국외출장 결과 보고

제5회 아시아 연구실안전 컨퍼런스 참가 결과
The 5th Asian Conference on Safety and Education in Laboratory

Ⅰ 출장 개요

❍ **목 적**

실험실 안전, 안전교육 프로그램, 실험실 안전증진 전략 등에 대한 사고태도와 정책에 대한 강연과 토론에 참석하고, 기술세션에서 한국의 실험실 위험성평가 연구 발표와 함께 실험실안전 최신 연구동향 수집 및 정보를 교류하여 연구 역량을 강화하고자 함.

❍ **기 간 :** 2018. 11. 20(화) ~ 11. 23(금), [3박4일]

❍ **대상국가 및 방문기관** : 일본, 오키나와 과학기술대학원대학교

(Okinawa Institute of Science and Technology Graduate University, Japan)

❍ **출장자** : 산업안전보건연구원 화학물질연구센터 이근원 소장

ACSEL(The Asian Conference on Safety & Education in Laboratory)의 개요

▷ 2013년 설립 이래, 아시아 지역의 대학 및 연구기관의 안전보건에 대한 지식과 best practices에 대한 플랫폼을 제공하는 협의체임.

▷ 매년 1회의 아시아 각국을 순회하면서 연구실안전 정보 공유와 연구논문 발표를 통해 아시아 국가의 연구실안전 분야의 발전에 기여하고 있음.

▷ 최근 2년전부터 미국, 독일, 호주, 뉴질랜드 등의 연구자도 참가하고 있으며, 발표 논문에 대해 일본 학회지인 Journal of Environment and Safety에 특집호 논문을 발간하여 연구실안전 분야 연구 동향 등을 공유하고 있음.

Ⅱ 출장 내용

❍ 출장 일정

일 정	출장지	주 요 내 용
11. 20(화)	이동	○ 출국 - 인천 공항 출발(14:35) → 오키나와 도착(17:00)
11. 21(수) ~ 11.22(목)	일본, 오키나와	○ 학회등록
		○ Keynote Lectures - Safety and emergency management at OIST: lessons learned - Conservation and restoration of coral reefs: the most diverse marine ecosystems - Never waste a good crisis: lessons from the 2011 Christchurch earthquake - Hazardous wastes treatment and disposal at the University of Freiburg
		○ Technical Sessions Oral Presentation
		○ Technical Sessions Poster Sessions - Risk assessment and application cases in research laboratory in Korea (이근원 소장 발표)
		○ Plenary Session - Field measurement and composition of particulate matter in Indonesia - Laboratory-safety management and education in Seoul National University - Benchmarking strategies for ensuring successful university safety and health programmes
		○ Technical Session Oral Presentation
		○ Panel Discussion
		○ Lab. Tour
11. 23(금)	이동	○ 입국 - 오키나와 출발(18:10) → 인천 공항 도착(20:40)

❍ 주요 활동 내용

o Plenary session

- 일본 오키나와과학기술대학원 대학교의 안전관리 시스템의 소개와 뉴질랜드 University of Canterbury에서 크라이스트쳐치 지진으로 인한 사고 교훈에 대한 보고가 있었음
- 독일 University of Freiburg의 유해폐기물 처리와 처분에 대한 설명과 인도네시아의 입자상물질의 조성과 현장 측정에 관한 보고가 있었음.
- 한국 서울대학교에서 실험실안전 관리와 교육에 대한 발표가있었고, 싱가폴대학교에서 성공적인 대학의 안전보건 프로그램의 확보하기 위한 벤치마킹 전략에 대한 보고가 있었음.

o Technical session

- 기술세션의 구연발표(Key note 포함)에서 실험실에서 환경안전의 이론적 분석과 실험실 안전관리, 비상 및 재난관리, 안전 보건 및 환경 보호, 안전교육 분야의 발표가 있었으며, 특히 안전교육은 특별 세션으로 운영하면서 일본, 사우디아라비아, 한국 및 싱가폴의 실험실 안전교육 프로그램 소개와 실행과 향상방안에 대한 토의가 있었음.
- 기술세션의 포스터발표에서 각국의 실험실안전관리와 교육, 사고사례, 점검(Audit), 위험성평가 등 50편의 논문 발표가 있었음.
- 본인(이근원)의 포스터 발표는 다음과 같음,

