## D2 Response

Section A. Header Details

A.1 Program and Proposal Title

Proposal Title: Proteomics Virtual Laboratory

Abbreviation: PVL

NeCTAR Program: Virtual Laboratories

A.2 Proposer

|  |  |
| --- | --- |
| Organisation Name | Macquarie University |
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A.2.2 Participating Organisations

|  |  |
| --- | --- |
| Organisation / Group Name (\* part of BPA) | Role |
| Macquarie University | Applicant, Contributor, Supporter, Beneficiary |
| Adelaide Proteomics Centre\* | Supporter, Beneficiary |
| Australasian Proteomics Society | Supporter, Beneficiary |
| Australian Proteome Analysis Facility\* | Contributor, Supporter, Beneficiary |
| Bioplatforms Australia | Supporter, Beneficiary |
| CSIRO | Contributor, Supporter, Beneficiary |
| EMBL Australia | Supporter, Beneficiary |
| Garvan Institute for Medical Research | Contributor, Supporter, Beneficiary |
| Genomics Virtual Lab, University of Queensland | Contributor, Supporter, Beneficiary |
| Hunter Medical Research Institute | Developer, User |
| Intersect | Contributor, Supporter, Beneficiary |
| Monash Antibody Technologies Facility\* | Supporter, Beneficiary |
| Monash Biomedical Proteomics Facility\* | Supporter, Beneficiary |
| Monash University | Contributor, Supporter, Beneficiary |
| Proteomics Australia | Supporter, Beneficiary |
| Queensland Institute of Medical Research\* | Supporter, Beneficiary |
| Queensland University of Technology | Contributor, Supporter, Beneficiary |
| TGR BioSciences\* | Supporter, Beneficiary |
| University of Western Australia | Contributor, Supporter, Beneficiary |
| NSW Systems Biology Initiative (UNSW) | Supporter, Beneficiary |
| VLSCI | Supporter, Beneficiary |
| WAIMR, Proteomics International\* | Supporter, Beneficiary |
| Wound Management Innovation CRC | Supporter, Beneficiary |

A.2.3 Project Funding Summary

Identify the total, amount of NeCTAR EIF Funds requested, and the amount of co-investment proposed. These should match the totals in Part D3: this is still to be worked on and is in progress

|  |  |
| --- | --- |
| EIF Funds Requested | Total Co-investment Offered |
| *$1.4-1.5M* | *At least same amount: more will be better* |

Section B. Proposal Summary

B.1 Executive Summary (1 pg)

The Proteomics Virtual Laboratory (PVL) seeks to provide digital connectivity on a national scale for Australian proteomics researchers, seamlessly linking them to niche data repositories and novel analysis and annotation workflows, providing an innovative research environment. PVL seeks to position Australian researchers at the forefront of global proteomics research *via* sophisticated analysis using unique datasets on national computational infrastructure, sharing resources and expertise and enhancing support for collaborations across the country.

Australia is a global leader in protein and proteome research, starting with the coining of “proteomics” at Macquarie University in 1995, and looking beyond the genes to the proteins they produce, while the rest of the world was focussed on sequencing the human genome. As the final products of genes, proteins are abundant and used as disease biomarkers, in molecular diagnostics, as drug targets and as vaccines. The proteome is the entire set of proteins expressed by a genome, cell, tissue or organism. More specifically, it is the set of expressed proteins in a given type of cell or an organism. While the genome is static and is the same in each cell of an organism, the proteome is dynamic and varies with the tissue type as well as the environment and state of the cell. With technological advancements in high throughput gel-free methodologies, array-based proteomics, structural proteomics and clinical proteomics, the informatics challenge lies in unambiguously identifying proteomics data given the variations arising from single nucleotide polymorphisms, splice variants and the plethora of post-translational modifications; implementing rigorous standards and proper annotation of gene function and in incorporating interaction data from protein ‘cross-talk’, with active interfaces to the underlying genome and transcriptome data as well as the metabolites modified by proteins.

PVL will provide an additional layer of integration to the NCRIS-funded proteomics facilities, building on their substantial computational and data-storage infrastructure already available and addressing analytical deficiencies identified by these and other proteomics researchers Australia-wide to provide an internationally competitive, accessible virtual lab. PVL will utilise infrastructure provided by Bioplatforms Australia, Australian National Data Service and the EMBL Australia mirror of EMBL-EBI and national projects such as NeCTAR, RDSI and NCI. PVL is collaborating with the Genomics Virtual Laboratory (GVL), integrating relevant eTools, analysis and for comprehensive protein annotation annotation workflows, and visualization of protein/proteome analysis results.

