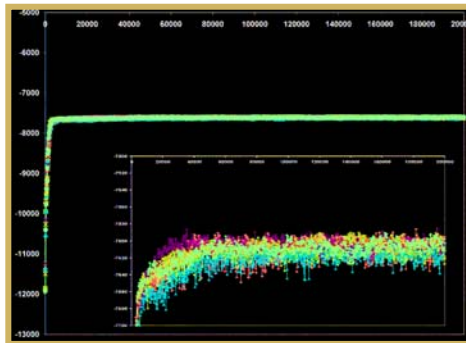


Computational Biology

Business Opportunity

Genomics and computational biology at the IMB uses advanced computer and database methods to investigate the changing aspects of genomes and the proteins they encode. Computational biology at the IMB encompasses: Comparative genomics; complex systems analysis; stochastic mathematical models; machine learning and pattern discovery; bioinformatics-directed discovery in cell biology; expression microarray analysis; protein structure and protein small molecule interactions; and 3D image reconstruction. IMB has state-of-the-art facilities including supercomputing with cluster and SMP architectures; advanced visualization technology and the latest IBM database software (the only academic installation in Australia).



Technology

Computational biology is the interface between the mathematical and biological sciences. Methods and techniques from mathematics, statistics, computer science and information technology are applied to problems from molecular and cellular bioscience, genomics and proteomics. Sometimes computational biology is distinguished from bioinformatics, with the latter referring more specifically to database and software development to address specific biological questions. At IMB, much of our research in computational biology is directed at modeling and simulating biological networks, including complex systems networks of gene regulation, protein-protein interaction and cellular signaling. We focus primarily on the spatial and temporal development of phenome from genome in mammalian cells.

The Market

Biosciences and IT will be the economic drivers of the 21st century and the intersection of these two disciplines in computational biology and bioinformatics has played a pivotal role in bio-based industries. The commercial bioinformatics market is estimated at US\$1 billion world-wide and is growing at 40% per annum. Global bioinformatics-based industries are estimated to be worth US\$11 billion in 2004. Outcomes for the biosciences industry include drug targets and drug development with a world wide potential market exceeding \$80 billion per annum.

Commercialisation

Opportunities exist for commercially oriented research (including reverse transfection for the development of new drug targets and evaluation of drug effects) and focused software development in association with industry partners. There is also the opportunity to develop a strategic partnership or network for the development of focused technology applications arising from computational biology research at the IMB. Commercial opportunities exists for product development in:

- . Simulation and modelling of networks
- . Integration of databases & 3D visualisation models
- . Wet lab interfaces
- . Software development; web and grid enabled tools

