Platforms EOI: Australian Systems Immunology Commons (Commune)

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Project title
Australian Systems Immunology Commons (Commune)

Field of Research code(s)
- 01 MATHEMATICAL SCIENCES

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Project description

The Systems Immunology Commons will bring together three existing, complementary, and internationally-recognised resources to create an integrated resource for biomedical researchers. These are Stemformatics.org; Interferome.org and http://innatedb.sahmri.com.

Each platform incorporates a deep ecosystem of integrated software tools and services and has a track record of stakeholder engagement and long-term sustainability. Each platform is open source and open access; adopts and contributes to the development of international data standards; and adheres to the FAIR data principles.
The Systems Immunology Commons will ensure the sustainability of the underlying platforms through shared development approaches for ease of automation, interoperability and maintenance. We will broaden accessibility and utility of the resources to a wider research community; enable analysis and integration of more diverse, higher-throughput, data to address emerging technology needs; and strengthen Australia’s position as a leader in this emerging field. This will benefit researchers from many different disciplines addressing immune system function during human development, disease and ageing.

### Existing technology

**Adopt**

1. Stemformatics architecture and data curation for the benchmarking of immune cell types, laboratory methods, cross species comparisons and description of blood cell development.
2. InnateDB platform and analysis tools, which over the last decade has led international efforts in the curation of molecular immunological networks.
3. Interferome, a curated database of molecules, pathways and motifs that characterised interferon-driven signalling in immune cells.

**Adapt**

1. Adapt existing pipelines to be automated across platforms.
2. Adapt the framework and technologies for the frontends towards common shared technology so that maintenance or improvements done on one can be easily rolled out to the others increasing the sustainability of all 3 platforms by reducing the ongoing development and maintenance overheads.
3. Adapt existing databases and frontends for more diverse, higher-throughput data including from emerging technologies (single cell, spatial omics, etc).
4. Refactor the middleware to ensure that they are light, agile, scalable and adaptable

**Build**

We will build a common interface to provide a seamless user experience across the three platforms. This will support a wide range of users to navigate between data sources and analysis approaches, ensuring sustainability by providing infrastructure that is robust and shareable, using environments that will allow exchange and integration with each other, and into allied international activities.

### Anticipated requirements

**Annual funding**

$900,000 - $999,000

**Proposed length**

2 years

**Other information**

**Other information you wish to provide**

Stemformatics.org (2009) has >370K users worldwide. Stemformatics data describe blood cell differentiation, activation or disease behaviours. It has infrastructure to curate transcriptomics, proteomics, chromatin and metabolomics data.

InnateDB (2008) is the world’s leading knowledgebase on innate immune interaction networks. >50K users in the immunology community.

Interferome is a curated database of gene biomarkers related to immune function. It's broad adoption by researchers has led to the identification of expression biomarkers. The tool has been cited >504 times.

### Terms

**I agree to the terms**

Yes