PVL envisages integrating niche protein databases and analysis software into a virtual proteomics lab, aimed at addressing the roadblocks facing the proteomics community in Australia. While individual labs may have in-house datasets or work-abouts, PVL proposes to make large-scale protein variation databases and comprehensive analysis and annotation workflows, harnessing extreme computational infrastructure in a shared collaborative environment available Australia-wide. The overall goals of PVL are:

to integrate tools, workflows and data into an accessible and shareable environment at local and national HPCs,

to implement proteomics analysis standards making experiments and workflows more reproducible and robust with data provenance recorded,

to facilitate a forum for proteomics researchers to collaborate and share data, workflows and analysis results ,

to address the compute-intensive infrastructure demands of proteomics researchers working with large datasets with multiple dimensions (e.g. mass spectrometric data, peptides, protein sequences, protein structures, protein interaction networks, metabolic pathways, functional domains and motifs, homologous sequences and structures, ligand/metabolite binding sites, variational data),

Develop training materials for imparting skills in cutting-edge proteomics research and

Mirror PVL data and resources at multiple national locations for continuity of service.

PVL’s aims are:

improve accurate protein identification by incorporating protein variation (mutations, single nucleotide polymorphisms, alternative splicing) information for mapping proteomic peptides,

develop a proteogenomic analysis pipeline for mapping proteomic peptides to their cognate genomes for accurate gene definition,

provide comprehensive analysis, annotation and data visualization tools to ascribe putative biological function for the “missing” proteins/peptides, leveraging on ANDS- and NeCTAR-funded eTools and services,

interface with the NeCTAR-funded GVL for gene/transcript related sequence analysis data and tools and reciprocally address protein analysis data and tools from GVL,

provide proteomic data visualization at a chromosomal level, similar to available genome browsers; protein 3D structure viewers to understand functional locations within proteins.

PVL will facilitate new research initiatives as a result of increased collaboration among proteome researchers and among institutions, address the limited or non-existent access to advanced analysis and niche data for the individual biomedical researcher and leveraging of the infrastructure investments, to improve clinical diagnostics, lead to new drug discovery and address plant and animal health and productivity.B.1.1 Summary for Public Release (0.5 pg)

Provide a one or two paragraph descriptor of the purpose and expected outcome of the project, which is suitable for media or other publicity material.

The Proteomics Virtual Laboratory (PVL) empowers proteomics research institutes and researchers across Australia to participate in a connected, collaborative high-performance computational infrastructure, accessing relevant niche protein and proteome datasets and advanced analysis, annotation and visualization tools, to generate globally competitive research results.

PVL is aimed at both sequence and 3D-structure level proteome-related life sciences, leading to disease biomarkers, in molecular diagnostics, as drug targets (especially in the case of enzymes) and as vaccines. PVL will provide researchers with access to NeCTAR eTools and annotation and analysis software from CSIRO and Macquarie University, accessing national-scale projects including RDSI, NCI, Bioplatforms Australia (BPA), Australian National Data Service, the EMBL Australia mirror of EMBL-EBI and the Genomics Virtual Laboratory for gene-related analysis.

PVL will be developed by primarily by Macquarie University and the Australian Proteome Analysis Facility, with support from Genomics Virtual Lab, BPA, CSIRO, Garvan Institute for Medical Research, Queensland University of Technology and the University of Western Australia, operated by Intersect and Victorian Life Science Computational Initiative and endorsed by the Australasian Proteomics Society, the Wound Management Innovation CRC and EMBL Australia. *Members include the Universities of Queensland, Melbourne, NSW and Western Australia, Queensland University of Technology and Monash University; CSIRO, and other universities and research institutes, representing a* ***thousand****(?) researchers.* The primary aims will be to:

make proteomics tools, workflows, data and *in silico* experiments more accessible, reproducible and robust;

facilitate access to HPC resources to improve productivity;

provide infrastructure tailored to the specific data demands of proteomics;

provide a forum for proteomics researchers to collaborate and share data and workflows;

promote the use of proteome informatics through training courses and outreach programs; and

build a proteome informatics platform on national infrastructure to interact seamlessly and interchange data and tools with other -omics and life science resources.

B.2 Research Community Profile (1 pg)

Provide a profile of the research community that is sponsoring the proposal; include the aims of the community, geographic spread or location and membership size.

Proteomics underpins Australian life science research and industry and contributes to all areas of life sciences, agriculture and livestock, and human health. *(More to be written)*

B.3 Development Organisation Profile (2 pages)

The lead supporting organizations of the Proteomics Virtual Laboratory are Macquarie University, the Australian Proteomics Analysis Facility (APAF), Macquarie University and Intersect Australia Ltd.

