

Science communication... it's an art!

Elizabeth Connor has spent the year in London studying for a Masters in Science Communication. She's home for the holidays and writes about her progression from science to communication and what the future might hold.



Elizabeth Connor – Science communicator

Here I am, sitting in a pool of sunlight warming my white winter legs at last, with a clear expanse of noiseless sky outside, the gentle press of jetlag on my senses and the vivacious smell of home. I have just arrived back in New Zealand today after a year and a bit in London doing my Masters in Science Communication at Imperial College. It feels like a good opportunity, before this vacant aeroplane-mind gets crowded with thoughts and I lose the sparkling new-comers view of home, to reflect on my journey so far.

To give you a brief life history: I was born in Wellington, went to Samuel Marsden College, did an honours degree in physics and maths at Victoria and worked a year for the MacDiarmid Institute of Nanotechnology and Advanced Materials as a journalist. I travelled round the country interviewing some of New Zealand's most innovative and successful scientists and learnt for myself what Kiwi ingenuity meant before heading to London for my Masters. From a very early age I was drawn to both science and art. I was inspired by the beauty of nature and in science I found a way to discover nature's deeper secrets. Through art I could express, explore and delight in nature's beauty. At school art was my best subject but it was totally separated from science – the departments were at opposite sides of the school with totally different methods and atmospheres and no communication between them. I felt

they had been sadly wrenched apart. I was quite young when I decided that I wanted to spend my life trying to bring them back together. To me they were the perfect pair – both relentlessly curious and creative, both looking for meaning in the world around – and I felt they needed each other. Science could offer art rich new worlds of concepts and images for exploration and inspiration and also keep it grounded in reality. Art could offer science methods of communication. It could help science overcome the limitations caused by specialisation by exploring the links between different fields and concepts and the social and cultural implications of science.

So, I embarked on my journey. I decided to start with science and move towards art. I enjoyed my physics and maths degree but it was a hard slog and by the end I felt that my creative side was suffocating. I longed to understand the concepts fully, link them together and explore their significance for people but there was never time. The department was very male dominated. I found that I worked in a different way to my male class mates. Although their marks weren't any better they seemed to have more confidence. When I got a job writing for the MacDiarmid Institute, I finally felt that I was coming into my own and bringing the science to completion – not just finding answers but expressing the life and character in it and its significance in society.

Paul Callaghan, the director of the MacDiarmid Institute and my former physics lecturer made me realise that 'science communication' could be the basis of a career and introduced me to some of its inspiring New Zealand pioneers. 'Do what you're good at' he said 'that's how you succeed' and this struck a chord. When I saw the website for the Imperial College Masters in Science Communication I knew it was for me and I set my heart on going. This left me the small problem of being accepted and finding 10,000 pounds for the fees. I think it was my sheer enthusiasm that got me a place on the course. Ten days before the course started, however, I still hadn't managed to find the money and had totally given up when I received an email saying there had been a late withdrawal from one of the scholarships and would I like 10,000 pounds to attend the course? I cancelled my life in Wellington, packed my bags and was there within a week.

From the first day of the course things began to fall into place. The department has set the ambitious task of

penetrating to the deeper philosophical, cultural and historical roots of science while providing the practical skills needed to enter the industry. I think they achieved their goal.

We made radio shows, wrote news and feature articles, designed exhibitions and websites, made documentaries, wrote dissertations and had around a month of work experience (I spent mine in the BBC Radio Science Unit). There were a vast amount of extra-curricular activities on offer – I helped present on a weekly science radio show, did design and writing for our award winning Imperial science magazine ‘Isience’ (<http://www.union.ic.ac.uk/media/isience/>), filmed for an entertainment show and presented a strand about science and the arts for the 2006 BA festival of science webcast (www.sciencelive.org). There is still a constant bombardment of emails offering jobs for graduates of ‘the course’ as it is called in the industry.

But, the most important thing about the course for me was the opportunity to formulate and address questions which had been growing throughout my degree, and to receive positive feedback. What is the place of creativity in science? What is the relationship between science and religion and why do they appear to conflict? Why did my creative side feel stifled studying science? Why am I the only girl in my class? Is there a relationship between the dominant scientific models and the way we think and behave? Is there such a thing as objective truth and is science more qualified to find it than religion or art?

The course offers the space to explore the areas that personally interest you and the tutors, who have a wide range of both industry and academic experience, were open and responsive to our individual interests. We were encouraged to examine critically the culture, methods and media portrayal of science as well as its implicit values and limitations.

During my year in London my world has expanded. A myriad of open doors have appeared around me and my dream of bringing science and art together has been affirmed and found direction and strength.

Strangely enough, out of all my experiences in England, one of the most inspiring was a NZ one. Earlier this year a group of Kiwis involved in the ‘Are Angels OK?’ collaboration between New Zealand scientists and writers gathered in London to celebrate the publication of the book, and I was invited. On the top story of New Zealand House perched above the city, the reception was like a breath of fresh New Zealand air. I listened to Witi Ihimaera, Paul Callaghan and Jo Randerson and talked to Glenda Lewis from the Royal Society of New Zealand and Kim Hill and what struck me was how open, free spirited and interested everyone was. We were talking about the kind of thing we covered in my course but it was as if the mental barriers had been removed. Collaboration between artists and scientists was possible because people were open to it – exploring and interested. I was really inspired. I could feel the potential for New Zealand to be a world

centre for this kind of work and I knew that these were the people that I wanted to be working with.

Flying into Wellington yesterday, I looked at the wind-battered cliffs of the south coast and thought – ‘I’m going to live there!’ My heart is in New Zealand and in the long run my home will be too, but in the mean time I feel I’ve got a lot to learn overseas. I’m applying for jobs in London, but for now it is summer, the mountains and waves are waiting and my lungs ready for a good draught of that New Zealand air.

Driven Research

Carrie Innes was a finalist in the Royal Society of New Zealand Emerging Scientist Competition with a poster based on her PhD research.



The full driving assessment rig at Burwood Hospital. The picture shows the participant undertaking one of the cognitive tests (Visual Search) that Carrie developed during her PhD.

The aims of my research were to design computerized tests of cognitive functions critical to driving and determine the predictive value of the cognitive tests, in conjunction with a battery of sensory-motor tests, for driving in persons with brain disorders. The study showed that the cognitive and sensory-motor tests were able to differentiate between persons who subsequently failed or passed an on-road driving assessment. Sixty-four percent of the people in the study (referrals to a hospital-based driving assessment service) failed the on-road assessment due to near-misses or definite safety concerns. An accurate off-road estimation of driving ability will minimize the need for unnecessary and potentially dangerous on-road assessments. The test battery also identifies physical, perceptual, and cognitive deficits underlying an inability to drive safely.

Following completion of my PhD, a little certainty came into my life when I was awarded a Canterbury Medical Research Foundation Fellowship to support my research at the Van der Veer Institute for Parkinson's and Brain Research in Christchurch for the next three years. The fellowship will allow me to continue my research into the assessment of deficits following brain injury or disease and to begin a new area of research focusing on the characteristics of brief lapses of consciousness or responsiveness ('microsleeps') during monotonous tasks encountered by people in high-risk occupations such as truck drivers, pilots, air-traffic controllers, and surgeons. Although still a growing Institute (~25 staff and students based in the Institute), things are really looking up for research at the Van der Veer with the arrival of a 3T MRI scanner – exciting times ahead!

