

## TEXAS STATE VITA

### I. ACADEMIC/PROFESSIONAL BACKGROUND

A. Name: HONG-GU KANG

Title: ASSISTANT PROFESSOR

#### B. Educational Background

<i>Degree</i>	<i>Year</i>	<i>University</i>	<i>Major</i>	<i>Thesis/Dissertation</i>
Ph. D.	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.	1994	Seoul National University	Agricultural Chemistry	Translational enhancement of maize <i>10kZ</i> in transgenic tobacco by the leader sequence of TMV
B.S.	1992	Seoul National University	Agricultural Chemistry	Undergraduate Thesis: 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-San Marcos	2012 - 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>
Biology 4480/5480 (Every Fall since 2012)	Cytology and Microtechnique
Biology 4441/5441 (Every Spring since 2013)	Cell Physiology

#### C. GRADUATE THESES/DISSERTATIONS OR EXIT COMMITTEES

**Advisees to PhD**

Student	Matriculation Date	Graduation Date	Thesis Title
Yogendra Bordiya Ji-Chul Nam	Jan 2015		

---

**PhD Student Committees**

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

---

**Advisees to MS degree**

Student	Date	Thesis Title
April Bonnard	MS	

---

**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

D. COURSES PREPARED AND CURRICULUM DEVELOPMENT

E. FUNDED EXTERNAL TEACHING GRANTS AND CONTRACTS

F. PENDING EXTERNAL TEACHING GRANTS AND CONTRACTS

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

**III. SCHOLARLY/CREATIVE****A. WORKS IN PRINT**

1. Books

2. Articles

#### a. Refereed Journal Articles

- Yogendra Bordiya and **Hong-Gu Kang** (2016). Genome-wide analysis of chromatin accessibility in Arabidopsis infected with Pseudomonas syringae. *Methods in Molecular Biology*, Submitted
- Yogendra Bordiya, Yi Zheng, Ji-Chul Nam, Hyong Woo Choi, Daniel F. Klessig, Zhangjun Fei and **Hong-Gu Kang** (2016) Pseudomonas infection enhances Arabidopsis genomic accessibility to transposons that physically interact with MORC1. *Molecular Plant-Microbe Interaction*, Submitted
- Thomas A. DeFalco, Huda Abdel-Hamid, Christopher B. Marshall, Ji Chul Nam, **Hong-Gu Kang**, Wolfgang Moeder, Mitsuhiro Ikura, Wayne A. Snedden, and Keiko Yoshioka (2016) An N-terminal calmodulin-binding site regulates cyclic nucleotide-gated ion channel 12 (AtCNGC12)-induced programmed cell death in Arabidopsis. *Plant Cell*, Under revision
- Jeong Hee Lee, Chang-Sik Oh, Ju Yeon Moon, **Hong-Gu Kang**, and Jeong Mee Park (2015) 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*, In press
- Patricia Manosalva, Murli Manohar, Ji Chul Nam, Karl-Heinz Kogel, **Hong-Gu Kang** and Daniel Klessig (2015) The GHKL ATPase MORC1 modulates species-specific plant immunity in Solanaceae. *Molecular Plant-Microbe Interaction*, **28**, 927-42
- Gregor Langen, Sabrina von Einem, Aline Koch, Jafarholi Imani, Subhash B. Pai, Murli Manohar, Katrin Ehlers, Hyong Woo Choi, Hyung-Gon Mang, Yogendra Bordiya, **Hong-Gu Kang**, Daniel F. Klessig, Karl-Heinz Kogel (2014) The CRT1 subfamily of MORC ATPases Modulates Disease Resistance in Barley to Biotrophic and Necrotrophic Pathogens. *Plant Physiology*, **164**, 866-78
- **Hong-Gu Kang**<sup>\*</sup>, Hyong Woo Choi, Sabrina von Einem, Patricia Manosalva, Katrin Ehlers, Po-Pu Liu, Stefanie umar, V. Buxa, Magali Moreau, Hyung-Gon Mang, Pradeep Kachroo, Karl-Heinz Kogel, Daniel F. Klessig<sup>\*</sup> (2012) CRT1 is a nuclear-translocated MORC endonuclease that participates in multiple levels of plant immunity. *Nature Communications* **3**, 1297 (\*corresponding author).
- Hyung-Gon Mang, Weiqiang Qian, Ying Zhu, Jun Qian, **Hong-Gu Kang**, Daniel F. Klessig, and Jian Hua (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.

