18 November 2022

Curriculum Vitae

**Kyeongnam Kim**

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| 80, Daehak-ro, Buk-gu, Kyungpook National University (KNU), 202 Agriculture & Life Sciences Building #1, Daegu, Republic of Korea 41566 | Position: Post-Doc. |
| Sponsors: S.E. Lee’s Lab. supported by Basic Science Research Program through the  National Research Foundation of Korea (NRF) |
| Email: kn1188@knu.ac.kr |
| Cell: (082) 10-9336-1188 |

**Education**

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| **Ph.D.** | Kyungpook National University, Daegu, Republic of Korea   * Applied Biosciences – Environmental Toxicology * Thesis - Toxicological mechanisms of methyl bromide and its alternative fumigants (phosphine and ethyl formate) against *Arabidopsis thaliana* and quarantine insect pests using multi-omics approaches | 2018-2022 |
| **M.S.** | Kyungpook National University, Daegu, Republic of Korea   * Applied Biosciences – Environmental Toxicology | 2016-2018 |
| **B.S.** | Kyungpook National University, Daegu, Republic of Korea   * Applied Biosciences – Molecular Microbiology (microbial toxin) | 2011-2014 |

**Position Held**

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| Post-Doc. | Institute for 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 |
| Project Manager | Social Community Business ‘KKONGBAT’, Daegu,  Republic of Korea | 2014-2016 |

**Awards, Fellowship, and Grants**

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| 1. | (*Current grant*) Basic Science Research Program through the  National Research Foundation of Korea (NRF) funded by the Ministry of Education  **- Development of mutant models of the red flour beetle (*Tribolium castaneum*) for assessing phosphine resistance mechanism and control** | $89698.84 (2 years) | 2022-2024 |
| 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 |
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**Publications**

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

1. **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.
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.**†, 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.
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.†, **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.
14. **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).
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**

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1. **Kim, K.**†, Kim, D.†, 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.†, **Kim, K.**†, 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.†, **Kim, K.**†, Choe, H., Kim, C., Lee, S. E. Melanogenesis inhibited by curcumin and DMC, BDMC. **2023** *Plants* (**In preparation)**

**Patents**

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| 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 ensodulfan comprising wax ester (10-2225307-0000) | 2017 |
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**Conferences & Symposia**

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| 1 | Fall International Conference of Korean Society of Applied Entomology (KSAE) - ***Invited***   * Phytotoxic mechanisms and reduction methods of major quarantine fumigants through transcriptome analysis | Oral | Oct., 2022 |
| 2 | The 77th Annual Meeting of the Korean Association of Biological Sciences - ***Invited***   * The current status of quarantine fumigants and their efficacy & phytotoxicity | Oral | Aug., 2022 |
| 3 | International Symposium and Annual Meeting of the KSABC – Young Scientist Presentation - ***Invited***   * Omics-based toxicological aspects of phosphine fumigant: Resistance and phytotoxic mechanisms | Oral | June, 2022 |
| 4 | 4th BK21 Participating Education Group Performance Forum - Excellent Performance Presentation Competition (**Top prize**) | Oral | Feb., 2022 |
| 5 | 4th BK21 program symposium (**Top prize**) | Oral | Feb., 2022 |
| 6 | International Symposium and Annual Meeting of the KSABC | Poster | Aug., 2021 |
| 7 | Fall International Conference of KSAE | Poster | Apr., 2021 |
| 8 | Fall International Conference of KSAE - Corteva award competition (Insecticide resistance: Mechanism and management) (**Top prize**)   * A novel mechanism in a phosphine (PH3)-resistant rice weevil (*Sitophilus* *oryzae*) to overcome PH3 fumigation via minimizing energy transduction | Oral | Oct., 2019 |
| 9 | Annual Meeting and International Conference of the Korean Society of Environmental Biology (KOSEB) | Poster | Oct., 2019 |
| 10 | International Symposium and Annual Meeting of the KSABC | Poster | June, 2019 |
| 11 | The 2nd International Conference on Biological Waste as Resource 2017 (BWR2017) in Hongkong   * Mixture Toxicities of Persistent Organic Pollutants and Combinational Effects on Gene Expression in Zebrafish Adults (*Danio rerio*) | Oral | May, 2019 |
| 12 | SETAC Europe 28th Annual Meeting in Rome | Poster | May, 2018 |
| 13 | International Symposium and Annual Meeting of the KSABC – Graduate Student Presentation   * 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 | Oral & Poster | June, 2018 |
| 14 | 3rd BK21 program symposium (**Excellent Paper**) | Poster | Jan., 2018 |
| 15 | International Symposium and Annual Meeting of the KSABC – Graduate Student Presentation (**Excellent Paper**)   * Developmental toxicity of carbon black waste generated from oil refinery process against zebrafish embryos (*Danio rerio*) | Oral | June, 2017 |
| 16 | Annual Meeting of The Korean Society of Pesticide Science | Poster | Mar., 2017 |
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**Invited and contributed lectures**

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| 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**

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| 1 | Organism breeding skills   * *Tribolium castaneum*, *Sitophilus oryzae*, *Rhyzopertha dominica*, *Galleria mellonella*, *Myzus persicae, Planococcus citri,* and so on * Cell lines (HepG2, AML12, C2C12, and B16F10), *Danio rerio, Eisenia fetida, Arabidopsis thaliana,* and various crops |
| 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 (T7E1and 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 Omics analysis (Transcriptomics, proteomics, lipidomics, and metabolomics) |
| 5 | Design tools   * GraphPad Prism, Adobe Illustrator, Photoshop, and Premiere |

**Teaching Experience**

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| 1 | School of Applied Biosciences, Kyungpook National University, Daegu, Republic of Korea   * Agricultural Food Hazardous Substances Informatics * Analytical Organic Chemistry Experiment * Functional Cosmetics based on Natural Product |  | 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**

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| 1 | Journal of Asia-Pacific Entomology (Elsevier) |  |  |
| 2 | Science of The Total Environment (Elsevier) |  |  |

**References**

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