

Curriculum Vitae  
**Kyeongnam Kim**

80, Daehak-ro, Buk-gu, Kyungpook National University (KNU), Daegu, Republic of Korea 41566	- Position: Post-Doc. - Email: kn1188@knu.ac.kr - Cell: (082) 10-9336-1188
---	--

### Education

<b>Ph.D.</b>	<b>Kyungpook National University, Daegu, Republic of Korea</b>	<b>2018-2022</b>
	<ul style="list-style-type: none"> <li>Department of Applied Biosciences – Environmental Toxicology</li> <li>Dissertation: 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</li> </ul>	
<b>M.S.</b>	<b>Kyungpook National University, Daegu, Republic of Korea</b>	<b>2016-2018</b>
	<ul style="list-style-type: none"> <li>Department of Applied Biosciences – Environmental Toxicology</li> <li>Thesis: 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</li> </ul>	
<b>B.S.</b>	<b>Kyungpook National University, Daegu, Republic of Korea</b>	<b>2011-2014</b>
	<ul style="list-style-type: none"> <li>School of Applied Biosciences – Molecular Microbiology</li> </ul>	

### Position Held

Post-Doc.	Institute of Quality and Safety Assessment of Agricultural Products, Kyungpook National University, Daegu, Republic of Korea	2022.09-Present
Post-Doc.	Department of Applied Biosciences (BK21 program), Kyungpook National University, Daegu, Republic of Korea	2022.03-08
Instructor	School of Applied Biosciences, Kyungpook National University, Daegu, Republic of Korea	2022

### Research Interests

Solving agriculture and environmental problems

- Molecular mechanism
- Multi-Omics
- Resistance mechanism

### Publications

- Students under my direct mentoring are underlined / †Authors equally contributed to this paper as first authors.

1. **Kim, K.<sup>†</sup>**, Kim, C.<sup>†</sup>, 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.
2. 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.
3. 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.

4. **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.
5. 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.
6. **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).
7. 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.
8. **Kim, K.**<sup>†</sup>, Kim, C.<sup>†</sup>, 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.
9. **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.
10. 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.
11. 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).
12. 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.
13. Lee, H.K.<sup>†</sup>, **Kim, K.**<sup>†</sup>, 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.
14. **Kim, K.**<sup>†</sup>, Yang, J. O.<sup>†</sup>, 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).
15. Jeon, H.J., **Kim, K.**, Kim, Y.D., Lee, S.E. Naturally occurring Piper plant amides potential in agricultural and pharmaceutical industries: perspectives of piperine and piperlongumine. **2019** *Appl Biol Chem* 62 (1), 63.
16. **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).
17. **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.
18. **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.
19. **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.

20. 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.
21. 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.

## Publications – In preparation

1. **Kim, K.<sup>†</sup>**, **Kim, D.<sup>†</sup>**, Jeon, H.J., Jeong, M., Shin, J.H., Lee, S. E. Phosphine resistant biomarkers of the red flour beetle (*Tribolium castaneum*) based on transcriptomics with machine learning approaches. **2023** *J Pest Sci* (**In preparation**)
2. **Kim, K.**, Jeon, H.J., **Kim, C.**, **Kim, Y.**, Kwon, T.H., Lee, B.H., Lee, S. E. Phytotoxic effect and reduction methods of Ethyl formate fumigants: new pest management methods in green-house for watermelon and *Myzus persicae*. *Sci Total Environ* (**In preparation**)
3. **Kim, D.<sup>†</sup>**, **Kim, K.<sup>†</sup>**, Jeon, H.J., Lee, S. E. Phosphine resistance in the red flour beetle (*Tribolium castaneum*) involved chitin biosynthesis. **2023** *Postharvest Biol Technol* (**In preparation**)
4. Jeon, H.J.<sup>†</sup>, **Kim, K.<sup>†</sup>**, **Choe, H.**, **Kim, C.**, Lee, S. E. Melanogenesis inhibited by curcumin and DMC, BDMC. **2023** *Plants* (**In preparation**)

## Patents

- |   |  |      |
|---|--|------|
| 1 | Method for reducing phytotoxicity of plant by methyl bromide (10-2022-0055032)   | 2022 |
| 2 | Biomarkers for diagnosing phosphine resistance-induced insects (10-2240047-0000)   | 2018 |
| 3 | Biomarker composition for discriminating remaining endosulfan or determining toxicity of endosulfan comprising wax ester (10-2225307-0000) | 2017 |

