

Curriculum Vitae
Kyeongnam Kim

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- Position: Postdoctoral researcher
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Education

Ph.D.	Kyungpook National University, Daegu, Republic of Korea · <i>Department of Applied Biosciences – Environmental Toxicology</i> · Dissertation title: Toxicological mechanisms of methyl bromide and its alternative fumigants (phosphine and ethyl formate) against <i>Arabidopsis thaliana</i> and quarantine insect pests using multi-omics approaches	2018-2022
M.S.	Kyungpook National University, Daegu, Republic of Korea · <i>Department of Applied Biosciences – Environmental Toxicology</i> · Thesis title: Heart Developmental Toxicity by Carbon Black Waste generated from Oil Refinery on Zebrafish Embryos (<i>Danio rerio</i>): Combined Toxicity on Heart Function by Nickel and Vanadium	2016-2018
B.S.	Kyungpook National University, Daegu, Republic of Korea · <i>School of Applied Biosciences – Molecular Microbiology</i>	2011-2014

Position Held

Post-Doc.	US Department of Agriculture-Agricultural Research Service (USDA-ARS), Daniel K. Inouye U.S. Pacific Basin Agricultural Research Center	2024.02-Present
Research Prof.	Institute of Quality and Safety Evaluation of Agricultural Products, Kyungpook National University, Daegu, Republic of Korea	2023.03-2024.01
Post-Doc.	Institute of Quality and Safety Evaluation of Agricultural Products, Kyungpook National University, Daegu, Republic of Korea	2022.09-2023.02
Post-Doc.	Department of Applied Biosciences (BK21 program), Kyungpook National University, Daegu, Republic of Korea	2022.03-2022.08
Instructor	School of Applied Biosciences, Kyungpook National University, Daegu, Republic of Korea	2022.03-2023.02

Research Interests

- Mechanisms of action of chemicals on plants and insects using Omics based molecular biology
- Environmental impact of agrochemicals and developing sustainable pest management strategies
- Environmental toxicology and ecotoxicology

Publications

- †Authors equally contributed to this paper as first authors. / Students under my direct mentoring are underlined
- 1. Cho, Y., Jeon, H.J., Lee, S.E., Kim, C., Kim, G., **Kim, K.**, Kim, Y.K., Lee, S.R. Microplastic accumulation dynamics in Han river headwaters: Sediment interactions and environmental implication. **2024**. *J. Hazard. Mat.* 472, 134445.
- 2. **Kim, K.**, Kim, D., Kim, C., Kim, D., Kim, B., Lee, B.H., Lee, S.E. Development of ethyl formate disinfestation treatment methods for the prevention of the introduction and establishment of exotic insect pests in greenhouse cultivation. **2023**. *Agriculture* 13(12), 2251.

