

Research and Development of Science and Technology for Counter-Terrorism in Japan

March 20, 2008

Shinichi MIZUMOTO

Office of Science and Technology for a Safe and Secure Society
Ministry of Education, Culture, Sports, Science and Technology (MEXT)

Biological, Chemical, Explosives Attacks in Japan

● Biological, Chemical Attacks

1993 **Botulinum Toxin, Anthrax** Release by Aum Shinrikyo

1994 Matsumoto **Sarin** Attack by Aum Shinrikyo (7 fatalities)

1995 Tokyo Subway **Sarin** Attack by Aum Shinrikyo (12 fatalities)



1998 Wakayama Curry and Rice Arsenic Poisoning Incident

2001-02 White Powder Incidents

● Explosives Attacks

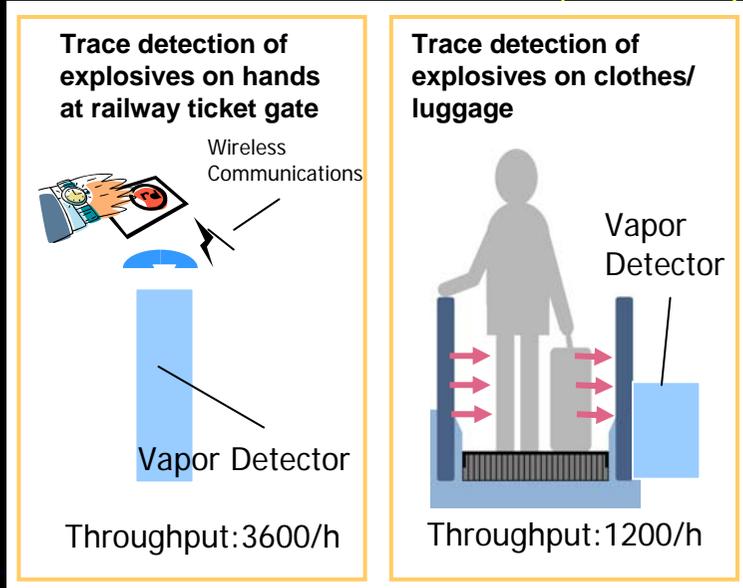
Over 15 **Explosives** Incidents since 2000

Challenges in R&D of S&T for Counter-Terrorism

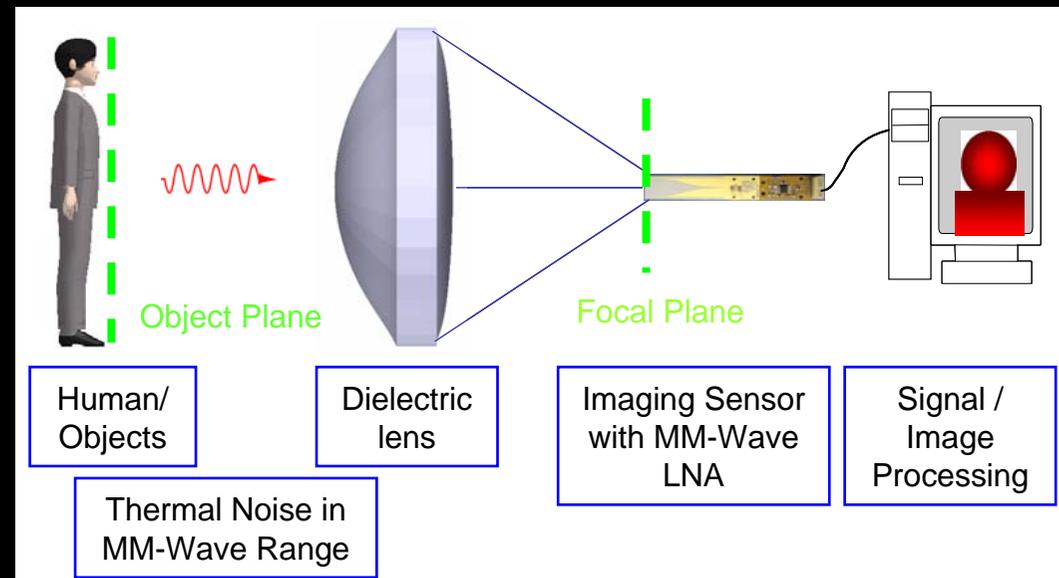
- **Appropriate R&D Plans to Meet Real Needs**
 - Object Materials, Detection Time, False Positive Rate, User Friendliness (in case of R&D of detection systems)
- **Building an Effective R&D System**
 - Inter-Agency Cooperation, Participation of First Responders, Participation of Manufacturing Companies
 - Demonstration Tests (Special Facilities, Real Field Tests)
- **Overcoming Hurdles before Practical Use in Society**
 - Certification, Standards, Small Market, Procurement
- **International Cooperation**
- **Human Resources Development**
- **Public Awareness**
- **Control over Sensitive Technologies and Information**

Examples of Explosives and Other Hazards Detection

High-Throughput Walkthrough Portal to Detect IEDs (Hitachi)



Passive Millimeter Wave Imaging System (Tohoku Univ.)