#### *Prior to the Appointment at Texas State University*

- Hyoung Yool Lee, Christopher Bowen, George Popescu, **Hong-Gu Kang**, Shisong Ma, Naohiro Kato, Savithamma Dinesh-Kumar, Michael Snyder and Sorina C. Popescu (2011) BTI1 and BTI2 Reticulon-Like Proteins Regulate Intracellular Trafficking and Activity of the FLS2 Immune Receptor. *Plant Cell*, **23**, 3374-3391.
- **Hong-Gu Kang**, Chang-Sik Oh, Masanao Sato, Fumiaki Katagiri, Jane Glazebrook, Hideki Takahashi, Gregory Martin and Daniel F. Klessig (2010). Endosome-associated CRT1 functions early signaling in *R (resistance)* gene-mediated defense signaling. *Plant Cell*, **22**, 918-936.
- Bong Soo Park, Hee Jeong Eo, In-Cheol Jang, **Hong-Gu Kang**, Jong Tae Song and Hak Soo Seo (2010) Ubiquitination of LHY by SINAT5 regulates flowering time and is inhibited by DET1. *Biochemical & Biophysical Research Communications*, **398**, 242-246.
- Joyce Baxter, Wolfgang Moeder, William Urquhart, Dea Shahinas, Kimberley Chin, Dinesh Christendat, **Hong-Gu Kang**, Magdalena Angelova, Naohiro Kato, and Keiko Yoshioka (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.

- Ken-Taro Sekine, Sayaka Kawakami, Shu Hase, Mayumi Kubota, Yuki Ichinose, Jyoti Shah, **Hong-Gu Kang**, Daniel F. Klessig, and Hideki Takahashi (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.
- **Hong-Gu Kang** and Daniel F. Klessig (2008). The involvement of the Arabidopsis CRT1 ATPase family in disease resistance protein-mediated signaling. *Plant Signaling & Behavior* 3, 689-690.
- **Hong-Gu Kang**, Joseph Kuhl, Pradeep Kachroo, and Daniel F. Klessig (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.
- Keiko Yoshioka, Wolfgang Möder, **Hong-Gu Kang**, Pradeep Kachroo, Khaled Masmoud, Gerald Berkowitz and Daniel F. Klessig (2006) The Chimeric *Arabidopsis* Cyclic Nucleotide-Gated Ion Channel AtCNGC11/12 activates multiple pathogen resistance responses. *Plant Cell* 18, 747-763.
- Frank Menke\*, **Hong-Gu Kang\***, Zhixiang Chen, Jeong Mee Park, Dharendra Kumar, Daniel F. Klessig (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)
- **Hong-Gu Kang** and Daniel F. Klessig (2005) Salicylic acid inducible *Arabidopsis* CK2-like activity phosphorylates TGA2. *Plant Molecular Biology* 57, 541-557.
- A.C. Chandra-Shekara, DuRoy Navarre, Aardra Kachroo, **Hong-Gu Kang**, Daniel Klessig, Pradeep Kachroo (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.
- **Hong-Gu Kang\***, Rhonda Foley\*, Luis Onate, Chentao Lin and Karam B. Singh (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)
- **Hong-Gu Kang** and Karam B. Singh (2000) Characterization of salicylic acid responsive *Arabidopsis* Dof domain proteins: overexpression of OBP3 leads to growth defects. *Plant Journal* 21, 329-340.
- **Hong-Gu Kang**, Yiwen Fang, and Karam B. Singh (1999) A glucocorticoid-inducible transcription system causes severe growth defects in *Arabidopsis* and induces defense-related genes. *Plant Journal* 20, 127-133.
- **Hong-Gu Kang**, Jee Won Park, Chung Ho Kim, Jae Yun Lim, and Yang Do Choi (1995) Translational enhancement by the leader of tobacco mosaic virus and soybean *glycinin* gene in transgenic tobacco plants. *Agricultural Chemistry & Biotechnology* 38, 224-231.
- Min Hyung Kang, **Hong-Gu Kang**, Min Gyu Lee, Sung Soon Park, Hee Jin Lee, Youngam Chae, and Yang Do Choi (1993) Molecular cloning of cytochrome P-450 oxidase gene in peppermint (*Mentha Piperita*). *Molecules & Cells* 3, 283-288.
- Chung Ho Kim, **Hong-Gu Kang**, and Yang Do Choi (1993) Interaction of nuclear factor with the 5' upstream region of soybean *Glycinin* Gene. *Molecules & Cells* 3, 165-170.
- Jee Won Park, Chung Ho Kim, **Hong-Gu Kang**, and Yang Do Choi (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*

