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Statement of Requirement for the R-Cloud Biology Strategic Capability

Introduction

The Defence Science and Technology Laboratory (Dstl), which is part of the UK Ministry of Defence (MOD), is refreshing its R-Cloud (Research Cloud) framework for Science and Technology (S&T) research. MOD places extensive fundamental, experimental and applied research with industry and academic suppliers. R-Cloud enables broader supplier access, reduces barriers to entry and enables agile contracting. This statement of requirement outlines the Biological Strategic Capability requirements for suppliers wishing to contribute to MOD research activity.

The UK is fully committed to its obligations under the Biological and Toxin Weapons Convention and the Chemical Weapons Convention. All MOD sponsored work must be in the context of the prophylactic, protective or other peaceful purposes that are not prohibited under the terms of these Conventions. Proposals using animals must be fully compliant with national legislation and institutions may be audited to ensure work is conducted to a suitable standard prior to a contractual commitment and whilst under contract.

Core Biological Capability Areas:

Understanding Biological Hazards

- Mechanisms of pathogenicity, virulence and infectivity
- Host–pathogen interactions and immune response
- Environmental persistence and stability (including aerosols)
- Transmission pathways and infective dose
- Production, storage and dissemination characteristics
- Particle and droplet size characterisation
- Literature analysis and emerging threat assessment
- Mathematical modelling of biological hazards

Mathematical Modelling of Biological Hazards

- Disease spread and outbreak modelling
- Dispersion and persistence modelling
- Detection system performance modelling
- Protective equipment effectiveness



- Physiological response modelling
- Operational impact modelling

Operational Analysis (Biological Focus)

- Risk assessment methodologies
- Cost-effectiveness and investment analysis
- Counter-proliferation strategy evaluation
- Identification of emerging technologies
- Decision-support tools

Detection of Biological Agents

- High sensitivity and selectivity
- Rapid, high-confidence identification
- Detection in aerosols and complex matrices
- Programmable detection platforms

Biological Diagnostics

- Point-of-care identification
- Laboratory diagnostic capability
- Early detection via biomarkers
- Integrated sample preparation and analysis

Physical Protection Against Biological Agents

- Respiratory and dermal protection
- Collective protection systems
- Air purification technologies
- Aerosol interaction with materials

Decontamination and Biological Hazard Management

- Novel decontamination approaches
- Waste treatment and disposal
- Surface contamination detection
- Antimicrobial and responsive materials

Medical Countermeasures for Biological Agents

- Vaccines and therapeutics
- Host immune response research
- In vitro and in vivo models
- Delivery and efficacy of treatments



Biological Analysis and Attribution

- High-confidence agent identification
- Source attribution
- Forensic biological analysis
- Genomics, proteomics and bioinformatics

In Summary

The R-Cloud Biological Strategic Capability requires multidisciplinary expertise spanning microbiology, immunology, modelling, detection technologies, protection systems, decontamination and medical.