

**centre for health informatics**  
annual report 10/11



**UNSW**  
THE UNIVERSITY OF NEW SOUTH WALES

science change analysis online **patient** tool study  
informatics surveillance evidence focus aging technology mining safe  
safety medical model system microbiology identity  
pattern care hospital incident policy chi modelling explore social biosurveillance cognitive  
clinical consumer management text translational simulation journal  
bioinformatics **research** search infectious datum knowledge  
complex control international trial gene method detection **disease**  
institute discovery university **health** internet decision association quality improve  
cancer national image healthcare **practice** retrieval human medicine  
computer information lung

**Cover image:** A map of 62658 clinical trials illustrating where drugs are tested "head-to-head" as a series of arcs, separated according to whether the trials were funded by industry (bottom) or non-industry (top).

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# What We Do

The Centre for Health Informatics (CHI) is Australia's oldest and largest academic research group in e-health and informatics.

**CHI conducts fundamental and applied research in the design, evaluation and application of *information and communication technologies for healthcare and the biosciences*.** Building a sustainable health system for the 21st Century will require the reinvention of much of the present day system and require the intelligent use of these technologies to deliver high quality, safe, efficient and affordable health care.

The Centre's work is internationally recognised for its groundbreaking contributions in a number of areas including clinical communication, the impact of IT on patient safety, evidence-based decision support technologies for consumers and clinicians, translational bioinformatics and the use of IT to support diagnosis, management and surveillance of infectious diseases.

A research centre of the University of New South Wales and a member of the Australian Institute of Health Innovation, CHI is supported by the Faculty of Medicine. We partner with major healthcare providers, research institutions and government.

CHI aims to drive change in healthcare and biomedicine by making contributions to:

## SCIENCE

break-through discoveries in information, communication, cognitive and organisational science needed to support health service innovation at a system level

## POLICY

providing expert input and leadership into government, shaping policy priorities and goals

## INNOVATION

invention of novel technologies and methods that can transfer into industry and health services

## EDUCATION

training future researchers through research degree programs to educate clinicians, technologists and policy makers in health informatics

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# Director's Report

Over the next ten years, around the world, we will build and deploy more information technology into the health system than in the entire previous history of our discipline. These systems are going to be larger in scope, more complex and move from regional to national and possibly supranational scale. Yet at roughly the same place in the technology maturity curve as the aviation industry was in the 1950s.

In Australia, mid-2012 is the date set for the launch of a nation-scale personally controlled electronic health record (PCEHR) – essentially a way of sharing clinical data between providers, with the consumer providing consent for the exchange. In the following years we are going to see many industry players emerge to capitalise upon this new national infrastructure.

Information technology has great potential to do good and we at CHI along with many others are strong advocates for investment in e-health. However, if poorly conceived, designed or implemented, e-health systems can languish unused, can generate strong negative reactions where they get in the way of other work, or in some cases, lead to patient misadventure and harm.

The challenge for organisations like CHI right now is to find ways of making sure research evidence underpins national e-health strategy as much as possible. The task of building e-health infrastructure is too often seen as a purely engineering or technical challenge. Yet we know that political success is fickle and dependent on many external and non-technical factors. Just because there is enthusiasm for a venture, or it has face validity, there is no guarantee of success. Indeed many nation-scale e-health systems are becoming case studies in how not to do it. There are many lessons to be learnt, for example, from the recent English experience, if anyone is open to them.

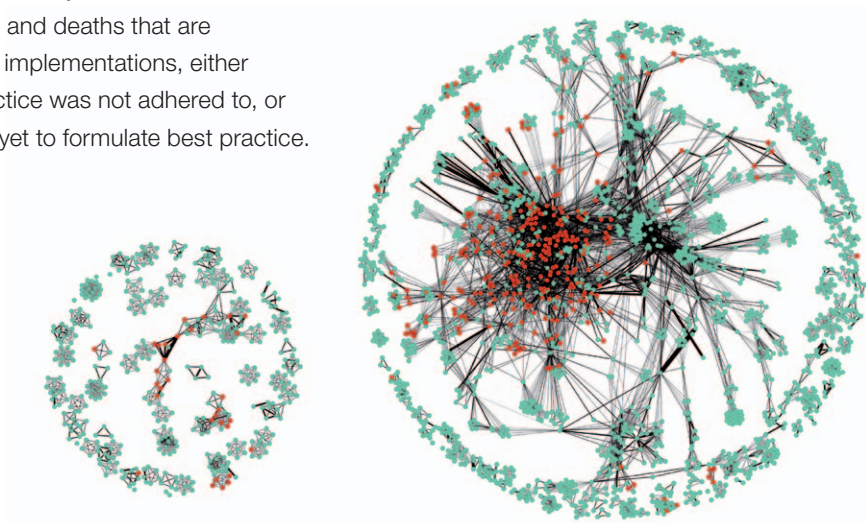
Most every other mission critical industry, from aviation to the mining industry, understands that research and ongoing learning are crucial to risk minimisation and maximising impact. There is at present little to no such recognition in e-health that we need that same approach. That is as much a failure of the research community to make the case, as it is the unwillingness of others to listen. It is also simply a marker of the maturity of the enterprise, as with time all will change out of pragmatic necessity.

