

---

# Biochemistry News

The newsletter of the Department of Biochemistry at the University of Otago

editor: Bronwyn Carlisle

July 2012

---

## In This Issue

View from the corner »  
Recent publications p. 3  
Conference reports p. 6  
Science Festival p. 8  
News from Around the  
Department p. 9



## Alumni notice

Kurt received an email from Dr Richard King recently. Richard is one of our alumni, and he wished to tell us about the death of Alison Maclean, who was one of his biochemistry classmates and “a brilliant student and a huge help to me as I struggled my way towards a BSc. She got into med school but didn’t take it up because her father told her he didn’t approve of women doing medicine.” Alison had a happy life married to a dentist in London, but died of a brain tumour just before Christmas.

## View from the Corner

As June rapidly raced by last month I thought it hard to believe the year was half-way spent, but all the signs were there. The days were shorter, the weather even colder (!) and the students done with their first term exams.

Certainly it has been an eventful year, both good and bad, and the events bear some reflection. One high point for me was the Inaugural Professorial Lectureship of Catherine Day. Catherine’s career has been quite remarkable and her projects span from basic science bench work to translational drug development research. Catherine’s work displays both great creativity and a passion for excellence and is a great example from which our young scientists can learn. Her well-attended IPL in Archway delineated her journey from Palmerston North to Auckland and now Otago, summed up her research to date and sketched out her future aspirations.

Speaking of excellence, about a week before Catherine’s IPL I was privileged to attend a dinner at which Murray Cockerill was given a 2012 Rotarian Pride of Workmanship Award. Murray has a campus-wide reputation for quality workmanship and he has been keeping our equipment running long past its use by date for 35 years. Just last month Murray repaired the departmental X-ray generator which started out appearing to have a simple problem, but in the process he repaired a broken turbomolecular pump, identified a faulty controller board rebuilt from the manufacturer but sent with serious flaws, and diagnosed a persistent vacuum leak as coming from a broken gauge and not a broken line. I don’t think anyone else could have done this repair! Murray only knows one way to work, carefully, cautiously and with a drive toward perfection. His work is also



a great example from which our young scientists can learn.

In June we celebrated two notable birthdays, a 40th and a 65th for Teena Joyce and Lyn Dowsett respectively. These two ladies have given so much to our department and they continue to give so much on a daily basis that it was only right to celebrate on that day.

Quiz night this term was a big success and took place on 1 June. Hosted by the student social club and Calum Johnstone, it featured Thermo-Fisher as the corporate sponsor and Peter Dearden as MC. Peter, who is our staff member most deserving of his own reality series, was hilarious and if he hosts again next year I think we have to record at least part of the evening on video for posterity, as the evening is so much fun and his commentary so entertaining. This year the Angry Birds from the Ledgerwood lab took first place, last years winner’s from Craig’s and my lab, the Smarties, took second while third place went to the Frantastics – a team named after  
cont’d over ...

Frances-Rose Schumacher, a recent PhD graduate from Catherine's lab who is now on a postdoctoral fellowship in Scotland. Many thanks to Dan Garama, Jodi Pilbrow, Calum and Malcolm Rutledge for all their hard work and to James Smith, our extra special friend from Thermo-Fisher who made this quiz sponsorship his swan song from that position.

One of the most surprising events of the most recent quarter was the Transit of Venus and its effect on many of us in the department. With all the prior publicity about Captain Cook's voyage on the Endeavor to view the Transit of Venus during which he discovered New Zealand, I was worried the actual event would be lost in the hype, but in fact it wasn't. The day itself had an auspicious beginning with great weather and perfect viewing conditions, some of the best in New Zealand. Kaye Wilson secured from the Astronomical Society some sun viewing filters. During the day I think everyone on the second floor looked at least once and I know I gazed at Venus at least eight times. Teena's desk

was perfectly positioned to allow viewing from just next to her computer monitor and she shepherded the filter through the afternoon. Somehow, as we all made a point to look together, we formed a wonderful shared memory.

As I close, I want to share a few words about the recent loss of our receptionist Mathew Emmerson. I think of Mathew quite often. He was a special employee. A bright spark who cheered us in the Biochemistry front office on a daily basis. I miss his engaging and caring personality. It's unbelievably sad that we lost Mathew at such a young age but I feel better for having gotten to know him. The beautiful portrait we have of him in the office helps keep his memory close.

When this newsletter comes out, we will be preparing to start Term 2 lectures, fresh from few days of rest and fun with friends and family, and I hope we all return with renewed energy to begin our classes again and look forward to spring.

