RCloud Tasking Form – Part B: Statement of Requirement (SoR)

Title of Requirement	**Genetic Predictors of High Responders to Physical Exercise**
Requisition No.	**1000167450**
SoR Version	**0.1**

1.	**Statement of Requirements**
1.1	**Summary and Background Information**
	Dstl has a requirement to conduct analysis of [redacted] samples that were collected as part of a previous study, [redacted]. Specifically suppliers should analyse functional adaptation data to identify high and low responders to exercise and evaluate the corresponding transcriptomes of samples collected during a crossover re-training study in order to discover novel predictive genetic biomarkers. This requirement will support Dstl in gaining a better understanding of the genetic control underpinning the variability observed in performance increases in response to exercise. Specifically, Dstl seeks to identify predictive transcriptional bio signatures of individuals that respond well to resistance training and/or aerobic training, [redacted] A large variability in response to physical training has been observed, with 15-20% of individuals undertaking a new exercise regime experiencing no performance gains, whilst approximately ~15% experiencing comparatively large training-induced gains (Phillips *et al*. 2013 & 2017, Bouchard *et al.* 2011). This “high- and low- responder” phenomenon is observed for both endurance (aerobic) and strength (resistance) training modes. Past research focussing on training specificity and performance outcomes identified genetic differences between high-performing endurance athletes and athletes that rely on strength and speed (e.g. short distance runners), which taken together suggests that the highest responders to aerobic training may not be the highest responders to endurance training and vice versa. An extension of such observations suggest it may also be

	possible to predict individuals who would respond well to retraining (e.g. change from an endurance training programme to a strength training programme). Previous research, using RNA profiling and single-gene marker association analysis identified 29 genetic markers (Single Nucleotide Polymorphisms – SNPs) that associate with and importantly can predict an individual's responsiveness to endurance training (Timmons *et al*. 2010), although the genetic control underpinning this is not understood. This requirement seeks to fund research to analyse functional adaptation data captured during a crossover re-training study and extend it by performing RNA profiling to discover transcriptional signatures that associate with the magnitude of response to endurance or strength training. Additionally, funding will be provided to identify transcriptional profiles unique to low responders that become high responders in response to a change in training regime. The ability to predict an individual's response to different training regimes will give insights into: • The feasibility of personalised training programmes to optimise performance. • A means to reduce training-induced injury frequency and; the possibility of personalised training that has high specificity to the physical demands of the operational role. Experimentation to investigate any such insights is outside the scope of this work.
1.2	**Requirement**
	To help Dstl to gain a better understanding of transcriptional predictors of performance gains in response to training, the supplier shall undertake transcriptional analysis on REDACTED UNDER FOIA EXEMPTION samples that were collected under a previous study, REDACTED UNDER FOIA EXEMPTION. The supplier shall compare the functional adaptations to (and transcriptional profiles associated with) variability in response to resistance and endurance training. This shall include profiles specific to low responders to one training regime (aerobic or strength) that subsequently respond well to an alternative training modality.

	Suppliers shall review JSP536 and address the requirement for a favourable opinion from MoDREC in their proposal. To attain MoDREC approval the Supplier is required to demonstrate that they are able to submit an application and attain MoDREC approval. On completion of this analysis, suppliers shall host a data review meeting with Dstl to summarise the outputs of the analysis. This meeting could be held as part of the monthly update meeting schedule, but the format should be agreed with the Dstl technical team in advance. **It is a condition of the Contract that the study shows compliance with JSP536** and this shall be confirmed before any laboratory work begins. ***Start-up meeting*** Supplier shall host a (virtual) start-up meeting with members of the Dstl team to outline the technical approach, deliverables, risks and dependencies of the project. These shall be mutually agreed as acceptable before task progresses past this point. ***Technical report*** Supplier shall prepare a technical report summarising the outputs of the analysis. The format of the report must be agreed with the Dstl technical team prior to commencement of the work. The report should provide: • Clear summaries of the inclusion and exclusion criteria of the muscle samples used. • Retrospective power calculations or effect size calculations used in the original study • Training adaptation responses observed and the corresponding bio-signatures identified to associate with the different responder categories. ***Final presentation*** Supplier shall provide a final presentation of this work to the Dstl technical team. ***Technical assurance*** Dstl will provide a Technical Partner (TP) throughout the tasking who will be responsible for ensuring that the technical quality of the work will meet MOD's needs and that the work remains focused on MOD's requirements. Suppliers shall hold a monthly update meeting with the Dstl technical team and will be responsible for producing a record of decisions / actions at the end of the meeting.
1.3	**Options or follow on work** *(if none, write 'Not applicable')*