**Macquarie University (MQ):** Macquarie University has a track record of eResearch initiatives. In 2005, the DADA-HCS (Distributed Access and Data Annotation for the Human Communication Science) project was funded by the ARC Special Research Initiative on eResearch, to build infrastructure to allow collaborative annotation of Linguistic resources and sharing of these resources among researchers around Australia. UniCarbKB is a NeCTAR-funded eResearch Tool developed by the Department of Chemistry and Biomolecular Sciences, while the Centre for Media History is a participant in the $1.33M NeCTAR-funded Humanities Networked Infrastructure (HuNI): Unlocking and Uniting Australia's Cultural Data.

**Australian Proteomics Analysis Facility (APAF):** APAF is the leading provider of proteomics services since 1995 and was the world’s first dedicated high-throughput proteomics laboratory. APAF has over 15 years experience in providing proteomics services, combined with leading edge infrastructure and expertise. APAF’s mission is to assist the scientific community address their protein analysis needs. APAF is generously supported by BioPlatforms Australia under the Commonwealth Government's National Collaborative Research Infrastructure Strategy (NCRIS) and Education Investment Fund (EIF). APAF is also supported by the New South Wales State Government Science Leverage Fund (SLF) and Macquarie University and is currently a part of the Department of Chemistry and Biomolecular Sciences, Macquarie University.

**Intersect:** Intersect Australia Ltd is a not-for-profit company limited by guarantee, owned and funded by its members; the universities in NSW; state government departments; and other organisations undertaking research in NSW. Intersect has a strategic focus on national research infrastructure. Intersect is a member of The National Computational Infrastructure (NCI), and the Australian Access Federation (AAF). Intersect has undertaken and is undertaking many projects deploying data capture and management solutions for the Australian National Data Service (ANDS). The software Intersect develops integrates with infrastructure provided through these bodies.

Since its establishment, Intersect has demonstrated that it is one of Australia’s leading eResearch organizations in having the capability and capacity for undertaking eResearch projects.

***Capacity and capabilities:***With approximately 50 staff, Intersect has established a capacity and capability to develop, deploy and support substantial and complex eResearch infrastructure, that is unique in Australia. This capability is built on a company culture which emphasises a focus on the client and of engineering excellence. Intersect has built a team that delivers eResearch solutions on time, on budget and of value.The staff in Intersect’s Engineering Division brings together many years of commercial experience in developing large scale IT systems across many sectors such as academia, government, banking and enterprise security tools. The team of 30 staff includes user interface designers, specialist test engineers, software and systems engineers and project managers.

The staff in Intersect’s Services Division has backgrounds in publically funded research, commercial research and development, and commercial information technology service provision. The team of eleven staff is responsible for outreach and engagement before, during and after development commences. They provide capability to carry out stakeholder management, requirements gathering, and product ownership.The Operations Division, comprising five staff, has been centrally involved in systems integration projects and the transitioning of projects from development to commissioning and ongoing hosting.

***Track record and relevant experience:***Intersect has undertaken and successfully delivered approximately 25eResearch projects till date, including projects with development and integration budgets in excess of $1 million. These projects provide solutions and infrastructure to research efforts across a range of disciplines**,** including:

analysis and integration projects for many NCRIS capability areas (e.g. AMMRF, PHRN, AAL)

analysis and development projects for non-university research bodies (ANSTO, NSW Office of Environment and Heritage)

software development projects funded through PfC capabilities (e.g. 11 ANDS data capture projects for 4 universities)

software development projects funded directly by our membership (e.g. Rainfall)

strategic software development projects funded by Intersect (e.g. Genomic Data Repository, Australian Schizophrenia Research Bank)

In the vocabulary of NeCTAR, a number of these projects would fit within the parameters of eResearch tools (e.g. ANDS data capture projects, ASRB) or virtual laboratories (e.g. PHRNi). Intersect is also currently delivering ANDS-funded projects for six of their members.

***Approach to quality standards:***Intersect has not sought formal certification under any standards (eg ISO 9000). Intersect follows a three part method for achieving quality:

1. “Say what you are going to do”. Starting from the concept stage of this project, and continuing throughout the project, we keep the customer informed of what we are doing and how we are doing it. We have processes covering Consultation, Business Analysis, Project Management and Software Engineering. We work with our clients to tailor these to suit their needs and the project’s needs.

2. “Do what you said you were going to do”. We follow our processes. If we encounter issues then we talk to our customers to find agreeable solutions.

3. “Prove it”. We keep the smallest quality record possible, as documented in a quality management plan**,** written during the elaboration stage of development (see Item 15), in conjunction between the stakeholders and NeCTAR.

Intersect’s on-going defect rate is less than one new defect discovered per month, across 25 deployed systems.

***Support and warranty mechanisms:***Intersect issues a formal 3-month warranty for all projects; the warranty commences after user-acceptance testing has completed. During this period all defects are fixed at no cost to the customer.In practice, our defect rate has been low enough that we have fixed the majority of defects that come to light after the warranty period has expired. Additional feature requests are carried out on a fee-for-service basis.