Although things are going well now, there was a time when I nearly gave up on science completely. At the completion of my MSc in Neuroscience, I felt anxious faced with a future of relatively lowly paid, fixed-term, grant-reliant research jobs. For some reason, completing a PhD felt like an unachievable goal and I lacked confidence in my ability to take on the career of a scientist. Considering all the great female role models in science I had had throughout my life I now wonder whether my self-doubt was due to being a woman going specifically into a scientific career or whether I would have felt the same way about taking any academic pathway? Because, lets face it, there are much easier ways to earn a living than research whether scientific or otherwise. Recently, I came across an interesting perspective on women in science from Philip Greenspun (<http://philip.greenspun.com/careers/women-in-science>). He commented that adjusted for IQ, quantitative skills, and working hours, jobs in science are the lowest paid in the United States. He goes on to suggest that the dearth of women in science may be due to the fact they found 'better jobs'. He could be partly right – trouble is, even with the stress of finding funding, getting papers published, and fitting family around career, I still can't think of a job I'd rather do.

Jilly Evans: A Crusader for Woman in Science

The Canterbury AWIS group had the great pleasure in September of meeting Jilly Evans, Vice President of Amira Pharmaceuticals, San Diego. Thanks to Sarah Hunger for writing this summary.

Jilly is a hugely successful career woman in biopharmaceutical science, mother of 2 twenty-something boys, an ex-pat kiwi and has a huge passion for the promotion of women and other minority groups in science. Her impressions of the industry after this visit have left her with the knowledge that we still have a long way to go to reach our goal of a family-friendly, equal-rights workplace that values diversity. Luckily for us, she is planning to return to New Zealand in the future to help us improve this situation!

Jilly's career began at Auckland University, where she achieved her doctorate, and after which she traveled to Montreal with her husband for a post-doctoral position. Working under highly influential Canadian biochemical scientists at McGill University placed her in a strong position for a career in the pharmaceutical industry. She commenced her biopharmaceutical career as Director of Cardiovascular Diseases at Merck & Co. Jilly then went on to produce two high profile pharmaceutical products (SINGULAIR™ and VIOXX™). Although she set herself a goal to become Vice-President at Merck & Co., she confessed that her strong morals sabotaged her progress as she refused to compromise her team for self-promotion. From this experience, she also acknowledged the importance of planning out a comprehensive strategy to meet career goals. After leaving Merck & Co. she went on to co-found her own highly successful, multi-million dollar company, Amira Pharmaceuticals.

Jilly shared some wonderful experiences with us and imparted her top ten tips for success.

Jilly's Top Ten Tips

1) Have passion for your work.

"There is no cure for birth and death, save to enjoy the interval" (G. Santanyana)

2) Continually learn new skills and gain work experience.

3) Network:

Make friends and mentors.

Provide support and encouragement to others.

4) Aim HIGH and celebrate your successes (but remember to forgive yourself for your failures).

5) Reassess priorities often.

6) Embrace new challenges and be a CAN DO person.

7) Don't sweat the small stuff.

Be professional but persistent....

8) Take advantage of serendipity.

"Chance favors only the prepared mind" (Louis Pasteur)

9) Strive for excellence.

10) Have fun!

Jilly was a delight to meet and quickly earned our respect and favour with her vivacious personality and generous nature (she even shouted us all a round of drinks!!). She took the time to discuss our career goals with each of us and encouraged us in our ambitions. It will be a great day for women in science, not to mention science in general, when she finally returns to New Zealand.

Marsden Success!

Many thanks to Don Smith at RSNZ for his help in contacting the Marsden recipients for this year. There were 33 women PIs this year out of 112 PIs overall, so the proportion who are women is 29.5%. A total of \$39.1m was awarded. Congratulations to everyone who was successful in gaining Marsden funding.

Optical coherence tomography and fluorescence for next-generation in vivo imaging.

Frederique Vanholsbeeck.

University of Auckland
140K Fast start



I am originally from Brussels (Belgium) where I studied Physics for 4 years after 2 years of Architecture and a Diploma in Teaching. Still in

Brussels, I worked towards a PhD degree in nonlinear fibre optics. During that time, I kept dreaming of travelling. So when my partner had to decide what to do next, it was obvious that we wanted to go overseas. Right at that time, my partner was offered a position at The University of Auckland. I landed in New Zealand on a sunny day of December 2003.

As we were both working in the same field, it was hard for me to get a position and I had to reorient my research. I decided to combine my knowledge of photonics with my passion for bioscience which was the subject of my MSc thesis and started to work in the new field of biophotonics, i.e., using laser technologies for the study of biological processes.

An important step in diagnosing and treating diseases is medical imaging - being able to actually see what is going on inside tissues and complex organs inside the body. In recent decades, imaging techniques have had a profound impact on our knowledge of the human body, resulting in early diagnosis, and more localised and less invasive treatments, saving many lives in the process.

Two modern imaging techniques are optical coherence tomography and fluorescence imaging. Optical coherence tomography uses low coherence light to provide structural three-dimensional images of tissues at the cellular level, while fluorescence imaging uses fluorescent dyes to reveal what specific cells are actually doing. Both can be used in vivo and dynamically to reveal the inner working of complex organs in real time.

In this context, I have been awarded in September 2006 a Fast-Start Marsden grant with the aim to integrate, for the first time, the images from these two technologies. The Fast-Start programme is an initiative to give emerging researchers an opportunity to explore an innovative idea, developing their capabilities and helping them establish their research career. With this grant, I intend to develop a new imaging probe that will use both optical coherence tomography and fluorescence imaging, together in a single instrument. This will simultaneously reveal structural and functional information, offering revolutionary new insights into the microscopic physiological processes occurring in complex organs, such as the heart.

In addition to the development of the probe, the research project involves collaboration with a European hospital where experiments are in progress involving the recovery of heart tissue damaged by heart attacks. The probe will be used to study the recovery process in detail. Other potential applications of this technology range from novel surgical procedures, to minimally invasive biopsies.

On top of combining my passion of travelling with my interest in physics, I now try to fulfil my love of architecture. To this end, doing some work in our newly bought home to make it the dream place for our newly born Kiwi boy seems the perfect option.

How do we know that we are hungry? Unravelling the molecular basis of sensing amino acid starvation.

Evelyn Sattlegger.

Massey University
745K



Even as a child I enjoyed uncovering why and how something works a certain way. And I am still doing the same at work, studying in detail a certain biological process, and studying the consequences

when this process is altered. My interest is in nutrient starvation and other stress conditions. I aim to uncover how cells sense stress and starvation, and how this information is processed further such that the cell can adjust quickly and optimally to the constantly changing environment.

Amino acids are particularly important nutrients, because as constituents of proteins they execute almost all biological functions. Two particular proteins, GCN1 and GCN2, are evolutionary highly conserved and are essential for every Eukaryotic cell - from baker's yeast to humans - to detect amino acid hunger. Interestingly, recent findings suggest that GCN2 has additional functions in e.g. feeding behaviour, long term memory formation, defending viral infections, and the immune system. So far the exact mechanisms of GCN2 action remain obscure, and the role of GCN1 has not been explored. In order to unravel the processes involving GCN2/GCN1, we first need to understand how GCN2 executes its universal cellular function, *i.e.* sensing amino acid hunger. We are studying the exact molecular functions of GCN1/GCN2 by using a simple eukaryotic model organism, baker's yeast. Yeast allows comprehensive studies as it is amenable to many molecular, biochemical, cellular and genetic techniques which we all employ. To the end, we will apply these findings to higher eukaryotes. E.g. in collaboration with international collaborators we have identified a brain protein that regulates GCN2.