	Costed Option 1 Final meeting to be held in person at Dstl facilities, otherwise this shall be performed virtually. **Costed Option 2** Preparation of a manuscript / conference presentation co-authored with Dstl. Note that all manuscripts / conference presentations resulting from this work will require review through the Dstl Permission to Publish process prior to submission. **Costed Option 3** The supplier may submit fully costed proposals to extend the study to provide further evidence that will help MoD to understand if genetic biomarkers can be used to predict an individual's response to difference training regimes. The Optional work will not be committed on Contract Let and Dstl reserves the right to not proceed with the optional work or activate them independently of each other.
1.4	**Contract Management Activities**
	Dstl will provide a Technical Partner (TP) throughout the tasking who will be responsible for ensuring that the technical quality of the work will meet MOD's needs and that the work remains focused on MOD's requirements. Should any Optional Work be required by Dstl, Dstl will inform the Supplier by writing in the form of a Contract Amendment.
1.5	**Health & Safety, Environmental, Social, Ethical, Regulatory or Legislative aspects of the requirement**
	Please detail any of the above in proposal submission

1.6	Deliverables & Intellectual Property Rights (IPR)					
Ref.	**Title**	**Due by**	**Format**	**Expected classification (subject to change)**	**What information is required in the deliverable**	**IPR Condition**
HA - 1	Start-up Meeting and Presentation	2 weeks after contract award	PP presentation	Official	Active participation and mutual agreement with the Dstl technical team of requirements for meeting.	DEFCON 705
HA - 2	Monthly Progress Meeting	1 Month after the start of contract and monthly thereafter	Teleconference followed by an email of actions	Official	Teleconference to discuss progress and next steps with supplier providing an emailed record of actions / decisions 5 working days after the review.	DEFCON 705
HA-3	Data review meeting	1 month after completion of analysis	In person followed by an email of actions	Official	In person at Dstl [redacted] with supplier providing an emailed record of actions / decisions 5 working days post review.	DEFCON 705
HA – 4	Final Written Technical Report	1st March 2022	Written report	Official	Submit a Final Technical Report covering findings of the experimental work.	DEFCON 705

HA – 5	Final Presentation to Dstl.	1 week after final written report	In person Presentation by supplier	Official	**1 week after submission of the final technical report. Format: May be in person at Dstl** REDACTED UNDE [redacted] **or virtually. Presentation by supplier explaining key findings and recommendations**	DEFCON 705

1.7	**Deliverable Acceptance Criteria**
	All Reports included as Deliverables under the Contract e.g. Progress and/or Final Reports etc. must comply with the Defence Research Reports Specification (DRRS) which defines the requirements for the presentation, format and production of scientific and technical reports prepared for MOD. Interim or Progress Reports: The report should detail, document, and summarise the results of work done during the period covered and shall be in sufficient detail to comprehensively explain the results achieved; substantive performance; a description of current substantive performance and any problems encountered and/or which may exist along with proposed corrective action. An explanation of any difference between planned progress and actual progress, why the differences have occurred, and if behind planned progress what corrective steps are planned. Final Reports: shall describe the entire work performed under the Contract in sufficient detail to explain comprehensively the work undertaken and results achieved including all relevant technical details of any hardware, software, process or system developed there under. The technical detail shall be sufficient to permit independent reproduction of any such process or system.

2	**Evaluation Criteria**
2.1	Method Explanation
	As part of your technical proposal submission, please ensure to address the following • How you intend to fulfil this requirement, including methods to be used, timeline for delivery. Please include sufficient detail for the technical team to understand how the requirement will be met • Please confirm that access to the appropriate samples generated under [redacted] will be granted to enable appropriate analysis for this requirement. Should this proposal not be deemed by Dstl to successfully fulfil the requirement, Dstl reserve the right not to award a contract based on the proposed supplier submission.
2.2	Technical Evaluation Criteria

	As part of your technical proposal submission, please ensure to address the following points: • Please detail your capability in this area including team member experience, similar requirements performed, publications in the area, facilities to be used in house and experience to perform the work stated in this SoR, specifically detailing expertise in transcriptomics**.** Should the technical proposal not be deemed acceptable to successfully fulfil the requirement, Dstl reserve the right not to award a contract based on the proposed submission.
2.3	Commercial Evaluation Criteria
	• Please ensure to include labour rates at or below those submitted in the R Cloud portal • Please ensure to include a copy of a valid Cyber Essentials Certificate for your organisation. • Please ensure to complete a research workers form for all personnel performing the requirement.