3. Kim., M.J., Kang, D., Lee, G.D., **Kim, K.**, Kim, J., Shin, J.H., Lee, S.J. Interplays between Cyanobacterial Blooms and Antibiotic Resistance Genes. **2023**. *Environ. Int.* 181, 108268.
4. **Kim, K.**, Kim, D., Lee, B.H., Roh, G.H., Kim, K.W., Jeon, H.Y., Lee, S.E. Ethyl formate as a new sanitary treatment for disinfecting the hitchhiking insect pest *Halyomorpha halys* on imported nonfood agricultural machinery. **2023**. *App. Sci.* 13(21), 11764.
5. **Kim, K.**[†], Kim, C.[†], Kwon, T.H., Jeon, H.J., Kim, Y., Cho, Y., Kim D., Lee, Y., Kim, D., Lee, B.H., Lee, S.E. Optimizing Ethyl Formate Fumigation in Greenhouse Cucurbit Crops for Efficient Control of Major Agricultural Pests, *Myzus persicae* and *Thrips palmi*. **2023**. *Chem. Biol. Technol. Agric.* 10, 112.
6. **Kim, K.**, Lee, Y., Kim, Y., Kim, D., Kim, C., Cho, Y., Park, J., You, Y., Lee, B.H., Lee, S.E., Acute toxicity of ethyl formate to non-target organisms and reduction effect of sodium silicate on ethyl formate-induced phytotoxicity. **2023**. *Korean J. Environ. Biol.* 41(3) : 193-203.
7. Lee, Y., Park,S.J., **Kim, K.**, Kim, T.O., Lee, S.E. Antifungal and Antiaflatoxicogenic Activities of Massoia Essential Oil and C10 Massoia Lactone against Aflatoxin-Producing *Aspergillus flavus*. **2023**. *Toxins*. 15(9), 571.
8. Kim, D.[†], **Kim, K.**[†], Lee, Y.H., Lee, S.E. Transcriptome and Micro-CT Analysis Unravels the Cuticle Modification in Phosphine-Resistant Stored Grain Insect Pest, *Tribolium castaneum* (Herbst). **2023**. *Chem. Biol. Technol. Agric.* 10, 88.
9. Jo, Y.J., Lee, G.D., Ahmad, S., Son, H.W., Kim, M.J., Sliti, A., Lee, S., **Kim, K.**, Lee, S.E., Shin, J.H. The Alteration of the Gut Microbiome during Ramadan Offers a Novel Perspective on Ramadan Fasting: A Pilot Study. **2023**. *Microorganisms* 11(8), 2106.
10. **Kim, K.**, Kim, D., Kwon, S.H., Roh, G.H., Lee, S., Lee, B.H., Lee, S.E., A Novel Ethyl Formate Fumigation Strategy for Managing Yellow Tea Thrips (*Scirtothrips dorsalis*) in Greenhouse Cultivated Mangoes and Post-Harvest Fruits. **2023** *Insects* 14(6), 568.
11. Jeon, H.J.[†], Kim, C.[†], **Kim, K.**, Lee, S.E. Piperlongumine treatment impacts heart and liver development and causes developmental delay in zebrafish (*Danio rerio*) embryos. **2023** *Ecotox Environ Safe* 258, 114995.
12. Kim, Y.[†], Jeon, H.J.[†], **Kim, K.**, Kim, C., Moon, J.K., Hwang, K.W., Lee, S.E. Enantioselective effect of trifloxystrobin in early-stage zebrafish (*Danio rerio*) embryos: Cardiac abnormalities impacted by E,E-trifloxystrobin enantiomer. **2023** *Environ Pollut* 327, 121537.
13. **Kim, K.**, Kim, D, Kwon, T.H., Lee, B.H., Lee, S.E., Effective phytosanitary treatment for export of Oriental melons (*Cucumis melo* var L.) using ethyl formate and modified atmosphere packaging to control *Trialeurodes vaporariorum* (Hemiptera: Aleyrodidae). **2023** *Insects* 14, 442.
14. Jeon, H.J.[†], Cho, Y.[†], **Kim, K.**, Kim, C., Lee, S.E. Combined toxicity of 3,5,6-trichloro-2-pyridinol and 2-(bromomethyl) naphthalene in the early stages of zebrafish (*Danio rerio*) embryos: Abnormal heart development at lower concentrations via differential expression of heart forming-related genes. **2023** *Environ Pollut* 325, 121450.
15. Cho, Y.[†], Jeon, H. J.[†], **Kim, K.** Kim, C., Lee, S.E. Developmental toxicity of a pymetrozine photo-metabolite, 3-pyridinecarboxaldehyde, in zebrafish (*Danio rerio*) embryos: Abnormal cardiac development and occurrence of heart dysfunction via differential expression of heart formation-related genes. **2023** *Ecotox Environ Safe* 253, 114654.
16. Jeon, H.J.[†], **Kim, K.**[†], Kim, C., Lee, S.E. Antimelanogenic effects of curcumin and its dimethoxy derivatives: Mechanistic investigation using B16F10 melanoma cells and zebrafish (*Danio rerio*) embryos. **2023** *Foods* 12, 926.
17. **Kim, K.**[†], Kim, C.[†], Yoo, J., Kim, J.R., Kim, Y.H., Lee, S.E. Phosphine gas in the dark induces severe phytotoxicity in *Arabidopsis thaliana* by increasing a hypoxia stress response and disrupting the energy metabolism: Transcriptomic approaches. **2023** *J Hazard Mater* 43, 130141.
18. Jeon, H.J., **Kim, K.**, Kim, C., Cho, Y., Kwon, T.H., Lee, B.H., Lee, S.E., Residual evaluation of ethyl formate in soil and crops after fumigation in green house. **2022**. *Korean J. Environ. Biol.* 40(3): 316-324.

