, Korea
- September 2022, A nuclear tRNA-derived small RNA, a transcriptional reprogramming molecule in plant immunity, University of Wyoming, Laramie, WY
- August 2022, A nuclear tRNA-derived small RNA, a transcriptional reprogramming molecule in plant immunity, Symposium at Plant Immunity Research Center, Busan, Korea
- October 2020, tRNA-derived sRNAs in plant resistance, NSF, Online
- February 2020, An unexpected role of tRNAs in plant resistance, Colorado State University, Fort Collins, CO
- August 2019, *Arabidopsis* DCL1-associated small RNAs may function as a positive transcriptional regulator for defense genes, *PIRC/BRL Joint Symposium*, Gyoung Ju, Korea
- May 2019, tRNA: its unexpected role in plant resistance, *Korea Advanced Institute of Science and Technology*, Daejeon, Korea
- May 2018, Chromatin dynamics and its role in plant defense responses. *Texas A&M AgriLife Dallas Center*, Dallas, TX

- May 2018, Chromatin dynamics and its role in plant defense responses. *Chung-Ang University*, Ansong, Korea
- May 2017, Role of Transposable Elements in Stress Response & Adaptation Pathogen infection and MORC1 affect chromatin accessibility of transposable elements and expression of their proximal genes in Arabidopsis. Department of Food and Biotechnology, Korea University, Sejong, Korea
- August 2017, Role of epigenetics in stress response and adaptation. Tohoku University, Sendai, Japan
- November 2016, Role of epigenetics in stress response & adaptation. Department of Biological Sciences, University of North Texas, Denton, TX
- July 2016, Pathogen infection and MORC1 affect chromatin accessibility of transposable elements and expression of their proximal genes in Arabidopsis. Department of Plant Pathology, Texas A&M, College Station, TX
- February 2016, Role of epigenetics in stress response and adaptation. Department of Biological Sciences, East Tennessee State University, Johnson City, TN
- November 2015, Role of epigenetics in stress response and adaptation. Department of Biology, University of Texas, Austin, TX
- November 2015, Arabidopsis MORC1 is associated with a subset of transposable elements proximal to defense genes. Department of Biology, University of Texas, San Antonio, TX
- September 2015, Arabidopsis MORC1 is associated with a subset of transposable elements proximal to defense genes. Department of Plant Biology, Penn State University, University Park, PA
- September 2014, Molecular clues to the function of CRT1/MORC1 family in plant immunity, Department of Chemistry and Biochemistry, Texas State University, San Marcos, TX
- August 2014, The CRT1/MORC1 ATPase family modulates an epigenetic control of immunity in plants, Department of Horticulture, Seoul National University, Korea
- June 2014. Molecular clues to the function of CRT1/MORC1 ATPase family in plant immunity. *16th International Congress on Molecular Plant-Microbe Interactions*. Rhode Island, Greece.
- February 2014, Potential epigenetic function of MORC1 in plant immunity. Department of Cell and Systems Biology, University of Toronto, Canada
- November 2013, Molecular clues to the function of CRT1/MORC1 family in plant immunity, Department of Biology, Baylor University, Waco, TX
- October 2013, Arabidopsis CRT1/MORC1, an Important Modulator in a Wide Range of Plant Immunity, Functions in RNA Dependent DNA Methylation, Annual Meeting of Korean Society of Plant Pathology, Suncheon, Korea.
- September 2013, Molecular clues to the function of CRT1/MORC1 family in plant immunity, Department of Horticultural Sciences, Texas A&M, College Station, TX
- August 2013. *Arabidopsis* CRT1 dimerizes with itself and some of family members through the C-terminal domain carrying a coiled-coil motif. *Annual meeting of American Phytopathological Society*. Austin, TX.