. 주제 : Risk assessment and application cases in research laboratory in Korea

. 요약 : 한국의 실험실에 적용하고 있는 위험성평가 소개, 산업안전보건법과 연구실안전환경조성법의 위험성평가 비교, 공단의 위험성평가지원시스템(KRAS) 소개 등

. 영문초록 : Laboratories deal with various kinds of chemicals and it is not easy to identify the diversity of risks due to the non-standardized experimental devices and experimental methods. In addition, it is becoming more difficult to manage hazard risk factors because it focuses on functionality for experimental purposes rather than safety considerations in the production and design of experimental devices. In order to prevent accidents occurring in laboratories, it is necessary to investigate and eliminate hazards to prevent the development of accidents in advance. The most practical way to reduce laboratory accidents is to find hazards and control risk in the laboratory. There are Act on Industrial Safety and Health Law and Law on Safety Environment for Laboratory in order to ensure the safety and to prevent accidents of laboratories in Korea. And also, the laboratory supervisor is required to carry out risk analysis of hazardous factors in the laboratory in order to identify the actual condition of harmful factors in the laboratory and to prevent accidents. In this study, we are reviewed the main contents of the risk assessment, and the problems and difficulties in applying the risk assessment are shared through practical cases applied to the laboratory using the KRAS (Korea Risk Assessment Support System) supported by the Korea Occupational Safety and Health Agency. It is expected that it will be possible to manage more effectively and systematically for accident prevention in laboratory by continuously controlling and managing the risk factors through the risk assessment.

❍ 성 과

- 한국의 실험실 위험성평가 연구발표를 통해 국가와 공단의 위상제고에 기여하고, 국가별 연구실안전 시스템 발표 및 토론회 참석으로 국제적인 환경 변화에 의한 신속한 대응
- 컨퍼런스 참석을 통한 수집된 정보, 경험 및 노하우를 향후 연구 및 사업에 반영하여 실험실안전 분야 연구역량 강화와 세계화에 대응

