**SPECIFICATION -** Single Cell & Spatial Transcriptomic System

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11. **Introduction**

The UK Health Security Agency (UKHSA) is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats. UKHSA was formed in April 2021.

1. **Background**

To address on-going needs to identify environmental hazards and to prioritise specific pollutant components (e.g. combustion particulates, allergens) for particular attention, there is a need to characterise hazards using toxicological methods. Transcriptomics analysis has increased the ability to detect hazards and exposure effects in tissue samples and research models, by orders of magnitude. This increased sensitivity has been matched more recently by the ability to detect whole genome effects within single cells.

This technology is at the forefront of toxicological detection methods and represents a generational step forward in the ability to identify health impacts from ongoing and future hazard exposure threats from chemical, radiation and environmental sources. The acquisition of the asset will allow for more accurate description of pathological changes and characterisation of the mechanism of toxic injury.

1. **Scope of the Contract**

UKHSA is looking to purchase a new system (or systems), to enable capture of single cell sequencing including spatial assignment information within tissue and cell samples. This will increase our capacity and resilience and enable us to seek additional collaborative and funding opportunities.

1. **Detailed Requirements**

4.1 Spatial Single Cell Transcriptomic Analysis

The asset required describes a spatial single cell transcriptomic analysis system, which combines the ability of define histochemical hazard effects and architecture of pathology, with whole genome transcriptomic profiling.

Specifically, equipment is required for the standardised transfer of histochemical tissue mRNA to specialised slides used for spatial transcriptome profiling.

The asset also includes a requirement for a single cell profiling system with the ability to capture and detect whole genome transcriptome RNA and concurrent DNA chromosomal accessibility region profiles at a single cell level (scATAC-seq).

The system purchased must allow analysis of a minimum of 1000 cells per sample within an experiment and for whole genome single cell mRNA and single cell ATAC sequencing to be carried out alone or in combination on the same cell.

Read Depth: The capacity to generate library pools where >20,000 reads per cell can be achieved is required for mRNA profiling and gene expression.

Multiplexing options for multiple samples based on oligonucleotide barcode labelling antibodies is required.

The capture area of the slides used in the spatial assay system should be a minimum of 6.5mm2 with spot size less than 55µm

The option for multi-omic analysis including immune cell profiling using antibody-barcode based detection is also desirable.

Species compatibility of reagents for mouse and humans is also required.

4.2 Software

The system must be capable of software analysis of sequencing data and its visualisation.

Software licencing must be provided for a minimum of one year with options for longer periods to be provided by the Supplier on tender including whether a worldwide, royalty-free, irrevocable, perpetual licence is available for the lifetime of the equipment. Software updates and patches are to be installed on issue.

4.3 Maintenance

The Supplier shall advise the relevant maintenance requirements and whether a maintenance contract is available or call out repairs. Maintenance costs (if applicable) will be billed as and when they occur and the Authority may choose to take out a maintenance contract or pay for repairs and call outs as and when they occur. The Supplier shall provide pricing for both options.

The Supplier shall state the typical lifetime expectancy of the machine with its tender response.

4.4 Security and safety (site visits)

Supplier staff will be required to comply with UKHSA security and safety policies and procedures when visiting the site. The Authority shall (where relevant) provide policies, site guidelines/instructions in advance of the Supplier attending the site.

The Authority reserves the right to remove immediately from the site any Supplier staff who do not conform to the reasonable instructions, policies, rules and regulations of the Authority.

4.5 Warranty

Warranty provision must be a minimum of one year. The Supplier shall specify warranty exclusions.

4.6 Delivery:

The Supplier shall deliver, the equipment to UKHSA, Radiation, Chemical and Environmental Hazards Directorate, Harwell Campus, Chilton, Didcot, OX11 0RQ, UK.

The Supplier shall specify its installation and commissioning process and the supporting paperwork that it will supply. The Supplier and the Authority must be able to sign off the installation acceptance.

The Supplier shall deliver the equipment on a Delivered Duty Paid (DDP) basis.

Delivery of the equipment system must be before the 31st March 2023 at the latest.

4.7 Sustainability

The Supplier is to indicate typical energy consumption of the equipment as well as details relating to the recycling of parts, disposal of waste and actions the supplier has taken to minimise emissions related to the manufacturing of the equipment.

1. **Service Levels and Key Performance Indicators (KPIs)**

Delivery before 31 March 2022: KPI: 100% If the supplier does not deliver prior to 31 March 2022 the Authority reserves the right to cancel the contract.

Performance of Equipment: No instance of breakdown during first year: KPI: 100%

1. **Sustainability**

UKHSA fully supports the UK Government's commitment to sustainable procurement. Contracted Suppliers are expected to support the Authority achieve its goals to continuously improve its environmental and sustainability performance. This is to meet statutory requirements, reduce energy use and carbon dioxide emission levels and achieve effective management of water, waste and transport.

The Supplier shall detail typical running costs for the equipment in its tender response (e.g. Kw/h electricity consumption).

1. **Pricing and Contract Period**

Prices submitted within the tender shall be valid for a minimum of 90 days for UKHSA acceptance from date of tender submission. Upon entry into a contract with UKHSA, the pricing submitted by the successful supplier shall be valid for the duration of the Contract Term and any potential extension options stated within the contract.

The contract period will depend on the software licence and maintenance options chosen. However the period will be for a minimum of one year.

1. **Financial Standing**

The Supplier and Ultimate Parent (if applicable) must be assessed as LOW risk. The Authority uses a range of indicators and analytics from Company Watch and Dunn &Bradstreet.

If the Supplier or UP are assessed as a higher risk then this may lead to exclusion unless suitable mitigations can be put in place, such mitigations to be decided at the time.

1. **Terms and Conditions**

Terms and conditions shall be in accordance with the UKHSA Short Form Contract.

11. Award

Please refer to the UKHSA Scoring Methodology for the detail of how the tender responses will be scored and the weighting that applies to each question.