**In vitro skin penetration studies (LSRS026)**

**Market Engagement:**

**In vitro skin penetration studies to identify optimal decontamination parameters for chemical simulants and toxic powders**

The UK Health Security Agency (UKHSA) wishes to inform the market of a potential future procurement to source a suitably qualified supplier deliver a series of two linked in vitro experiments, using a skin diffusion cell system:

Please note this Prior Information Notice (PIN) for market engagement is intended to enable UKHSA to alert the market and potential suppliers who may be interested in the upcoming opportunity.

The presently anticipated route to the market will be under the auspices of a Regulation 14 (Research) exemption of the Public Contracts Regulations 2015 (as amended) however the Authority wishes to proceed with a fair and transparent competition

Therefore, Requests for Proposal (RFP) will be issued to all those Expressing an Interest (EOI) as a result of this market engagement; and any bids received will be evaluated in accordance with Most Economically Advantageous Tender (MEAT) principles using the project specific evaluation criteria detailed in the RFP.

Please see the draft specification and requirements on page 2 for further information regarding this opportunity.

If you are interested in participating in this procurement, please confirm your Expression of Interest (EOI) via return response on Atamis.

**The expression of interest closes at 4pm (16.00hrs) Monday 14th November 2022.**

Please note that UKHSA will not meet any costs incurred by any organisation relating to responding to this EOI or any subsequent RFP.

**Your EOI Response:**

Please confirm your interest in this project and capability to deliver along with your organisation’s name and address and details for both the main contact and Atamis contact for this project.

**Draft Requirements & Specification**

***In vitro* skin penetration studies identifying optimal decontamination parameters for chemical simulants and toxic powders**

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| **Introduction** |
| **Organisation the work is for**The UK Health Security Agency (UKHSA) exists to protect and improve the nation's health and wellbeing and reduce health inequalities. It does this through advocacy, partnerships, world-class science, knowledge and intelligence, and the delivery of specialist public health services. UKHSA is an operationally autonomous executive agency of the Department of Health and Social Care.**Why is this work being done?**The tender is part of a project commissioned by the Department of Health and Social Care’s (DHSC) National Institute for Health Research (NIHR) that will provide evidence for best practices for skin decontamination, which will help to mitigate the adverse effects of hazardous substance exposure via the dermal route.The outcomes of this research will provide evidence to support the best practice for decontamination of toxic chemicals from skin.**Description of the project**This project is led by the Chemicals and Environmental Effects Department at UKHSA and is funded by NIHR for a period of two years (being extended due to COVID-19). The project will provide a robust assessment of the efficacy of decontamination protocols for the removal of physicochemically diverse hazardous chemical substance from skin. Specifically, this section of the project aims to:* Develop and test optimal decontamination strategies for one liquid, four powders and three corrosive compounds.
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| **Overview of the RFP** |
| **Budget**This is a fixed price contract with a maximum value of £252,250**Expected contract length**12 months beginning in Nov 22 and ending Nov 23.