Additionally, the following organizations will be participating in the development of PVL:

**CSIRO:** CSIRO has a distinct role as Australia’s leading large-scale multi-disciplinary mission-directed science and technology organization. CSIRO has extensive experience in developing and delivering researcher-driven ICT platforms supporting its flagship projects, aligned with National eResearch goals. Recent achievements include the successful completion of ANDS-funded data management projects as well as success in securing EIF funds for Sustainable Energy for the Square Km Array.

**Bioplatforms Australia (BPA):** BPA is responsible for bolstering Australia’s research capability and capacity in the fields of genomics, proteomics, metabolomics and bioinformatics, with National Collaborative Research Infrastructure Strategy (NCRIS) funding. Besides supporting Australian life science research with crucial investments in state-of-the-art technologies and expertise, BPA is now supporting the generation of framework data established around nationally significant research themes and data analysis systems.

**EMBL Australia:** Australia is an associate member of the European Molecular Biology Laboratory (EMBL) and has set up EMBL Australia as a research centre mirroring EMBL data resources. The mirror provides Australian access to the most used data services of the European Bioinformatics Institute (EBI) within the European Molecular Biology Laboratory (EMBL) such as databases, software frameworks and on-line tools for data retrieval, querying, analysis, comparison, integration and visualisation.

The Garvan Institute of Medical Research

**The University of Queensland:** hosts the Genomics Virtual Laboratory……

Victorian Life Sciences Computational Initiative:

**(others to be listed)…..**

**The University of Western Australia:** The Centre for Genetic Epidemiology & Biostatistics at UWA comprises a multi-disciplinary team committed to developing ways of investigating the determinants of complex human disease and exploring ways of using genetic information to improve human health. The Cloud-based Bioinformatics Tools project is a NeCTAR funded eResearch Tools project with the objective of providing a suite of secure, integrated web-based tools that incorporate the majority of the functionality required to conduct a complex study or clinical trial. The Centre for Genetic Epidemiology & Biostatistics is also a collaborative partner in the NeCTAR Genomics Virtual Laboratory project.

B.4 Operational Organisation Profile (2)

Provide details of the organisations that will contribute to the development of the proposed infrastructure once they have been commissioned; include information about their capacity and capabilities, their track record and relevant experience in this role, their approach to quality standards, support and warranty mechanisms, etc. Include any supporting statements from Research Users.

Where specific projects are mentioned, indicate specifically the aspects that support your track record or experience.

**Intersect:** Intersect Australia Ltd is also a development partner for this project. Please see above for details of the organization.

***Capacity and capabilities****:* Intersect provides hosting, operations, outreach, L&D and support for our members’ and affiliates’ eResearch needs. Intersect hosts its production infrastructure with commercial hosting partners ac3. The hosting is located at the Global Switch datacenter in Ultimo. Our hosting partners provide managed services, including backup, system monitoring and logging, and core network connectivity for all services. Our systems administration team performs network management, user-level support and troubleshooting, and general systems administration. Intersect has an access agreement with AARNet; all systems hosted by Intersect are “on-net”. Issues with services hosted at ac3 are notified to the head of Intersect’s systems administration team.

Operations, advocacy, L&D and support is built on a full-time team of nine eResearch Analysts, an HPC specialist, a data management specialist and five systems administrators.

The team is currently responsible for:

Operations of and merit-based allocation to HPC facilities, both through our own McLaren service, hosted at ac3, and Intersect’s partner share of NCI.

Hosting data and applications on behalf of our members’ researchers. We host off-the-shelf applications, customized open-source applications, bespoke software developed by Intersect, data accessible via the DataFabric, and data management systems. Hosted systems include Confluence, Jira, OpenClinica and OpenCDMS.

Hosting hardware on behalf of our clients, for example the SAX Institute

Providing first-tier support for HPC users, as well as users of national services such as the ARCS Data-Fabric, ARCS Grid Computing Service, and AAF’s authentication services.

Our team of Analysts has a background in publically funded research, commercial research and development, and commercial information technology. They provide both one-off and ongoing assistance to research groups, and combine experience across a large number of research disciplines.

Intersect’s system administration team bring together commercial- and research-based experience supporting and integrating administrative as well as research systems.

Intersect has applied to the RDSI NoDe program and has a plan to build and operate an RDSI node. Intersect has applied to the NeCTAR Research Cloud program, and has a plan to build and operate a research cloud node. Both services will operate alongside our existing infrastructure, hosted in commercial hosting facilities.