*Kent Krause*

## Congratulations Professor Day



**... and congratulations  
to Murray Cockerill**

## Recent Publications

### **A Systematic Review of the Prevalence of Gout and Hyperuricemia in Australia.**

PC Robinson, WJ Taylor, and TR Merriman

*Internal medicine journal*, 2012

**Objectives:** Gout is a growing worldwide health problem especially in affluent countries such as Australia. Gout and hyperuricemia are associated with the metabolic syndrome, diabetes mellitus, obesity and hypertension. Importantly Australia has a growing prevalence of these important health problems. The aim of the study was to systematically review published information regarding the prevalence of gout and hyperuricemia in Australia. **Methods:** A systematic search was undertaken of the MEDLINE, EMBASE and Web of Science databases as well as relevant websites for journal articles and reports relating to the prevalence of hyperuricemia and gout in Australia. **Results:** Twenty five journal articles and 5 reports were included in the review. Data collected in a standardized way show gout increased in prevalence from 0.5% population prevalence to 1.7% population prevalence from 1968 to 1995/6. There has been a significant rise in the prevalence of gout in the Australian Aborigine population from 0% in 1965 to 9.7% in males and 2.9% in females in 2002. Consistent with the rise in gout prevalence serum uric acid in blood donors has increased from the 1950s to 1980 (17% in 30-40 year old males). **Conclusions:** The rate of gout and hyperuricemia in Australia is high in relation to comparable countries and is increasing. The prevalence of gout in elderly male Australian's is second only to New Zealand which has the highest reported rate in the world. Further research on Aboriginal and Torres Strait Islander gout and hyperuricemia is required due to the lack of contemporary data.

### **Carotenoid-binding proteins; accessories to carotenoid function.**

Jodi Pilbrow, Daniel Garama, and Alan Carne

*Acta biochimica Polonica*, 2012 vol. 59 (1) pp. 163-165

Understanding of the widespread biological importance of carotenoids is increasing. Accompanying this is the developing recognition that the interaction of carotenoids with other molecules, such as proteins, is also essential. Here the significance of carotenoid-protein interactions with respect to biological function is reviewed for three well characterised carotenoprotein complexes; crustacyanin, the orange carotenoid protein and glutathione-S-transferase P1. In addition a preliminary report is made on the recent partial purification of an echinenone-binding protein extracted from a New Zealand sea urchin, *Evechinus chloroticus*.

### **Characterisation of commercial papain, bromelain, actinidin and zingibain protease preparations and their activities toward meat proteins.**

M. Ha, A.E.-D.A. Bekhit, A Carne, and D.L. Hopkins

*Food Chemistry*, 2012 vol. 134 (1) pp. 95-105

### **Clinical and genetic risk factors for perianal Crohn's disease in a population-based cohort.**

T.W. Eglinton, R. Roberts, J Pearson, M. Barclay, T R Merriman, F.A. Frizelle, and R B Gearry

*American Journal of Gastroenterology*, 2012 vol. 107 (4) pp. 589-596

### **Distinct families of cis-acting RNA replication elements epsilon from hepatitis B viruses.**

Augustine Chen and Chris Brown

*RNA biology*, 2012 vol. 9 (2) pp. 130-136

The hepadnavirus encapsidation signal, epsilon ( $\epsilon$ ), is an RNA structure located at the 5' end of the viral pregenomic RNA. It is essential for viral replication and functions in polymerase protein binding and priming. This structure could also have potential regulatory roles in controlling the expression of viral replicative proteins. In addition to its structure, the primary sequence of this RNA element has crucial functional roles in the viral lifecycle. Although the  $\epsilon$  elements in hepadnaviruses share common critical functions, there are some significant differences in mammalian and avian hepadnaviruses, which include both sequence and structural variations. Here we present several covariance models for  $\epsilon$  elements from the Hepadnaviridae. The model building included experimentally determined data from previous studies using chemical probing and NMR analysis. These models have sufficient similarity to comprise a clan. The clan has in common a highly conserved overall structure consisting of a lower-stem, bulge, upper-stem and apical-loop. The models differ in functionally critical regions- notably the two types of avian  $\epsilon$  elements have a tetra-loop (UGUU) including a non-canonical UU base pair, while the hepatitis B virus (HBV) epsilon has a tri-loop (UGU). The avian epsilon elements have a less stable dynamic structure in the upper stem. Comparisons between these models and all other Rfam models, and searches of genomes, showed these structures are specific to the Hepadnaviridae. Two family models and the clan are available from the Rfam database.

**Evidence that deletion at FCGR3B is a risk factor for systemic sclerosis.**

C McKinney, J C A Broen, M C Vonk, L Beretta, R Hesselstrand, N Hunzelmann, G Riemekasten, R Scorza, C P Simeon, V Fonollosa, P E Carreira, N Ortego-Centeno, M A Gonzalez-Gay, P Airo, M Coenen, J Martín, T R D J Radstake, and T R Merriman

*Genes and Immunity*, 2012

There is increasing evidence that gene copy number (CN) variation influences clinical phenotype. The low-affinity Fc receptor 3B (FCGR3B) located in the FCGR gene cluster is a CN polymorphic gene involved in the recruitment of polymorphonuclear neutrophils to sites of inflammation and their activation. Given the genetic overlap between systemic lupus erythematosus and systemic sclerosis (SSc) and the strong evidence for FCGR3B CN in the pathology of SLE, we hypothesised that FCGR3B gene dosage influences susceptibility to SSc. We obtained FCGR3B deletion status in 777 European Caucasian cases and 1000 controls. There was an inverse relationship between FCGR3B CN and disease susceptibility. CN of  $\leq 1$  was a significant risk factor for SSc (OR=1.55 (1.13-2.14),  $P=0.007$ ) relative to  $CN \geq 2$ . Although requiring replication, these results suggest that impaired immune complex clearance arising from FCGR3B deficiency contributes to the pathology of SSc, and FCGR3B CN variation is a common risk factor for systemic autoimmunity. *Genes and Immunity* advance online publication, 3 May 2012; doi:10.1038/gene.2012.15.