It is intriguing to me that our basic research promises to be of value to applied sciences. For example in health in disease involving GCN2, finding measures against neurological disorders (e.g. Alzheimer's disease), rejection of organ transplants, eating disorders, drug side effects, the virulence of eukaryotic pathogens. Furthermore, as amino acids are crucial for protein synthesis and cell growth, knowledge about GCN2-function may aid in the improvement of organisms used in the biotechnology sector for producing proteins or other compounds, beer or food.

I was born in the USA, grew up in Germany, studied Biology at the University of Hannover (Germany), went to the National Institutes of Health (USA) for a postdoc, and finally moved to New Zealand to become simultaneously researcher and teacher. I love nature and wildlife, thus New Zealand is the ideal country for me. My advice is to believe in yourself, make your passion your profession, and you will do well. I enjoy my work very much, however, I picture myself as being successful when I have equipped my students with knowledge such that they can pursue successfully their career, whatever that may be.

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CSI: New Zealand! The meanings of DNA evidence.

Victoria Grace

The University of Canterbury
624K



Science is about knowledge. I first became interested in research as a community development worker in my home town. I was curious about a process I saw happening over and over again when initiatives or ideas for community development would be either endorsed or rejected by experts on the basis of 'research has shown...'. I could see that the status of 'science' or 'research' inevitably went unchallenged when people did not know how to critically question its validity. I went back to university to try to understand what is research really about, how does scientific knowledge justify and validate its knowledge claims, especially in the domain of social and human sciences.

As a social scientist, I am mainly interested in fundamental questions about how we can make claims to knowledge about psychosocial processes involving human beings. The knowledge claims we make do have influence in the world of policy and action, so how they can be validated matters. As a *critical* social scientist, I work with approaches to knowledge that insist that knowledge is grounded in action, and is contextual (it is not abstracted from our intentionality, not dislocated and 'objective'). Given that much of science assumes otherwise, I am interested in analyzing critically how the objects of inquiry in science are constructed, and how this construction intersects with public understanding of science. In other words, how does knowledge originate, how does it circulate, how is it political, how do we evaluate it?

In particular I am interested in gender and the biological sciences. So this means exploring how biology *theorizes*, and how the life sciences build concepts related to important fields such as genetics. Examples of my recent work include investigating understandings of genetic inheritance in the context of gamete donation, understandings of genetics and causality in human genome epidemiology, the construct of pain without organic pathology in pain medicine, notions of sexual dysfunction in sexology. My current project is a team-based research project to find out how both professional experts and the lay public understand the use of DNA technology in the forensic context in the formation of evidence. All of these topics involve fundamental questions related to the construction of scientific knowledge, as these work in specific domains of social action.

My academic work is utterly integrated into my life. I am passionate about pursuing questions and simply could not imagine life without this focus and intense intellectual involvement. I enjoy wine and good food, walks in the countryside, skiing holidays, boating in the summer – but wherever I am, and pretty much whatever I'm doing, questions about knowledge, about culture, about science, about environmental issues, about futures, are never far away from my thoughts and discussions with my partner or friends and colleagues. I am thoroughly immersed in my work and could not imagine wanting to do anything else!

Genius in the gallery: Literary authors as parliamentary reporters.



Nikki Hessel
Massey University
140K Fast Start

If you could choose a famous author to report on politics and parliament, who would it be? Charles Dickens perhaps? Or maybe Samuel Johnson? These two authors are part of a small group of prominent literary writers who worked as parliamentary reporters during their careers and yet very little research has been done on their reports. It has always surprised me that researchers aren't more interested in the journalism produced by major literary figures—after all, it provides exciting evidence about how they wrote and which current events caught their imagination. Journalism of any kind has typically been regarded as a waste of literary talent, researched only in order to shed light on the more valued literary productions of an author. As a sub-genre of journalism, parliamentary reporting poses even greater challenges to traditional definitions of worthwhile writing. Not only are the reports part of the commercial enterprise of the newspaper business, they are often simply an account of someone else's words. But by ignoring the parliamentary reports that these writers produced we might be missing out on crucial evidence about the careers of some expert witnesses to history.

I started studying English at university simply because I was good at it at high school. As each year went by, I became more and more interested in improving my writing, learning about new authors and texts, and becoming a better literary critic. Studying literature makes you aware of a whole world of interconnected ideas that cover not just writing and reading but also history, culture, societies, and communication.

My Marsden research in 2007 and 2008 will focus on the parliamentary reports of Johnson and Dickens, although the project in the long-term will also include analysis of reports by the poet Samuel Taylor Coleridge and the New Zealand novelist and poet Robin Hyde. I have been fascinated by the relationship between journalism and literature since I wrote my PhD dissertation on Coleridge's

journalism. I was lucky enough to have two wonderful women mentors in my academic career: Heidi Thomson at Victoria University of Wellington and Heather Jackson at the University of Toronto. Heidi and Heather both encouraged me to work with old newspapers as sources of information. I now spend a lot of my time hunting through copies of daily papers (some more than 250 years old) searching for clues about writing, authorship, publishing trends and reading habits. It's addictive—once you've found a new piece of writing that no-one has ever spotted before or figured out what motivated an author to produce a particular work, you just want to keep searching for more hidden treasures.

When I'm not working on my research I can usually be found reading, watching films or following soccer and cricket. I try to keep my work quite separate from my home life and almost never take research home with me.

A causal model for resource estimation of Web projects.

Emilia Mendes
The University of Auckland
140K Fast Start



Resource estimation is the process of predicting and allocating resources effectively such that software and Web projects are delivered on time and within budget. Resources represent factors (e.g. cost, effort, quality, 'problem size', tools, team size, technologies) that

have a bearing on a project's outcome, and reliable resource estimation of Web projects is one of the cornerstones of good Web project management. However, despite its importance, currently we do not as yet have a thorough understanding of what factors affect a project's outcome, the causal relationships between these factors and the uncertainty associated with such relationships. In addition, within this domain, the causal relationship between factors is not deterministic. E.g. assuming there is a relationship between development effort and an application's usability, it is not necessarily true that increased effort will lead to improved usability. However, as effort increases so does the *probability* of improved usability.

The goal of this research is to construct and validate a large-scale Bayesian Network (BN) that incorporates all the fundamental factors related to resource estimation of Web projects, their relationships and associated uncertainties. A Bayesian Network is a model that embodies existing knowledge of a complex domain in a

way that supports reasoning under uncertainty. Large-scale Bayesian Networks combine the advantages of an intuitive representation with a sound mathematical basis in Bayesian probability.

My own interest in resource estimation of Web projects started 7 years ago when I joined the University of Auckland as a lecturer, after completing my PhD in Computer Science from the University of Southampton (UK). Since moving to Auckland I have investigated in depth effort estimation, one of the main areas within resource estimation, using several techniques for effort estimation and proposing new metrics to size Web applications. The results of my research have been applied to numerous Web companies in New Zealand and overseas, and the Marsden grant will provide an opportunity to widen my research in resource estimation of Web projects.

In addition, I have been a software developer and project manager for 10 years, before heading to the UK in 1995 to commence my PhD. I chose Computer Science as I believed it would be a thrilling area to be in, and, 20 years later, I have not regretted it.

I was born and raised in Rio de Janeiro and have moved to New Zealand 7 years ago with my husband. Apart from my work, I also like very much to walk, read and paint.

Biological Bouncer!

Dr Rachel Anderson, from the Food, Metabolism & Microbiology Section of the Food & Health Group at AgResearch Limited, was recently awarded a FRST Postdoctoral Fellowship for her project "Keeping the gut microflora at bay; cross talk between the guardians of the epithelium?"