***Track record and relevant experience****:* Intersect provides operational support for HPC, valued at approximately $1m annually, to its membership. Over the last three years, we have provided support directly to more than 100 research projects comprising hundreds of researchers. In the last year we provided specialist ongoing support, in the form of scripting, troubleshooting, compilation of software, and design of experiments, to approximately 30 research projects.Intersect hosts applications or application spaces for approximately 30 groups across seven institutions. Hosting is provided through a combination of in-house infrastructure and in partnership with ac3.

Systems administrators at Intersect have been involved in the roll-out and support of national services, through most of the PfC programs, including ARCS, the AAF and ANDS. Intersect’s eResearch Analysts provide ongoing support comprising engagement and outreach, issue management, and learning and development to hundreds of researchers each year.

***Approach to quality standards:***Intersect has systems and procedures in place that provide quality control and assurance to our customers. The tools used in these systems and procedures include: ‘Jira’ to raise and track external and internal issues; ‘Nagios’ to automate service monitoring and raise alerts; ‘Cacti’ for usage trend analysis and reporting; ‘Splunk’ for log management, troubleshooting and forensics; and ‘Confluence’ to document and manage procedures and processes. There is an end-to-end process for raising and resolving support issues, including a process by which support issues are prioritized and escalated.

***Support and Warranty Mechanisms:*** Intersect issues a formal 3-month warranty for all projects; the warranty commences after user-acceptance testing has completed. During this period all defects are fixed at no cost to the customer. In practice, our defect rate has been low enough that we have fixed the majority of defects that come to light after the warranty period has expired. Additional feature requests are carried out on a fee-for-service basis.

The systems administration team provides user support for hosted services andworks with the customer to configure the initial setup of their service. This work includes making a decision on the appropriate hosting arrangements (e.g. local, Intersect, commercial) based on the required level of service. After commissioning, issues are tracked using Jira, and issues are triaged into support and defect cases. Defects are escalated to the engineering team. Responsibility for each support issue is assigned to a case manager, who looks after the reporter until the issue is either resolved or escalated. All services are monitored automatically using Nagios. Outages and anomalies are reported to the systems administration team, and emails are sent to the owners of the service using mailman.Scheduled outages are negotiated with the customer as they are required e.g. for upgrade of hardware or maintenance releases of software.

Services are promoted through Intersect’s website, newsletter, marketing collateral and outreach program.Outreach activities include promotion of services, including through an Intersect-maintained tools register (soon to be integrated with CAUDIT’s eResearch portal), as well as providing one-on-one assistance to researchers deciding on and using services in their research.Training is supported though Intersect’s learning and development (L&D) program. Existing L&D material has been developed for services including: interactive and self-paced training courses (covering e.g. HPC, Google’s REFINE); written material available through our website (e.g. guides to Evo, Collaborative Authoring); and an emerging program of web-casts demonstrating concepts and usage of tools (e.g. Subversion).

**VLSCI:** to be written....

B.5 Other Participants (0.5)

Name any other institutions or groups that will need to be involved in the project planning and execution and their roles.

PVl will work with additional participants including national groups from:

NeCTAR and

RDSI;

along with international groups/teams representing

the Galaxy implementation,

the neXtprot database at the Swiss Institute of Bioinformatics, Geneva and

the Science Collaboration Framework project.

B.6 Key Personnel (0.5)

State any key individuals that are required for specific project activities and their availability.

Provide names, organisational locations, and their expected roles.

Project Manager: xxx (Intersect)

PVL integration:

Variant Peptide Mapping

Research Leader(s)

Coordinator:

Protein analysis, annotation and data visualization

Research Leader(s)

Coordinator:

Proteogenomics and Data exchange

Research Leader(s)

Coordinator:

B.7 Infrastructure (2)

Describe the proposed infrastructure to be developed. Provide supporting documentation, specifications etc as required. Please nominate a Project Manager and describe how they will be given sufficient authority over the project resources across all participating organisations to fulfil the role as described in section A-4.3.

The PVL infrastructure to be developed is targeted at several key user groups (to be wriiten):

**Technologies:**

Galaxy (workflows with Intersect)

CloudBioLinux (like GVL)

Scientific Collaboration Framework (CSIRO)

User authentication and data privacy protocols (Intersect)

**Databases**

UniProt (from EMBL-Australia)

neXtprot (SIB-Geneva)

BLAST databases (Genomics VL)

dbSNP (NCBI, USA)

ENSEMBL variation data (EBI, UK)

RefProteins?

KEGG?

**eTools**

NeCTAR Cloud-based Bioinformatics Tools (White, UWA)

NecTAR UniCarbKB (Packer, Macq Uni)

Reflect (text-mining) from CSIRO

Machine Learning for Proteomics; Semantic Web and Database Technologies for Bioinformatics (Hogan, QUT)

PloGO; (APAF)

**Visualization of results**

Proteome Browser (Monash)

Visual Analysis Tools (Hogan, QUT)

SRS3D from CSIRO (SI O’Donohue, CSIRO)

The Steering Committee will ensure that the key personnel will have sufficient authority over the project resources to fulfil their roles defined above, especially the project manager, named in B.6, to fulfil the role described in A-4.3.