**Extraction and analysis of carotenoids from the New Zealand sea urchin *Evechinus chloroticus* gonads.**

Daniel Garama, Phil Bremer, and Alan Carne

*Acta biochimica Polonica*, 2012 vol. 59 (1) pp. 83-85

Sea urchin gonad (roe) is a highly valued food in Japan and North America. Gonad price is strongly influenced by quality, with appearance, especially colour being a major determinant. Previous attempts to extract a carotenoid profile from the New Zealand sea urchin species *Evechinus chloroticus* have been challenging due to the large amount of lipid present in the gonad. A carotenoid extraction and high performance liquid chromatography (HPLC) analysis method was developed to reduce lipid contamination by incorporating a saponification and lipid cold precipitation in the extraction procedure. This method enabled greater carotenoid purity and enhanced analysis by HPLC. Echinenone was found to be the main carotenoid present in all *E. chloroticus* gonads. Dark coloured gonads contained higher levels of fucoxanthin/fucoxanthinol,  $\beta$ -carotene and xanthophylls such as astaxanthin and canthaxanthin. This information on the modification and deposition of carotenoids will help in the development of diets to enhance gonad colour.

**Isolation and characterization of an enzyme from the Greenshell™ mussel *Perna canaliculus* that hydrolyses pectenotoxins and esters of okadaic acid.**

L.A. MacKenzie, A.I. Selwood, and C Marshall

*Toxicon*, 2012 vol. 60 (3) pp. 406-419

**JMJD6 is a driver of cellular proliferation and motility and a marker of poor prognosis in breast cancer.**

Y.F. Lee, L.D. Miller, X.B. Chan, M A Black, B. Pang, C.W. Ong, M. Salto-Tellez, E.T. Liu, and K.V. Desai

*Breast Cancer Research*, 2012 vol. 14 (3)

**Lipoprotein(a), Interleukin-10, C-Reactive Protein, and 8-Year Outcome After Percutaneous Coronary Intervention.**

I. Kardys, R.M. Oemrawsingh, I.P. Kay, G T Jones, S.P. McCormick, J. Daemen, R.J. Van Geuns, E. Boersma, R.T. Van Domburg, and P.W. Serruys

*Clinical Cardiology*, 2012

**No evidence for association of Chr 9p21 variant rs1333049 with gout in New Zealand case-control sample sets.**

Angela Hsu, Nicola Dalbeth, Peter Gow, Andrew Harrison, John Highton, Peter B Jones, Lisa K Stamp, and Tony R Merriman

*Rheumatology* (Oxford, England), 2012 vol. 51 (6) pp. 1129-1130

**The pharmacokinetics and pharmacogenetics of the antiemetic cyclizine in palliative care patients.**

J.W.A. Vella-Brincat, E.J. Begg, B.P. Jensen, P.K.L. Chin, R L Roberts, M. Fairhall, S. MacLeod, and K. Reid

*Journal of Pain and Symptom Management*, 2012 vol. 43 (3) pp. 540-548

**Secreted amyloid precursor proteins promote proliferation and glial differentiation of adult hippocampal neural progenitor cells.**

S. Baratchi, J. Evans, W P Tate, W C Abraham, and B. Connor

*Hippocampus*, 2012 vol. 22 (7) pp. 1517-1527



## Primordial soup or vinaigrette: did the RNA world evolve at acidic pH?

Harold S Bernhardt and Warren P Tate

*Biology direct*, 2012 vol. 7 p. 4

**BACKGROUND:**The RNA world concept has wide, though certainly not unanimous, support within the origin-of-life scientific community. One view is that life may have emerged as early as the Hadean Eon 4.3-3.8 billion years ago with an atmosphere of high CO<sub>2</sub> producing an acidic ocean of the order of pH 3.5-6. Compatible with this scenario is the intriguing proposal that life arose within alkaline (pH 9-11) deep-sea hydrothermal vents like those of the 'Lost City', with the interface with the acidic ocean creating a proton gradient sufficient to drive the first metabolism. However, RNA is most stable at pH 4-5 and is unstable at alkaline pH, raising the possibility that RNA may have first arisen in the acidic ocean itself (possibly near an acidic hydrothermal vent), acidic volcanic lake or comet pond. As the Hadean Eon progressed, the ocean pH is inferred to have gradually risen to near neutral as atmospheric CO<sub>2</sub> levels decreased.

**PRESENTATION OF THE HYPOTHESIS:**We propose that RNA is well suited for a world evolving at acidic pH. This is supported by the enhanced stability at acidic pH of not only the RNA phosphodiester bond but also of the aminoacyl-(t)RNA and peptide bonds. Examples of in vitro-selected ribozymes with activities at acid pH have recently been documented. The subsequent transition to a DNA genome could have been partly driven by the gradual rise in ocean pH, since DNA has greater stability than RNA at alkaline pH, but not at acidic pH.

**TESTING THE HYPOTHESIS:**We have proposed mechanisms for two key RNA world activities that are compatible with an acidic milieu: (i) non-enzymatic RNA replication of a hemi-protonated cytosine-rich oligonucleotide, and (ii) specific aminoacylation of tRNA/hairpins through triple helix interactions between the helical aminoacyl stem and a single-stranded aminoacylating ribozyme.