19. Park, J., Kim, Y., Jeon, H. J., **Kim, K.**, Kim, C., Lee, S., Son, J., Lee, S.E. Acute and developmental toxic effects of mono-halogenated and halomethyl naphthalenes on zebrafish (*Danio rerio*) embryos: Cardiac malformation after 2-bromomethyl naphthalene exposure. **2022**. *Environ Pollut* 297, 118786.
20. Park, J., Kim, C., Jeon, H.J., **Kim, K.**, Kim, M.J., Moon, J. K., Lee, S.E. Developmental toxicity of 3-phenoxybenzoic acid (3-PBA) and endosulfan sulfate derived from insecticidal active ingredients: Abnormal heart formation by 3-PBA in zebrafish embryos. **2021** *Ecotoxicol Environ Saf* 224, 112689.
21. **Kim, K.**, Park, M. G., Lee, Y. H., Jeon, H. J., Kwon, T. H., Kim, C., Park, J., Lee, B. H., Yang, J. O., Lee, S. E. Synergistic Effects and Toxic Mechanism of Phosphine with Ethyl Formate against Citrus Mealybug (*Planococcus citri*). **2021** *Appl Sci-Basel* 11 (21).
22. Choe, H., Kim, M. J., Jeon, H. J., **Kim, K.**, Kim, C., Park, J., Shin, J., Lee, S. R., Lee, S. E. Acute toxicity of the insecticide EPN upon zebrafish (*Danio rerio*) embryos and its related adverse effects: Verification of abnormal cardiac development and seizure-like events. **2021** *Ecotox Environ Safe* 222.
23. **Kim, K.**, Kim, C., Park, J., Yoo, J., Kim, W., Jeon, H.J., Kim, J.R., Lee, S.E., Reduction effects of N-acetyl-L -cysteine, L -glutathione, and indole-3-acetic acid on phytotoxicity generated by methyl bromide fumigation- in a model plant *Arabidopsis thaliana*. **2021**. *Korean J. Environ. Biol.* 39(3): 354-361.
24. **Kim, K.**[†], Kim, C.[†], Park, J., Jeon, H. J., Park, Y. J., Kim, Y. H.; Yang, J. O., Lee, S. E., Transcriptomic evaluation on methyl bromide-induced phytotoxicity in *Arabidopsis thaliana* and its mode of phytotoxic action via the occurrence of reactive oxygen species and uneven distribution of auxin hormones. **2021** *J Hazard Mater* 419, 126419.
25. **Kim, K.**, Lee, S. E. Combined toxicity of dimethyl sulfoxide (DMSO) and vanadium towards zebrafish embryos (*Danio rerio*): Unexpected synergistic effect by DMSO. **2021** *Chemosphere* 270, 129405.
26. Jeon, H. J., **Kim, K.**, Kim, C., Kim, M. J., Kim, T. O., Lee, S. E. Molecular Mechanisms of Anti-Melanogenic Gedunin Derived from Neem Tree (*Azadirachta indica*) Using B16F10 Mouse Melanoma Cells and Early-Stage Zebrafish. **2021** *Plants-Basel* 10 (2).
27. Kim, C., Choe, H., Park, J., Kim, G., **Kim, K.**, Jeon, H. J., Moon, J. K., Kim, M. J., Lee, S. E.. Molecular mechanisms of developmental toxicities of azoxystrobin and pyraclostrobin toward zebrafish (*Danio rerio*) embryos: Visualization of abnormal development using two transgenic lines. **2021** *Environ Pollut* 270.
28. Kim, S.R., Ko, J.K., **Kim, K.**, Jeon, H.J., Lee, S.E. Lignins and their close derivatives produced by biorefinery processes for the treatment of human diseases. *Book Chapter* in Biomass, Biofuels, Biochemicals. **2021**. *ELSEVIER*.
29. Kim, Y.C., Lee, S.R., Jeon, H.J., **Kim, K.**, Kim, M.J., Choi, S.D., Lee, S.E. Acute toxicities of fluorene, fluorene-1-carboxylic acid, and fluorene-9-carboxylic acid on zebrafish embryos (*Danio rerio*): Molecular mechanisms of developmental toxicities of fluorene-1-carboxylic acid. **2020** *Chemosphere* 260.
30. Lee, H.K.[†], **Kim, K.**[†], Lee, J., Lee, J., Lee, J., Kim, S., Lee, S.E., Kim, J.H. Targeted toxicometabolomics of endosulfan sulfate in adult zebrafish (*Danio rerio*) using GC-MS/MS in multiple reaction monitoring mode. **2020** *J Hazard Mater* 389, 122056.
31. Jeon, H.J., **Kim, K.**, Kim, Y.D., Lee, S.E. Antimelanogenic activities of piperlongumine derived from *Piper longum* on murine B16F10 melanoma cells in vitro and zebrafish embryos in vivo: its molecular mode of depigmenting action. **2019** *Appl Biol Chem* 62, 61.
32. **Kim, K.**[†], Yang, J. O.[†], Sung, J.Y., Lee, J.Y., Park, J. S., Lee, H.S., Lee, B.H., Ren, Y., Lee, D.W., Lee, S.E. Minimization of energy transduction confers resistance to phosphine in the rice weevil, *Sitophilus oryzae*. **2019** *Sci Rep* 2019, 9 (1).
33. **Kim, K.**, Lee, Y. H., Kim, G., Lee, B.H., Yang, J.O., Lee, S.E., Ethyl formate and phosphine fumigations on the two-spotted spider mite, *Tetranychus urticae* and their biochemical responses. **2019** *Appl Biol Chem* 62 (1).
34. Jeon, H.J., **Kim, K.**, Kim, Y.D., Lee, S.E. (Review) Naturally occurring Piper plant amides potential in agricultural and pharmaceutical industries: perspectives of piperine and piperlongumine. **2019** *Appl Biol Chem* 62 (1), 63.