RESEARCH COMMUNITY NEEDS & BENEFITS

B.8 Target Research Community (0.5)

Identify the research communities and the expected number of users.

APAF to list user community here.....

B.9 Needs and Impact (2)

Describe the needs of the research community. Describe the impact on current research practices and any opportunities the new infrastructure will provide to those communities.

List the benefits to be derived from the delivered infrastructure, describe them in quantifiable terms where possible.

Outline how the impacts and benefits will be tracked, managed and measured. Include specific measures that will be used to report on utilisation and uptake by the research user community.

Type or paste your response here.

B.10 Broader adoption (0.5)

State which additional communities, resource providers or organisations would also be expected to benefit from the use of the new infrastructure and services should the project succeed.

Type or paste your response here.

B.11 Value adding (1)

Identify the components of the project that are adding value to existing research infrastructure investment. For example; building new services on top of and using existing research infrastructure.

Describe the alignment with national research infrastructure and eResearch infrastructure priorities. See <http://www.innovation.gov.au/Science/ResearchInfrastructure/Pages/default.aspx>.

Note how this project will engage with, and leverage off, the other national infrastructure programs such as ANDS, AAF, NCI, and RDSI, as well as any other NCRIS Capability Platforms.

Identify components that could be used by other research communities and organisations to resolve their problem. For example; a part of the workflow that could be used by other domains and research communities.

Type or paste your response here.

PROJECT MANAGEMENT

B.12 Governance (1)

State who is accountable for assessing project performance, what process will they apply.

Describe the authority structure over resources in the proposed project.

List all members of the Project Governance Body, ensuring adequate representation for participating organisations, operators of the infrastructure and research users beyond the organisations participating in the project. Please confirm that the NeCTAR director (or delegate) will be invited to participate as an observer. Describe the frequency that the Project Governance Body will meet (noting that NeCTAR expects governance bodies to meet at least quarterly.)

Describe how the Governance Body will be provided access to appropriate expert technical advice.

Describe the organisation’s Project Management methodology, scaled as appropriate for the proposed sub-project, and the maturity of its use within the organisation.

Describe the key processes and templates used internally by the organisation for governance and project management.

Governance Committee (tbc)

Professor Jeff Gorman, Proteomics Australia

Professor Richard Simpson, President, Australasian Proteomics Society

Dr David Lovell, Director, Australian Bioinformatics Network (CSIRO & EMBL-Australia)

Prof. Zee Upton, Director, Wound Management Innovation CRC

Prof. Michael James, garvan Insitute for Medical Research

Prof. Marc Wilkins, Director, NSW Systems Biology Initiative

Dr. Michael Crouch, Chief Scientific Officer, TGR Biosciences

Assoc. Prof. Andrew Lonie, Head, VLSCI, University of Melbourne

Dr. Michael Pheasant, Manager GVL

Xxxxxx, Manager PVL.

B.13 Project Scale, Key Deliverables and Acceptance Criteria (1.5)

Describe the overall scale expected in the project including total effort.

Nominate any other participants that have indicated a willingness to participate through providing resources and what they are.

Define the key project deliverables. Deliverables include the services, infrastructure and functionality specified above for development by the sub-project as well as any required project management artefacts.

Show the Acceptance Criteria against each deliverable. These will be further elaborated during project delivery when Commissioning Tests are prepared.

Acceptance Criteria should be measurable, and where possible related to end user capabilities.

Define the Acceptance Criteria specific to Commissioning.

**The deliverables should match those used in the Milestone Template (Part D3.2). To assist this, you may wish to assign a unique ID to each key deliverable.**

Please add/delete rows as required.

Type or paste your response here, and complete the table of deliverables and acceptance criteria ensuring the deliverables match those in the Milestone Template (Part D3.2).

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| ID | Deliverable | Acceptance Criteria |
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B.14 Staged Deployment (0.5)

To resolve ambiguities about “production” versus “development” deliverables, please complete the table below showing for each “production” service or deliverable the date it will be first usable by a pilot group of research users (where relevant); and the date first deployed for production. Note that NeCTAR encourages proposals to identify early delivery of pilot and production infrastructure to support early engagement and uptake by the research community.

**Where relevant, please use the same naming as in the Key Deliverables (Part D2 Section B.13) and the Milestone Template (Part D3.2)**

Please add/delete rows as required.

|  |  |  |  |
| --- | --- | --- | --- |
| **Milestone No.** | **Name of Service/Deliverable** | **Date of deployment for pilot use** | **Date of deployment as production service** |
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B.15 Project Approach (1)

Detail how the required services will be developed and delivered. Outline the different stages of activity.