**IMPLICATIONS OF THE HYPOTHESIS:**Our hypothesis casts doubt on the hypothesis that RNA evolved in the vicinity of alkaline hydrothermal vents. The ability of RNA to form protonated base pairs and triples at acidic pH suggests that standard base pairing may not have been a dominant requirement of the early RNA world.

## Solution structure of CyanoP from *Synechocystis* sp. PCC 6803: New insights on the structural basis for functional specialization amongst PsbP family proteins.

Simon A Jackson, Mark G Hinds, and Julian J Eaton-Rye

*Biochimica et biophysica acta*, 2012 vol. 1817 (8) pp. 1331-1338

The structure of the CyanoP subunit of photosystem II from the cyanobacterium *Synechocystis* sp. PCC 6803 has been determined in solution by Nuclear Magnetic Resonance spectroscopy. Combined with homology modeling of PsbP-like structures we have identified distinct structural differences between PsbP homologues which may account for the functional differences apparent between members of this protein family. A surface cleft containing a large number of conserved residues found only in CyanoP and PsbP-like homologues has been identified and our findings suggest that one of the potential cation binding sites found in CyanoP may be functionally significant. Evidence for the evolution and divergence of the PsbP super family is presented from a structural perspective including identification of residues which distinguish the PsbP family from unrelated proteins with a similar domain fold. This article is part of a Special Issue entitled: Photosynthesis Research for Sustainability: from Natural to Artificial.

## Varying amounts of different aldehydes present in the cryoprotectants dimethyl sulphoxide and 1,2-propanediol.

Michael Legge and Mathew S Byers

*Cryobiology*, 2012 vol. 64 (3) pp. 297-300

Using high-pressure liquid chromatography two cryoprotectant solvents, dimethyl sulphoxide (four manufacturers) and 1,2-propanediol (one manufacturer) were investigated for aldehyde content. Fractionation of the aldehydes by high pressure liquid chromatography identified up to 11 aldehydes and two ketones in both cryoprotectant solvents in varying concentrations, which differed between manufacturer and container type. Of the 11 aldehydes identified, formaldehyde and acetaldehyde were consistently in the greatest concentrations. As the low molecular weight aldehydes identified contain reactive polarised carbonyl groups they represent a potential source of intracellular damage when used in oocyte cryopreservation.

**The renal urate transporter SLC17A1 locus: confirmation of association with gout.**

Jade E Hollis-Moffatt, Amanda J Phipps-Green, Brett Chapman, Gregory T Jones, Andre van Rij, Peter J Gow, Andrew A Harrison, John Highton, Peter B Jones, Grant W Montgomery, Lisa K Stamp, Nicola Dalbeth, and Tony R Merriman

*Arthritis research & therapy*, 2012 vol. 14 (2) p. R92

**ABSTRACT: INTRODUCTION:** Two major gout-causing genes have been identified, the urate transport genes SLC2A9 and ABCG2. Variation within the SLC17A1 locus, which encodes sodium-dependent phosphate transporter 1, a renal transporter of uric acid, has also been associated with serum urate concentration. However, evidence for association with gout is equivocal. We investigated the association of the SLC17A1 locus

with gout in New Zealand sample sets. **METHODS:** Five variants (rs1165196, rs1183201, rs9358890, rs3799344, rs12664474) were genotyped across a New Zealand sample set totaling 971 cases and 1,742 controls. Cases were ascertained according to American Rheumatism Association criteria. Two population groups were studied: Caucasian and Polynesian. **RESULTS:** At rs1183201 (SLC17A1), evidence for association with gout was observed in both the Caucasian (odds ratio (OR) = 0.67,  $P = 3.0 \times 10^{-6}$ ) and Polynesian (OR = 0.74,  $P = 3.0 \times 10^{-3}$ ) groups. Meta-analysis confirmed association of rs1183201 with gout at a genome-wide level of significance (OR = 0.70,  $P = 3.0 \times 10^{-8}$ ). Haplotype analysis suggested the presence of a common protective haplotype. **CONCLUSION:** We confirm the SLC17A1 locus as the third associated with gout at a genome-wide level of significance.

## Conference Reports

There's a little black spot on the sun today . . .

. . . as The Police used to sing. Currently they are sunspots, but the other week, as you all well know, it was Venus transiting the sun. This event was used as an excellent excuse to run a symposium in Gisborne to discuss the future of science and scholarship in NZ, as well as its role in society. This symposium, driven by the late great Prof Sir Paul Callaghan, took up much of my time last week, and much thought this week.

The symposium kicked off with a remarkable day with the people of Tolaga Bay, Uawa, that demonstrated the stunning abilities and future that community has. I would really like to thank them for their hospitality.

The next two days tried to address some of the issues around science, scholarship and society and, to be honest, most this was frustrating. Apart from a good session on communication, I think we identified a lot of problems, and provided few answers. The phrase "Transiting Venus" became synonymous with that glazed look you get when someone says they will be brief and then goes on for 20 minutes.

Along with this it became clear that many of the old stereotypes of research were alive and well in the public's mind. "Scientists are bad communicators" was trotted out a few times. Anyone reading the blogs at [sciblogs.co.nz](http://sciblogs.co.nz) would know that many scientists are awesome communicators. "Universities aren't part of the real world" was also stated, which is infuriating to those who try so hard to make them relevant.