**Summary of the work required by the supplier**The supplier organisation will be required to deliver a series of two linked *in vitro* experiments, using a skin diffusion cell system to: Task 1 – Determination of the efficacy of decontamination interventions for the removal of a liquid and four powders from skin  and Task 2 – Determination of the efficacy of decontamination interventions for corrosive substances from skinTask 1:Decontamination interventions will include *in vitro* versions of commonly used methods for skin decontamination of chemicals (see below sections). These include dry, wet and combined decontamination methods. The chemicals requiring investigation are: Liquid 1 - Benzyl salicylate Powder 1 - Avobenzone Powder 2 - Aldicarb Powder 3 - Brodifacoum Powder 4 - PhosmetTask 2 will involve investigating the efficacy of decontamination interventions for the removal of corrosives from skin as measured by changes to skin integrity. The corrosives being tested are:Corrosive 1 - Sodium hydroxideCorrosive 2 - Sulphuric acidDecontamination methods will be similar to Task 1 but will also include diphoterine. Skin integrity before and after corrosive application and decontamination will be measured using an appropriate methodology (e.g. electrical resistance, tritiated water penetration, or suitably validated alternative). |
| **Essential requirements of the supplier** |
| The supplier is expected to have existing laboratory capability that includes a validated skin diffusion cell system, ability to conduct *in vitro* skin penetration studies, appropriate approvals for work with toxic materials and the types of skin samples proposed, a proven track record of project delivery and capability to work to internationally recognised quality standards (OECD-428), demonstrated by, for instance, appropriate accreditation (e.g. GLP, ISO9001 and ISO17025, UKAS) or equivalent internal policies of laboratory quality standards. Registration numbers (if applicable), internal quality standards documents, SOPs, lab books and references will be evaluated, and shortlisted suppliers may be asked to undergo a laboratory visit by the contractor and/ or undergo an interview to determine their suitability.  |
| **Further information** |
| **Sustainability**The supplier is required to provide information about their sustainability policies, such as how they source their equipment and reagents.**Evaluation Criteria** Responses will be evaluated in terms of the combination of value for money and compliance with our quality assurance requirements and ability of suppliers to achieve the required technical outcomes. Only supplier organisations who meet the performance requirements and standards stipulated will be considered suitable to deliver the project. Suppliers will be invited to demonstrate their facilities so that an informed decision can be made about the preparedness of the supplier for the work. Suppliers will also be assessed by how well they adapt to ‘worst-case’ methodological issues such as failure to reach the limit of quantification.**Performance Requirements**Timely delivery of project deliverables. Access granted to all relevant records, raw data-sets in open formats, materials and laboratories, on request, during the project. It is expected that the project will be conducted in line with GLP (or similar) standards, and that equipment will be maintained and calibrated. Equipment maintenance records will be available on request during the project and delivered at the end of the project. Progress will be reviewed regularly, and the contractor reserves the right to terminate the contract if progress does not meet with the project requirements.**Standards*** The successful supplier will have appropriate accreditation for their skin penetration research methods, e.g. ISO9001, equipment maintenance records, auditable lab books, proof of adherence to GLP standards; or accreditation from United Kingdom Accreditation Service (UKAS); or laboratory quality standards that are in line with those required for accreditation. All available forms of accreditation must be disclosed in the application.
* The successful supplier will have Standard Operating Systems (SOPs)in place for their existing laboratory capabilities. The contractor will request copies of SOPs to support the assessment process.
* The successful supplier will have a proven track record for delivering *in vitro* research projects, as demonstrated by customer satisfaction records.
* The supplier will work to COSHH regulations (including control equipment, ways of working, and working behaviour) and all staff working on the project will have completed appropriate COSHH training.
* The supplier’s laboratory must have accreditation from UKAS (or laboratory quality procedures that are in line with accreditation requirements).