Describe how your generic project methodology has been tailored to this specific project.

Type or paste your response here.

B.16 Quality Control (1)

Identify the personnel, processes and any special resources that will be required for Quality Control, Acceptance and Commissioning Testing activities on the proposed project.

State who is responsible for the completion of each deliverable.

State who is accountable, within the sub-contracted organisation, for the acceptance of each deliverable.

In contrast to “what we will test” described earlier, this is a “how we test” description.

Type or paste your response here.

B.17 Risk and Issue Management (1)

Define the key risks to the successful delivery of the proposed project.

Define any open issues that need resolving before the proposed project can start delivery.

Detail any key questions that will affect the operation of the proposed project pending a decision.

Define how the major risks and issues to the proposed project will be managed.

Type or paste your response here.

LEVERAGING

B.18 Standardisation and Interoperability (0.5)

Describe the global technology development or standardisation work that will be adopted, adapted or extended within the project and any risk reduction or additional value available by collaboration with similar activities occurring elsewhere in the world.

Identify any local or emerging standards that will be incorporated by the project.

Type or paste your response here.

FINANCIAL

**PLEASE COMPLETE DETAILS IN ATTACHMENT D3 MILESTONE AND FUNDING TEMPLATE**

SERVICES AND SUPPORT

B.19 Service Levels (0.5)

Specify the service level that will be offered for each service in relation to the levels discussed in the relevant Part B document.

Type or paste your response here.

B.20 Operations and User Support (1)

Detail the proposed operator of each service, what support will be provided to users and by whom.

Type or paste your response here.

B.21 Sustainability (0.5)

Describe how the project infrastructure will be made sustainable following the completion of the project and becoming operational, when EIF funds cannot be used. Include information on the proposed business/financial model and the timeframes to which they apply.

Type or paste your response here.

B.22 IP, Licensing and Access (0.5)

State if any software licences will be used for software developed by the proposed project, or other software used for the services to be delivered by the proposed project.

State if software developed by the project will be made available under an open-source licence.

State if other Intellectual Property (IP) or licensing restrictions are relevant to the services that will be delivered.

State if there are any restrictions on access to the services that will be delivered.

Type or paste your response here.

B.23 Communications and Engagement (0.5)

Describe the means by which customer satisfaction with the proposed project’s planning, requirements gathering, scoping decisions, progress, quality and outputs will be measured.

Type or paste your response here.

B.24 Constraints and Dependencies (0.5)

Define and explicitly quantify any schedule, expenditure, resource, scalability, performance, and quality constraints or limitations on the project and its deliverables.

State the dependencies with external parties, including other NeCTAR projects, which have been identified in planning the proposed project.

**NOTE: Please write your response in the box below AND complete a row in the table for each EXTERNAL Dependency.**

Add/Delete rows as required.

Type or paste your response here, and complete the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **External Party** | **Capability Required** | **Date first required** | **Milestones or Deliverables dependent on that capability** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
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# Section C - Selection Criteria

The following table outlines the criteria that will be used to assess proposals, based on the responses in Parts D2 and D3. They are provided here only for the information of respondents and to ensure that responses consider the key elements being sought.