I have always been interested in how the human body works, and I can not think of a better way to spend my time than trying to understand how we function in order to improve peoples' health. My research focuses on the gastrointestinal barrier



which is the largest interface between us and our environment. The gastrointestinal barrier acts as a "biological bouncer" that protects our bodies from the entry of disease-causing bacteria and antigens, so its integrity is fundamental to the delicate balance between health and disease. This integrity is disrupted during emotional stress, aging, and gastrointestinal diseases and infections (e.g. inflammatory bowel diseases, irritable bowel syndrome and food poisoning).

Although the importance of the gastrointestinal barrier is well recognised, the mechanisms involved in the

preservation of this complex system are unknown. The hypothesis of my research is that molecular interactions between commensal (resident) bacteria, intestinal epithelial cells and immune cells are critical in regulating the gastrointestinal barrier. The aim of my research is to understand this "cross-talk" between the different cell types. My project differs from existing research because it will be focussing on the anaerobic bacteria. Anaerobic bacteria account for 99.9% of the bacteria in the gut but they are not easily studied because they cannot survive in the presence of oxygen. The knowledge gained from my research will be used to develop novel functional food products that have a sound scientific-basis to reduce the incidence and symptoms of inflammation and maintain intestinal health. Such products could be used by people who wish to improve their general intestinal function, in situations where the gastrointestinal barrier is impaired such as during emotional stress, or by patients with intestinal disorders like inflammatory bowel diseases.

I always wanted to be a research scientist. I just did not know that was what it was called. At high school, I enjoyed physics and maths so I decided to do a BTech degree at Massey University to apply these skills. I was originally enrolled in the Environmental Engineering option but a few days before classes started, while waiting in the queue to get my enrolment form signed, I was attracted to a picture of a DNA molecule on the pamphlet advertising Biotechnology and decided to change options. This turned out to be a good move because I discovered that my real passion is biology.

I first realised that I wanted a career in research during a summer internship at HortResearch where I purified anthocyanins from berry fruits, and after doing my 4th year project on isolating antimicrobial peptides from ovine blood, I decided to continue and do a PhD. During my PhD, I was lucky enough to spend four months at the University of British Columbia working with Professor Robert Hancock who is a leading microbiologist and one of the founders of the cationic antimicrobial peptide field. I was able to learn new techniques and use state of the art equipment to determine the mechanisms of action used by my antimicrobial peptides to inhibit micro-organisms. My PhD project resulted in the capture of IP which will be used to create value-added products for the NZ Meat Industry.

I believe one of the most important skills we can have as scientists is the ability to communicate our research findings. There is no use in making important discoveries if we do not successfully inform people of them so that the knowledge can be used and everyone can benefit. I was very pleased to win the Best Postgraduate Student Poster Prize at the New Zealand Institute of Chemistry Conference in Nelson in 2003, and more recently the Best Young Investigator Poster Prize at the International Conference on Nutrigenomics and Gut Health in Auckland in 2006. Currently, at AgResearch, I am further developing my communications skills by organising a regular presentation practice group for the Postdoctoral Scientists and PhD students.

Screening for Pregnancy Endpoints - The SCOPE Study

A landmark international study called SCOPE (Screening for Pregnancy Endpoints) is hoping to make pregnancies safer for future mothers and their babies. The main aim of the project is to develop novel tests that predict early in pregnancy which women will develop the three major complications of late pregnancy. **Robyn North** very kindly prepared this article for AWIS.



Robyn North and Lesley McCowan

SCOPE is led by Associate Professor Robyn North, in collaboration with Associate Professor Lesley McCowan at the University of Auckland, and is funded by the Foundation for Research, Science & Technology and the Health Research Council. They lead a team of 18 professors around the world, and a team of over 25 in New Zealand including research midwives, lab technicians,

scientists, students and bioinformaticians.

Preeclampsia (a severe hypertensive complication), small for gestational age infants (babies who are undernourished at birth) and spontaneous preterm birth complicate almost one in five first pregnancies, and cause deaths and ill-health in mothers and babies worldwide. Four thousand New Zealand first time mothers are affected by these conditions annually and about 200 babies are stillborn or die in the newborn period as a consequence. Children born premature or growth restricted may suffer from neuro-developmental delay and are at increased risk of cardiovascular disease and diabetes as adults. The associated human and economic costs are enormous. Lesley and Robyn are both clinicians who have cared for women with these conditions for over twenty years and seen the heartache for families. If women at risk were able to be identified in early pregnancy, then interventions could be offered that may prevent the conditions occurring.

Aims of this research

- to discover patterns of proteins circulating in maternal blood associated with abnormalities in the placental blood supply and later pregnancy complications
- develop early pregnancy screening tests based on clinical risk factors and/or biomarkers that predict the three major diseases of late pregnancy
- to incorporate these tests into every woman's antenatal care

Key facts about late pregnancy complications

- preeclampsia affects 5 per cent of first time mothers and this figure is growing due to more first time mothers in the population and obesity
- globally, approximately 70,000 women die each year from preeclampsia
- 1 in 10 pregnancies produce growth restricted babies
- 1 in 10-15 babies are born premature

These diseases present in the second half of pregnancy and at present there is no way to predict which first time mothers and babies will develop them. Many single biomarkers (biochemical markers such as plasma proteins) known to be associated with these complications can be detected in early pregnancy, but to date none has proven to be a clinically useful screening test. It is likely that novel combinations of clinical risk factors and/or biomarkers will accurately identify which first-time mothers are at high risk of developing these diseases.

More than 1900 pregnant women in Auckland and Adelaide are participating in SCOPE so far, and recruitment will begin in England and Ireland in 2007. Participants are seen at 15 and 20 weeks of pregnancy when a detailed clinical history about risk factors is taken, specimens of blood and urine are collected and a scan to measure blood flow to the baby is performed at 20 weeks. The specimens are stored in the unique SCOPE pregnancy biobank and are being used to discover novel tests to screen for these pregnancy complications. Biomarkers are being identified using several approaches, including proteomic and metabolomic research. In Auckland, proteomic technologies are used to 'fingerprint' proteins in blood to identify novel sets of proteins in women who subsequently develop these complications that are not found in women who have healthy pregnancies. The bioinformatics SCOPE team apply advanced statistical modelling and knowledge engineering methods to identify novel disease specific patterns in blood proteins. It is anticipated this research will result in new methods of predicting these severe pregnancy problems. By improving understanding of the pathogenic mechanisms, this research has the potential to also lead to new treatments for the prevention of these pregnancy diseases.

SCOPE is a team effort involving many women researchers both in the clinical study, biobank management and research to discover novel biomarkers. It is hoped the project will lead to development of reliable tests that will be incorporated into routine pregnancy care to improve the outcome for future mothers and their babies.

More women who are ≤ 16 weeks in their first pregnancy are needed to participate in the SCOPE study, which aims to recruit 2500 Auckland women. If you can help or would like more information about SCOPE please either call (09) 308 2300, visit www.scope.net or email us at scope@auckland.ac.nz

Genethics Essay competition

Now in its third year, the Genethics competition is sponsored by Toi te taiao: Bioethics Council, the New Zealand Organisation for Rare Disorders (NZORD) and the Royal Society of New Zealand. The activity is an innovative competition that provides secondary school students with an opportunity to discuss ethical issues associated with human genetics research. Students are provided with a scenario which requires them to make a judgment based on scientific and ethical reasoning. The top seven essayists are selected and brought to Wellington to present their arguments where they are then assessed on the basis of their presentation.

Scenario 2006

Babies' best interests or mothers' choice? Which should prevail?