CHI's research focus on patient safety is central to much of what is soon to come. We are leading the world in describing the scope and nature of IT risk in healthcare, creating the world's first classification of IT-related incidents. We are also exploring the many ways in which IT can be used for good and reduce the risk of patient harm. Our simulation and modelling group is working hard to help us understand system complexity, and our consumer group is particularly well placed, given our ground-breaking work on consumer e-health systems. Longer term, as e-health becomes more pervasive, our work on translational bioinformatics will come to the fore, helping consumers and clinicians harness complex genomic and biological data sets to make more personalised and better informed decisions.

So, over the next ten years, there will be some health IT failures. In many cases large-scale implementations will still fail to meet expectations. Regrettably there are bound to be adverse events and deaths that are associated with IT implementations, either because best practice was not adhered to, or because we have yet to formulate best practice.

Just as most major drugs benefit the many but have unwanted side-effects for the few, a measured and considered approach to ICT design and implementation will see most of us benefit. We should not shy away from this reality. The next 10 years are going to finally see the fruits of many decades of hard work transform the healthcare system through the application of IT.

However there is a crucial need for openness and maturity about the very real risks of IT failure. Any industry that shows that it is serious about learning, is honest and transparent about its failings and demonstrates that it can rapidly improve when things go wrong is bound to succeed. That has been the lesson from aviation. But for some in e-health it is going to be a dangerous decade.



Collaboration networks for research into the drugs mirtazapine (left) and olanzapine (right)

## 2010 Key Performance Indicators

- > We were **awarded multiple new grants and contracts**, including the Cancer Institute of New South Wales, \$89,250, Australian National Data Service (ANDS), \$60,000, Faculty of Medicine, Goldstar Awards, \$80,000 and UNSW MREII, Major Equipment & Infrastructure Scheme for \$98,000.
- > In 2010 our research generated **47 publications**, with two books and five book chapters, 22 peer-reviewed journal papers, 13 full conference papers, and five conference abstracts.
- > Our research staff gave **seven invited presentations**, including a Keynote to the European Union's High Level e-Health Ministerial Conference in Barcelona by Professor Coiera.
- > CHI researchers were recognised by two best paper nominations or awards at the 2010 World Congress on Medical Informatics (Medinfo) in Cape Town.
- > In 2010 CHI researchers again featured heavily in the press and news wires with an opinion piece in the *Sydney Morning Herald*, more than ten articles in the national and international press, and two radio interviews.

## Research Funders

We are grateful to our partners and funders for their ongoing support of our research program. CHI's research is supported by the following organisations:

- > NSW Health
- > Australian Research Council (ARC)
- > National Health and Medical Research Council (NHMRC)
- > HCF Health and Medical Research Foundation
- > The Cerebral Palsy Institute

# Research Programs

## **PATIENT SAFETY INFORMATICS**

### **Program Leader: Dr Farah Magrabi**

Ensuring that patient care does not unintentionally lead to patient harm is one of the unsolved problems of health services research.

Our Patient Safety Informatics program is examining how health service delivery can be made safer through the effective use of information technology (IT). We are also investigating the unintended 'side effects' of IT, which itself may cause patient harm. The work is supported by an NH&MRC project grant, a NH&MRC program grant in patient safety, and a past ARC Linkage grant in partnership with the Prince of Wales Hospital.

Highlights for this year include:

**Making clinical processes safe:** Through our Program Grant, we are studying common clinical processes such as ordering and responding to test results, to understand how variations in these processes can lead to poor patient outcomes. Working with our partners at St. Vincent's Hospital in Sydney our goal is to first understand the dynamics of these high frequency events and eventually to design systems that create a safety envelope around these processes. Dr Frank Lin who was awarded his PhD in 2010 presented a clinical workflow model for facilitating the design and evaluation of computerised clinical decision support systems at the Health Informatics Conference in Melbourne.