## Conferences & Symposia

- |    |  |      |            |
|----|--|------|------------|
| 1  | Fall International Conference of Korean Society of Applied Entomology (KSAE) - <b>Invited</b>  | Oral | Oct., 2022 |
|    | • Phytotoxic mechanisms and reduction methods of major quarantine fumigants through transcriptome analysis   |      |            |
| 2  | The 77th Annual Meeting of the Korean Association of Biological Sciences - <b>Invited</b>  | Oral | Aug., 2022 |
|    | • The current status of quarantine fumigants and their efficacy & phytotoxicity  |      |            |
| 3  | International Symposium and Annual Meeting of the KSABC – Young Scientist Presentation - <b>Invited</b>  | Oral | June, 2022 |
|    | • Omics-based toxicological aspects of phosphine fumigant: Resistance and phytotoxic mechanisms  |      |            |
| 4  | 4 <sup>th</sup> BK21 Participating Education Group Performance Forum - Excellent Performance Presentation Competition ( <b>Top prize</b> )   | Oral | Feb., 2022 |
| 5  | 4 <sup>th</sup> BK21 program symposium ( <b>Top prize</b> )  | Oral | Feb., 2022 |
| 8  | Fall International Conference of KSAE - Corteva award competition (Insecticide resistance: Mechanism and management) ( <b>Top prize</b> )  | Oral | Oct., 2019 |
|    | • A novel mechanism in a phosphine (PH <sub>3</sub> )-resistant rice weevil ( <i>Sitophilus oryzae</i> ) to overcome PH <sub>3</sub> fumigation via minimizing energy transduction |      |            |
| 11 | The 2nd International Conference on Biological Waste as Resource 2017 (BWR2017) in Hongkong  | Oral | May, 2019  |

	<ul style="list-style-type: none"> <li>Mixture Toxicities of Persistent Organic Pollutants and Combinational Effects on Gene Expression in Zebrafish Adults (<i>Danio rerio</i>)</li> </ul>		
13	International Symposium and Annual Meeting of the KSABC – Graduate Student Presentation	Oral	June, 2018
	<ul style="list-style-type: none"> <li>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</li> </ul>		
15	International Symposium and Annual Meeting of the KSABC – Graduate Student Presentation ( <b>Excellent Paper</b> )	Oral	June, 2017
	<ul style="list-style-type: none"> <li>Developmental toxicity of carbon black waste generated from oil refinery process against zebrafish embryos (<i>Danio rerio</i>)</li> </ul>		

### Grants, Fellowship, and Awards

1.	( <i>Current grant</i> ) Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education	\$89698.84 (2 years)	2022-2024
	<b>- Project title: Development of mutant models of the red flour beetle (<i>Tribolium castaneum</i>) for assessing phosphine resistance mechanism and control</b>		
2.	The top prize in the 4th BK21 Participating Education Group Performance Forum Excellent Performance Presentation Competition (Bioscience & Engineering Department)	\$3737.45	2022
3.	The top prize in KNU Alumni Association Academic Award	\$3737.45	2022
4.	The top prize in Participating Graduate Students Performance Sharing Presentation in the 4th BK21 Program	\$768.90	2022
5.	4th BK21 Government Scholarship Program: Doctor course	\$38810.0 (3.5 years)	2018-2022
6.	The top prize of the Corteva award competition (Insecticide resistance: Mechanism and management) in KSAE	\$768.90	2019
7.	3rd BK21 Government Scholarship Program: Master course	\$11044.8 (2 years)	2016-2018
8.	Excellent Paper Presentation Award in 3rd BK21 Program		2018
9.	Excellent Paper Presentation Award in KSABC		2017
10.	KNU Challenge Scholarship: Undergraduate Student (Tuition)	\$84328.0 (3 years)	2012-2014
11.	KNU Challenge Scholarship – Global program (Australia)	\$1917.5	2013
12.	KNU Challenge Scholarship – Global program (Philippine)	\$1917.5	2012
13.	KNU Undergraduate Student Tutoring Service Scholarship	\$920.40	2013-2014

### 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
---	---	------------

### Experimental skills

1	Organism breeding skills <ul style="list-style-type: none"> <li><i>Tribolium castaneum</i>, <i>Sitophilus oryzae</i>, <i>Rhyzopertha dominica</i>, <i>Galleria mellonella</i>, <i>Myzus persicae</i>, <i>Planococcus citri</i>, and so on</li> <li>Cell lines (HepG2, AML12, C2C12, and B16F10), <i>Danio rerio</i>, <i>Eisenia fetida</i>, <i>Arabidopsis thaliana</i>, and various crops</li> </ul>
2	Molecular biology techniques

- 
- DNA/RNA isolation, PCR (RT-PCR, qRT-PCR), Western blot, Enzyme assays
  - Gene cloning, Microinjection (in *Tribolium castaneum* and *Danio rerio*), Genotyping (T7E1 and CAPS methods)
- 3 Analytical instruments
    - HPLC-DAD (and FLD), LC-MS/MS, LC-Q-TOF-MS
    - GC-MS, GC-FID (and ECD, NPD)
  - 4 Bioinformatics
    - R for Multi-Omics analysis (Transcriptomics, proteomics, lipidomics, and metabolomics)
  - 5 Design tools
    - GraphPad Prism, Adobe Illustrator, Photoshop, and Premiere

### Teaching Experience

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

### References

- 
- |   |                       |
|---|-----------------------|
| <b>Sung-Eun Lee</b> , Ph.D. (M.S. And Ph.D. advisor)<br>Kyungpook National University, Daegu, Republic of Korea | selpest@knu.ac.kr     |
| <b>Dong-Woo Lee</b> , Ph.D. (Collaborator)<br>Yonsei University, Seoul, Republic of Korea                       | leehicam@yonsei.ac.kr |