



# Registration Form: Korea-EU Horizon Europe Researchers Networking Forum 2026 on Cluster 3 & 6

Cluster 3: Civil security for society & Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment

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## Your Target Calls/Topics

HORIZON-CL3-2026-01-DRS-01 Designing new ways of risk awareness and enhanced disaster preparedness.

## Your expected contribution to the project/consortium

Objectives: Designing new ways of CBRN(Chemical, Biological, Radiation and Nuclear weapons related) risk awareness and enhanced rapid disaster response and training system as global preparedness against CBRN disaster

## The current TRL of your research or technology

TRL 4-6: Development / proof of concept / laboratory testing Transporte

## Biography (200~300 words)

1. The relevance to the selected Cluster 3 topic: CBRN(Chemical, Biological, Radiation and Nuclear weapons related) is the one of the most dangerous risk and should build-up the global harmonized standard procedures ,
2. Research concept: simulation and AI based rapid response against the CBRN risk,
3. Expertise: I am a general user license holding veterinary toxicologist(strategic response developments for the CBRN using radiation & RI using lab/facility level simulation)

I got the PhD on the major of veterinary toxicology and pharmacology in 2002 from the college of veterinary medicine, Chungnam National University. And I have working with radiation and radioisotope from 1999 for the development of radiopharmaceuticals about 30 years and I got the general license for radioisotope using in 2002. I have about 4 and half years postdoctoral trainin at Clinical center of NIH in USA from 2004 to 2008. From Dec 2008 upto now, I work at Korea Atomic Energy Research Institute as

Principal Researcher. To develop the advanced protective methodologies for CBRN(Chemical, Biological, Radiological, Nuclear, Explosives) environments we can serve the lab-scale simulation using radioisotope working facility as well as irradiation under the national radiation protection regulation. Also we can serve the evaluation of the safety and efficiency of smart protective equipment for RN disaster responders

4. International collaboration experience: I have involved in several international collaborative projects such as IAEA CRPs,

5. Expected outcomes: Global standard for the smart response against the CBRN disasters

### **Research Area / Interests (+-10 lines)**

1. Main research field: Radiation and radioisotope applying preclinical studies; 2. Technological specialization: based on KAERI/ARTI's a variety radiation and radioisotope adapted research facilities simulations for the nuclear & radiation disaster in the lab-scales under radiation safety guidelines; 3. research experiences: have performed and ongoing 3 IAEA Coordinated Research Projects as well as several Korean government research projects; and currently proposing the establishment of a rapid response system against nuclear & weapons of mass destruction disasters

### **Existing/Potential Partner(s)**

-existing collaboration networks: researchers of STUK and University of Helsinki of Finland, IAEA groups

### **Motivation, Expectation and Plan**

To expand the collaboration networks and consortium building

Objectives of proposal: Designing new ways of CBRN (Chemical, Biological, Radiation and Nuclear weapons related) risk awareness and enhanced rapid disaster response and training system as global preparedness against CBRN disaster,

-partner search needs: European organization which have a R&D regarding CBRN responses and preparedness



# Registration Form: Korea-EU Horizon Europe Researchers Networking Forum 2026 on Cluster 3 & 6

Cluster 3: Civil security for society & Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment

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### Your Target Calls/Topics

HORIZON-CL3-2026-01-INFRA-03

Cluster 3 Topic Title: Targeted innovative capabilities for the resilience of critical entities to natural and human-induced disasters, including hybrid scenarios

### Your expected contribution to the project/consortium

This research has been also partially supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT), (Analysis of Logical Social Dependencies and Resilience of Social Infrastructure), in which I have been participating as a advisory committee, collaborating with faculty members, postdoctoral researchers, and graduate students across participating universities on coauthored work. This research focuses on how to make current infrastructure systems more resilient. Specifically, it analyzes legal and regulatory arrangements governing infrastructure management to proactively identify vulnerable areas (weak ties and loopholes) susceptible to complex disasters and risks, with the ultimate goal of strengthening and reinforcing public infrastructure systems (Logical, institutional interdependence analysis). We are conducting this research in collaboration with other universities in Korea and Purdue University in the United States. In addition, we are currently engaged in various other international collaborative research projects. Through these efforts, our goal is to make infrastructure in both Europe and South Korea more resilient and sustainable.

### The current TRL of your research or technology

TRL 1-3: Fundamental / exploratory research  
TRL 4-6: Development / proof of concept / laboratory testing  
Transporte  
TRL 7-9: Pilot scale / demonstration / deployment

### Biography (200~300 words)

Dr. Changdeok Gim is Assistant Professor in the Department of Technology and Society at SUNY Korea. Before joining SUNY Korea in 2024, he served as Associate Director of Water UCI at the University of California, Irvine, where he worked on collaborative research projects in water resource governance, climate adaptation, equity and water industry, water quality issues, PFAS, and digitized water management. He previously worked on projects on mainstreaming climate adaptation, adaptation monitoring and evaluation, and climate adaptation technology law

and policy at the Korea Environment Institute and the Korea Environmental Industry & Technology Institute, engaging in environmental law, infrastructure management, water policy, and regulatory reform. He received a Ph.D. in Human and Social Dimensions of Science and Technology from Arizona State University, where his dissertation focused on institutional management for infrastructure resilience. He also earned an LL.M. (Master Degree) specialized in the American Law Program from the University of California, Irvine School of Law, building on earlier graduate training in urban planning and environmental management from Seoul National University and undergraduate training in law at Seoul National University. His academic and professional background reflects a sustained interdisciplinary trajectory across environmental policy, science and technology studies, resilience studies, AI governance, and legal-institutional analysis. He enthusiastically seeks to build on a collaborative research network with European Universities through the EU-Horizon grant.