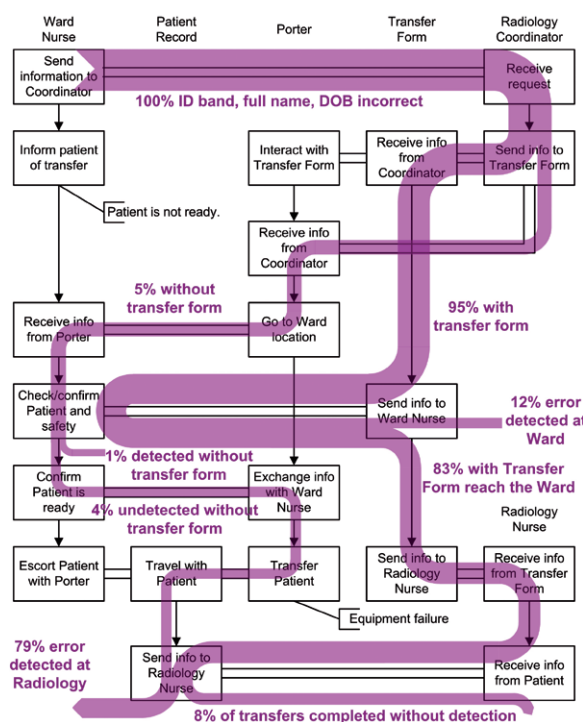
**Automatic evidence summarisation:** We are continuing our work using natural language technologies to help improve the process of translating research studies into clinically useful summaries. The growth in evidence means that even organisations like the Cochrane collaboration are struggling to manage the evidence deluge, and computer methods to discover and help analyse research are likely to become an essential technology in the near future. Our work on automating the summarisation of randomised controlled trial reports is proving fruitful, and should complete a major milestone in 2011 with the completion of large-scale trial of the technology.

**Learning from incident reports:** We currently know little about causes or severity of many IT incidents on patient safety. To help study the causes, consequences and outcomes of the use of IT in hospitals, we systematically reviewed incidents from state-wide incident reporting systems, as well as comparable international databases such as the FDA. We have identified 36 categories of problems relevant to IT using reports and are continuing to expand and refine that classification. Working with Professor Bill Runciman this work will form the basis for a new international classification system for IT safety incidents. Dr Magrabi's invited address about how IT problems contribute to error in medical imaging was well received at the Australasian Conference on Error in Medical Imaging held in Sydney.



**Safety of clinical software:** In July 2010 we commenced a newly funded NH&MRC project to examine the safety of widely used clinical software in Australian General Practice, in collaboration with Flinders University and the Sydney South West Area Health Service General Practice Unit. We are developing a Gold Standard that will be used to benchmark commonly used prescribing software. This work will develop evidence-based recommendations that should guide national standards for software safety and user training.

**An engineering approach to improve compliance with infection control:** Adverse events occur in 71% of patient transfers within hospitals. Many of these events are associated with poor communication amongst staff. In collaboration with the Prince of Wales Hospital, we investigated communication failures during in-patient transfers. Mei-sing Ong who completed her PhD in this area in 2010 also conducted a randomised controlled trial to examine the effectiveness of a checklist and a visual cue to improve adherence to infection control precautions during inpatient transfers. She has shown significant improvements in process compliance because of these interventions. Mei-sing presented her work, "Inpatient transfer journey – A free ride for bugs? An observational study of inpatient transfers to Radiology" at the 8th Australasian Conference on Safety and Quality in Health Care in Perth.



A distribution of error trajectories for misidentification during in hospital patient transfers.



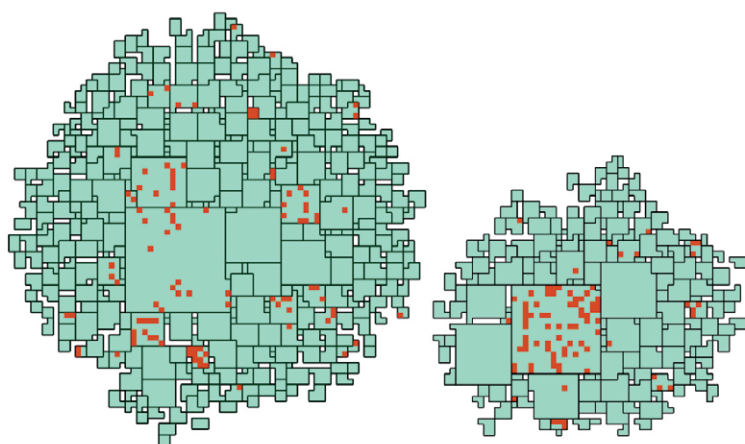
## MODELLING AND SIMULATION IN HEALTH

**Program Leader: Dr Blanca Gallego-Luxan**

Globally, healthcare is plagued by major problems with cost, safety, sustainability and poor translation of evidence into practice. Our health and clinical systems are under increasing stress from an ageing population, higher prevalence of chronic conditions and advances in expensive medical technology and drug therapies.