Despite this I was excited by some of what I heard, and impressed by many of the people I met. I particularly was interested by the idea that scientists should become public intellectuals. I'm not completely sure what that means, probably more than just doing more thinking in public. If it means more engagement with the public, more comment on topics for which we have expertise, more critical analysis of public matters, then this is great. We do need to ensure that support for this role, and time to do it, is made available by our institutions, but I say, hell yeah!

The other idea, which perhaps was not stated directly, but I think was floating around, is the idea of a "new enlightenment". Its time for New Zealand's researchers and academics to be more involved, to drive the energy and innovation this small nation needs. To lead, in our own disciplines, to a future where evidence plays more of a role in policy, in decision making, in public life.

Perhaps this is the most important thing I took from the transit of Venus. It re-energised me to increase my links with community, business and society, and I hope others took the same message. It encouraged me to be more critical and to speak out more, as only through speaking out, pointing out where errors are made, and using knowledge and training to improve things, will we bring about the new enlightenment that I think we urgently need. It is a call to arms for all of us.

The next line of the Police song quoted in the title is "it's the same old thing as yesterday", and I think, if others feel the way I do, perhaps its not.

Peter K. Dearden

## 13th International Conference on Neuronal Ceroid Lipofuscinosis (Batten Disease) and Patient Organisation Meeting. London, March 2012

After 36 hours of travel, Steph and I arrived at Heathrow airport for the 13th International Conference on Batten Disease. This was my first trip further than 3 hours flight from New Zealand! I was greeted into England with a missing suitcase... Luckily, someone had mistaken a big purple bag for their own not so similar suitcase and the situation was soon resolved.

After leaving the airport we had a couple of days to see the sights of Central London, including a double decker bus tour, the Tower of London, a boat cruise down the river Thames, and the London Eye. We then headed out to the beautiful Royal Holloway College in Surrey, where the conference was held.

The three day conference covered many aspects of NCL research, including genetics, disease mechanisms, links to other diseases, clinical trials and other clinical data, and experimental therapies. It was great to hear about all the exciting advances in the study of this deadly disease, including the identification of four new genes!

I got the opportunity to present a poster. This was a very valuable experience, as everyone at the conference was involved in the research of the same group of diseases so I ended up with a lot of useful ideas for further research!

The conference was held in parallel with a patient organisation meeting, a get together of parents with children affected by the disease. A number of children were brought along as well. It was a huge shock to see the severity of disease in these children, most of who were in a severe Parkinsonian-like state. Although, these children were extremely motivating! The parents were free to attend the conference sessions of interest to them, in particular the sessions involving clinical studies and experimental therapies. This was a great opportunity for patient organisations, parents, scientists, and clinicians to learn about the work being carried out by the other groups.

Conference accommodation and sessions were on the same campus so all meals were eaten together, providing a great informal opportunity for everyone to get to know each other. This also gave the conference organisers the opportunity to hold social events, including the 'UK Pub Experience', which included fish and chips and a pub quiz. Another social highlight was the Conference Banquet, held on the final night of the conference.

This conference is a bi-yearly event which is scheduled to be held in Argentina sometime in 2013, I'm already looking forward to meeting up with everybody again!

Nicole Neverman





## Science Festival

Dunedin turned on two lovely winter days for the Otago University Science Expo, which was held in conjunction with the biennial International Science Festival. The fine weather saw Dunedinites big and small come out in their droves to see how cool science can be. In keeping with the festival theme of “What makes us tick?”, the biochemistry display was based around molecular clocks. With posters looking at flowering time, how your natural clock can be thrown out by shift work and long distance travel, and a simple animation showing a basic intracellular clock, there was plenty for the inquisitive to delve into. As always, the hands-on stuff was very popular, with many people (especially kids) taking the “Pipetting Challenge”. We also had a “make a flower” table for the smaller folk that was extremely popular. Shar made up some exemplars for the kids to see and put them in pots as part of the display. Well, some kids decided that rather than take their flowers with them, they wanted to plant them in our garden, so at the end of the two days we had a very colourful display. The kids (big and small alike) also got to take home some pea seeds to plant, with some suggested experiments they could do, based on the timing of flowering and leaf movement.

As always, putting on these displays is team event, so thank-you to all of the following for their help in either putting together the material for the display or fronting up at the expo and representing the department so well: Robyn Lough, Sharleen Rae-Whitcombe, Bronwyn Carlisle, Richard MacKnight, Minh Ha, Lyn Dowsett, James McKellar, Annika Bokor, Anne von Zychlinski-Kleffmann, Rhessa Budhidarmo, Jackie White, Anthony Riseley, Eiren Sweetman, Harold Bernhardt, Jane Campbell, Craig Marshall, Jodie Mutch and Sam Jamieson.

Tony Zaharic





## News from Around the Department

The Ledgerwood lab presents...

### ANGRY BIRDS\*



*Moira*

Moira recently returned from a two week holiday in sunny Australia. She liked it so much, that she and Mike decided to forgo the summer-less south and permanently move....to Perth!! We are all excited for her but she will be missed.



*Tracy*

Tracy has recently submitted her PhD and plans on staying in Dunedin for a little bit longer. She has entered some of her Antarctica photos into the OSMS photo competition. The photos will be on display at the Dunedin Railway Station from 30 June - 8 July.



*Lily*

Lily Ong recently joined the lab to start a PhD. Since being in the lab she has experienced a birthday, cheese rolls, cinnamon scrolls, Baldwin street and chilly lab temperature highs of 14°C.