### **Research Area / Interests (+10 lines)**

My research examines the institutional and sociotechnical dimensions of infrastructure resilience, environmental governance, and risk, focusing on how interdependent water, energy, fire, and transportation systems fail when the institutions governing them interact in unanticipated ways. Its distinctive contribution is a law-and-systems toolkit that makes these interdependencies visible, combining Institutional Grammar (ABDICO) coding of regulatory texts with network analysis, adapted AcciMap, and STAMP/STPA to show how institutional mandates can collectively produce systemic failure, a dynamic I have theorized. Grounded in dual training in environmental law and science and technology studies, this work has been applied to cases such as the Hebei Spirit oil spill, the Osong underpass disaster, and the Palisades wildfire, and is reflected in Q1 publications in *Systems* (social-interdisciplinary, 2026), five manuscripts under revision and review (2026), *Regulatory Scheme Analysis of Water Quality in the US* (2024), *Mainstreaming of Climate Adaptation* (2023), *Current Opinion in Environmental Sustainability* (2022), and *Environmental Science and Policy* (2019), supported by funding from the US NSF, the Korea National Research Foundation, and the Cyrus-Tang Foundation (US, Las Vegas)(US 1.3 million dollars).

### **Existing/Potential Partner(s)**

There are currently no European researchers with whom I am actively collaborating. However, two researchers appear to be particularly closely aligned with my research interests.

My research focuses primarily on **embedding laws and regulations into Digital Twins to support more resilient cities and participatory decision-making** (e.g., <https://www.diplomacy.edu/blog/part-7-converging-realities/>). I would like to further develop research on **legal and institutional Digital Twins**.

In particular, I would be very interested in meeting and collaborating with:

1. **Marco Pistore** (University of Bologna, Italy), author of *Towards Civic Digital Twins: Co-Designing the Citizen-Centric Future of Bologna*. His work closely relates to my interests in civic and participatory Digital Twins. <https://arxiv.org/search/cs?searchtype=author&query=Pistore,+M>
2. **Amineh Ghorbani** (Faculty of Technology, Policy and Management, TU Delft, Netherlands), whose research on **Institutional Grammar** is highly relevant to my work. I would welcome an opportunity to explore potential collaboration with her.

### **Motivation, Expectation and Plan**

One of the main reasons I would like to participate in Horizon Europe networking and matchmaking events is that direct outreach to individual European researchers often results in limited engagement. Given the generally cautious and conservative nature of academic networking in Europe, unsolicited approaches frequently receive little response or no response at all.

For example, I have already published my research profile, expertise, and career background on the EU Horizon networking platform, but I have not received any direct contact or collaboration inquiries through this channel.

I believe that researcher exchanges and networking opportunities facilitated through official governmental or institutional frameworks, particularly those supported by the Korean government, can significantly enhance the credibility and visibility of my research. Such institutional backing can also help establish trust more quickly among potential European partners and create a more effective environment for meaningful scientific dialogue and long-term collaboration.

Therefore, participation in Horizon Europe-related events would provide a valuable opportunity to build reliable research networks, identify suitable collaborators, and develop future joint research projects between Korea and Europe.



# Registration Form: Korea-EU Horizon Europe Researchers Networking Forum 2026 on Cluster 3 & 6

Cluster 3: Civil security for society & Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment

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## Your Target Calls/Topics

HORIZON-CL3-2026-02-CS-ECCC-02 Enhancing the Security, Privacy and Robustness of AI Models and Systems (SecureAI), HORIZON-CL3-2026-02-CS-ECCC-01 Approaches and tools for security in software and hardware development and assessment

## Your expected contribution to the project/consortium

1. Research strategy overview:
  - Development of Vulnerability Analysis and Robustness Enhancement Tools for Next-Generation AI Systems
2. Our team's contribution (expected) to the project:
  - To identify emerging security threats within the state-of-the-art AI architectures -- such as Multimodal Learning and Neuromorphic Learning (Spiking Neural Networks, SNNs) - To provide frameworks for their diagnosis and defense
3. Our specific research approach:
  - (1) Identification of New Attack Surfaces and Proposing Vulnerability Assessment Methodologies for Next-Generation AI Models
    - Compensation Pathway Threat Analysis: We identify the 'internal compensation module,' which restores missing data in multimodal models, as a new attack surface. We provide diagnostic tools for attacks targeting this pathway.
    - Availability Backdoor Threat Modeling: We investigate availability backdoor attack scenarios in SNNbased object detection models that preserve nominal accuracy while deliberately delaying execution time.
  - (2) Development of Security Tools from a Hardware-Software Co-design Perspective
    - Edge Resource Exhaustion Detection and Defense: We develop technology to detect availability threats by monitoring CPU utilization and the reduction of scheduling slack in real-time during AI model execution on edge devices (e.g., NVIDIA Jetson). This directly contributes to software/hardware supply chain security and the development of system assessment tools.
    - Anomaly Detection Based on SNN Firing Dynamics: By tracking abnormal neuron firing patterns (burst spikes) within SNNs, we analyze how adversarially generated event streams escalate hardware load.
  - (3) Robust AI System Design and Security Enhancement Strategies

- Compensation Pathway-Specific Adversarial Training: We enhance the fundamental robustness of AI models against external attacks by applying adversarial training techniques that enforce consistency between clean and adversarial representations.
- Cross-modal Agreement Monitoring: We design a runtime security architecture that detects discrepancies between observed data and internally compensated data. This system provides real-time blocking to prevent internal representations from being manipulated in specific semantic directions intended by an attacker.