Yet our best attempts at system reform often fail to deliver what is expected, and usually have unpredicted and undesirable consequences. Behind these failure lies our lack of understanding of the complex behaviour that characterises adaptive systems and the missing knowledge derived from good quality and comprehensive data.

At CHI, we are working to model and possibly eventually 're-invent' the healthcare system by finding the mechanisms that underpin this inertia to change. Given the complex and multi-scale nature of health and clinical systems, we draw on modelling techniques from applied mathematics and socio-physics, including chaos and complex systems theory, statistical modelling, machine learning, dynamical systems and social network analysis. Our work is supported by an NH&MRC Program grant in patient safety.



Research community structure for atorvastatin (left) and rosiglitazone (right). Industry-affiliated authors (dark squares) inhabit communities in which non-company authors (light squares) are also present.

This year, some of our research projects have included:

**Networks of comparative effectiveness**

**research:** The reason that many good practices are not taken up may lie in distortions in the production of the evidence base. We are working with colleagues at Harvard Medical School to examine exactly how industry, academia and government allocate research resources to the comparison of drugs. There is growing concern that doctors lack comparative research comparing different treatment alternatives and that there is a bias in the research, favouring comparisons against placebo or commercially advantageous comparative studies. The research is using new methods from network science to explore the state of comparative effectiveness research, based on a registry of over 100,000 clinical trials.

In related work we have examined networks of co-authorship of clinical evidence to measure the influence of industry on the evidence base of prescription drugs using network analysis. The results show that industry-based authors are more central in their networks, are deeply embedded in their research communities and have the potential to disproportionately influence the flow of information through these communities because they tend to occupy the position of mediator.

**Impact of hospital adverse events on**

**survival:** We have examined the impact of hospital adverse events on in-hospital and post-discharge survival up to 550 days after separation. We have found that patients experiencing adverse events in hospital have a higher risk of death. The higher odds of dying during admission follows a very different pattern than that after discharge. By examining such a long period post discharge we believe we are showing that the impacts of adverse events in hospital may stretch well beyond the traditional 30 day mark used for current studies.

**Simulating temporal sequences of medical**

**errors:** It is often the case in complex systems that small apparently harmless errors can combine to create the opportunity for a catastrophic event. In this project PhD student Jason Thorne is building models of the pathways that lead to hospital adverse events with the aim to discover the best error checks that can substantially increase patient safety.

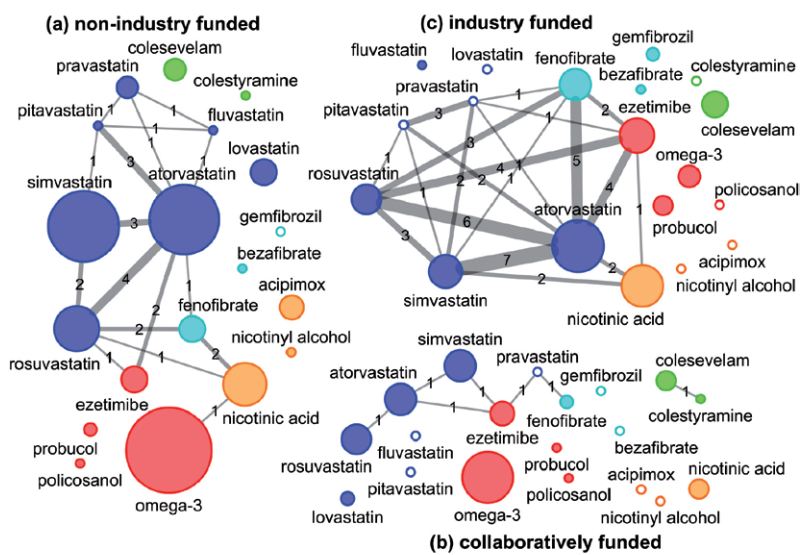
**Inertia as an inevitable property of the health**

**care system:** The inertia to change found in healthcare systems around the world may not be easily explained by clinical culture, poor resourcing or entrenched interest, but be a more fundamental property of the system as a whole. This research project, led by Prof Coiera, explores this property of healthcare systems and its implications for policy and research translation.