- May 2013. Arabidopsis CRT1, an endonuclease, participates in multiple levels of plant immunity. *Department of Agricultural Chemistry, Seoul National University, Seoul, Korea*
- May 2013. Arabidopsis CRT1, an endonuclease, participates in multiple levels of plant immunity. *Institute of Biotechnology, Korea University, Seoul, Korea*
- May 2013. Arabidopsis CRT1, an endonuclease, participates in multiple levels of plant immunity. *Department of Biochemistry and Biophysics, Texas A&M, College Station, TX*
- August 2012. CRT1 participates in multiple levels of plant immunity, is nuclear localized, and is a member of the MORC ATPase superfamily. *Annual meeting of the American Society of Plant Biologists. Austin, TX.*
- February 2011. CRT1-a key component in four levels of plant immunity. *Department of Plant Breeding & Genetics, Cornell University. Ithaca, NY.*
- June 2010. Characterization of CRT1, an early signaling component in *R* gene-mediated resistance, implicates carbohydrates in plant defense responses. *Institute of Crop Sciences, Chinese Academy of Agricultural Sciences. Beijing, China.*
- November 2008. CRT1, a new player in *R (resistance)* gene-mediated plant resistance. *Department of Plant Pathology & Plant-Microbe Biology, Cornell University. Ithaca, NY.*
- June 2008. CRT1, an *Arabidopsis* ATPase that interacts with diverse resistance proteins and modulates disease resistance to turnip crinkle virus. *Annual meeting of the American Society of Plant Biologists. Merida, Mexico.*
- June 2006. CRT1, a novel GHKL ATPase, interacts with HRT and other *R* proteins, and modulates resistance to *Turnip crinkle virus*. *Department of Agricultural Biotechnology, Seoul National University. Seoul, Korea*
- November 2004. Phosphorylation/dephosphorylation of a TGA transcription factor and its potential role(s) in *Arabidopsis*. *Korea Research Institute of Bioscience & Biotechnology. Taejon, Korea.*
- June 2000. Characterization of Arabidopsis Dof transcription factors, a novel zinc finger protein family in plants. *Department of Biological Sciences, Korea Advanced Institute of Science and Technology. Taejon, Korea.*

C. GRANTS AND CONTRACTS

1. FUNDED EXTERNAL RESEARCH GRANTS

- September 2018 - August 2020 (Program Faculty). NIH. The South Texas Doctoral Bridge Program
- March 2016 – February 2023 (\$786,023). NSF-IOS. CAREER-Characterization of epigenetic factors and their regulatory roles in modulating transposable elements, plant immunity and transgenerational inheritance

2. PENDING EXTERNAL GRANTS FOR RESEARCH

- NSF-USDA (recommended for funding; 2025-2027; single PI; \$741,697). Characterization of tRNA-Derived small RNAs as Signaling Molecules and Positive Transcriptional Regulators in Plant Immunity

3. SUBMITTED BUT NOT FUNDED EXTERNAL GRANTS AND CONTRACTS

- January 2026 – December 2028. NSF-IOS. High-Throughput Genome-Wide Resistance Analysis in Arabidopsis: Empowering Genomic Resources for Plant Science
- January 2024 – December 2026. NSF-PFI. Unraveling the therapeutic potential of transfer RNA-derived chromatin-associated RNAs for controlling crop plant diseases.
- March 2023 - February 2025. NSF-IOS. Collaborative Research: Defense-phenomics in Arabidopsis and its integration with genomic resources
- January 2021. CPRIT-HRHI. tRNA-derived small RNAs as a tumorigenesis regulator in eukaryotic cells
- April 2020. Keck Foundation. Examination of tRNA-derived sRNAs as an immunity-boosting agent in animals and plants
- February 2015. NIH-AREA. Characterization of chromatin dynamics modulated by epigenetic factors during the activation of plant immunity
- July 2014. NSF-IOS. CAREER-Characterization of heterochromatin dynamics in plants responding to biotic stress and transgenerational memory
- July 2013. NSF-IOS. CAREER-Characterization of heterochromatin dynamics in plants responding to biotic stress
- January 2013. NSF-IOS. Characterization of Arabidopsis CRT1 in plant immunity and genome stability.
- October 2012. NIH-AREA. Characterization of programmed cell death in host immune responses
- February 2012. NIH-AREA. Characterization of programmed cell death in host immune responses
- January 2012. NSF-IOS. Molecular, genetic, and biochemical characterization of CRT1 in plant immune responses

FUNDED INTERNAL GRANTS AND CONTRACTS

- 2014. MIRG (PI: **Kang**, co-PIs: Song, You, and Li). Development of electrochemical impedance spectroscopy-based device sensing epigenetic changes for early cancer detection
- 2022. Materials Application Research Center Proposal (2022; lead PI). Replacement of an aging prep-scale centrifuge

PENDING INTERNAL GRANTS FOR RESEARCH

SUBMITTED BUT NOT FUNDED INTERNAL GRANTS AND CONTRACTS

- October 2022. REP (PI: Kim, co-PI: Kang). Integrated Sample-to-Answer Microfluidic System for Rapid *In Vitro* Molecular Diagnostics
- February 2022. MIRG (co-PI: Valles). Completion of a fully-automated high-throughput plant resistance phenotyping pipeline by developing deep learning-based image processing
- October 2017. REP (co-PI: Kumar). Development of CRISPR Cas9-based genome editing and its fidelity assessment in *Clostridium difficile*, a rare DNA repair-deficient genetic system

- April 2017. MIRG. Development of massive parallel RNA sequencing for cancer diagnosis
- October 2015. REP. Characterization of chromatin dynamics in plants under biotic stress.
- October 2013. REP. Characterization of chromatin dynamics in plants under biotic stress.
- October 2012. REP. Functional characterization of CRT1 in immunity-associated genome stability.