- 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. *16<sup>th</sup> 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. *21<sup>st</sup> International Conference on Arabidopsis Research.* Yokohama, Japan
- July 2009. CRT1, a new player in *R* gene-mediated immunity in plants. *14<sup>th</sup> 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. *18<sup>th</sup> 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. *16<sup>th</sup> 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/OBF in *Arabidopsis*. *13<sup>th</sup> International Conference on Arabidopsis Research*. Seville, Spain.
- June 1999. Characterization of *Arabidopsis* Dof transcription factors, a novel zinc finger protein family in plants. *10<sup>th</sup> 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:

- 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. *16<sup>th</sup> 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

- July 2015. NSF-IOS. CAREER-Characterization of epigenetic factors and their regulatory roles in modulating transposable elements, plant immunity and transgenerational inheritance. (Award process in progress; 2016-2021; \$786,023; PI)

### 2. PENDING EXTERNAL GRANTS FOR RESEARCH

### 3. SUBMITTED BUT NOT FUNDED EXTERNAL GRANTS AND CONTRACTS

- February 2015. NIH-R15: 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. Molecular characterization of plant genome stability in response to biotic stresses
- October 2012. NIH-R15. Characterization of programmed cell death in host immune responses
- February 2012. NIH-R15. 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

#### *PENDING INTERNAL GRANTS FOR RESEARCH*

#### *SUBMITTED BUT NOT FUNDED INTERNAL GRANTS AND CONTRACTS*

- 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**

- 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**

- PCT/US2012/043976 Daniel F. Klessig, Hong-Gu Kang, Patricia Manosalva, Karl-Heinz Kogel. Compositions and methods for the generation of disease resistant cereals.
- Aug 2014 (disclosure). Hong-Gu Kang and Daniel F. Klessig. Accelerated and enhanced trait development/improvement (breeding) through increased genome/epigenome instability induced by altering CRT1 Family-type MORCs expression or function.

#### **IV. SERVICE**

University:

- 2014 – Current. Biosafety Committee.

College:

Departmental:

- 2015. Judge, The 2nd Annual Departmental 3MT Competition
- 2013. Strategic Hiring Plan Committee
- 2012 - Current. Managed deionized water in the Supple building
- 2014 – Current: Managed Research Greenhouse



- 2012. Judge, Department Colloquium

Community:

- Science Fair Judge:
  - ExxonMobil Texas Science and Engineering Fair (2014; 2015)
  - Austin Energy Regional Science Festival (2014; 2015)
  - Bowie High School Science Fair (2013; 2014; 2015)
- 2013- Current: Vice-president, Austin Chapter of Korean-American Scientist & Engineer Association
- 2014. Epigenetics. Other side drive. KTSW 89.9 Radio Station

Professional:

- Session Chair
  - 2015. Epigenetics. Annual meeting of the American Society of Plant Biologists.
- Grant review panelist
  - 2014. NSF-IOS
- Grant *ad hoc* reviewer
  - 2015. Hungary National Research Development and Innovation Office.
  - 2012. German-Israeli Foundation for Scientific R&D.
- Journal reviewing editor
  - *Frontier in Plant Science* (2015 – current)
- Journal *ad hoc* reviewer (2012- current):
  - *BMC-Plant Biology, Planta, Plant Journal, Molecular Plant Pathology, PLoS Pathogens, Plant Physiology and Biochemistry*

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 Science.
- Korean-American Scientist and Engineer Association