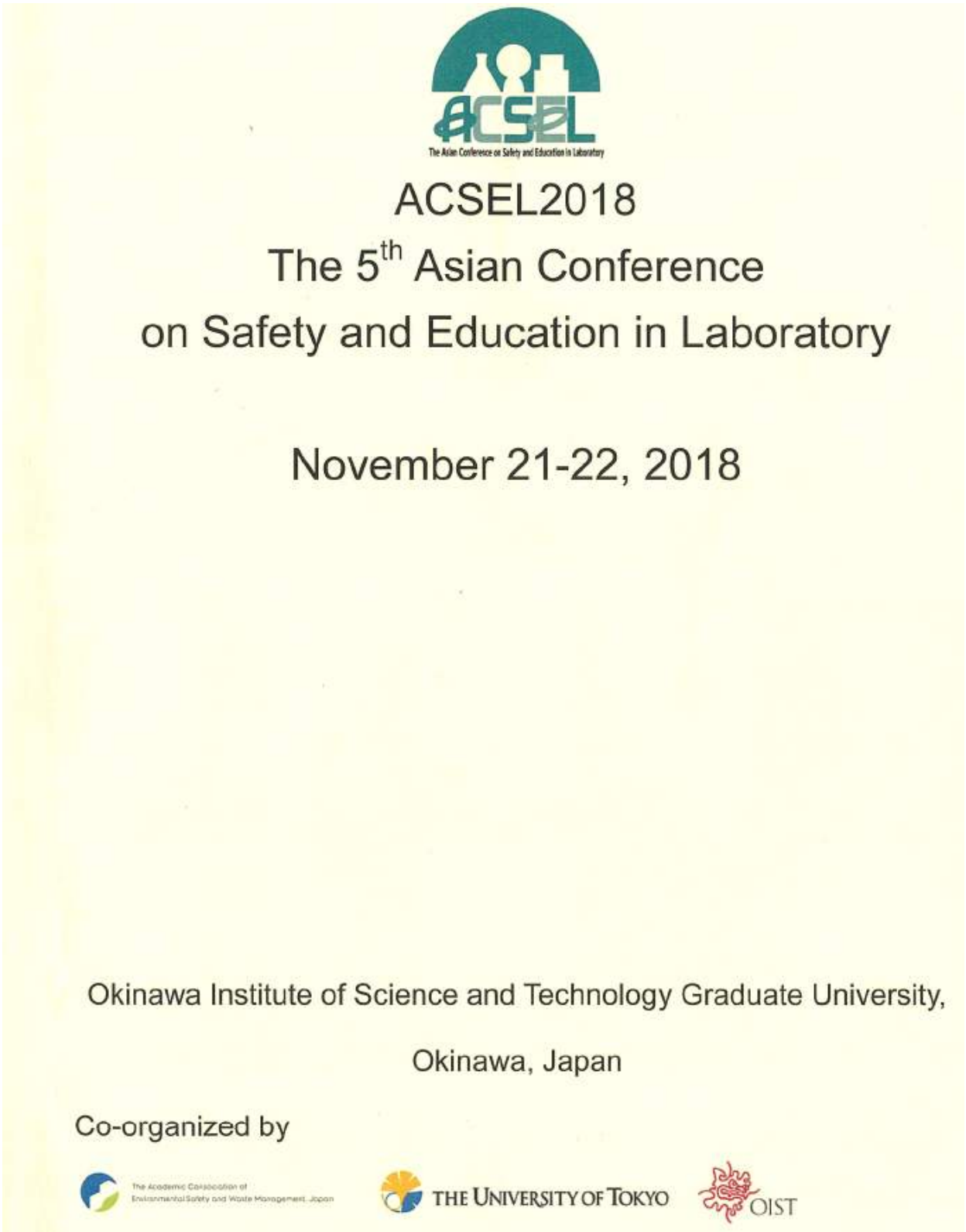
Ⅲ 시사점 및 특이사항

- ❍ 연구실(실험실)안전에 관한 특화된 아시아 컨퍼런스로서 시작되었으나, 오세아니아, 유럽 국가의 참여로, 글로벌화 하는 학회로 발전하고 있음.
- ❍ 실험실안전에 관한 각국의 다양한 분야의 경험 발표가 있었으며, 특히 오래앉아 있는 연구원의 작업자세에 대한 연구발표가 인상 깊었음
- ❍ 포스터발표는 일대일 질의응답으로 철저한 준비와 우수한 언어(영어)능력이 필요함.
- ❍ 동일한 주제로 매년 개최되는 학회에 공단의 지속적인 참여로 사업장의 안전보건 뿐만 아니라 실험실안전에 관한 연구와 경험을 공유하여 한국의 국제적인 이미지 제고에 계속 되기를 희망함.

Ⅳ 수집 자료

- ❍ 학회 발표 초록집

○ 수집자료(학회 책자)


ACSEL
The Asian Conference on Safety and Education in Laboratory
ACSEL2018
The 5th Asian Conference
on Safety and Education in Laboratory
November 21-22, 2018
Okinawa Institute of Science and Technology Graduate University,
Okinawa, Japan
Co-organized by
The Academic Consociation of Environmental Safety and Waste Management, Japan
THE UNIVERSITY OF TOKYO
OIST

November 21-22, 2018

ACSEL 2018
at OIST, Okinawa, Japan

The 5th Asian Conference on Safety and Education in Laboratory

"Promoting Innovation and Advanced Interdisciplinarity through Environmental Safety Science"