Four new mothers sitting together in the maternity day room and proudly nursing their wee babies were approached by the nurse to discuss the newborn screening programme for metabolic diseases. "It's time for the Guthrie Card test", said nurse Alison. "I'm sure you heard about this at ante-natal classes. It checks for hidden diseases that might show up in infancy in your baby. The tests on the blood spots taken from the heel-prick can warn about some serious diseases and allow treatments that may save baby's life or prevent serious long term health and disability problems if we know about it soon enough".

Nurse Alison talked about the diseases that are checked for, handed out the consent forms and brochures from the National Testing Centre, and said she'd be back in an hour with the lab technician to collect their consent forms and take the samples from the babies.

The conversation in the room changed from their birth experience and their aspirations for their child, to talk about health problems that might have to be faced. Sally and Moana both took the form and signed the consent to the samples being taken. Both said they wanted the best health possible for their baby and thought the test was a great idea to guard against serious health problems. "It will hurt my baby and I don't want to see her cry, but it is worth a few minutes of discomfort to guard against some very serious diseases", said Sally. Moana agreed. She had been reading about ill health and unexplained deaths in newborns before the first of these tests was introduced in the 1960s and was pleased to know that some of those risks could be guarded against.

Jude, on the other hand, took a different view. "I think there is too much emphasis on the negative side of health. If we concentrate on wellness and channel positive energy to our child along with the best nurture and good nutrition, we can prevent ill health from occurring", she said. "The chance of my baby being affected by one of these diseases is so remote I don't think it is worth the discomfort of a heel-prick even for a few moments. I think the test will break the special aura my baby has and I don't intend to

give consent for the test. Besides, our families have never had one of those diseases occur in many generations, so I think my baby is not at risk".

Lynne was also hesitant but for different reasons. She too had been reading a lot about children's health and eagerly followed debates about how research was increasing medicine's ability to detect and treat diseases. "Well I certainly will be signing up for my baby's test, but I want more tests done than the seven on the list. I want them to test for every known condition that might impact on my child, so I can give her the best chance in life. I think it's only fair that if more conditions can be tested for, then they should do all those tests".

Entrants were asked to discuss the following questions in their essays.

Do you think Jude should be free to refuse consent for the heel-prick test on her newborn baby?

Do you think Lynne is entitled to have all available tests done from her baby's blood sample?

New Born Screening

Sasha Srivastava was the winner of Genethic's with this essay.

Medicine's aim is maintenance of well being and sustenance of life. Starting early, addressing issues upfront is what newborn metabolic screening (NBMS), does. The Guthrie Card Test forms the basis of NBMS. Blood drops collected from a pin-prick to the side of a baby's heel onto absorbent paper. Dried blood spots are subjected to mass-spectrometry where individual molecules are separated by weight. Additional to identifying compounds by mass, quantity also is revealed.

In inherited metabolic diseases, specific enzymes that facilitate breakdown of amino-acids, or oxidation of fatty-acids to energy, do not function, resulting in accumulation of metabolites. Once in excess these become poisonous. The metabolites are identified by the mass spectrometer, indicating likelihood of metabolic abnormalities.

New Zealand Newborn Metabolic Screening Programme tests about 55,000 babies' per-annum. Guthrie Card Tests are carried out 48-72 hours after birth. Approximately 30 abnormal cases are found allowing timely corrective action, preventing mortality or life-long disability.

Objective of NBMS is to pick-up rare metabolic diseases early, allowing treatment initiation before irreversible neurological damage, mental retardation, organ-damage occurs. Timeliness is paramount in preventing morbidity & life-long disability. 1:1500 babies will have a disorder detectable by NBMS. 5% of Sudden Infant Deaths are attributable to undiagnosed metabolic conditions. Parents with no family history, even earlier having had healthy children can still have babies with abnormalities. This is more often the case, besides babies with disorders seemingly appear normal. Family history of abnormalities

is not generally found because these conditions are Autosomal-Recessive. Metabolic abnormalities can sometimes result from spontaneous mutations.

In some instances even if treatment and support systems for a condition are not established, knowledge of a condition can help in family planning issues. Overall, whilst weighing the possibility of adding a condition to routine-screening profile, consideration of all costs versus not including it, must be made.

DNA testing examines protein sequences that form genes, confirming or refuting a genetic condition or a possible pre-disposition to that condition. Extensive though our Genetic knowledge, not all possible mutations causing abnormalities have been identified. Example, Cystic fibrosis has over 1000 detected mutations; newer forms could be missed. Metabolite testing, cheaper, simpler, more amiable to routine mass application, detects the presence & quantity of abnormal metabolites. Multiple substances are screened for simultaneously. Futuristically DNA Micro-Array technology is likely to become inexpensive and applicable for Newborn screening.

Paediatric Society of New Zealand has recommended "Expanded" Newborn Screening. This implies use of Tandem Mass Spectrometer (MS/MS) which detects Amino-acids and Acylcarnitines.

Starting with antenatal sessions NBMS is introduced to the mother-to-be. Screening is offered to all NZ newborns free-of-cost. Pre-test information and health-professional face-to-face counselling is available. Screening is strongly recommended, followed by an informed consent form, worded in simple understandable language, being presented for signature to the mother. Alternatively Oral concurrence is recorded in a Register.

In NZ the right to be fully informed and then make an informed choice about any medical procedure is engrained in the Code of Health and Disability Consumer Rights. Informed Consent is viewed as a process rather than a single-point-in-time-action, culminating in a signature on a form.

Being adequately educated and informed about NBMS, NZ recognizes that an individual mother is in a unique position to decide whether a test is in their interest or not. A mother in making a "Surrogate choice" on behalf of her baby has the right to choose whether or not she wants her baby screened. However there is current on-going debate on whether consent for NBMS is necessary.

The situation for NBMS in the United States is different. With exception to two States NBMS is mandatory, by Law.

Having been adequately educated and informed about the objective of NBMS, Jude refuses testing for her baby. By so doing she is leaving open the chance for an existing condition remaining undetected. Her baby could die suddenly or be effected life-long by severe debilitation. Faced with a major health crisis in her baby, Jude will then

approach the State Health Board, demanding treatment. When that does not help her baby will fall into life-long welfare support and dependency at horrendous cost. This scenario is nothing short of catastrophic for the baby, parents and Society as a whole. All of this avoidable by a non-invasive test without adverse side-effects, no personal cost. Infact just a timely pin-prick.

When Jude's City Council decides more money is needed for improved garbage collection and drainage, her rates will go up. She will not have the option of opting for dirtier streets. Auckland roads need major development. Jude pays a 5 cent per/litre tax on petrol. She is not offered an option to sign an undertaking that she will never use Auckland roads and not pay that levy. Yet when it comes to averting the possibility of major health issues for her baby, Jude has a choice? On the face of it NBMS should not be an issue open to consent. NBMS is clearly in the best interests of baby.

When asked for consent, Jude consciously or unconsciously makes a Gain-Loss calculation. The gain obviously is confirmation of not having any abnormality. Loss is learning that baby does. She probably wonders if learning the good news is worth risking, hearing the bad!

Delve deeper and we arrive at the concept of Autonomy – "the individual-right-to-choose." NBMS after all has not been sought. It has been offered. Jude's mental capacity is not diminished. Her reasoning as far as she is concerned is good. Why should it be struck-down because it is *perceived* to be incorrect?

Denying the possibility of disease in her baby, Jude enters the realm of "DENIAL"-the "aura" she refers to. Denial is a critical, yet fragile component of well-being. Should it be disregarded? Most people are not risk averse but LOSS averse. When faced with a certain gain they tend to view aspects positively. But when the possibility of a loss or adverse outcome is considered, people sometimes, sub-consciously, back away.