This year we also introduced the **AIHI Health Systems Modelling Series**, designed for the teaching and discussion of computer simulation methods in health, chaired by Dr Geoff McDonnell.

Our work takes place in collaboration with colleagues at the Centre for Clinical Governance & Research in Health, the Simpson Centre for Health Services Research and the Centre for Primary Healthcare and Equity, and the Centre for

Health Systems and Safety Research at UNSW; the Australian Patient Safety Foundation; St Vincent's Hospital and Westmead Hospital. Our research informs government health organisations such as the Australian Commission on Safety and Quality in Health Care and the Australian Institute of Health and Welfare.



Comparative effectiveness networks for cholesterol-lowering drugs.

## CONSUMER INFORMATICS

### Program Leader: Professor Enrico Coiera

The Federal Government has now committed to seeing all Australians having access to an online personally controlled health record (PCEHR) from mid 2012, with an investment of about \$477 million. As patients begin to access their records online and share them with different members of their care 'team', we will increasingly see online system used to manage self-care. At the same time internationally, social computing sites like Facebook and Twitter are gaining unprecedented community acceptance and we are also seeing these technologies being harnessed to help consumers engage more actively in their self-care.

To better understand the impact that the PCEHR and these other technologies have on disease prevention and self-management we have developed a new consumer e-Health platform to support personal and socially mediated decision-making, called *Healthy.me*. Our research has been supported by the HCF Health and Medical Research Foundation.

A summary of our program activities for this year includes:

#### Supporting patients undergoing in-vitro fertilization (IVF) treatment

Working with our clinical partners at IVF Australia, we completed a usability trial of *Healthy.me*, supporting 14 women over the eight weeks needed to complete one in-vitro fertilization (IVF) cycle, from Oct 2009 to Jan 2010. IVF was chosen because of the significant

demands made upon patients to manage complex schedules of medications and procedures and their need to deal with multiple members of the care team. Participants accessed the site to check on their treatment plans and schedules, update their personal health record or access information about the next steps of their treatment cycle. Interview data revealed variation in system usage depending upon IVF stage and task, and concurrent uses of traditional sources of support. We had many examples of the system triggering patients to contact their doctor or clinic nurse on critical issues they became aware of only when using our system.

#### Promoting uptake of preventative healthcare actions

Working with the UNSW University Health Service, we undertook a large randomised controlled trial of *Healthy.me* linking it to the health services clinic on campus over the 2010 winter season. A cohort of 855 students took part, half assigned to *Healthy.me* and the remainder to normal care. Our focus was to assess impact on health behaviours and on decisions to undertake preventative care actions. We measured influenza vaccination rates, self-reported symptoms and rate of visits to the clinic in both populations. We have demonstrated a statistically significant difference in the two populations. *Healthy.me* users were more likely to have an influenza vaccination ( $p = .008$ ) and to visit the campus clinic ( $p = .003$ ) demonstrating the impact of this class of system on changing health behaviours.



### Establishing an online health community at UNSW

We have now opened up Healthy.me to all participants in the randomised controlled trial, creating a cohort of 600 users. We have introduced new social computing elements to the system, including discussion forums associated with different health topics, such as recommended health screening at different age groups for men and women according to the guidelines of the Royal Australian College of General Practitioners. Forums are sometimes moderated by a clinician, who can also answer questions posed on the forum. Users are also able to create a personal health diary and can choose to share their diary with others in the system, protected by a pseudonym. The trial is ongoing into 2011 and will study the way online social interactions impact health service utilisation and outcomes.

### Publications and conference presentations

Healthy.me was presented and demonstrated by Prof Coiera at the Health Informatics Conference in Melbourne in August 2010. Dr Annie Lau presented at 13th World Congress on Medical Informatics in Cape Town, South Africa. Her paper on *The influence of crowds on consumer health decisions: an online prospective study* was one of 18 nominated for best paper award, out of 261 papers accepted.

She was invited to submit the manuscript for a Special Issue in Applied Clinical Informatics. An invited paper led by Dr Lau on behalf of the International Medical Informatics Association (IMIA) workgroup on social media with authors from seven countries was also accepted for publication in the IMIA Yearbook.

### Next steps

Plans for 2011 include collaborating with the Cancer Services at South Western Sydney Local Health Network to test the use of Healthy.me with breast cancer patients. Further collaborations with other health service providers such as UNSW Counselling and Psychological Services are also under development. Studies providing evidence on how e-Health, online social networks and socially mediated interventions affect the way we manage our health, make health decisions and adapt our health behaviours will be conducted throughout the year.