*Carolyn*

Carolyn has been elbows deep in work, even powering through a cold to get results before her boss went on vacation to Fiji!!



*Aziz*

Aziz joined the lab over summer, deciding to carry on with an Honours project. He has just completed exams and is excited about getting back to the bench. His favorite gel percentage is 10% and prefers 2x loading buffer without DTT. He reckons Spain are going to win the Euro 2012 tournament.



*Liz*

Liz is happy that Aziz is doing his Honours project in her lab, that Lily has joined the lab from Malaysia to do her PhD, that Tracy has submitted her thesis, and that her marking is finished. She is sad that the lab is so cold and that Moira is leaving soon. She isn't angry.

*\*The official first place winning Angry Birds quiz team team included Carolyn, Tracy, Lily, Gill Hughes & Stephen Clarke*

Note from Editor: I can't tell you how much I enjoy getting the Ledgerwood Lab contributions to the newsletter.

### Foo's yer doos?

Lab 216 has been slugging through these colder months, with the winter woollens coming out in force. On and around the heaters are the most highly populated areas, with only the brave few venturing beyond the warmth-circumference.

Iain has been hiding in his office, marking exam scripts and writing grant applications and occasionally surfacing for coffee. He is off to Europe next week for a conference and promises to bring back some Belgian chocolate. Lois has taken a well-earned break for a few days to visit her family in Cambridge (NZ!), we look forward to her return and will see if she needs a rest after all the baby-sitting! Georgi has been away from the lab for a bit and we look forward to having her back soon. Cynthia has settled well into her role as lab bully, keeping us on our toes with her sarcastic comments. She is becoming a reliable source of pumpkin-themed baking, to Leo's delight. Katy has been honing her

primer-designing skills, third time's a charm! Julia has been enjoying a well-deserved holiday after the stresses of the exam period. Tom has been using up all of his bad luck early in his career. Problems with antibodies have been the main factor in restricting his progress, but he'll get there. Andrea had her three minutes of fame in the three minute thesis competition this year, and recommends it to everyone. She has finally been granted ethical approval to manipulate her rats before they are euthanized- watch out Stewart (Julia's pet rat). Becky is doing Becky stuff in her Wellington lab; we hope to see her back here soon. Leo managed to arrive on time to the 8am lab breakfast earlier this year; the allure of food can result in an outlier in even the most robust of trends. He is aiming to have his bench work finished by the end of July. He didn't actually say this; we just thought it would be good to set him a date.

See you in the spring...

### Krause Lab

The Krause group have been a productive bunch in the lab, well, I think they must have been as no one had anything exciting to report! That is, everyone except Ashley Campbell. Ash, aka *Piña collider*, has been busy training for her big event this Saturday (July 7th) when her team ACC (Accident Causation Corporation) take on B\*A\*S\*H at roller-derby. Come on Ash, give them the Bash!

Our lab did very well in the recent departmental quiz. "The Smarties", represented by **Kurt Krause, Craig Marshall, Sylvia Luckner, Emma Scaletti, Roman Mortuza, Helen Opel-Reading** and ????? got second and **Victoria Stock** and I got a very close third with the Frantastics.

I was coerced into writing this report, as I will shortly be leaving and heading to Penn State University in Pennsylvania, USA. I joined the department a few years ago (I won't admit the year!) and studied for my MSc and PhD with Sigurd Wilbanks and then post-docs with Julian Eaton-Rye and Kurt Krause. I have enjoyed my time here enormously and will miss this place and the people.

Cheers,

Rob Fagerlund





## Merriman Lab

Even though the weather has gotten cooler (I am told “this is warm comparative to spending a week in Canada at any time of the year”), things have been ‘hotting up’ in our lab. Here are some of the goings on since our last news letter.

Cushla on now leave now waiting out the last few weeks of her pregnancy and busy preparing things at home for their baby. Murray, Marilyn and Ruth, Tanya and Edana have been dealing with huge numbers of incoming samples from all sorts of places besides our usual ones. Samples have been arriving in from Psychology for the ‘Genetics of Happiness -Daily Life Study, Dentistry (Long Face Study), another Psychology Study (Neurological Pain Syndrome). It is great to see Tamlin Conner (a collaborator) from Psychology was awarded an Emerging Researcher Grant from the HRC recently.

Sara is currently in Oz to see her husband Zeeshan whom she hasn’t seen since getting married way back in December. Tanya has been off to Auckland to conduct interviews with Gout patients as part of her PhD project and also made sure the suitcase of consumables gets to our Research Nurse. Aimee has been up to Nelson to celebrate Adelyn’s first birthday with her family. And Mandy is preparing for Liam and Jame’s second birthday – where does time go? The Merriman lab phone has been ringing hot of late - so much so that even the newest addition to our lab, Kim, has felt the need to stick her thumb to her forehead and yell ‘bags not!’ when it rings. Incidentally, the phone is almost always for Marilyn. Kim is very excited to have received parcels from the Book Depository. Ruth says she has nothing exciting to add; however we are finding it fun to guess where Mark (her husband) is when he phones Ruth.... Wanaka, Balclutha, Palmerston, MaCraes Mine, Ranfurly for a pie? She also has a new kitchen. Humaira says she is freezing and is trying to maintain her weight by roaming between the offices of Tony and Sally using the stairs. She is enjoying many potlucks, and also says she enjoys our enjoying sunny days despite the cold. She

is here doing her PhD, which currently entails plenty STATA analysis, FPLC, and dealing with the “sometimes annoying” ELISA results. Mansour has been quietly working way in the corner and is awaiting the arrival of their baby.