I personally will allow screening. I recommend it to all mothers. I consider it foolish not to test. But I would not want to be *forced* into anything. And that is why I respect the option of making an informed choice as opposed to not having my views, no-matter how flimsy, considered, in a matter where I am the focus.

Respect Jude's choice., we must. Then probe and explore her reasoning. Address her insecurities and misunderstandings in the matter. Persistent refusal should be honoured but also not treated as "end-of-discussion." Further effort in convincing Jude that the principle of Beneficence as applicable to her baby clearly favours testing and that she is only providing Surrogate-Consent should be made. That said, Jude's right-of-choice should stand supreme. Individual right-of-choice is as fundamental as individual right-of-existence.

Tandem Mass Spectrometry is fast advancing. Currently 50+ conditions can be detected. Several have no treatment and when detected will serve no purpose other than

provoke anxiety. However it makes sense to test for all conditions that do in fact have some treatment avenue available. Albeit these conditions are rare, even so if present, there is gain in early detection. Lynne wants to take no chances with the quality of her child's health, wanting "all" detectable conditions to be tested for. "ALL" conditions falls outside the per-view of criteria for inclusion in even Supplemental Testing profiles, however carrying out a more extensive screening will ideologically foster well for her baby.

In a mass state funded program there are limitations of cost. Lynne must realize that if there is the slightest indication suggestive of any condition, her Paediatrician will pursue it. Lynne's request is notable but it is not feasible for fiscal considerations, to offer everyone "Supplemental-(+) Testing". Should Lynne insist, she should be allowed Supplemental-(+) testing at her cost from a suitable laboratory.

Screening for conditions where there is treatment available but not funded by the Government should be included in the screening profile. Following detection, other financing options, difficult as they may well be, is the prerogative of the affected party.

Adult onset conditions like susceptibility to Coronary Artery Disease and Diabetes Mellitus escape detection until organ damage has probably taken place. If detected at NBMS stage, corrective life-style changes can be enforced, most likely altering adverse developments. Testing for these conditions is highly recommended and well worth the cost. However currently, contrary opinion recommends waiting until 18 years. The limiting factor today is that, at screening stage, these conditions are at *best* "predictive", not "Diagnostic". Assuming detection of susceptibility, of such a condition, a parent in-conjunction with qualified health-care professional's help, should introduce changes and treatment into the baby's life, informing it appropriately about the condition. Young children are surprisingly adaptable and responsive. The positive-effect of corrective measures will far out-weigh the inevitable anxiety perceived. Again this should be restricted to conditions for which beneficial aspects or treatment exist.

Never doubt that small, highly focused, well meaning actions can improve the way we live and survive. Indeed they are the only things that ever have. Our endeavour to continuously push forward medical frontiers will ensure betterment of our well-being and sustenance of life. Today, better than yesterday. Tomorrow better still.

AWIS listserver (free!)

A low volume forum for announcements and discussions relevant to women in science.

To join, visit

<http://lists.otago.ac.nz/listinfo/awis-list>

From the National Executive

Several AWIS exec members attended the Running Hot conference. The conference provided an ideal opportunity to get some ideas of what worked (and what didn't work) for the AWIS conference in 2008, whilst also encouraging us to think about the future of science in NZ. Initial planning stages for the AWIS 2008 conference are underway, so if you have any suggestions for speakers etc please get in touch.

A big thank you to Lyn Dowset who represented AWIS at the National Council of Women national conference. Lyn suggests that AWIS members take a more active role in the NCW so if anyone is interested please get in touch with me.

Many thanks to everyone who has contributed to AWIS this year. We are currently looking for an enthusiastic person to take over the editing of the newsletter. If you feel like this is something you would like to know more about please email awisnewsletter@gmail.com.

I hope everyone has a Merry Christmas and a safe and happy New Year.

Malina Storer

New Horizons for Women Trust Awards Evening

Christchurch, 13th of October 2006.

Elisabeth Wells

AWIS has contributed to the NHWT for their second chance education awards. Consequently our members were invited to attend. I was designated to represent the AWIS executive at the Christchurch ceremony. Other Awards ceremonies were held in Wellington and Auckland. The Christchurch ceremony was held in the old Municipal Chambers which were designed by Hurst Seager, one of the leading architects in Christchurch at the end of the 19th century. I had not been upstairs in the building before and enjoyed looking at the architecture and the historical information on display. There were nibbles and drinks before and after the ceremony providing an opportunity to meet the women who had won awards. Because of the small number of awards there was time for each woman to talk about her path to second chance education and her plans for the future. The stories were quite varied and interesting. All had overcome considerable difficulties or disadvantages to start again on education and all had already shown that they could achieve in the area they have chosen. It was good to see their children also at the ceremony. Thanks are due to the NHWT for their work in obtaining and pooling money from multiple sources and processing applications so that they were able to make these awards.

Congratulations

Communicators Award

Congratulations to Liz Carpenter, Waikato AWIS convenor who recently received a NZ Association of Scientists Science Communicator Award.

Liz plays an active role in AWIS, having been national executive convenor, and Waikato Branch convenor, and has recently convened the annual AWIS conference.

Liz trained as a high school teacher prior to embarking on a scientific research career. Many of you will have witnessed Liz's passion for teaching and sharing her love of science. Over the last five years, Liz has made presentations to community groups, academic groups, primary & secondary school classes, and to several farmers groups (end-users for the hyper-immune milk technology). Liz even managed to make one of her recent presentations a family affair "... I visited Ohaupo School (Waikato) and talked about Cells & DNA to the Yr 7/8 class. Both my nieces were in the class for the "DNA experiment" and as my parents were in town visiting my brother's family, I suggested they come along and learn about DNA too. It hadn't been discovered when they went to school, after all."



Discovering DNA, Liz's nieces (Madeline and Emma), her parents (Theo and Anne), Liz, and another class member, Georgia Kelly. Photo Charlotte Martin.

Liz is an Immunologist within the Dairy Science & Technology Section, at AgResearch Ruakura. Liz leads a group working on hyper-immune milk and her recent presentations on the work over the past 12 months have generated significant media interest.

Additionally Liz has frequently organized science lab visits and seminars for high school students and teachers to stimulate their interest in science as a career. She continues to present her research, pitched at the appropriate level, to farmers, and community groups. In all school & lab visits she endeavours to involve the audience by giving them the chance to perform an activity to reinforce the theme of the

presentation. Liz also frequently acts as a judge at school science fairs, including the role of senior biology judge, and has given several presentations to school groups on 'How to do a good Science Fair project'.

In her presentations and labs Dr Carpenter often uses examples and props that make her presentations easy to understand and enjoyable. Dr Carpenter presented at the Hamilton Café Scientifique recently. Her use of photos of her work colleagues depicting various cells of the immune system was extremely well received.

Manāki Tangata Innovation Award

The University of Auckland Women in Leadership Programme won the Manāki Tangata Innovation Award at this year's EEO Trust Work & Life Awards presented by the Prime Minister Rt. Hon. Helen Clark on Thursday 31 August 2006.

The programme focuses on the development and promotion of women in leadership roles in the University of Auckland and seeks to redress the historically low numbers of women in senior positions at the University.

James Cook Research Fellowship

Congratulations to A/Professor Catherine Casey, University of Auckland, who was awarded a James Cook Research Fellowship for research entitled "Economy, work and education".

The James Cook Research Fellowships are awarded to "forward thinking" researchers who will make a significant contribution to New Zealand's knowledge base. The Fellowships allow them to concentrate on their chosen research for two years.

Fulbright Senior Scholar

Congratulations to Penelope Brothers who has been named a Fulbright Senior Scholar, an award which will allow her to spend six months at the Los Alamos National Laboratory (LANL) in New Mexico.