35. **Kim, K.**, Wang, C.H., Ok, Y. S., Lee, S.E. Heart developmental toxicity by carbon black waste generated from oil refinery on zebrafish embryos (*Danio rerio*): Combined toxicity on heart function by nickel and vanadium. **2019** *J Hazard Mater* 363, 127-137.
36. Jeon, H.J., **Kim, K.**, Kim, Y.C., Lee, S.E. Acute Toxicities of Emulsifiable Concentrates and Granules of Valeriana fauriei Briquet and Alpinia galangal Swartz Essential Oils against *Cyprinus carpio*. **2018** *Korean J. Environ. Biol.* 36(4), 659-664.
37. **Kim, K.**, Park, J., Yang, J.O, Lee, S.E., Proteomic Evaluation of Insecticidal Action of Phosphine on Green Peach Aphids, *Myzus persicae*. **2018** *Appl Sci* 8 (10), 1764.
38. Nam, T.H., Jeon, H.J., **Kim, K.**, Kim, H.M., Kim, Y.C., Lee, S.E. Ecotoxicities of emulsifiable concentrate and granules of cinnamon (*Cinnamomum zeylanicum*) essential oil against *Cyprinus carpio* and *Danio rerio*. **2018** *J. Appl.Biol. Chem.* 61(2), 151-155
39. **Kim, K.**, Jeon, H.J., Choi, S.D., Tsang, D. C. W., Oleszczuk, P., Ok, Y. S., Lee, H.S., Lee, S.E. Combined toxicity of endosulfan and phenanthrene mixtures and induced molecular changes in adult Zebrafish (*Danio rerio*). **2018** *Chemosphere* 194, 30-41.
40. **Kim, K.**, Lee, B.H., Park, J.S., Yang, J.O., Lee, S.E. Biochemical mechanisms of fumigant toxicity by ethyl formate towards *Myzus persicae* nymphs. **2017** *J. Appl.Biol. Chem.* 60(3), 271-277.
41. Kim, L., Jeon, J.W., Son, J.Y., Park, M.K., Kim, C.S., Jeon, H.J., Nam, T.H., **Kim, K.**, Park, B.J., Choi, S.D., Lee, S.E., Concentration and distribution of polychlorinated biphenyls in rice paddy soils. **2017** *Appl Biol Chem* 60 (2), 191-196.
42. Nam, T.H., Kim, L., Jeon, H.J., **Kim, K.**, Ok, Y.S., Choi, S.D., Lee, S.E. Biomarkers indicate mixture toxicities of fluorene and phenanthrene with endosulfan toward earthworm (*Eisenia fetida*). **2017** *Environ Geochem Health* 39 (2), 307-317.
43. Nam, T.H., Jeon, H.J., Kim, K., Choi, Y., Lee, S.E. Acute Toxicity of Emulsifiable Concentrate of Coriander Essential Oils against *Cyprinus carpio*. **2016**. *Korean J. Environ. Biol.* 34(3), 208-211.