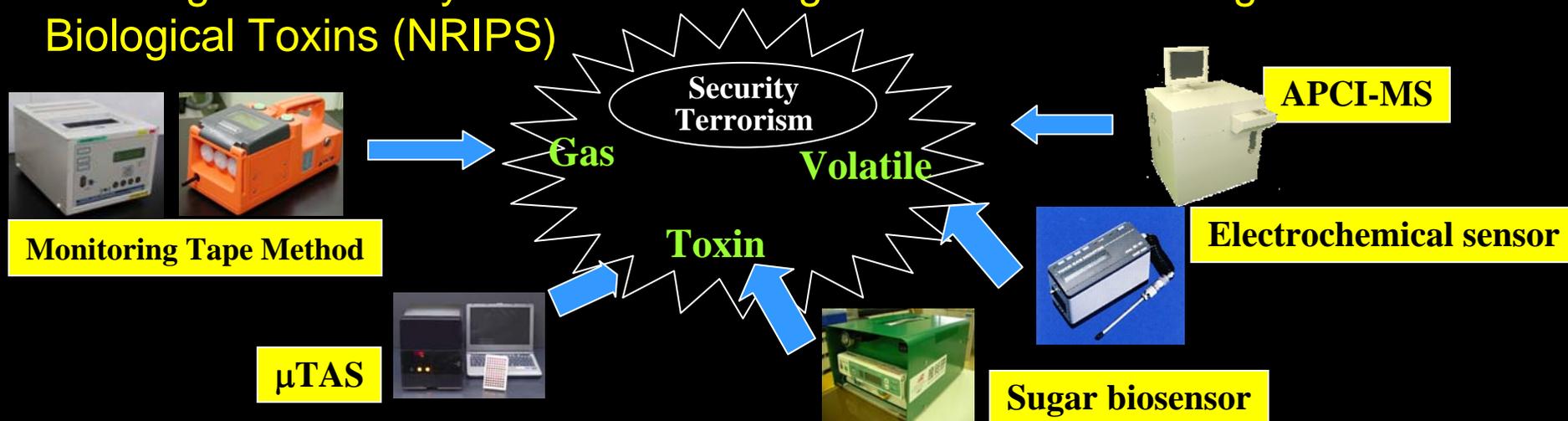
Non-Invasive Detection Techniques by Using Terahertz Waves (RIKEN)

This composite image demonstrates the use of terahertz waves for non-invasive detection of drugs in mail:

- Left:** A photograph of a mail container with a **10mm** scale bar. A yellow box highlights the area where drugs were detected. Labels below indicate **MDMA**, **Aspirin**, and **Methamphetamine**.
- Middle:** Three corresponding terahertz images showing the detection of **MDMA** (labeled **Illegal**), **Aspirin** (labeled **Legal!**), and **Methamphetamine** (labeled **Illegal**).
- Bottom Center:** The text **Illegal drug detections in mail**.
- Right:** A photograph of the laboratory equipment used for **Identification by spectroscopy**.

Examples of S&T for Biological or Chemical Terrorism Countermeasures

- Thorough On-Site System for Detecting Chemical Warfare Agents and Biological Toxins (NRIPS)



- Mobile-Type Full-Automatic Multi-BWA (Biological Warfare Agent) Detection System (NRIPS)



- Prediction and Mitigation Simulation System for CBR Hazards (Univ. of Tokyo)

International Cooperation

U.S.-Japan Framework Initiative for a Safe and Secure Society (FIS3)

- Purpose

To strengthen S&T cooperation in areas that will create safer and more secure societies within both countries

- Co-Chairs

U.S. S&T Adviser to the Secretary of State

Japan Director General, S&T Policy Bureau, MEXT

- Activities up to Now

- FIS3 Workshops (Feb. 2004, Mar. 2005, Oct. 2006)
- Medical Biodefense Research and Bioterrorism Symposium
- Explosives Countermeasures Workshop
- Critical Information Infrastructure Protection (CIIP) / NSF-JST
- Advanced Sensor Research / NSF-JST
- Marine Asset Tag Tracking System (MATTS)