## The current TRL of your research or technology

TRL 1-3: Fundamental / exploratory research

TRL 4-6: Development / proof of concept / laboratory

## Biography (200~300 words)

### 1. Brief introduction (Dr. Eun-Kyu Lee)

- A professor in the Dept. of Information and Telecommunication Eng. at Incheon National University (INU), South Korea
- Ph.D. in Computer Science from UCLA in 2014 - Experience in industry:
- A principal research engineer at Symantec Research Lab, USA (2014-2015)
- A researcher at Electronics and Telecommunications Research Institute (ETRI), Korea (2002-2008)

### 2. Research project experience

- Leading cyber security research projects over 25 years
- Application domains: Connected autonomous vehicles (CAV), smart energy systems, and future LEO (low Earth orbit) satellites
- Core research expertise: secure collaborations in networked systems and at a secure AI for neuromorphic systems
- Publications: Over 90 papers in top conferences and journals (say, IEEE/IFIP International Conference on Dependable Systems and Networks and IEEE Transactions on Mobile Computing)
- Award: He earned the most cited paper award in 2014 from the IEEE IoT Initiative (for his work of "Internet of Vehicles: From Intelligent Grid to Autonomous Cars and Vehicular Clouds" proposing a distributed computing model for future connected vehicles)

### 3. International collaborations

- Dr. Lee has established strong international collaboration partnerships over the world, especially in Asia and North America.
- Two recent international collaborations:
  - (i) One was with Pacific Northwest National Laboratory (PNNL), one of the US Department of Energy national laboratories, where he developed a secured edge system architecture for a smart energy campus.
  - (ii) The other was about resilient hybrid technologies for microgrids with EU collaborators (Imperial College London and University of Oxford), where he was responsible for secure data processing and communications. This was an International Collaborative Energy Research Program, not a Horizon project.

Now we seek to bring his unique expertise to European collaborative consortia, contributing to the codesign of resilient, secure, and trustworthy AI ecosystems.

## Research Area / Interests (+-10 lines)

### 1. Main Research Fields:

- (1) Neuromorphic (SNN) & Edge Security: Evaluating availability threats and backdoor elimination for Spiking Neural Networks (SNNs) in resource-constrained environments
- (2) Structural Robustness of Multimodal AI: Analyzing and securing the internal pathways of missingmodality-robust models

(3) Secure Collaborative Perception (V2X): Developing trust-based consensus and selection mechanisms for autonomous vehicular networks

## 2. Technological Uniqueness:

- Availability Backdoor & Resource Integrity: We identified the "Event Burst Trigger (EBT)" that exploits the  $O(N^2)$  algorithmic complexity of NMS in SNN detectors, inflating latency by 38x while maintaining detection accuracy — a threat invisible to accuracy-centric monitoring.
- Internal Pathway Hijacking Analysis: Unlike conventional input-noise defense, we pioneer research on "Compensation Hijacking," where an attacker manipulates the internal representation of missing modalities by only perturbing observed inputs.
- Dynamic Ego-Agent Security: Our "EgoLoc" framework prevents privilege hijacking in collaborative perception by replacing fixed ID-based selection with communication-efficiency and trust-validation scores.

## 3. Latest Publications & Awards

- Recent flagship results published in top-tier security and systems venues: DSN (EBT, EgoLoc), ICDCS (AutoGranularity), ESORICS (Compensation Hijacking, under review)
- Awarded the "Most Cited Paper Award" by the IEEE IoT Initiative for foundational work on Internet-of-Vehicles distributed computing

## Existing/Potential Partner(s)

### 1. Current Status:

- Actively seeking to establish new strategic networks and join a multidisciplinary consortium for the Horizon Europe calls.
- Currently, there are no fixed prior collaborations for this specific topic, providing high flexibility for integration into new consortium structures.

### 2. Target Partner Profiles:

- Open to collaboration with any EU-based academic institutions, research organizations (RTOs), SMEs, or industrial partners whose research vision aligns with Trustworthy AI and Structural Model Security. - We are looking for partners who require specialized expertise in Adversarial Robustness Testing and AI Availability Defense for their systems.

### 3. Research Domains for Application:

- Highly focused on fundamental cybersecurity challenges (e.g., Compensation Hijacking, Backdoor Elimination),
- Also interested in applying our security technologies to diverse domains including: Connected and Autonomous Vehicles (CAVs), Space AI, Healthcare & Medical AI, Edge intelligence

## Motivation, Expectation and Plan

### 1. Motivation:

- To co-develop 'Trustworthy AI' technologies that strictly align with the European AI Act and the Cyber Resilience Act (CRA) by ensuring the security, privacy, and robustness of AI models.
- To contribute our specialized expertise in Compensation Hijacking and SNN-based availability threat analysis to reinforce the EU's collective ability to detect and mitigate adversarial manipulations.

### 2. Expectation:

- To identify and network with potential partners who share our research vision regarding the structural vulnerabilities of AI architectures.
- To successfully form or join a multidisciplinary consortium capable of addressing the specific challenges of the SecureAI (CS-ECCC-02) and/or CS-ECCC-01 calls.

### 3. Plan:

- Joint Proposal Submission: Collaborate with consortium partners to prepare and submit a highquality proposal for the 2026 HORIZON-CL3 calls.

- Technical Exchange: Facilitate mutual knowledge transfer through laboratory visits and joint technical workshops.
- Strategic Partnership: Establish long-term strategic alliances and formalize cooperation through the signing of Memorandums of Understanding (MoUs) to ensure sustainable research collaboration beyond the project period.