Publications –In preparation

1. **Kim, K.**, Kim, D., Jeong, M., Shin, J.H., Kim, J.R., Lee, S.E. Phosphine resistant biomarkers of the red flour beetle (*Tribolium castaneum*) based on transcriptomics with machine learning approaches. **2024** *Pest Manag. Sci.* **(In preparation)**
2. **Kim, K.**, Kim, C., Lee, S.E. Phytotoxic mechanism of ethyl formate fumigation towards *Arabidopsis thaliana* and application on nursery plants. **2024** *J. food. Agri. Chem.* (In preparation)

Patents

1	Biomarker composition for diagnosing phosphine-resistant pests comprising sm4 and tim10b proteins or genes encoding them (10-2024-0032315)	2024.03
2	Method for reducing phytotoxicity and composition for reducing phytotoxicity to agricultural crops by silicate compounds (10-2023-0173464)	2023.12
3	Development of reducing chemicals and conditions on phosphine-induced phytotoxicity (10-2023-0036575)	2023.03
4	A method for reducing the weakening of imported seedlings by ethyl formate and a composition for fumigation control of quarantine pests (10-2023-0036574)	2023.03
5	A method for reducing damage to agricultural crops by ethyl formate and a protective agent for agricultural crops (10-2022-0182608, Technology Transfer-completed)	2022
6	Method for reducing phytotoxicity of plant by methyl bromide (10-2022-0055032)	2022
7	Biomarkers for diagnosing phosphine resistance-induced insects (Granted patent (4th Apr.2021): 10-2240047)	2018
8	Biomarker composition for discriminating remaining endosulfan or determining toxicity of endosulfan comprising wax ester (Granted patent (3th Mar.2021): 10-2225307)	2017

Experimental skills

- 1 Molecular biology techniques
 - DNA/RNA/Protein isolation, PCR (RT-PCR, qRT-PCR), Western blot, and Enzyme assays
 - Gene cloning, Microinjection, CRISPR-Cas9 tech., Genotyping, RNAi and so on.
- 2 Analytical instruments

- LC: HPLC-DAD (and FLD), LC-MS/MS, and LC-Q-TOF-MS
 - GC: GC-MS, GC-FID (and ECD, NPD)
- 3 Fumigation methods: Methyl bromide, Ethyl formate, and Phosphine
 - 4 Bioinformatics: R for Omics analysis (Transcriptomics, proteomics, lipidomics, and metabolomics)
 - 5 Organism breeding skills
 - **Insects:** *Tribolium castaneum*, *Sitophilus oryzae*, *Rhyzopertha dominica*, *Galleria mellonella*, *Myzus persicae*, *Planococcus citri*, and so on
 - **Plants:** *Arabidopsis thaliana*, and various crops
 - **Other organisms.:** Cell lines (HepG2, AML12, C2C12, and B16F10), *Danio rerio*, and *Eisenia fetida*
 - 6 Design tools: GraphPad Prism, Adobe Illustrator, Photoshop, and Premiere

