BETTER PROTECT THAN RESPOND

BIOHAZARD
PREVENTION
CENTRE
University of Lodz

BETTER KNOWLEDGE
BETTER PROTECTION

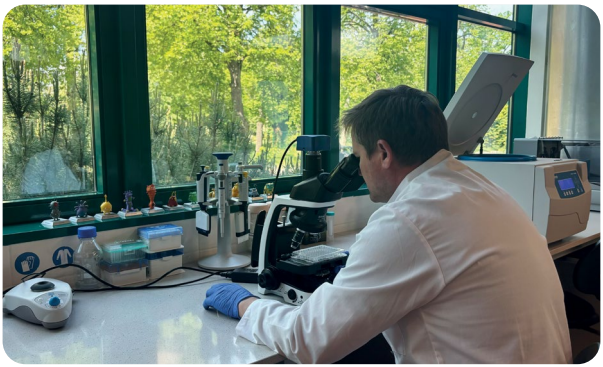
WHO WE ARE & WHAT WE DO?

The Biohazard Prevention Centre (BPC) is a part of University of Lodz, one of the largest public universities in Poland. BPC is a leading research and operations unit established to enhance institutional preparedness and reinforce public space resilience against biological and broader CBRNe threats.

We bridge the gap between advanced scientific research, cutting-edge technological development, and tactical security applications, engineering actionable solutions for frontline end-users. We work closely with **law enforcement, public administration, critical infrastructure operators, military forces, first responders and private sector innovators** to create a safer and more resilient environment. We implement this goal through combining academic research and implementation of security projects.

Our team

Our team brings together highly qualified researchers, experts, trainers and practitioners with strong international experience in CBRN security and public spaces protection. We combine expertise in biological, chemical, and radiological threat assessment, detection, and response, supported by a high scientific standing and operational background, including ex-military specialists. Additionally, our competencies cover the full project lifecycle, from proposal development and consortium building, through project management, to results exploitation and impact delivery.



WORLD-CLASS SCIENTIFIC & RESEARCH PROFILE

Our operational excellence is driven by rigorous, ground-breaking scientific research that sets new standards in CBRNe threat protection. Our Centre operates within a world-class laboratory infrastructure, featuring advanced facilities designed to safely manage the most demanding analytical tasks. As an innovation centre, our laboratory is equipped with a state-of-the-art suite of high level diagnostic technologies, including:

Next-Generation Nanopore Sequencing: Providing unparalleled, real-time genomic insights for advanced threat characterization.

Semi-confocal THUNDER Imaging Systems: Delivering rapid, high-sensitivity 3D imaging with real-time computational clearing for precise and efficient cell-based assay analysis.

High-Precision Flow Cytometry: Enabling rapid, highly sophisticated cellular analysis.

Advanced Multiplex PCR Platforms: Delivering fast, definitive, and precise pathogen identification.

Label-Free Protein-Protein Interaction Assays Platform: Delivering real-time, high-throughput characterization of protein-protein interactions without labelling for faster, more accurate biomolecular analysis.

Mobile Molecular Laboratory: Enabling independent, on-site molecular analyses during field operations for rapid and reliable decision-making.

PROJECTS' EXPERTISE AND EXPERIENCE

Our Centre has extensive experience in the management of national and international projects in CBRN, defence and security areas. In the last 10 years, we have delivered more than 20 projects and managed a budget of over 20 million EUR.

Core competencies:

- **Risk & Vulnerability Assessment** – Identification of gaps and needs, development of realistic CBRN threat scenarios.
- **User-Friendly Guidance** – clear procedures, guidelines, handbooks, and materials designed for different user needs.
- **Training & Awareness** – Tailored training programmes for operators, staff, and first responders.
- **Large scale exercises & validation workshops** – Scenario-based, multi-agency exercises involving emergency services, and end-users.
- **Rapid Detection & Analysis** – Field-to-laboratory systems enabling fast on-site screening and confirmatory CBRN analysis.
- **Support for First Responders** – Portable diagnostic tools combined with simple, practical response procedures.
- **Food Security & Safety** – Protection of supply chains against both intentional and accidental contamination.
- **Advanced Diagnostics** – Integration of modern molecular methods with rapid field testing.
- **Decision Support** – Tools enhancing situational awareness and decision-making during emergencies.
- **Tailored Protection Systems** – Multi-layered CBRN security solutions adapted to public spaces and infrastructure.
- **Threat Modelling** – Simulation of CBRN spread in complex and high-density environments.
- **Decontamination Solutions** – Methods adapted to public spaces, transport systems, and mass events.
- **Exploitation and sustainability** – Strategies, guidelines, blueprints.
- **Project management** – Proposal drafting, project & financial management, quality assurance, risk management, exploitation and dissemination.

PORTFOLIO OF SELECTED PROJECTS

Protection of Public Spaces

UNICOPS

Universal CBRNE protection system supporting the safety and open nature of higher education institutions

HOTHREAT

Tailored CBRNe protection measures for hotels and conference centres.

SAFE STADIUM

Integrated large sport facilities protection system supporting the CBRN security of mass events.

ProSPeReS

Protection System for large gatherings of People in Religious Sites.

CBRN4rail

CBRNe preparedness for passenger rail transport hubs.

Next-Generation Detection & Security Systems

HoloZcan

Deep Learning Powered Holographic Microscopy for Biothreat Detection on Field.

NEST

An interoperable multidomain CBRN system.

DIAGNOTROP

Innovative Integrated System for Field and Stationary Diagnostics of Parasitic, Bacterial, and Viral Invasions in Polish Military Contingent Areas.

Projects' Funding Institutions

CBRN Centres of Excellence
An initiative of the European Union

NCBR
National Centre for Research and Development

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