A number of us attended a Pacific greeting course a couple of weeks ago – we can definitely recommend their coconut loaf. We also had a research station at the Pacific Health Day in South Dunedin run by the 5th year Medical Students. The public had the opportunity to get a thorough health snapshot and partake in our Gout Study. We were most impressed that the students managed to complete our questionnaires very well. Measuring peoples’ uric acid levels on our ‘point of care’ Reflotron machine and doing blood glucose readings proved to be very popular. It was really nice to interact with the community, as we normally do not get to see this side of things.

Tony has a conference to attend in the school holidays in Rarotonga, so we are taking our oldest two kids to visit, so we can check out schools, housing etc as part of Tony’s sabbatical leave will be spent there next year..... Not a bad place to go, we reckon. Our kids have been keeping us busy with both school and extra curricular events. Marilyn reckons if she got paid \$20 for every time Kara had been to He Waka Kotuia events recently (King’s & Queen’s High School Kapa Haka), she would have a good stash by now.

June has been a bit bare on the birthday front however we did have our annual ‘Pot Luck Dinner’ at the Merrimans which was enjoyable and the food was delicious with from our culturally diverse group. Some of the yummy things we got to devour included homemade stuffed and unstuffed breads, Russian salad, Cheeseburger pie, Curries, Chocolate and Coffee layer cake and New York cheesecake.

By Marilyn



Note from Editor:

Next newsletter can we please have the recipe for Cheeseburger Pie? I’m sure it can’t really be what it sounds like it is.



## Tate Lab

The lab has had some sad farewells lately as we said goodbye to two old timers and a relative newbie. Simon and Gary, two stalwarts in our Alzheimers group, have submitted their Masters theses and headed over the ditch, joining the brain drain to Australia - Gary doing a brief stint with Les and colleagues in Otago Genomics before he left. They can't have been totally put off their experience at Otago, with both choosing to stay in the Alzheimers/neurodegenerative disease area for their PhD studies. Simon has gone to the University of Melbourne to work with A. Prof Kevin Barnham, testing the hypothesis that 'Modulating cellular Cu and Zn levels is a valid therapeutic strategy to protect against the effects of excitotoxicity in neurodegenerative disease', while Gary has gone to the the Garvan Institute in Sydney to work with Bryce Vissell - the Head of their Neuroscience Programme - on a project within the area of synaptic function, memory, stem cells, and Alzheimer's and other neurological diseases. Gary got distinction for his MSc thesis, while Simon is making a few (hopefully minor!) corrections.

Meanwhile, our resident Danish student - and competitive cyclist extraordinaire - Maj Schneider Thomsen - has returned to Denmark, but not before putting on a sumptuous lab lunch with many and varied Danish treats (the name of which escapes me, but they were all very nice!) Maj's thesis has been examined in Denmark and also had an oral exam, for which she gained the highest grade point possible (12 on a 12 point scale) - congratulations from all of us, Maj! The title of her thesis was 'Protective and toxic proteins in Alzheimer's Disease', as part of which she successfully tested the hypothesis that secreted amyloid precursor alpha interacts with beta amyloid, the causative agent of Alzheimer's Disease, and this may explain part of its neuroprotective function.

We are already missing Maj's smile and Simon and Gary's chit-chat (and knowledge of all things Alzheimer's) around the lab.

Warren has been very busy lately with teaching and marking, as well as talking at a public seminar/workshop put on by the ME/CFS Support group Bay of Plenty in Tauranga in June, at which he and Auckland GP Dr Ros Vallings were guest speakers. Over 100 attended and there was a spirited discussion period after the two presentations. Warren's talk was titled "Reflections on ME/CFS in 2012 from a research and family perspective".

Warren talked about how patient symptoms relate to research areas, from his family observations and his research experience. He highlighted the new molecular technologies and how they might be relevant to the study of ME, and for longitudinal monitoring of the progression of the illness for an individual patient (when the price comes down!).

Warren is collaborating with Ros Vallings as the GP in New Zealand who knows most about the disease and who has managed the illnesses of ~6000 patients in the last 15 years, including our own Angus Mackay. She is on the Governing body of the international body IACFS, and has been part of the drafting group for international clinical diagnostic guidelines for ME/CFS(2011). She recently visited Dunedin for discussions of progressing the research/clinical interface and, in turn, Warren has written a foreword for her soon-to-be-published book on the illness aimed at the patient group, estimated to number over 20,000 in New Zealand.

Warren is also an invited speaker at the upcoming QMB 2012 Non-coding RNA satellite meeting, giving a talk titled 'Reflections on non-coding RNAs from the early post-biotic world and preservation of their assigned functions within the modern cell'!

Angus has passed the first year milestone of his PhD studies on Finding biomarkers for ME.

As many may know, Liz Poole has been undergoing treatment for a major illness in the last 6 months and has had to spend time away from the department for therapy and recovery from it. There are still major hurdles for her to overcome, but we have much appreciated seeing more of Liz in the lab recently.

