
Biochemistry News

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

editor: Bronwyn Carlisle

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Nunn Lipscomb, Jr p.6
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And the winners were:

Three Minute Thesis Competition:

First: Katie Hope
Second equal: Shar Rae &
Meaghan O'Neill

Department Quiz Evening:

First: Smarties (Krause &
Marshall Labs)
Second: Leaves and Pond
Scum (Macknight &
Eaton-Rye Labs)
Third: Big Bang Theory
(Lamont Lab)

View from the Corner

Welcome to the May-June edition of the Biochemistry Newsletter. It has been a busy year, as usual, but not so busy that we didn't have time for some fun. Below you will read about our Departmental "Three Minute Thesis" competition, which was very well-attended and hugely entertaining. Congratulations to all who participated and to the three top finishers, Katie Hope, and Sharleen Rae and Meaghan O'Neill! This past Friday night we had a very well run quiz night organized by a group of our wisest postgraduate students, sponsored by Thermo-Fischer and emceed by the inimitable and always engaging, Peter Dearden.

Strategic Planning has become a passion for some of us in the Department following on the recommendation for same by our External Review Panel. This planning is being guided by Craig Marshall of behalf of the Departmental Coordinating Group. If Craig, or a representative of the Coordinating Group taps you on the shoulder to ask you to contribute to or help out with the plan, I hope you will give it your best effort. My old friend and well-known streptococcal researcher, James Musser, once told me that successful planning is simply "skating to where the puck will be" which I think he borrowed from Wayne Gretsky. It's an apt saying because although the Department is in a great place right now, in order to make sure it stays there, we have to plan ahead, anticipating our needs. The best way to plan of course is for all of us to contribute to the process which in turn helps the best plan emerge.

On a sadder note, my PhD mentor William Nunn Lipscomb, Jr died a few weeks ago at the age of 91. He was suffering from dementia and from a recent fall and passed away quietly in Cambridge, Massachusetts, USA. It's



hard for me to overstate the profound contribution he made to my life in the six years I was in his group, but it was an amazing experience for me. He was a Nobel Laureate for the discovery of electron deficient bonds in boron hydride complexes and during the 80s at Harvard he maintained a group with three foci - protein crystallography, theoretical enzymology, and theoretical inorganic chemistry studying boron complexes, often using his own quantum mechanical methods. He was an accomplished clarinetist and an avid tennis player. Almost every night he returned to the laboratory and the best time to visit with him was between 9pm and 10pm in his office in Gibbs Laboratory. I owe him much and am grateful for every moment I had with him. A few years back I wrote a short piece about him for his 80th birthday celebration. I have asked Bronwyn to include this piece, slightly updated, in the newsletter [it's on p.6]. I hope you will enjoy reading a bit more about him. Take care and I hope we have some great discoveries here over the winter!

Recent Publications

A Nagarajan, R Winter, J Eaton-Rye, R Burnap.

A synthetic DNA and fusion PCR approach to the ectopic expression of high levels of the D1 protein of photosystem II in *Synechocystis* sp. PCC 6803.

Journal of Photochemistry and Photobiology B: Biology (2011)

Brie Sorrenson, Rachel J Suetani, Vivienne M Bickley, Peter M George, Michael J A Williams, Russell S Scott, Sally P A McCormick.

An ABCA1 truncation shows no dominant negative effect in a familial hypoalphalipoproteinemia pedigree with three ABCA1 mutations.