Co-organized by

THE UNIVERSITY OF TOKYO

OIST

Cooperated by

Environmental Protection Association of Private Universities
Environment, Health & Safety Promotion, Nagoya University

Supported by

Ministry of Education, Culture, Sports, Science and Technology
Japan Science and Technology Agency
Science Council of Japan
The Japan Association of National Universities
Federation of Japanese Private Colleges and Universities Associations
Okinawa Prefecture

Plenary talk


Prof. Chuya Shinzato, Japan


Dr. Jürgen Steck, Germany


Dr. Mary Collins, Japan


Mr. Bruce White, New Zealand


Prof. Puji Lestari, Indonesia


Prof. Seung Hyeok Seok, Korea


Mr. Saravanan s/o Gunaratam, Singapore

Keynote lecture


Prof. David Koh, Brunei


Prof. Dra. Fatma Lestari, Indonesia

Special session

"How should we harmonize the safety education with diversity in research site"

The diversity of the research site is not limited to the complexity and sophistication of the research and the interdisciplinarity of the research field, but also includes the internationalization / gender of the members, the differences in the cultural background, and the types of equipment and chemicals used in the experiment. Though these issues likely depend on individual circumstances, they are still common issues in every country, and it is expected that the safety education methods that are effective at each site will also have high commonality. This session will introduce the current situation of diverse research sites and various advanced initiatives of safety management and education based on diversity, and will discuss the importance of harmonization for sharing and cooperating on an innovative way of safety management and education methods.

URL http://www.acsel.esc.u-tokyo.ac.jp/2018/index.html

Agenda

This is a preliminary agenda and is subject to change.

Tuesday - November 20, 2018

12:00-15:00	**Registration** *Location: Entrance Hall, Conference Center*
13:00-14:30	**Lab. Tour**

Wednesday - November 21, 2018

8:15	**Welcome Coffee** **Registration** *Location: Entrance Hall, Conference Center*
Opening	*Location: Auditorium*
Chair	Ms. Naoko Kiyan
9:00	**Opening remarks** Prof. Shizuaki Murata, Chair of ACSEL2018, Nagoya University, Japan
9:10	**Welcome address** Dr. Peter Gruss, President / CEO, Okinawa Institute of Science and Technology Graduate University, Japan
9:15	**Congratulatory address** Mr. Hiroshi Yoshimoto, Director General, Higher Education Bureau, Ministry of Education, Culture, Sports, Science and Technology, Japan
Plenary Session	*Location: Auditorium*
Chair	Mr. Saravanan s/o Gunaratam
9:20 ***PI-11***	**Safety and emergency management at OIST: lessons learned** Dr. Mary Collins, Provost, Okinawa Institute of Science and Technology Graduate University, Japan
10:00 ***PI-12***	**Conservation and restoration of coral reefs: the most diverse marine ecosystems** Prof. Chuya Shinzato, The University of Tokyo, Japan
Chair	Prof. Teppei Nunoura
10:40 ***PI-13***	**Never waste a good crisis: lessons from the 2011 Christchurch earthquake** Mr. Bruce White, Deputy Registrar, University of Canterbury, New Zealand
11:20 ***PI-14***	**Hazardous wastes treatment and disposal at the University of Freiburg** Dr. Jürgen Steck, Albert-Ludwigs-Universität Freiburg, Germany
12:00-13:00	**Lunch Buffet** *Location: Entrance Hall, Meeting Room 1, 2, 3, Lawn Field*
Technical Session Poster Presentation	*Location: Spacious Lobby Area*
13:00-13:45	**odd numbered presentation**
13:45-14:30	**even-numbered presentation**
14:30-15:00	**Free discussion**
P-01	**Risk assessment and application cases in research laboratory in Korea** K. W. Lee* and Y. R. Chio, KOSHA
P-02	**Emergency preparedness & response in biomedical research facilities** C. J. E. Goh*, Singapore Health Services Pte Ltd
P-03	**Accident prevention analysis on traffic management at Universitas Indonesia** Y. Kusminanti*, F. Lestari* and A. Attahiroh*, Universitas Indonesia