# Registration Form: Korea-EU Horizon Europe Researchers Networking Forum 2026 on Cluster 3 & 6

Cluster 3: Civil security for society & Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment

**Full Name (English)** Seung Joon YANG  
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## Your Target Calls/Topics

HORIZON-CL3-2026-02-CS-ECCC-02 Enhancing the Security, Privacy and Robustness of AI Models and Systems (SecureAI)

## Your expected contribution to the project/consortium

Our expected contribution to the SecureAI consortium is to provide expertise in reliable and resilient AI systems for autonomous manufacturing, robotics, and safety-critical industrial environments.

Our proposed research approach focuses on developing secure and robust AI frameworks spanning the AI lifecycle, including multimodal perception, reliable model learning, deployment monitoring, and resilient AI operation in cyber-physical systems. In particular, we aim to contribute technologies and validation scenarios related to:

- adversarially robust multimodal AI systems,
- reliable Vision-Language-Action (VLA) and embodied AI models,
- AI reliability assessment, monitoring, and defense mechanisms,
- resilient AI deployment for industrial robotics and autonomous systems,
- real-world validation in autonomous manufacturing environments.

At UNIST, we are conducting nationally funded research projects on autonomous manufacturing AI, digital twin-based robot learning, and intelligent robotic systems in collaboration with industrial partners including HD Hyundai Heavy Industries and Korea Hydro & Nuclear Power (KHNP).

Through collaboration with European partners, we aim to support the development of scalable, humancentric, and internationally competitive SecureAI technologies and establish long-term Korea–EU research cooperation frameworks.

## The current TRL of your research or technology

TRL 1-3: Fundamental / exploratory research

## Biography (200~300 words)

Seungjoon Yang is Director of the Safe AI Research Center and Associate Professor in the Graduate

School of Artificial Intelligence at Ulsan National Institute of Science and Technology (UNIST), Republic of Korea. His research focuses on autonomous manufacturing AI, robotics AI, trustworthy AI systems, and intelligent cyber-physical systems for industrial and safety-critical environments.

His recent work includes Vision-Language-Action (VLA) systems for robotic task learning, digital twin-based robot learning frameworks, embodied AI systems, multimodal AI for industrial applications, and reliable AI deployment in complex industrial environments. He has led and participated in multiple nationally funded R&D projects related to autonomous manufacturing, industrial robotics, and AI-enabled robotic systems.

Prof. Yang actively collaborates with major Korean industrial partners, including HD Hyundai Heavy Industries and Korea Hydro & Nuclear Power (KHNP), on AI-driven manufacturing and intelligent robotic technologies. He also leads interdisciplinary research collaborations through the Safe AI Research Center at UNIST, where participating researchers work on broader topics including AI security, AI governance, resilient AI systems, and trustworthy AI evaluation.

He has published research in artificial intelligence, and industrial AI applications and is actively expanding international collaboration networks with universities, research institutes, and industry partners. His current interests align closely with Horizon Europe priorities in secure, resilient, and human-centric AI technologies for industrial and autonomous systems.

### **Research Area / Interests (+-10 lines)**

- Autonomous manufacturing AI
- Robotics AI and intelligent robotic systems
- Vision-Language-Action (VLA) models
- Digital twin-based robot learning
- Embodied AI and multimodal AI systems
- AI for industrial automation and inspection
- Reliable AI for safety-critical environments
- Industry-academia collaborations with Korean manufacturing industries
- Leadership of nationally funded AI research centers at UNIST
- Large-scale R&D and publications in AI and robotics

### **Existing/Potential Partner(s)**

Dominic Gorecky, Head of Swiss Smart Factory

Dominik Rohrmus, CTO, Labs Network Industrie 4.0 e.V. (LNI 4.0)

### **Motivation, Expectation and Plan**

Existing/Potential Collaborators

- Dominic Gorecky, Head of Swiss Smart Factory
- Dominik Rohrmus, CTO, Labs Network Industrie 4.0 e.V. (LNI 4.0)

Potential Collaboration Areas

- Trustworthy and resilient AI systems
- Industrial AI and autonomous manufacturing
- Robotics AI and embodied AI systems
- Secure AI deployment for cyber-physical systems • Human-centric and safety-critical AI technologies

Target Regions for Collaboration

- Germany
- Switzerland
- EU research institutes and industrial innovation networks related to Industry 4.0 and trustworthy AI



# Registration Form: Korea-EU Horizon Europe Researchers Networking Forum 2026 on Cluster 3 & 6

Cluster 3: Civil security for society & Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment

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### Your Target Calls/Topics

HORIZON-CL3-2026-01-FCT-06 - Prevention and mitigation of misuse of synthetic biology for bioterrorism purposes  
HORIZON-CL3-2026-02-CS-ECCC-02 - Enhancing the Security, Privacy and Robustness of AI Models and Systems (SecureAI)  
HORIZON-CL3-2026-01-SSRI-01 - Open topic on supporting disruptive technological innovations for civil security

### Your expected contribution to the project/consortium

I can contribute an MEA-based electrochemical DNA synthesis and biosensing platform for synthetic biology biosecurity, including traceability/authentication of synthesized DNA, rapid electronic screening of suspect sequences, and automated assay workflows. My group can provide a 256-channel MEA switching board, impedance/electrochemical measurement modules, and FastAPI/MCP-based laboratory automation connecting liquid handling, qPCR, and AI-driven experiment planning. These capabilities can support proof-of-concept development, validation protocols, and data generation for biosecurity, SecureAI, and disruptive civil-security sensing proposals.