## TRANSLATIONAL BIOINFORMATICS

### Program Leader: Dr Guy Tsafnat

The Translational Bioinformatics stream is dedicated to help scientists studying human disease find the genes responsible for different illnesses. We invent new machine learning algorithms and data visualization methods that sift through the vast stores of biological knowledge and help pinpoint disease causing genes. We currently are applying these algorithms to infectious diseases, cancer and cerebral palsy. Our research is supported by a NSW Health Capacity Building Grant and the Cerebral Palsy Institute.

Our work on infectious diseases is a longstanding partnership with researchers at the Centre for Infectious Diseases and Microbiology (CIDM) at Westmead hospital. Our work on cancer occurs in partnership with researchers at the Lowy Institute for Cancer Research at UNSW. We have a number of projects, which are revealing the power of computer methods to aid discovery.

Our ground-breaking work on the higher order language of DNA continues to advance our understanding of the biomolecular mechanisms underlying the growing antibiotic resistance problem. In a paper in the prestigious *Bioinformatics* journal Dr Guy Tsafnat and Prof Coiera published a novel method to systematically sift through bacterial DNA sequences to find new mechanisms by which antibiotic resistance genes spread.

Dr Stephen Anthony, Dr Vitali Sintchenko and Prof Coiera developed a new tool for visualising networks of relationships in the biomedical literature. Publishing their work in *PLoS One*, they applied these visualisation methods to infectious diseases. Essentially sifting the entire corpus of papers available in Pubmed, they constructed a dynamic 'textbook' of infectious diseases. The networks allows researchers to visualise how organisms relate to diseases, show changing patterns of association over time and allows viewers to 'zoom' in from organism to gene. We have worked closely with the Cerebral Palsy Institute to customise this tool to assist CP researchers explore the literature and 'connect the dots' between CP syndromes and potentially undiscovered causal agents.

Using a grant from the Australian National Data Services, Dr Guy Tsafnat and Mr Vitaliy Kim have translated the group's earlier research on DNA languages into a free service to the microbiology community. The Repository of Antibiotic-resistance Cassettes (RAC) went public at the start of 2011 and will be officially announced at the 21st European Congress of Clinical Microbiology and Infectious Diseases in Milan, Italy in May 2011. Gene cassettes are bits of DNA that can move between bacterial organisms even of different species and are the most complex mechanisms for antibiotic resistance transfer. RAC provides a definitive listing of all known antibiotic resistance cassettes and offers a way for researchers to

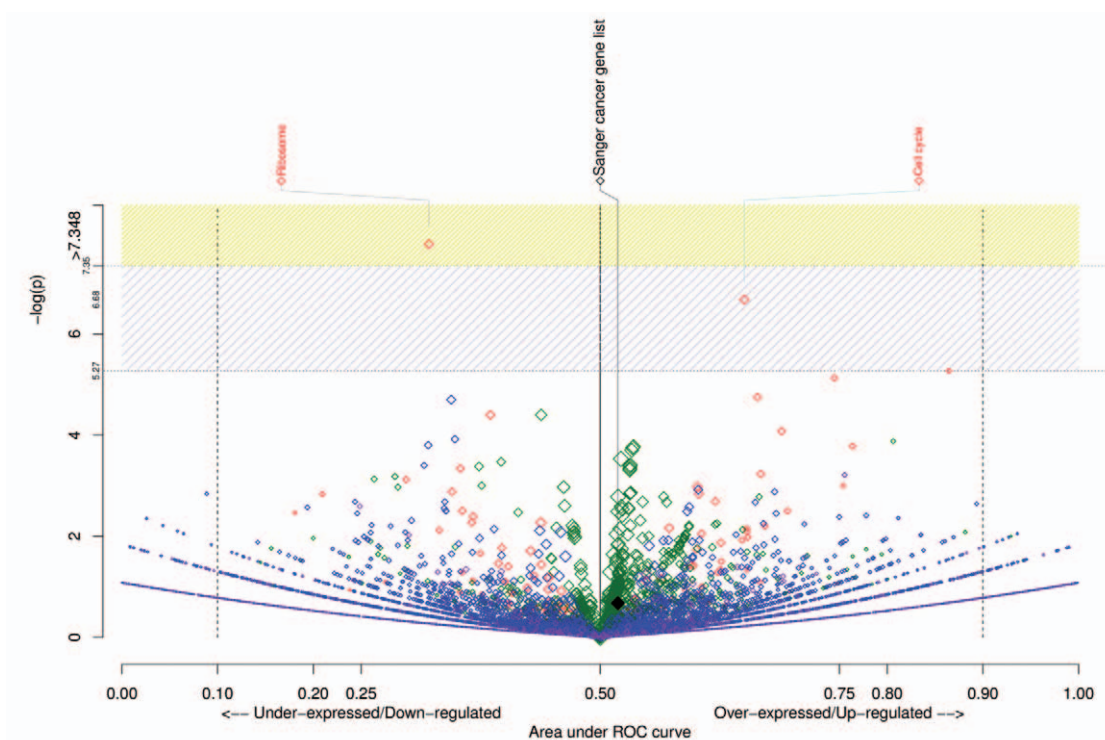


contribute new cassettes as they are discovered and free access to our grammatical annotation engine Attacca.

