



omics.data.edu.au

What is the Omics project?

The Omics project has built a platform of cloud-based data services and tools allowing Australian researchers to gather, curate, analyse, and interpret genomic, transcriptomic, proteomic and metabolomic data, initially focussing on Sepsis, a life-threatening illness caused by your body's response to infection.

Building upon three existing NCRIS capabilities; RDS data services, the Genomics Virtual Laboratory (GVL), and Bioplatforms Australia, the Omics platform empowers the modern biologist to go from raw biological data to complex and collaborative downstream analysis on a flexible and world leading online platform.

The platform

The platform is made up of functional layers creating a robust and user friendly workbench.

The platform:

- integrates raw multi-omics data from any source;
- accesses computational tools to process the raw data into forms that are useful for further analysis, annotation and interpretation;
- has developed methods and tools to combine and perform analyses across multi-omics data;
- has developed tools to publish open reference datasets of national and international interest;
- provides reproducible pipelines and protocols developed by omics experts;
- has published training materials supporting the use of cloud-based eResearch infrastructure;
- designs and prototypes the implementation of how Australian and European reference pathogen datasets can be exchanged and federated.

Software services and tools

User Interface

Publications

Services: API, containers, indexes

Scientific Analysis, visualisation, tools and workflows

What's been built so far?

A structured data environment, as well as tools and workflows encompassing multi-omics and cross-omics systems biology, have now been incorporated into the Omics Platform and deployed on RDS storage and the Nectar Research Cloud.

An online suite of self-directed training materials has already been used in a series of workshops to introduce users to the full capabilities of the Omics Platform.

Frequently asked questions

Without the Omics project, would these services have been developed?



World-class Australian researchers, who are not usually funded to build such tools, have collaborated on the project, sharing their expertise across the research community.

What is the value of multi-omics investments to the wider community?



Severe sepsis and septic shock affects tens of thousands of people every year in Australia and costing society millions of dollars. Antibiotic resistance is rising and new solutions need to be found. The Omics Platform represents a new tool in the pathway to innovative solutions.

Does the project engage with user communities to encourage feedback, guiding future development?



The current testing and evaluation phase of the project will determine what is most useful, what could be included or improved and what might be customised to meet future needs. The Omics Platform will evolve according to this community exchange.

Will the Omics Platform continue in the future?



Yes, as an easily-accessible portal for Omics data sets of national research importance such as Sepsis, Koala Genome, Oz Mammals and other national reference data sets. Plans are underway for Australian Genome Research Facility (AGRF) transcriptomic data to be saved directly to an online data repository for collaborative access on the Nectar Research Cloud.

What's next?

Data from the national Antibiotic Resistant Pathogens Initiative (funded by Bioplatforms Australia) is being uploaded to the Platform through 2017. This will enable timely research on infectious blood pathogens responsible for antibiotic resistant sepsis (blood poisoning).

The reference data can then be:

- co-analysed and stored in one system;
- managed through a common data management system;
- have bioinformatics analysis performed on it via a common interface;
- made accessible to biology researchers in Australia and internationally and,
- published to international repositories.

Development by:



VicNode



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