### The current TRL of your research or technology

TRL 1-3: Fundamental / exploratory research

### Biography (200~300 words)

Young Jun SONG is an Associate Professor in the Department of Bioengineering at Incheon National University. He works at the interface of bioengineering, semiconductor-based devices, electrochemistry, molecular diagnostics, and AI-enabled laboratory automation. His professional background includes industry experience at Samsung Electronics and Hyundai Motor Company, together with research experience at UC San Diego in the groups of M. J. Heller and X. Huang. This path shaped his perspective on translating device engineering, electronic measurement, and molecular biology into practical bioelectronic platforms. His current research focuses on electrochemical DNA synthesis and DNA data storage, microelectrode-array sensing, AI-assisted chip and experiment design, and secure automation for biological laboratories. He is particularly interested in preserving valuable biological data and domain knowledge while reducing risks of data leakage or misuse in AI-driven workflows. He has not yet led an EU Framework Programme project, and is using this forum to initiate concrete consortium discussions with EU partners in synthetic biology biosecurity, trustworthy AI, and civil-security diagnostics.

### **Research Area / Interests (+-10 lines)**

Electrochemical DNA synthesis on microelectrode arrays (MEA); DNA data storage and programmable droplet/fluidic processing; MEA-based bioelectronic sensing and impedance/electrochemical measurement; AI- and robotics-assisted laboratory automation; AI-assisted chip design for bioelectronic and microelectrode-array devices; secure preservation and controlled reuse of biological data, experimental records, and domain knowledge; prevention of unintended leakage of sequence/design/experimental data through AI systems; auditable workflows for automated biolaboratories; electrode-chip-based capture and enrichment of genetic materials; rapid molecular diagnostics using MEA/bioelectronic sensing platforms; synthetic-biology biosecurity, including sequence screening, traceability, and authentication of synthesized DNA. Related biochip and bioelectronic research outcomes have been published in ACS Nano, Advanced Functional Materials, Science Advances, Advanced Science, and Nature Communications.

### **Existing/Potential Partner(s)**

I am open to collaboration with EU partners and potential coordinators working on synthetic-biology biosecurity, DNA synthesis screening, bioforensics, MEA/bioelectronic sensing, laboratory automation, secure AI, and civil-security diagnostics. Through this programme, I hope to discuss concrete cooperation that can connect complementary technologies and build a competitive Horizon Europe Cluster 3 proposal. Beyond a single proposal, I would like to develop a durable Korea-EU research partnership that can lead to meaningful joint research outcomes, shared platforms, publications, and follow-up projects. I am therefore interested in meeting coordinators, work-package leaders, and research teams with whom we can define practical roles and continue collaboration after the forum.

### **Motivation, Expectation and Plan**

My motivation is to expand our internally developed biochip, DNA data storage, MEA sensing, and AI automation technologies into broader Korea-EU collaborative research. I would like to explore projects ranging from DNA data storage and secure preservation of biological or cultural-heritage information to security and counter-terrorism sensing, liquid-biopsy-style molecular diagnostics, and AI automation for the bio domain. A key interest is how sensitive biological data, experimental records, and domain knowledge can be safely stored, reused, and protected from unintended leakage or misuse in AI-assisted workflows. Through this forum, I hope to meet partners who can connect these technologies with real civil-security and biomedical needs, define joint validation scenarios, and develop Horizon Europe proposals that can grow into long-term collaborative research outcomes beyond a single application.



# Registration Form: Korea-EU Horizon Europe Researchers Networking Forum 2026 on Cluster 3 & 6

Cluster 3: Civil security for society & Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment

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## Your Target Calls/Topics

HORIZON-CL6-2026-01-BIODIV-06 Boosting agrobiodiversity for food security and sustainable competitiveness

## Your expected contribution to the project/consortium

1. Dual System: Vaulting for Security, Banking for Innovation:

Seed Vault (Redundancy & Safety): We operate the only wild plant seed vault in Asia, ensuring the permanent, long-term safety duplication of genetic resources against global environmental risks.

Seed Bank (Research & Utilization): Our active Seed Bank serves as the operational center for phenotypic characterization, breeding research, and germplasm distribution, directly advancing the goals of agrobiodiversity.

2. Strategic Access to Asian Germplasm: Leveraging our robust regional network, we provide exclusive access to climate-resilient germplasm from Central Asia and other biodiversity hotspots. This addresses the critical need for novel traits in European breeding programs.

3. Integrated Translational Research Pipeline: As the leader of the national CWR project, we manage a comprehensive pipeline from field collection and ex-situ conservation to phenotypic evaluation and direct application in breeding. We provide both the genetic materials and the research methodology to integrate them into sustainable food systems.

4. Data-Driven Innovation (Seedpedia): Through our "Seedpedia" platform, we provide high-fidelity datasets on seed traits. This enables predictive modeling for crop improvement, directly supporting the EU's objective of enhancing sustainable competitiveness through data-informed biodiversity management.

## The current TRL of your research or technology

TRL 4-6: Development / proof of concept / laboratory testing Transporte

## Biography (200~300 words)

I am a Seed Scientist and the Seed Bank Manager at the Baekdudaegan National Arboretum, South Korea. I hold a B.S., M.S., and Ph.D. from Korea University, followed by postdoctoral research in Austria. My professional career is

dedicated to the ex-situ conservation and comprehensive study of wild plant seeds, bridging fundamental research with practical application.

Managing our active Seed Bank, I oversee the systematic collection, storage, and utilization of germplasm for research. As the project leader for the national Crop Wild Relatives (CWR) initiative, I manage a critical pipeline that integrates field collection, conservation, and research into the functional traits of wild species. Her core work includes developing "Seedpedia," a comprehensive database of wild seed traits, which is pivotal in transforming raw seed data into valuable insights for global biodiversity conservation.