The ATP binding cassette transporter A1 (*ABCA1*) is a key determinant of circulating high density lipoprotein cholesterol (HDL-C) levels. Mutations in *ABCA1* are a major genetic contributor to low HDL-C levels within the general population. Following the finding of three different *ABCA1* mutations, p.C978fsX988, p.T1512M and p.N1800H in a subject with hypoalphalipoproteinemia, we aimed to establish whether the p.C978fsX988 truncation exerted a dominant negative effect on the full-length *ABCA1* alleles within family members as has been reported for other *ABCA1* truncations. Characterisation of the p.C978fsX988 mutant in transfected HEK 293 cells showed it to be expressed as a GFP fusion protein but lacking in cholesterol efflux function. This was in keeping with results from cholesterol efflux assays in the fibroblasts of p.C978fsX988 carriers which also showed impaired efflux. Allele-specific quantification of p.C978fsX988 mRNA and analysis of *ABCA1* protein levels in the fibroblasts of p.C978fsX988 heterozygotes showed negligible levels of mRNA and protein expression. There was no evidence of a dominant negative effect on wildtype or p.N1800H protein levels. We conclude that in the case of the p.C978fsX988 truncated mutant a lack of expression precludes it from having a dominant negative effect.

Biochemical and biophysical research communications (2011) pp.

S.J Baldwin, K.G Dodds, B Auvray, R.A Genet, R.C Macknight, J.M.E Jacobs.

Association mapping of cold-induced sweetening in potato using historical phenotypic data.

Annals of Applied Biology (2011) vol. 158 (3) pp. 248-256

Nina Dickerhof, Torsten Kleffmann, Ralph Jack, Sally McCormick.

Bacitracin inhibits the reductive activity of protein disulfide isomerase by disulfide bond formation with free cysteines in the substrate-binding domain.

The peptide antibiotic bacitracin is widely used as an inhibitor of protein disulfide isomerase (PDI) to demonstrate the role of the protein-folding catalyst in a variety of molecular pathways. Commercial bacitracin is a mixture of at least 22 structurally related peptides. The inhibitory activity of individual bacitracin analogs on PDI is unknown. For the present study, we purified the major bacitracin analogs, A, B, H, and F, and tested their ability to inhibit the reductive activity of PDI by use of an insulin aggregation assay. All analogs inhibited PDI, but the activity (IC₅₀) ranged from 20 μm for bacitracin F to 1050 μm for bacitracin B. The mechanism of PDI inhibition by bacitracin is unknown. Here, we show, by MALDI-TOF/TOF MS, a direct interaction of bacitracin with PDI, involving disulfide bond formation between an open thiol form of the bacitracin thiazoline ring and cysteines in the substrate-binding domain of PDI.

The FEBS journal (2011) pp.

J Lopez, S John, T Tenev, Gilles J.P Rautureau, Mark G Hinds, F Francalanci, R Wilson, M Broemer, Massimo M Santoro, Catherine L Day, P Meier.

CARD-Mediated Autoinhibition of cIAP1's E3 Ligase Activity Suppresses Cell Proliferation and Migration.

Molecular Cell (2011)

J.J Eaton-Rye.

Construction of gene interruptions and gene deletions in the cyanobacterium *Synechocystis* sp. strain PCC 6803.

Methods in molecular biology (Clifton, N.J.) (2011) vol. 684 pp. 295-312

L.-M Diaz-Gallo, L Espino-Paisán, K Fransen, M Gómez-García, S Van Sommeren, C Cardeña, L Rodrigo, J.L Mendoza, C Taxonera, A Nieto, G Alcain, I Cueto, M.A López-Nevot, N Bottini, M.L Barclay, J.B Crusius, A.A Van Bodegraven, C Wijmenga, C.Y Ponsioen, R.B Geary, R.L Roberts, R.K Weersma, E Urcelay, T.R Merriman, B.Z Alizadeh, J Martin.

Differential association of two PTPN22 coding variants with Crohn's disease and ulcerative colitis.

Inflammatory Bowel Diseases (2011)

Martin F Hohmann-Marriott, Robert E Blankenship.

Evolution of photosynthesis.