Last but not least, Harold is finally flying solo! He has had his first sole-authored paper accepted for publication by the online journal Biology Direct, the title of which owes a debt to Winston Churchill's famous comment on democracy: 'The RNA world hypothesis: the worst theory of the early evolution of life (except for all the others)'. The review critiques a number of the objections that have been raised to the RNA world hypothesis, including the increasingly popular hypothesis known as 'proteins first', which proposes that proteins either preceded RNA in evolution, or at least that proteins and RNA coevolved. Harold is also giving a seminar on this (among other topics) at a seminar in the Zoology Department in July.

## Rites of Passage

The Wilbanks lab celebrated a hat trick of bittersweet passages this autumn; in May we gathered at Sigurd's to celebrate Richard Ahokovi Tukia getting capped by the vice chancellor. In June Samuel handed in his MSc theses on single molecule FRET and almost immediately hosted us at Little India (followed by karaoke for the brave). We followed up the next weekend with a farewell party at Henning and Anna's, with New Zealand barbecue and a flaming German mulled wine.

In preparation for upcoming passages, Tracy has submitted her doctoral thesis, not too many days behind Samuel and at about the same page-count - perhaps Samuel could have edited with more vigour. Richard Souness and Peter are not far behind, with advanced drafts of their own theses.

Other lab members have been engaged with less terminal activities. Egor jetted off to America for the 2nd Penn State Bioinorganic Workshop, with training in lots of cool techniques, from the truly cool (freeze-quench) to the scary (ORCA). Antonia vacationed at home in Germany, whence she sent to her bosses a message along the lines of: "Terribly ill with dreadful flu - must change flight to later date"; subsequent reports suggest she might have written "Being pampered by mother and visited by friends with birthday wishes while watching the European championships - must change flight to later date." Both versions seem to be true. So long as the novel lactoperoxidase results keep coming, the bosses do not care on which continent she watched the championships.

Rachel, Yohan and Sigurd are relieved to see the end of semester 1 - of the three, Rachel seems to have best survived the experience. Malcolm has been turning his hand to the leconotide project and learning some of Henning's secrets with inteins and mass spec.



Aimée, Matthias and Sigurd took a quick trip to the Australian synchrotron to evaluate new developments and collect X-ray crystallographic data. The new guesthouse is luxurious compared to the old apartments and the ladies at the new canteen are very helpful in packing one a dinner for a late night of data collection - much better creature comforts overall! Continuing a lab curse, they collected better data for those not travelling (Richard, Rob, Victoria and Abhishek) than for those of who made the trip across the Tasman with their own crystals. The lesson is either, 1) send your crystals with a colleague, 2) take crystallisation lessons from your colleagues or 3) be lucky. They were in fact lucky - they missed by a day a Victorian earthquake that shut down the beamlines and while they were collecting the crystal-handling robot chose to go on holiday - had they been operating it from the usual, remote vantage in the Wilbanks lab write-up room, they would have been out of luck. As it is, they could take over and mount crystals by hand.

By the time this report comes off the presses, Samuel should be in Copenhagen, Jess and Aimée should be back from their SAXS workshop in Christchurch, Sigurd should be collecting SAXS data for them both at the Stanford Synchrotron, Egor will be visiting family in Turkey and Moscow and Henning should be well into his and Anna's six-week tour of God's Own Country before they return home to Germany. Bon voyage to all!

## Dearden Lab

The Dearden lab is rocking on as usual; Ro handed in her beautiful PhD and is writing up papers on the writing bursary. Megan and Ajay are off to their first international conf's these next two weeks, combined with a bit lot of travel around Europe. Peter and Liz are joining them, for the big EvoDevo conf in Lisbon, and combining the opportunity with a visit to England for presentations at Oxford, Cambridge and the like. Such popular kids. Both Megan and Ajay were granted oral presentations, causing much nerve-tinged excitement. Several old LED members will be at Euro EvoDevo, and everyone is looking forward to the stories and pictures with Matt and Nathan. And for those of us left at home (sob); postcards.

Peter and Liz are both also giving oral presentations at Euro EvoDevo, so it looks to be a strong show for the Dearden lab. Liz is heading off to attend the Brazilian Bee Meeting after, where she is giving her first ever invited talk. Whoop!

Meaghan is submitting her Master's thesis in the next week or so, but will hopefully be sticking around for some further work in the lab. The honours minions students, Frano & Julie, have been hard at work learning just how little they know and discovering just how contrary science can be.

Our visiting Biology secondary school teacher, Praneeta, who has been with us on a Royal Society-funded sabbatical for 6 months, is leaving the lab in the next week. She has been doing brilliant work with flies, diet and mismatch and will hopefully be popping back in for visits forever more. Else there will be tears. Sarah's lame. Our brilliant new postdoc, Lucy (aka Amy), has settled into the lab and is running experiments with flies, diet and development. She is also working on cooking up a new person for tip-racking, which is good because we are running low. An eagerly anticipated mini-Lucy. Towards the end of June she also attended the now-famous NRCGD writing retreat up in Auckland, with Prof David Lindsey.

The bee season is once again over, with the frantic sample collection and dissections put to bed for another year. Varroa was found in the south island these past few months, including in our lab hives, resulting in new TV appearances for Peter, and for Otto's hives; and the development of new protocols for maintenance of populations. We have a new postdoc starting in July, Andrew Cridge (whom some of you may remember from his PhD with Warren), which should be fun; and everything else continues as normal. Peace out.