I am deeply committed to international collaboration, leveraging her robust Asian networks to facilitate scientific exchange and the sustainable management of plant genetic resources. Building on my experience as a project coordinator for a Horizon Europe proposal, I remain actively engaged in pursuing international research consortiums. I am passionate about fostering interdisciplinary cooperation— harmonizing botanical science with art and public education—to advocate for the vital importance of wild plant conservation. Through my academic rigor and leadership, I continues to drive innovations that address the urgent need for biodiversity resilience in an era of climate change.

### **Research Area / Interests (+-10 lines)**

I specialize in Seed Physiology and Ecology, bridging ex-situ conservation with practical application. As the leader of the national CWR project, I manage the full lifecycle of seed research—from field collection and storage to physiological analysis. I am highly proficient in HPLC for analyzing bioactive compounds, and I spearheaded "Seedpedia," a database of wild seed traits to make biodiversity data actionable. My research is both rigorous and productive, yielding over 10 papers and 3 patents annually. Beyond academia, I actively manage corporate consortiums to co-develop products, turning foundational research into industrial solutions. I am committed to creating a seamless pipeline from biodiversity conservation to sustainable industry. I look forward to contributing this integrated expertise to our consortium to address urgent climate challenges.

### **Existing/Potential Partner(s)**

SLU - Swedish University of Agricultural Sciences (스웨덴농업대학교) Lise Lykke Steffensen

### **Motivation, Expectation and Plan**

My commitment to the Horizon Europe framework is both strategic and long-term. Having led a consortium as a project coordinator last year—even though our proposal was not selected—I have gained invaluable, hands-on experience in navigating the complex proposal process and aligning diverse research goals. I am eager to leverage this experience to build robust, enduring partnerships with European researchers. My goal is not merely to participate in this specific call, but to establish a sustainable network that serves as a foundation for continuous scientific cooperation. I am dedicated to actively identifying and creating diverse international research opportunities beyond Horizon Europe, aiming to develop transformative projects that address our shared global challenges. I am excited to connect with prospective partners and foster a collaborative ecosystem where our collective expertise can drive meaningful innovation.



# Registration Form: Korea-EU Horizon Europe Researchers Networking Forum 2026 on Cluster 3 & 6

Cluster 3: Civil security for society & Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment

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Hyun Seok Kim

**Position**

Professor

**Organization**

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**Personal Link(s)** <https://calslab.snu.ac.kr/treephys/>

**Your Target Calls/Topics**

HORIZON-CL6-2026-01-CIRBIO-07: Advancing the European Bio-Based Innovation Enabled by Biotechnology and Biomanufacturing Concepts

**Your expected contribution to the project/consortium**

Our team at Seoul National University contributes to this Horizon Europe initiative by developing a next-generation biotechnology platform that enables rapid and climate-resilient post-harvest forest regeneration. We focus on the bio-manufacturing of green nanoparticles using non-pathogenic tree endophytic fungi, particularly *Trichoderma koningiopsis* strains isolated from drought-surviving *Abies koreana* roots. Leveraging the fungi's rich enzymatic systems and secondary metabolites, we biosynthesize iron oxide, cerium oxide, silicon, zinc, and manganese-based nanoparticles through an environmentally benign and low-energy process. These bio-derived nanoparticles function as nanozymes that enhance antioxidant capacity, stimulate root system development, and improve water and nutrient uptake, thereby increasing seedling survival and early growth under drought, heat, nutrient deficiency, and other climate-induced environmental stresses.

Our research approach integrates biochemical characterization, plant physiological analysis, and multi-scale field validation across diverse climate gradients in Korea and Europe. We combine photosynthesis and water-flux measurements, ROS detoxification assays, fine-root architectural analysis, and molecular profiling to elucidate the mechanisms through which nanoparticle–endophyte interactions promote stress resilience. Furthermore, we develop operationally feasible application strategies—including seed coating, root dipping, soil drenching, and foliar spraying—that are suitable for large-scale afforestation sites where labor and terrain constraints limit conventional treatments. Long-term trials in boreal, hemiboreal, temperate, and subalpine regions will be conducted jointly with European partners to optimize nanoparticle formulations and application frequencies for species such as Norway spruce, Scots pine, *Abies koreana*, *Pinus densiflora*, *Pinus koraiensis*, and *Quercus* species.

Through this biotechnology-enabled reforestation platform, our team provides a critical contribution to the project by creating a scalable bio-based innovation that aligns directly with the Horizon Europe priorities on biotechnology,

biomanufacturing, and the circular bioeconomy. Specifically, we deliver (i) a sustainable biogenic nanoparticle production system, (ii) enhanced regeneration strategies that accelerate forest recovery after logging and disturbance, (iii) significant reductions in sapling mortality and replanting costs, and (iv) a transferable EU–Korea nano-formulation toolkit that strengthens long-term forest resilience and biomass productivity. By restoring forest growth trajectories more rapidly, our technology also amplifies carbon sequestration potential and reinforces the feedstock base for Europe's sustainable wood-based bioeconomy.