○ 포스터 발표자료

OSHRI

Risk Assessment and Application Cases in research laboratory in Korea

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Introduction

- Since the Act on Laboratory Safety and Environment was introduced in 2006, the number of accidents is not sufficiently controlled at experimental laboratories in Korea. The most practical way to reduce laboratory accidents is to find hazards and control risk in the laboratory.
- There are Industrial Safety and Health Act and Law on Safety Environment for Laboratory in order to ensure the safety and to prevent accidents of laboratories or workplaces in Korea. And also, the laboratory supervisor or manager is required to carry out risk analysis of hazardous factors in the laboratory in order to identify the actual condition of harmful factors in the laboratory and to prevent accidents.
- The study reviewed the main contents of the risk assessment, and the problems and difficulties in applying the risk assessment are shared through practical cases applied to the laboratory using the Korea Risk Assessment Support System.

Outlines of Risk Assessment

- **Risk Assessment**

➢ is a series of processes in which an employer identifies the hazardous factors of the hazardous area, determines the probability and severity of the injury or disease caused by the hazardous hazard, and establishes reduction measures.

- **Legal Basis**

➢ Industrial Safety and Health Act, Article 41-2(Risk assessment)
➢ Guidance on risk assessment of workplace(Ministry of Employment and Labor Notice, No. 2016-17)
➢ Laboratory Safety Environment Act, Article 5-2(Designation/Operation of laboratory supervisor)
➢ Guideline for conducting risk analysis of hazardous factors in the laboratory(Ministry of Science and Technology Notice, No. 2017-7)

Comparisons of System in Risk Assessment

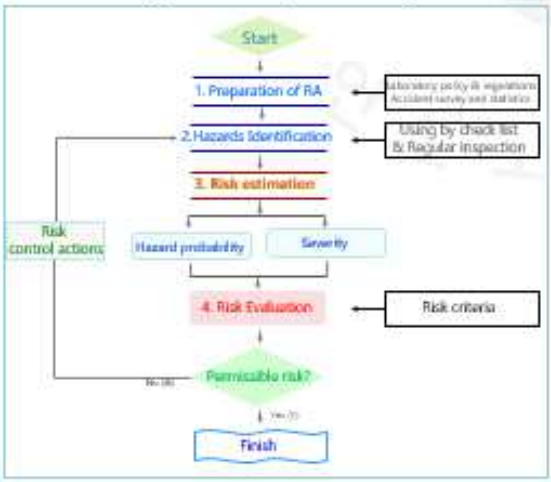
Responsible Subject	Lab. Supervisor/Head	Employer
Check & Writer	Lab. Supervisor, Researchers	
Check Items	Chemicals, Gases, Organism, Physical factors, PPE, Safety facilities, Experimental Procedure, Safety plan, Emergency Action Plan	Process Hazardous Materials Identification of Hazardous factors, Risk estimation, Reduction measures
Time of implementation	Before starting a new experiment or research project	In case of incidents
Related Laws	Laboratory Safety Environment Act, Article 5-2	Industrial Safety and Health Act, Article 41-2
Department of Management	Ministry of Science and Technology	Ministry of Employment and Labor

Problems and Challenges in Risk Assessment

- There is no willingness of the researchers and supervisor to participate
- Not all researchers participate, only some researchers participate.
- By patrol check in laboratory was insufficient the hazard identification.
- Participation in risk assessment education is poor.
- There is a lack of awareness about the implementation of risk assessment every year.
- New researchers do not have enough knowledge about the characteristics of work by research stage.
- The risk estimation is determined to be low, and there is no measure for improvement.

Comparison of Risk Assessment Procedure

By Industrial Safety and Health Act



By Laboratory Safety Environment Act

Conclusion

We are expected that it will be possible to manage more effectively and systematically for accident prevention in laboratory by continuously controlling and managing the risk factors through the risk assessment.

Poster No.: P-91 (A18-058)

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안전보건공단