原子力平和利用と核不拡散・核セキュリティに係る国際フォーラム2025
@イイノカンファレンスセンター Room A

“備えの技術”で守る核セキュリティ：核鑑識と協力強化による核・RIテロ抑止の取組

初動対応と核鑑識
First Response and Nuclear Forensics

警察庁　科学警察研究所　物理研究室

Physics Section, National Research Institute of Police Science (NRIPS)

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NRIPS（科警研）

Location:
Kashiwanoha, Kashiwa-shi, Chiba

▶ **N**ational **R**esearch **I**nstitute of **P**olice **S**cience（科学警察研究所）

Comprehensive Research Institute for Criminal (Forensic) Science

NRIPS
@ National Police Agency
（NPA：警察庁）

- Training
- Advice
- Novel methods

- Request of investigation reports
- Needs

47 Forensic Science Laboratories
(FSL：科捜研)
@ 47 prefectures

▶ Activities of NRIPS

① **Research & Development of forensic science（研究）**
② Analysis & Identification of criminal evidence（鑑定）
③ Training for staff in prefectural FSL（研修）

※ **RN**（**R**adiological, **N**uclear）

Physics Section（物理研究室）

R&D in forensic science using **applied physics**
（**物理学を応用**した捜査鑑識技術の研究開発及び鑑定）

- ▶ R&D for **RN counter terrorism** (on-site activities)
- ▶ Analysis and identification (**Nuclear Forensics**)
- ▶ Training for first responders

▶ Activities of FSL

① Research & Development
② **Analysis & Identification**
③ Training for prefectural police officer

※ 写真は警察白書、科警研HPより

Nuclear Forensics Process

▶ Investigation

CBRNE threat (Chemical, Biological, Radiological, Nuclear, Explosive)

① Sampling (試料の採取)

On-site Activity
- Protection (Neutron & Gamma-ray)
- Collect g～kg of radiological residue

② Categorization (試料の分類)

On-site Analysis
- Gamma-ray spectroscopy
  - ➡ Identify nuclide (Nuclear/Other Radioactive material or not ?)
- Dose measurement for Safety (Neutron & Gamma-ray)

Transport
(試料の搬送)

③ Analysis & Characterization (分析と特性評価)

Data base of
Nuclear Forensics Library

Laboratory Analysis

Nuclear Forensics : 核鑑識
- Gamma-ray or Alpha-ray spectroscopy
- ICP-MS, SEM, TEM etc.

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Traditional Forensics : 伝統的鑑識
- Fingerprints（指紋）
- Trace evidence（微物）
- DNA etc.

④ Interpretation & Conclusion (解釈と結論)

Safekeeping of contaminated samples（試料の保管）

Identification of Material Origin
（RN物質の起源・履歴の特定）

Identification of Criminals
（犯罪者個人の特定）

Needs from Investigation Side

① Rapid and Safe On-site Forensic Activities

- Visualization of contaminated areas (field, samples)
- Detection and collection utilizing robots, drones, etc.
- Minimization of radiation exposure
- Low cost, High dose tolerance, Portability, etc.

② Integrating Nuclear Forensics with Traditional Forensics

- Separate nuclear forensic samples from traditional forensic samples (DNA, fingerprints, etc.) at the crime scene and collect only the necessary amount.

③ Human Resource Development

- Attracting young people's interest in nuclear forensics and nuclear security
- Active participation in institutions (Research, Government, International, Industry)