**Constraints** The supplier must be in a position to begin work from January 2023 and complete all project deliverables by the deadlines outlined in the Delivery Timescales section below. In addition, due to dependencies with other work packages, there may be specific deadlines for some of the activities. Deadlines and deliverables will be discussed and agreed between the contractor and subcontractor, prior to the commencement of work.**Contract management requirements*** The supplier is required to appoint an Account Manager who will be responsible for managing the contract on the supplier’s side.
* The supplier will be required to provide updates in a monthly teleconference for the duration of this project and attend a mid-term meeting. The contractor may be required to attend additional meetings.
* The supplier will be subject to regular data audits and lab visits by the contractors.
* The supplier will be required to provide evidence of quality assurance and to submit copies of all lab books, raw data in open formats, equipment maintenance and calibration records to the contractors at the end of the project.
* The supplier will be required to sign a data confidentiality agreement.

**Exit Management**The data and intellectual property generated during this *work* will belong to the contractor and raw data in open formats, lab books and any other related records must be provided to the contractor on completion of the project.  |
| **Detailed requirements for the work** |
| **Task 1: Evaluating the efficacy of dry and wet decontamination procedures for one liquid and four powders.** A standard OECD test guideline (OECD 428) is used by National Regulatory Authorities to assess dermal absorption and provides the pivotal data in dermal exposure and human risk assessment for industrial chemicals, including pesticides, biocides and cosmetic products. The studies conducted under this task will be required to conform to OECD 428 guidelines. Where guidelines are not prescriptive, full justification for experimental design will be required. Task 1 will involve a preliminary validation step in which chemical application, decontamination protocols and recoveries will be designed and validated for suitability. Chemical application will include how powders will be reproducibly deposited onto the skin. If required, previously used in vitro decontamination protocols and methodologies can be provided. The subcontractor will be required to provide a detailed protocol, SOPs, risk assessments and to report the results of method development and validation prior to the commencement of Task 1 decontamination studies.The design of these studies should include the assessment of dermal absorption of target chemicals through skin and the full mass balance/distribution of the test chemical in all the compartments of the skin model. This task will utilise radiolabelled chemicals (or suitably validated alternative) to determine the proportion of the chemical that is remaining on the skin at a particular time following exposure, the proportion of the chemical that has penetrated the skin, and the proportion that has reached the receptor fluid beneath. Determination of the proportion of chemical remaining on the skin or stratum corneum will utilise a commonly used tape stripping procedure as described in previous studies [https://doi.org/10.1016/0887-2333(94)90039-6](https://doi.org/10.1016/0887-2333%2894%2990039-6). Receptor fluid collection will be conducted at regular time intervals (informed by previous studies of this nature) to detect any temporal variations associated with the interventions.**Task 1** will involve conducting skin penetration studies incorporating decontamination interventions to determine whether interventions temporally alter penetration rate. The interventions being investigated are:* 1. Control condition – no decontamination used as a control.
	2. Dry decontamination (15 min after application). Gentle swabbing of the skin’s surface with paper roll.
	3. Intervention (2) + cold showering (30 min after application). Dry + simulated showering of the skin with cold water.
	4. Intervention (3) + warm soapy showering (60 min after application). Dry + cold showering + showering of the skin with 32°C water containing 0.05% liquid detergent.
	5. Amphoteric decontamination (15 min after application) Application and removal of an amphoteric solution e.g. Diphoterine.

If not already provided as part of proof of *in vitro* decontamination experience during the application process, deliverables will also need to include proposed methodology, validation data including Limits of Quantification (LOQs) and Limits of Detection (LODs), and pilot results.**Task 2:** **Optimal methods for the decontamination of corrosive substances.***In vitro* studies (using the models established in Task 1) using corrosives will be undertaken, comparing the reduction of skin degradation following decontamination. The interventions used will be:* 1. Control condition – no decontamination used as a control.
	2. Dry decontamination (15 min after application). Gentle swabbing of the skin’s surface with paper roll.
	3. Intervention (2) + cold showering (30 min after application). Dry + simulated showering of the skin with cold water.
	4. Wet decontamination (5 min after application). Applied using a bottle of water and flow-restrictor shower device.
	5. Amphoteric decontamination (15 min after application) Application and removal of an amphoteric solution e.g. Diphoterine.

Heat generated during decontamination will be monitored using a thermal camera or equivalent, and damage to the skin will be measured through decrease in skin integrity (either through electrical resistance, tritiated water passage or similar validated technique). The work will be conducted according to internationally recognised testing guidelines e.g. OECD 428 and utilising protocols that have been refined over several years of similar research in the area of dermal decontamination. The number of experiments required to observe statistically significant differences between contamination interventions and control conditions will be calculated based on similar research.  |
| **Delivery timescales** |
| **Task 1****Expected deliverables:**1. Comprehensive technical reports and associated quality and standards documentation associated with each activity, as each activity is completed. Timeframes to be suggested by the supplier in their response to this tender and agreed with the contractor when the contract is awarded.
2. Sourced radiolabelled (or equivalent) chemicals for use in Task 1.
3. Methods and proposed experimental outlined for Task 1 (including proposed method for reproducible deposition of powders *in vitro*).
4. Comprehensive technical reports and associated quality and standards documentation associated with each activity, to be delivered as each activity is completed. Timeframes to be suggested by the subcontractor in their response to this tender and agreed with the contractor when the contract is awarded.
5. Determination of the efficacy of *in vitro* versions of current decontamination interventions in the removal of one liquid and four powder compounds. Comprehensive studies conducted, data extracted, and summaries and conclusions provided in reports.
6. Full disclosure of raw data in open formats, project reports and associated documents.

**Task 2****Expected deliverables:**1. Comprehensive technical reports and associated quality and standards documentation associated with each activity, to be delivered as each activity is completed. Timeframes to be suggested by the subcontractor in their response to this tender and agreed with the contractor when the contract is awarded.
2. Determination of the efficacy of *in vitro* versions of current decontamination interventions in the protection of skin from corrosive compounds. Comprehensive studies conducted, data extracted, and summaries and conclusions provided in reports.
3. Full disclosure of raw data in open formats, project reports and associated documents.
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