## Criteria for Virtual Laboratory Proposals

|  |  |  |
| --- | --- | --- |
| **Category** | **Weight (%)** | **Criteria** |
| **Research Community** | **20%** |  |
| Research community to benefit is well-defined (by location, institutions, size), nationally significant and the proposal is well supported by the research community | | |
| The needs of the research community to be addressed by the proposal are well defined and significant | | |
| Researcher participation in the proposal is well defined, significant and national or international in scale, supporting outreach, uptake, testing and evaluation of the project infrastructure | | |
| The proposal is aligned to national research priorities | | |
| The proposal is aligned with, and contributes to implementation of, national research infrastructure and eResearch priorities | | |
| **Research Impact** | **30%** |  |
| The benefits to be delivered to the identified research community are well described, achievable, significant and measurable. The process for tracking and measuring the benefits is defined and achievable | | |
| The proposal delivers a transformative impact for Australian research:  • Supporting broader delivery of the benefits of eResearch infrastructure  • Transforming research and eResearch practice within the research community identified in the proposal | | |
| The proposal integrates significant infrastructure and research capabilities on a national scale to deliver a transformative impact for the research community identified in the proposal:   * Improving access to instruments, data, compute and other research infrastructure * Enables new research practices through research workflows * Address emerging research challenges * Support cross-institutional and cross-disciplinary research workflows through the provision of integrated collaborative ICT infrastructure * Connect significant infrastructure capabilities to support discipline and problem oriented research workflows: e.g. remote laboratory access, computation, research data repositories, workflow tools and sensor networks * Provide an exemplar to research communities of the benefits of integrating significant research support capabilities into a rich online collaborative environment | | |
| Potential benefits from re-use across research disciplines are well described, realisable and significant | | |
| **Implementation** | **30%** |  |
| An appropriate Governance structure has been defined for the Project   * A Governance body appropriate to the project has been defined * Authority structure over resources in the project has been described * Key personnel (if required) and their roles have been clearly defined | | |
| The infrastructure to be created by the proposal is well-described, achievable and will deliver the research impacts described.   * The scope is realistic and outcomes are achievable * Project Management is well-described and appropriate to the proposal scale * Key risks have been identified and are manageable * Issues that require solving have been identified * Dependencies with third parties have been listed | | |
| Capability and track record in development and operation of eresearch infrastructure   * The contribution and track record of each organisation in the proposal to development and operation of the infrastructure is well-described and appropriate to the successful delivery of the proposal infrastructure | | |
| The proposal leverages or builds upon existing research infrastructure where appropriate:   * the NeCTAR Research Cloud and NSP for infrastructure hosting and computation * existing research and eresearch infrastructure (eg. RDSI, ANDS, NCI, Pawsey, Super Science, NCRIS Capabilities, State and Institutional infrastructure)   It is expected that proposals will utilise the AAF for common authentication services. Where it is not possible for the proposed infrastructure to utilise the AAF for authentication purposes, appropriate and reasonable justification has been provided. | | |
| **Financial and Co-investment** | **20%** |  |
| The project budget is well-described, matched to appropriate milestones and appropriate to the needs of the project | | |
| The identified co-investment achieves the target level, is appropriate to the needs of the project, and adequately covers the operational requirements of the proposal | | |
| The proposal identifies an appropriate model for delivering future sustainability of the infrastructure | | |
| Proposed expenditure of EIF funds is adequately described and conforms to the EIF funding guidelines (Mandatory) | | |
| The proposal conforms to the principles on Access and Pricing as described in Part B of the NeCTAR RFP (Mandatory) | | |

## Criteria for Research Cloud Proposals

|  |  |  |
| --- | --- | --- |
| **Category** | **Weight (%)** | **Criteria** |
| **Research Community and Impact** | **30%** |  |
| Research community to benefit is well-defined (by location, institutions, size), nationally significant and the proposal is well supported by the research community | | |
| The needs of the research community to be addressed by the proposal are well defined and significant | | |
| Researcher participation in the proposal is well defined, significant and national or international in scale | | |
| The proposal is aligned to national research priorities | | |
| The proposal is aligned with, and contributes to implementation of, national research infrastructure and eResearch priorities | | |
| The benefits to be delivered to the identified research community are well described, achievable, significant and measurable   * Process for tracking and measuring the benefits is defined and achievable | | |
| **Implementation** | **40%** |  |
| An appropriate Governance structure has been defined for the Project   * Proposers commit to operate under the Governance arrangements for the RC as described in the NeCTAR Final Project Plan (Section 4.3) * Research Cloud node proposers commit to operate in accordance with the principles described in Section 4.3.1.3 of the NeCTAR Final Project Plan * Authority structure over resources in the project has been described * Key personnel (if required) and their roles have been clearly defined | | |
| The infrastructure to be created by the proposal is well-described, achievable and will deliver infrastructure in a timely manner.   * Project Management is well-described and appropriate to the proposal scale * Key risks have been identified and are manageable * Issues that require solving have been identified * Dependencies with third parties have been listed | | |
| Capability and track record in development and operation of significant ICT infrastructure for research users   * The contribution and track record of each organisation in the proposal to development and operation of the infrastructure is well-described and appropriate to the successful delivery of the proposal infrastructure | | |
| The proposal leverages or builds upon existing research infrastructure where appropriate:   * Co-location with proposed nodes of the RDSI Project * Co-location of proposed Research Cloud nodes to achieve cost reductions * Co-location with other significant eresearch infrastructure (eg. HPC, Repositories Instruments) | | |
| **Financial and Co-investment** | **30%** |  |
| The project budget is well-described, matched to appropriate milestones and appropriate to the needs of the project | | |
| The identified co-investment achieves the target level, is appropriate to the needs of the project, and adequately covers the operational requirements of the proposal | | |
| The proposal identifies an appropriate model for delivering future sustainability of the infrastructure | | |
| Proposed expenditure of EIF funds is adequately described and conforms to the EIF funding guidelines (Mandatory) | | |
| The proposal conforms to the principles on Access and Pricing as described in Part B of the NeCTAR RFP (Mandatory). | | |