D. FELLOWSHIPS, AWARDS, HONORS

- September 2020, Presidential Research Award, Texas State University
- August 2017, College Achievement Awards, COSE, Texas State University
- July 2015: ASPB Recognition Travel Award - American Society of Plant Biologist, Minneapolis, MN
- July 2013: Travel Award – Plant Biology 2013 - American Society of Plant Biologist, Providence, RI
- June 2013: Travel Award – International Conference on Arabidopsis Research, Sydney, Australia
- February 2013: Travel Award - Scientists and Engineers Early Career Development (SEECD) Workshop, Korean-American Scientist and Engineer Association, Atlanta, GA
- 1994-1997: Korean Ministry of Education Pre-doctoral Fellowship

E. PATENTS

- Kang HG, Kim SI. 2023. Modulating stress responses by a novel chromatin-associated guide RNA derived from transfer RNA. US Patent Application US 2023/0112054. Published 2024, *currently under review*

IV. SERVICE

University:

- 2014 – 2021. Institutional Biosafety Committee Member
- 2021 – current: Institutional Biosafety Committee Chair
- 2025: Search Committee for the Assistant Vice President and Chief Research Compliance Officer

College:

Departmental:

- 2023: Coordinated Name Change of Existing Major: “Microbiology” to “Microbiology and Molecular Genetics”
- 2016 – 2022: Tenure-track mentoring committee
 - Dr. Mar Huertas (2016 - 2021)
 - Dr. Camila Carlos-Shanley (2018 - 2022)
- 2018, 2023, 2024, 2025: Faculty Search Committee: Microbial Functional Genomics (2018), Evolutionary Ecology (2023), Microbiology Cluster (2024), Aquatic Microbiome (2025)

- 2017 - current: Technical Support Personnel
- 2017 - current: Department Seminar Committee
- 2015: Judge, The 2nd Annual Departmental 3MT Competition
- 2013: Strategic Hiring Plan Committee
- 2012 - 2018: Managed deionized water in the Supple building
- 2014 - 2017: Managed Research Greenhouse
- 2012. Judge, Department Colloquium

Community:

- Science Fair Judge:
 - Alamo Regional Science Fair (2019; 2018; 2017)
 - ExxonMobil Texas Science and Engineering Fair (2014; 2015)
 - Austin Energy Regional Science Festival (2014; 2015)
 - Bowie High School Science Fair (2013; 2014; 2015)
- 2024 – present: Scholarship Committee, Korean-American Scientist & Engineer Association
- 2020 – present: Auditor, Austin Chapter of Korean-American Scientist & Engineer Association
- 2017 - 2020: President, Austin Chapter of Korean-American Scientist & Engineer Association
- 2013- 2016: Vice-president, Austin Chapter of Korean-American Scientist & Engineer Association
- 2014. Epigenetics. Other side drive. KTSW 89.9 Radio Station

Professional:

- Grant review panelist
 - 2014, 2016, 2017, 2020, 2022: NSF-IOS
 - 2016: USDA-NIFA
- Grant *ad hoc* reviewer
 - 2018, 2022, 2024: NSF-IOS
 - 2025: NSF-MCB, NSF-IRES
 - 2015. Hungary National Research, Development, and Innovation Office.
 - 2012. German-Israeli Foundation for Scientific R&D.
- Conference session chair
 - 2015. Epigenetics. Annual meeting of the American Society of Plant Biologists.
- Journal editor
 - *Frontiers in Plant Science* (2015 – current; Reviewing Editor)
 - *Molecular Plant-Microbe Interactions* (2016 – 2019; Associate Editor)
 - *Plant Biotechnology Reports* (2019 – current; Editorial Board)
- Journal *ad hoc* reviewer (2012- current):
 - *BMC-Plant Biology*, *Planta*, *Plant Journal*, *Molecular Plant Pathology*, *PLoS Pathogens*, *PLoS Genetics*, *Frontier in Plant Science*, *Molecular*

*Plant-Microbe Interactions Plant, Plant Cell, Physiology and
Biochemistry, Scientific Reports, Trends in Plant Science*

PENDING EXTERNAL GRANTS FOR SERVICE

ORGANIZATIONS OF WHICH I AM OR HAVE BEEN A MEMBER
Professional:

- American Society of Plant Biologists.
- American Phytopathological Society.
- American Association for the Advancement of Science.
- Korean-American Scientist and Engineer Association