Dr Brothers' research uses porphyrins, a class of molecules which occur in biological and environmental settings. They can be used to form complexes with a wide range of metals and non-metals to create new materials with properties which can be used in a number of applications. As part of her research, Dr Brothers will work with scientists at LANL on two projects, the potential of porphyrins for chemical sensing of beryllium, a highly toxic metal used in manufacturing, and the use of boron porphyrins to investigate the storage of hydrogen, an important alternative fuel source. LANL is one of the few centres in the world equipped for beryllium research, and also has several ongoing research projects in alternative energy sources.

"The purpose of the Fulbright Awards is to allow New Zealand researchers to undertake research or to lecture in the USA for a short period, and to create mutual

understanding across cultures,” says Dr Brothers. “The beryllium labs at Los Alamos will allow me to study beryllium porphyrin chemistry using facilities that aren’t available in New Zealand, whilst allowing me to investigate future opportunities for my colleagues and graduate students. I’m pleased that Fulbright New Zealand has awarded me this honour which will provide many benefits to New Zealand over time.”

Branch News



Overseas

Jilly Evans, Convener
(Jilly.Evans@amirapharm.com)

Not a lot to report from the overseas branch. We are now up to 7 members (from the initial 5). I am eager to get more members if anyone knows other NZ women scientists who are working overseas. I found an American AWIS site (www.awis.org) that has useful articles, the summer 2006 magazine and AWIS T shirts, mugs and bears for sale. I will join the San Diego AWIS chapter and update you on events. I cooked my first Thanksgiving turkey and it was a big success. Just shows that it's worth giving new things a try. There was a nice write up on me and my company in NZ Herald (see www.amirapharm.com).



Dunedin

Lyn Dowsett, Convener
(lyn.dowsett@stonebow.otago.ac.nz)

The last time we met was for Women's Suffrage Day when a small group gathered for breakfast. This included a new lecturer in Chemistry at the university. I did invite the AWIS members to a meeting where we had the awardees from New Horizons for Women talking about their studies. However, as I forgot to put the date on the notice, no-one was able to come! Better luck next year.



Christchurch

Fiona Carswell, Convener
(CarswellF@landcareresearch.co.nz)

In September Jilly Evans, Vice-President (Biology) of Amira Pharmaceuticals in San Diego, talked about her career development as a biologist in the pharmaceutical industry. Jilly was also very generous in shouting the drinks for the meeting! Jilly is a New Zealander who completed her undergraduate studies at the University of Auckland and is passionate about New Zealand science. She also has had two kids while making her way to a position of influence in employment conditions for others coming through. Jilly shared lots of useful tips on how to “make it” while

demonstrating that you can get to the top of the career ladder and retain your sense of humour and still have time to hang out with women at the start of their careers! Thank you Jilly!

In October Nicola Day, Women’s Officer on the Lincoln University Student Executive shared her experiences of the role and talked about some of the great projects she has been involved in over the past couple of years. Selma Stuffrein also shared images and stories from her amazing voyage to Antarctica and some of the sub-Antarctic islands.

Finally, we wrapped up the year with a shared dinner at the Ensis seminar room where we talked about plans for the AWIS conference to be held in Christchurch in 2008. This will continue as the theme for AWIS branch meetings in 2007. We will likely meet for dinner once a month to brainstorm ideas and progress conference organisation. If anybody else in Christchurch wants to organise additional branch meetings with speakers etc I am more than happy to support you but I just don’t have enough energy to organise both things while working and trying to do the best for my two little kids. Also, we’re still looking for anybody else who wants to contribute to conference organisation – thanks very much to those of you who have volunteered already.

Nelson

Jenipher Hubley, Convener
(Jenipher.Hubley@nz.mwhglobal.com)

Look out for details of a meeting in January

Other Branch Contacts

Waikato

Liz Carpenter, Convener
(liz.carpenter@agresearch.co.nz)

Palmerston North

Nicole Roy, Convener
(nicole.roy@agresearch.co.nz)

Wellington

Liz Feary, Convener
(elisabeth_feary@frst.govt.nz)

Auckland

Needs a new convener, please contact the exec if you can help.

Several AWIS members attended the “Running Hot” hosted by the Oxygen Group in conjunction with the Ministry of Research Science and Technology.

Fiona Carswell

The Running Hot conference was a good opportunity to meet some of the bright stars in New Zealand science and talk with policy makers about their vision for the future of NZ Science. The highlight for me was definitely Kathy Sykes’ talk. Kathy is passionate about science communication and also researches biodegradable plastic in the United Kingdom. Kathy had some really good insights on how best to discuss science with the community and how to build a shared understanding of scientific concepts. I think Kathy is an amazing role model for female (and male) scientists everywhere who want to connect with the general public.

Julia Wilson-Davey

I didn’t really know what to expect when I turned up at the “Running Hot” Science in New Zealand conference. I felt a little out-of-place to start off with not being a ‘real’ scientist (I don’t have a PhD) or a science manager or a policy maker. However, by the end of the first day I realised that my opinion is as valid as anyone’s and that it’s important to have people from a diversity of backgrounds – and not just in science – involved in discussing the future of science in New Zealand.

Over all, I enjoyed the conference. There were some dynamic, articulate speakers who energised me and made me think, and laugh! Kathy Sykes (Professor for Science and Society at Bristol University in the UK) was definitely a highlight. She is an excellent science communicator - passionate, intelligent and practical. I also enjoyed Kim Hill’s panel discussions. I know she is an incisive interviewer but she also has a great sense of humour. These speakers got me thinking about how dynamic and creative science can be, quite unlike the stereotypical perception of being dull, difficult, and consisting of “... laws established by long-dead white men ...”. It also made me realise that scientists don’t necessarily ‘know better’ than the general public, and often the public raise important ‘big picture’ issues unseen by the scientist working in their specialised area.

Malina Storer

The conference brought together a dynamic range of speakers and conference attendees including researchers, policy makers, science communicators, and students. As I have recently finished my PhD I found this conference was encouraging as it made me realise that there were plenty of other people with similar uncertainty as to what their future holds. It was also inspiring to meet some people who have previously been in that position and now found a niche in science.

Science you can bank on

Sarah Hunger

How often do we cast our thoughts to the end product of our research endeavours while pottering around at the laboratory bench? According to leading economist David Skilling, American angel investor Kevin Scanlon, venture capitalist Neville Jordan, and DeviceWorks™ general manager Jillian Laing we should be considering this often! This was the subject up for discussion in the ‘Science Stock Market’ panel facilitated by Mark Billingham at the recent Running Hot conference.

Dr. Skilling identified advances in sustainability as the key moneymaker for New Zealand in the future, especially under the auspices of our ‘clean, green image’. However, he also acknowledged that 1.1% of GDP (\$150 million) is a woefully inadequate sum for a knowledge economy to invest in R&D. He recommended a future target of at least 2.25% (the OECD average) with this extra investment coming from both public and private sectors. Dr. Skilling also indicated that the ascension of the asian economy would create huge opportunities and this, combined with the fact that it has never been easier to rapidly create value (e.g. the rise of TradeMe), should place New Zealand in good stead to improve our OECD position with clever marketing of smart NZ science.

Angel investors, such as Dr. Scanlon, invest in only 4% of the ideas brought to them by new entrepreneurs. He indicated that the majority of the 96% failure rate is due to inadequate IP protection. Mr Jordan noted the need for ‘value multiplication’ over just ‘valued added’ products in worthy investments and the importance of a talented and dedicated business team who are prepared to sacrifice everything for success. Support from companies, such as Ms. Laings’ DeviceWorks™, provide these new start-ups with valuable advice in market development and maintenance of a supply chain.

