

Student bursaries in clinical bioinformatics

Background

At the outset of the Melbourne Genomics workforce development program, in 2016, it was recognised internationally that there was a workforce shortage in bioinformatics expertise generally and particularly in the emerging field of clinical bioinformatics (as distinct from research bioinformatics).

Bioinformatics is a research discipline involving the analysis of biological data. Clinical bioinformatics is a cross-disciplinary field, intersecting bioinformatics, computer science and health informatics for diagnostic and clinical use.

Clinical bioinformaticians play a vital role in managing and analysing genomic information to produce a patient's genomic test result.

Project description

The objective: to attract postgraduates in bioinformatics into the field of clinical bioinformatics, by providing real-world experience while undertaking a Master of Bioinformatics.

This project targeted students from The University of Melbourne's Master of Bioinformatics degree. Bursaries were provided to students to undertake clinical bioinformatics research projects within the Melbourne Genomics member organisations.

A working group collaborated with the program team to liaise between The University of Melbourne and Melbourne Genomics member laboratories, to propose and support suitable clinical bioinformatics projects.

Activities

Four bursaries were awarded: one in 2017, two in 2018 and one in 2019.

Projects covered: cardiac and cancer genomics, protein domain prediction, and transcriptome sequencing.

Member organisations involved were: The University of Melbourne, The Royal Melbourne Hospital, the Australian Genome Research Facility, Murdoch Children's Research Institute (and the Victorian Clinical Genetics Service), and the Peter MacCallum Cancer Centre.

Pre-bursary and post-bursary interviews were conducted to evaluate the value of the approach.

Outcomes

This initiative resulted in four students gaining experience in clinical bioinformatics. Students were exposed to the operational complexities of clinical and diagnostic services, including the processes and systems for variant interpretation.

Students reported increased genetics and genomics knowledge and strengthened their skills in computational aspects of bioinformatics, as well as scientific writing.

Capability and collaboration across the Melbourne Genomics Health Alliance in clinical bioinformatics were also enhanced:

- Laboratories gained experience in the supervision and training of bioinformatics students.
- Research groups gained a better understanding of the skills required for clinical bioinformatics (as distinct from a traditional research bioinformatics role).

Impact

Of the bursaries completed to date, two students have so far been employed in a clinical bioinformatics role (at the Peter MacCallum Cancer Centre and at a bioinformatics and molecular genetics group based in Sydney).

Lessons learnt

- The availability of, and competition for, high-performing students limited the uptake of bursaries.
- Students need strong computational skills to undertake research projects in clinical bioinformatics.
- Alliance member organisations had limited capacity and capability to provide high-quality supervision for research projects that span both laboratory and bioinformatic fields.
- Any future bursary programs to attract graduates into clinical bioinformatics should consider broadening the pool of candidates to other Master degree programs in data science (e.g. Master of Computer Science), rather than being limited to Master of Bioinformatics students.
- Other approaches to growing capacity in clinical bioinformatics should also be considered, such as continuing professional development that brings together people with different expertise to learn from each other.