Dr Frank Lin, Dr Miew Keen Choong and Dr Guy Tsafnat won the first prize for a poster and presentation at the Annual International Conference on Bioinformatics and Computational Biology in Singapore, March 2011. The poster describes a prototype for a new literature based discovery system to interpret microarray assays – a cornerstone high throughput method used by biologists, in particular in cancer.

Dr Miew Keen Choong and Dr Guy Tsafnat published a review of the genetic and epigenetic markers of colorectal cancer. This systematic review paper will serve as an important benchmark for computational analysis systems used in cancer genetics.

Dr Vitali Sinchenko, Dr Frank Lin and Dr Guy Tsafnat presented well received seminars and posters at the 2011 American Medical Informatics Association’s Summit on Translational Bioinformatics in San Francisco.



Manhattan plot showing gene sets associated with breast cancer.

# Statement of Financial Performance

	2009	2010	Notes
	\$	\$	
<b>Income</b>			
External Funds	1,476,063	1,274,729	1
Faculty Contribution	551,051	610,921	2, 3
<b>Total Income</b>	<b>2,027,114</b>	<b>1,885,650</b>	
<b>Expenses</b>			
Payroll	1,960,887	2,126,319	
Stipend	66,488	61,942	4
Equipment	56,292	15,371	
Materials	209,600	247,775	
Travel	48,160	56,331	
<b>Total Expenses</b>	<b>2,341,427</b>	<b>2,507,738</b>	
<b>Operating result</b>	<b>(314,313)</b>	<b>(622,088)</b>	5
<b>Surplus (Deficit) Bfwd from Prior Year</b>	<b>919,769</b>	<b>605,456</b>	
<b>Accumulated Funds Surplus (Deficit)</b>	<b>605,456</b>	<b>(16,632)</b>	6
<b>Debtors</b>		<b>303,812</b>	

## Notes to the Statement of Financial Performance

- External revenue includes CHI component of the Institute of Health Innovation NHMRC Patient Safety Grant and CBIG Infrastructure Grant.
- Faculty contribution includes salary support for two academic and one general administration position.
- Faculty contribution also includes Fellow Enhancement and one Goldstar award in 2010.
- Stipends for two full time and one part time PhD students.
- The operating result is due to increased payroll as a result of overlap between start and end time for research grants and employment of researchers on these grants.
- The accumulated funds deficit is due to late payment of Debtors.

# Management Committee

## **COMMITTEE ROLE**

The management committee's role is to monitor the financial performance of the centre and ensure that the business objectives of the centre are pursued. The committee meets at least three times a year and meetings are properly minuted and distributed to committee members.

## **COMMITTEE MEMBERS**

Professor Denis Wakefield (Chair)

Professor Gavin Andrews

Professor Nigel Lovell

A/Prof Maurie Pagnucco (2011)

## **COMMITTEE MEETINGS 2010**

31 October 2010

30 November 2010

## **COMMITTEE MEETINGS 2011**

9 March 2011

14 July 2011

9 November 2011

# Staff



**Professor Enrico Coiera**  
Director



**Dr Tatjana Zrimec**  
Senior Lecturer



**Gerard Viswasam**  
Business Manager



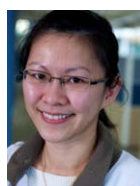
**Dr Farah Magrabi**  
Senior Research Fellow



**Dr Guy Tsafnat**  
Senior Research Fellow



**Dr Blanca Gallego**  
Senior Research Fellow



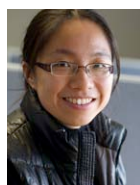
**Dr Miew Keen Choong**  
Research Fellow