### **The current TRL of your research or technology**

TRL 4-6: Development / proof of concept / laboratory testing Transporte

### **Biography (200~300 words)**

After completing my undergraduate and master's studies in Forest Resources at Seoul National University, I pursued advanced research training at the University of Washington and Duke University, focusing on forest physiology, ecohydrology, and carbon–water fluxes. My doctoral work at Duke deepened my expertise in canopy radiation modeling, stomatal regulation, and ecosystem carbon cycling. Following my postdoctoral fellowship at Duke, I returned to Seoul National University, where I now serve as a professor in Forest Sciences. Over the past decade, I have led national research programs on drought physiology, forest growth modeling, phenology, particulate matter mitigation, and carbon balance assessment using flux towers and advanced instrumentation. I have also expanded my work into plant biotechnology, developing endophyte-mediated nanoparticles that enhance seedling stress tolerance, now forming the foundation of EU–Korea collaborative research. Internationally, I have contributed to global forest databases and large-scale synthesis studies, publishing in leading journals including Nature, Nature Communications, and PNAS. I currently serve as Editor-in-Chief of Forest Science and Technology and as a committee member in scientific societies such as AsiaFlux and the Ecological Society of Korea. Throughout my career, I have sought to integrate physiology, biogeoscience, and biotechnology to understand and enhance forest resilience under climate change. My ongoing work aims to bridge science and practice by developing innovative, scalable solutions for forest restoration, carbon neutrality, and sustainable bioeconomies.

### **Research Area / Interests (+-10 lines)**

Our research focuses on developing a biotechnology-enabled forest regeneration platform using endophytic fungus-mediated nanoparticles. We aim to synthesize eco-friendly metal and metal-oxide nanoparticles (FeO, CeO<sub>2</sub>, Si, Zn, Mn) through green biomanufacturing processes using *Trichoderma* strains isolated from drought-surviving *Abies koreana*. These nanoparticles function as catalytic nanozymes that enhance ROS detoxification, stimulate fine-root development, and improve seedling drought and heat tolerance. By strengthening early-stage physiological resilience, the treatments significantly increase survival and growth rates in post-harvest and climate-disturbed forest areas. Our work integrates nanoparticle chemistry, tree physiology, and molecular analyses to reveal species-specific responses in *Picea abies*, *Abies koreana*, *Pinus* spp. and *Quercus* spp. Multi-site trials in Korea and Europe evaluate nanoparticle application strategies—seed coating, root dipping, soil drenching, and foliar spraying—optimized for large-scale and rugged afforestation sites. Through these approaches, we develop practical, low-input regeneration technologies suited for boreal, temperate, and subalpine forest systems. Ultimately, this research provides a scientifically grounded framework for accelerating post-harvest reforestation using nanotechnology. It also contributes to advancing forest ecophysiology and establishing a novel bio-based innovation pathway within Europe's climate-adaptive forestry sector.

### **Existing/Potential Partner(s)**

Francisco X. Aguilar: Professor in Forest Economics at Swedish University of Agricultural Sciences

Torgny Näsholm: Professor in Forest Ecology and Management at Swedish University of Agricultural Sciences

Reimo Lutter: Professor in Forestry at Estonian University of Life Sciences

Alar Just: Professor in Structural Engineering at Tallinn University of Technology

Mirko Presser: Professor in Business Development and Technology at Aarhus University

## **Motivation, Expectation and Plan**

My primary motivation for participating in this event is to strengthen the scientific foundation for our research on nanotechnology-enabled forest regeneration and to establish a cohesive Korea–Europe research framework for Horizon Europe. In particular, I aim to deepen collaboration with our existing partners in Sweden, Estonia, and Denmark by refining joint experimental designs, harmonizing analytical protocols, and co-developing cross-climate field trials using endophyte-mediated nanoparticles. I also expect this forum to play a critical role in expanding our collaboration network to include new research partners in Germany and France. Establishing partnerships with researchers from these countries will allow us to broaden the mechanistic scope of our nanoparticle studies and evaluate their performance across diverse European forest ecosystems, including boreal, temperate, and Mediterranean zones.



# Registration Form: Korea-EU Horizon Europe Researchers Networking Forum 2026 on Cluster 3 & 6

Cluster 3: Civil security for society & Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment

<b>Full Name (English)</b>	JI HYUN KIM
<b>Position</b>	Professor
<b>Organization</b>	Yonsei University
<b>Email</b>	jfk1@yonsei.ac.kr



### Personal Link(s)

<https://scholar.google.com/citations?user=-TS8RvQAAAAJ> [www.microbiome.re.kr](http://www.microbiome.re.kr)

### Your Target Calls/Topics

HORIZON-CL6-2027-02-FARM2FORK-01-two-stage: Strengthening plant health: addressing emerging plant pest risks, HORIZON-CL6-2026-01-BIODIV-06: Boosting agrobiodiversity for food security and sustainable competitiveness

### Your expected contribution to the project/consortium

We may contribute to the consortium project through our expertise in rhizosphere microbiome studies including whole metagenome analysis to meta-omics functional characterization and systems/synthetic biology approaches.

### The current TRL of your research or technology

TRL 1-3: Fundamental / exploratory research  
TRL 4-6: Development / proof of concept / laboratory

### Biography (200~300 words)

Dr. Jihyun F. Kim is a pioneer in microbial genomics, systems and synthetic biology, and microbiome research in Korea. He serves as the Yonsei Lee Youn Jae Fellow Professor and Director of the Microbiome Initiative at Yonsei University. He earned his bachelor's and master's degrees from Seoul National University, and received his Ph.D. from Cornell University in 1997, with seminal work on the pathogenicity mechanism of the fire blight bacterium. Following his postdoctoral experience at Cornell, he began his career as a professional scientist at Korea Research Institute of Bioscience and Biotechnology in 2000. From 2014 to 2022, Prof. Kim led the Strategic Initiative for Microbiomes in Agriculture and Food, a national program that advanced Korea's microbiome research infrastructure.