At the end of the panel, Dr. Mark Billingham asked each of the panelists to sum up in a sentence their key recommendations for science in New Zealand: Dr. Skilling highlighted the importance of an R&D future; Dr. Scanlon’s words were “follow your passion”; Mr Jordan believes investment should be made in our children to secure our future; and Ms Laing encouraged us to strive to reach all of our goals. In the words of Bill Buxton: “*The commercialisation of research...is far more about prospecting than alchemy.*”

Leaving the World a Better Place: The Contribution of Science to Society workshop

Julia Wilson-Davey

This workshop was facilitated by Margaret Kilvington (The Oxygen Group) and included panellists Mark Stuart (Waikato Link Limited), Eljohn Fitzgerald (Massey University), Anne Firth Murray (Stanford University, USA) and Robert Jaffe (MIT, USA). After a brief brainstorm about what science contributes to society, which got slightly sidetracked into issues which inhibit scientists from conducting their work most efficiently, each panellist gave their perspective on the topic.

Mark Stuart talked about science and economic development, focusing on the interface between commerce and academia. He identified that universities contribute to economic development through producing such things as trained workers, but this is not the reason why they exist. For universities economic development is a by-product of their primary roles of teaching, research and technology transfer. It is a myth that 'good' basic research will automatically be funded by industry so universities can provide good sites for this.

Eljohn Fitzgerald agreed that research should benefit society but pointed out that this has not been the case for Māori. There have been many studies on the Māori population but the benefits to Māori society have been minimal. As a result there is widespread scepticism to research. In addition, Māori and iwi often do not have the capacity to comment on the science which they are consulted on. We need to build Māori science capacity.

Anne Firth Murray considered that we need a paradigm shift in the way we relate to each other, in society and in science. We have a very hierarchical view of the world and attach values to the differences between people, valuing those who are highly educated over those with minimal education, and rich over poor, for example. We need to change this and welcome differences, not value them as better or worse.

Robert Jaffe spoke about the role of the media in science communication. Science is communicated to the public overwhelmingly through the media. It is important that scientists act responsibly with journalists and express ideas in a digestible form to the general public. The media in their turn needs to change how they report 'news', there is often a focus on controversy. Robert encouraged scientists who are enthusiastic about communicating to get out and do it because a good communicator with technical knowledge is valuable to everyone.

After the panellists we split into groups for discussion. My group started talking about the media and the value of specialist science journalists. We thought that the media often produces what it thinks the public wants so we need to increase the public value of science. Someone had the idea of creating science "heros", inspiring people to put a human face on science. There can be a bit of an 'us and

them' view between scientists and the public and we need to break that down. We need to maintain respect for other ways of viewing the world, for example, cultural knowledge. Someone identified that New Zealand society will change in the future with an increasing proportion of young and Māori and Pacific Island people. If science is going to maintain its profile it has to be promoted especially to these groups.

The workshop finished with the groups reporting back on their discussions.

EWM07: European Women in Mathematics

3-6th September 2007, Cambridge, UK

The 13th general meeting of European Women in Mathematics (EWM), open to members and non-members of EWM, will take place at the Centre for Mathematical Sciences (CMS), University of Cambridge from lunchtime on Monday 3 September to lunchtime on Thursday 6 September 2007. Accommodation has been arranged at Fitzwilliam College, Cambridge. Website: <http://www.maths.cam.ac.uk/ewm>

5th New Zealand Computer Science Research Students Conference,

April 10-13 2007 at Waikato

Computer Science graduate students in New Zealand (and elsewhere!) are invited to participate in the 5th New Zealand Computer Science Research Students Conference, held April 10-13 2007 at Waikato University in Hamilton. Conference Website: <http://www.cs.waikato.ac.nz/nzcsrsc2007/>



New members

A warm welcome to the following new AWIS members:

Christchurch

Diane Dinnis
Anna Pilbrow

Dunedin

Liz Ledgerwood

Auckland

Harriet Wilson
Sarah Johnston

Hamilton / Waikato

Suzanne Dowling

We have 122 financial members.

Julia Wilson-Davey
Membership Secretary

National Council of Women National Conference

Lyn Dowsett

This conference took place in Invercargill from 28 September to 1 October. 134 women from 29 areas, 24 Nationally Organised Societies and 2 National Members (one of whom is AWIS). I was exhausted at the end of the conference as it was not just the items on the agenda or the workshops (we started at 8.00 on two mornings and at 9.00 on the last morning) but all the networking at each break and at the dinners. My five minute presentation about AWIS in the final session was received well with some interested questions.

One major item from this meeting as the setting up of a database to be held by NCW. Forms have been distributed to branches but I have asked if they can be made available online. This database is to complement those held by the Ministry of Women's Affairs and the Ministry of Consumer Affairs.

As well as the customary reports from President, Treasurer etc, we had reports from each standing committee convenor. Each Standing Committee has corresponding members from all round the country so a wide range of opinion is brought to bear on all issues. Standing Committees have the following focus, Consumer Affairs, Economics, Education, Employment, Environment, Family Affairs, Health, Justice and Law Reform, Public Issues, Social Issues and Parliamentary Watch Committee. The latter keeps its eyes on what is coming before parliament at any one time, when select committees will be meeting etc.

During 2005-2006, NCW made 45 submissions and wrote 24 letters of substance, if anyone has been involved in writing a submission you will understand the workload that this represents. This is nearly one per week and does not allow for holidays etc.

Six remits were presented with one being lost and the other five proceeding. Each remit proposer has to present an action plan to the Executive within a month of the remit being passed into policy. This ensures that those putting forward the remit, (who obviously know a lot about the topic), do not just pose a problem but have to help search for an answer. Remits proceeding dealt with Rest Home funding, breastfeeding, prisoners' education, hospice funding and repealing the Foreshore and Seabed Act.

Plenary speakers were Alana Bowman, Strategic Alliances Co-ordinator from the National Collective of Independent Women's Refuges (who spoke on the myth that are beginning to circulate that women are as violent towards men as men are to women), Dr Anamah Tan, President, International Council of Women, (such a lovely lady who gave a spirited and enthusiastic description of the work at the international level with particular reference to the United Nations and the CEDAW report), Hon Lianne Dalziel, Minister of Women's Affairs (who read the mission statement from the first setting up of the Ministry and which still sounds like the goals we are working

towards today) and Susan Biggs from Human Rights Commission (women in leadership and governance).

The decision taken at the Auckland Conference AGM for AWIS to join NCW has been a very sensible move. We have many knowledgeable women helping to form policy and we need to be part of this. Branches exist all over the country and I think we should, where possible, nominate someone to join the nearest branch and to join a standing committee. It does cost (\$70 which includes The Circular, one of the best informed monthly newsletters), but as part of our role in contributing to society, this is a really sensible way to do it.

Women on Boards

Seen in *Her Business* (Annah Stretton supports New Horizons for Women in various private ways, including sending members of the Board a copy of her magazine!) "Three new databases are being established to make it easier for private sector companies to find women with the skills and experience necessary for board jobs"

1. Sandy Maier and Jens Mueller from Waikato University's School of Management
2. Auckland Chamber of Commerce (Michael Barnett) in partnership with the Equal Employment Opportunities Trust (Phillippa Reed)
3. Roasanne Hawarden (Computer Support Enzed Ltd and Syspro New Zealand Ltd) is setting up a web-based initiative

The Minister of Women's Affairs, Lianne Dalziel, has supported this move and the Ministry will liaise with the three database managers.

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