**Dr Geoff McDonnell**  
Research Fellow



**Dr Hieu Phan**  
Research Fellow



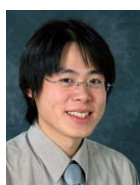
**Dr Annie Lau**  
Research Fellow



**Dr Adam Dunn**  
Research Fellow



**Dr Vitali Sintchenko**  
Conjoint/Visiting  
Research Fellow



**Dr Frank Lin**  
Research Fellow



**Denise Tsiros**  
Finance &  
Administration



**Danielle Del Pizzo**  
Administrative &  
Executive Assistant



**Oscar Perez Concha**  
Postdoctoral  
Research Fellow



**Janine McIlwraith**  
PhD Student



**Jason Thorne**  
PhD student



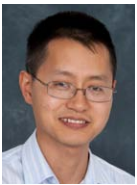
**Dr Simon Li**  
Research Associate



**Dr Stephen Anthony**  
Computational Linguist



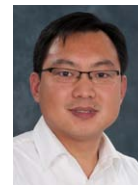
**Farshid Anvari**  
Software Engineer



**Vitaliy Kim**  
Java/Jee Programmer



**Mei Sing Ong**  
PhD Candidate



**Jingbo Liu**  
Java/Jee Programmer



**David Lyell**  
PhD Candidate



**Diane Rock**  
PhD Candidate



**Rosemarie Sadsad**  
PhD Candidate



**Zafar Hashmi**  
PhD Candidate



**Tian Erho**  
Research Assistant



**Tanya Vavilova**  
Research Assistant



**Elin Lehnbohm**  
Research Assistant

**Andrew Clayphtan**  
Programmer

**Noella Sheerin**  
Research Assistant

**Amanda Parker**  
Research Assistant

**Werner Van Huffel**  
Masters Student

**Kay Johnson**  
Research Assistant

#### Visiting Master Students

**Dennis Jasch**  
Heidelberg University, Germany

**Ann-Sofie Holm Henriksen**  
Aalborg University, Denmark

**Kasper Esben Kannik**  
Aalborg University, Denmark

#### Visiting Academic

**Dr Jos Aarts**  
Erasmus University, Netherlands

# Grants

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## Accelerating our understanding of the causal pathways to Cerebral Palsy with a computer supported discovery system

Funding Source:	Cerebral Palsy Institute	
Investigator:	Professor Enrico Coiera	
Funds:	2008	\$40,000
	2009	\$40,000
	2010	\$40,000

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## Computational Discovery of Cancer-Affiliated Lon-Range Methylation Sites

Funding Source:	Cancer Australia	
Investigator:	Dr Guy Tsafnat	
Funds:	2010	\$84,987
	2011	\$4,263

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## An International antibiotic-resistance gene cassette database

Funding Source:	Australian National Data Service	
Investigator:	Dr Guy Tsafnat	
Funds:	2010	\$60,000

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## Evaluating the safety of computer decisions support systems in general practice

Funding Source:	NHMRC	
Investigator:	Dr Farah Magrabi	
Funds:	2010	\$103,250
	2011	\$88,250
	2012	\$98,250

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## Patient Safety: enabling and supporting change for a safer and more effective health System

Funding Source:	NHMRC	
Investigators:	Professor Jeffrey Braithwaite, Professor Enrico Coiera, Professor Johanna Westbrook, Professor William Runciman and Professor Richard Day	
Total Funds:		\$8,400,000
CHI Funds:	2009	\$630,914
	2010	\$778,352
	2011	\$809,726
	2012	\$540,465

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### Capacity Building Infrastructure Grants Program

Funding Source: NSW Health  
Investigator: Professor Jeffrey Braithwaite  
CHI Funds: 2010 \$212,136  
2011 \$237,857  
2012 \$247,371

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### FACULTY RESEARCH GRANTS

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#### Discovering bacterial antibiotic resistance genes and transmission patterns using computational grammars

Funding Source: ARC Goldstar Award 2010  
Investigator: Dr Guy Tsafnat  
Funds: 2010 \$40,000

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Funding Source: UNSW Major Equipment and Infrastructure Scheme (MREI)  
Investigator: Professor Enrico Coiera  
Funds: 2011 \$98,137

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#### Comparative evaluation of personal and socially mediated approaches to online consumer health decision-making

Funding Source: Goldstar Award Faculty of Medicine, UNSW  
Investigator: Professor Enrico Coiera  
Funds: 2011 \$40,000

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science change analysis online **patient** tool study  
**informatics** surveillance evidence focus aging technology mining safe  
**safety medical model system** microbiology identity  
pattern **care hospital incident policy chi** modelling explore social biosurveillance cognitive  
**clinical consumer** management text translational simulation journal  
**bioinformatics research** search infectious datum knowledge  
complex control international trial gene method detection **disease**  
institute discovery university **health** internet decision association quality improve  
cancer national image **healthcare practice** retrieval human medicine  
computer information lung



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