Between 2022 and 2024, he held multiple leadership roles at Yonsei University, including the Vice President of the Office of Research Affairs at Yonsei University, the President of the Yonsei University-Industry Foundation, and the Chief Executive Officer of Yonsei Technology Holdings Inc. He has spearheaded numerous high-impact publications in highly regarded journals such as Nature, Nature Biotechnology, Nucleic Acids Research, Genome Biology, and Microbiome. He is a respected member of the Korean Academy of Science and Technology, and also serves on the Deliberative Council within the Presidential Advisory Council on Science and Technology.

He has many scientific accomplishments, including several prestigious awards such as the NAS Award of the National Academy of Sciences of the Republic of Korea and Presidential Citation and Medal, as well as a number of highly cited publications on genome, evolution, pathogenicity, and interaction for a number of bacterial systems. With a career marked by academic excellence, strategic vision, and scientific innovation, Dr. Kim continues to push the boundaries of discoveries and application in life sciences.

<https://scholar.google.com/citations?user=-TS8RvQAAAAJ>

### **Research Area / Interests (+-10 lines)**

Microbial Genomics and Metagenomics,  
Systems/Synthetic Biology,  
Genome Evolution,  
Microbiome Studies,  
Microbe-Host Interactions

### **Existing/Potential Partner(s)**

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# Registration Form: Korea-EU Horizon Europe Researchers Networking Forum 2026 on Cluster 3 & 6

Cluster 3: Civil security for society & Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment

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### Personal Link(s)

<https://scholar.google.com/citations?user=fXq6jCAAAA&hl=en> <https://kfbt.korea.ac.kr/kfbt/3117/subview.do>

### Your Target Calls/Topics

HORIZON-CL6-2026-2027-01-CIRCBIO-0X: Increasing the circularity of bio-based sector: upcycling and recycling for higher value and environmental benefits (or similar calls related to sustainable processing and bioactives in Cluster 6)

### Your expected contribution to the project/consortium

Korea University will lead the in-vitro and pathological efficacy/toxicity cross-validation of natural bioactives. We utilize a multi-task AI platform (Pharmaco-Net, provided by our SME partner, Calici) that predicts cellular permeability and binding affinity. Our core contribution is establishing New Approach Methodologies (NAMs) to minimize animal testing and providing safety/efficacy evaluations for upcycled plant resources, which perfectly aligns with the European Green Deal and Circular Bioeconomy.

### The current TRL of your research or technology

TRL 4-6: Development / proof of concept / laboratory

### Biography (200~300 words)

Professor Young Jun Kim is a Professor in the Department of Food and Biotechnology at Korea University, South Korea. His core research expertise lies in the discovery and industrialization of functional natural products and bioactive materials through rigorous in vitro and in vivo experiments. Throughout his academic career, he has extensively contributed to standardizing natural ingredients, elucidating their mechanisms of action, and validating preclinical efficacy for applications in metabolic and neurodegenerative diseases.

Recently, his research has advanced toward regulatory science, focusing on the development and global institutionalization of alternative testing methods (New Approach Methodologies, NAMs) that utilize Artificial Intelligence for natural product discovery. He is currently a key Principal Investigator in the 'PROACTIVE' global consortium and is actively preparing a Horizon Europe Cluster 6 proposal. In this multinational, multi-actor initiative, he collaborates closely with leading European institutions, including Utrecht University (the Netherlands) and the

University of Oxford (UK), as well as partners from Canada (University of Saskatchewan) and Ukraine. Through these collaborative EU research projects, Professor Kim aims to overcome the limitations of traditional animal testing by integrating AI-driven predictive modelling with cross-validated assessments of pathological efficacy and toxicity.

### **Research Area / Interests (+-10 lines)**

Professor Kim's main research field focuses on the functional evaluation, mechanism elucidation, and standardization of natural product-derived bioactive compounds. His technological uniqueness lies in integrating multi-task Artificial Intelligence (such as the Pharmaco-Net platform, via SME partnership) with traditional in vitro and in vivo cell permeability and toxicity testing. This multidisciplinary approach enables rapid screening and efficacy prediction of complex natural materials, serving as a disruptive technology that replaces costly, time-consuming animal testing (NAMs). His flagship research includes the preclinical validation of various plant extracts and the establishment of manufacturing standardization models. Currently, he is highly interested in expanding this AI-driven alternative test evaluation platform to support the global commercialization of sustainable bio-based products. His ongoing Horizon Europe 'PROACTIVE' project perfectly reflects this research excellence, aiming to build a globally standardized predictive framework for upcycled crop-derived bioactives while closely aligning with the European Green Deal.

### **Existing/Potential Partner(s)**

We have already formed a strong multinational consortium named "PROACTIVE". Our existing European and global partners include:

- Netherlands (EU): Prof. Sanne Abeln, Dr. Roxana Radulescu, Dr. Ronnie de Jonge (Utrecht University)
- UK (Associated): Prof. Grant Churchill, Prof. Daniel Anthony (University of Oxford)
- Ukraine (Associated SME): Enamine
- Canada (Global Partner): Prof. Martin J.T. Reaney (Univ. of Saskatchewan) & Prairie Tide Diversified (SME).

We are open to expanding our network with institutions possessing expertise in sustainable biomanufacturing and pilot-scale processing.

### **Motivation, Expectation and Plan**

My primary motivation for attending this forum is to hold a face-to-face kick-off meeting with our EU partners (Utrecht Univ. and Oxford Univ.) to finalize our Horizon Europe Full Proposal for the 'PROACTIVE' project. Specifically, we aim to confirm the Work Package (WP) distribution, discuss the Lump-sum budget allocation, and refine our strategy to maximize EU policy alignment (e.g., Multi-actor approach, zero pollution). Our concrete follow-up plan is to successfully submit the joint proposal for the upcoming Horizon Europe Cluster 6 calls and to solidify our global research network.