Grants, Fellowship, and Awards

1.	A Commendation from the Deputy Prime Minister and Minister of Education as an Outstanding Participant in the 4th BK21 program		2023.12.31
2.	Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education - Project Title: Development of mutant models of the red flour beetle (<i>Tribolium castaneum</i>) for assessing phosphine resistance mechanism and control	\$89698.84	2022.09-2024.05
3.	The Excellent Prize of Oral Presentation in General session in KSAE	\$80	2023
4.	The Top prize in the 4th BK21 Participating Education Group Performance Forum Excellent Performance Presentation Competition (Bioscience & Engineering Department)	\$3737.45	2022
5.	The Top Prize in KNU Alumni Association Academic Award	\$3737.45	2022
6.	The Top Prize in Participating Graduate Students Performance Sharing Presentation in the 4th BK21 Program	\$768.90	2022
7.	4th BK21 Government Scholarship Program: Doctor course	\$38810.0	2018-2022
8.	The Top Prize of the Corteva award competition (Insecticide resistance: Mechanism and management) in KSAE	\$768.90	2019
9.	3rd BK21 Government Scholarship Program: Master course	\$11044.8	2016-2018
10.	Excellent Paper Presentation Award in 3rd BK21 Program		2018
11.	Excellent Paper Presentation Award in KSABC		2017
12.	KNU Challenge Scholarship: Undergraduate Student (Tuition)	\$84328.0	2012-2014
13.	KNU Challenge Scholarship – Global program (Australia)	\$1917.5	2013
14.	KNU Challenge Scholarship – Global program (Philippine)	\$1917.5	2012
15.	KNU Undergraduate Student Tutoring Service Scholarship	\$920.40	2013-2014

Conferences & Symposia

1	American Chemistry Society (ACS) Fall in San Francisco, CA.	Poster	Sep., 2023
2	Spring International Conference of Korean Society of Applied Entomology (KSAE) - Excellence prize	Oral	Apr., 2023
3	Fall International Conference of Korean Society of Applied Entomology (KSAE) - Invited	Oral	Oct., 2022
4	The 77th Annual Meeting of the Korean Association of Biological Sciences - Invited	Oral	Aug., 2022
5	International Symposium and Annual Meeting of the KSABC – Young Scientist Presentation - Invited	Oral	June, 2022
6	4 th BK21 Participating Education Group Performance Forum - Excellent Performance Presentation Competition - Top prize	Oral	Feb., 2022
7	4 th BK21 program symposium - Top prize	Oral	Feb., 2022
8	Fall International Conference of KSAE - Corteva award competition (Insecticide resistance: Mechanism and management) - Top prize	Oral	Oct., 2019

9	The 2nd International Conference on Biological Waste as Resource 2017 (BWR2017) in Hongkong	Oral	May, 2019
10	International Symposium and Annual Meeting of the KSABC – Graduate Student Presentation	Oral	June, 2018
11	International Symposium and Annual Meeting of the KSABC – Graduate Student Presentation (Excellent Paper)	Oral	June, 2017

Invited and contributed lectures

1	Theory and practice of analytical instrumentation (GC-MS and HPLC), Plant Quarantine Technology Center, Animal and Plant Quarantine Agency, Gimcheon 39660, Republic of Korea	Aug., 2022
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Teaching experience

1	School of Applied Biosciences, Kyungpook National University, Daegu, Republic of Korea	2022-present
	<ul style="list-style-type: none"> • Agricultural Food Hazardous Substances Informatics • Analytical Organic Chemistry Experiment • Functional Cosmetics based on Natural Product 	
2	Facilitator Workshop using Design Thinking, Design Thinking Community (DTC), Daegu, Republic of Korea	2015-2016
3	Youth Community Workshop for Career Exploration, Daegu, Republic of Korea	2014-2016

Journal review and Editorial service – peer reviewer

1	Journal of Asia-Pacific Entomology (Elsevier)
2	Science of The Total Environment (Elsevier)
3	Journal of Environmental Sciences (Elsevier)
4	Ecotoxicology and Environmental Safety (Elsevier)

References

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