Energy conversion of sunlight by photosynthetic organisms has changed Earth and life on it. Photosynthesis arose early in Earth's history, and the earliest forms of photosynthetic life were almost certainly anoxygenic (non-oxygen evolving). The invention of oxygenic photosynthesis and the subsequent rise of atmospheric oxygen approximately 2.4 billion years ago revolutionized the energetic and enzymatic fundamentals of life. The repercussions of this revolution are manifested in novel biosynthetic pathways of photosynthetic cofactors and the modification of electron carriers, pigments, and existing and alternative modes of photosynthetic carbon fixation. The evolutionary history of photosynthetic organisms is further complicated by lateral gene transfer that involved photosynthetic components as well as by endosymbiotic events. An expanding wealth of genetic information, together with biochemical, biophysical, and physiological data, reveals a mosaic of photosynthetic features. In combination, these data provide an increasingly robust framework to formulate and evaluate hypotheses concerning the origin and evolution of photosynthesis. -

Annual review of plant biology (2011) vol. 62 pp. 515-48

Megan J Wilson, Helen Abbott, Peter K Dearden.

The evolution of oocyte patterning in insects: multiple cell-signaling pathways are active during honeybee oogenesis and are likely to play a role in axis patterning.

SUMMARY In *Drosophila* it is well established that signaling between the germline and surrounding follicle cells establishes the axes of the future embryo and is required for patterning of the eggshell. However, little is known about how this is achieved in other insects. Genome sequencing studies imply that maternal axis determination may be rapidly evolving, as a number of *Drosophila* maternal patterning genes are absent from the genomes of other insects. We have examined the distribution and function of six developmental signaling pathways present, and active, in honeybee ovarioles. We have confirmed an evolutionarily conserved role for transforming growth factor- α -epidermal growth factor receptor signaling in dorsal-ventral (DV) patterning. We also found evidence for the involvement of Dpp/Mad and JNK-MAPK pathways in DV patterning, unlike *Drosophila*. Several of these pathways are also active in the germarium, implicating them in germ and somatic stem cell maintenance and proliferation, similar to their activities in *Drosophila* ovaries. -

Evolution & Development (2011) vol. 13 (2) pp. 127-37

Rebecca L Roberts, Lina-Marcela Diaz Gallo, Murray L Barclay, María Gómez-García, Carlos Cardeña, Tony R Merriman, Richard B Geary, Javier Martin.

Independent replication of an association of CNVR7113.6 with Crohn's disease in caucasians.

BACKGROUND: A recent genome-wide association study (GWAS) of copy number variants (CNVs) in Crohn's disease (CD) confirmed association of three CNVs. The GWAS also provided evidence that a fourth CNV, CNVR7113.6, on chromosome 17 may alter susceptibility to CD ($P = 0.0018$). The aim of our study was to confirm the CNVR7113.6 association by genotyping two independent inflammatory bowel disease (IBD) cohorts and by conducting a subsequent meta-analysis. **METHODS:** In all, 1369 New Zealand Caucasians (489 CD patients, 463 ulcerative colitis [UC] patients, and 417 controls) and 2737 Spanish Caucasians (711 CD patients, 549 UC patients, and 1477 controls) were genotyped for a single nucleotide polymorphism (SNP), rs413778, in high linkage disequilibrium ($r(2) = >0.99$) with CNVR7113.6. Chi-square analysis was conducted to test for association of rs413778 with overall CD, UC, IBD, and with disease phenotype. New Zealand and Spanish genotypes were then combined with imputed rs413778 genotypes from the Wellcome Trust Case Control Consortium (WTCCC) and the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) CD datasets to conduct a meta-analysis. **RESULTS:** The minor allele of rs413778 conferred protection against CD in the Spanish cohort (CD: $P = 0.004$, odds ratio [OR] = 0.82, 95% confidence interval [CI]: 0.71-0.94). A similar, albeit nonsignificant protective effect was observed in New Zealand CD patients ($P = 0.098$, OR = 0.83, 95% CI: 0.66-1.04). No association with UC or disease phenotypes was detected in either cohort. Meta-analysis found significant cumulative evidence for a protective effect of rs413778 in Caucasian CD ($P = 1.19E-05$, OR = 0.86, 95% CI: 0.80-0.92). **CONCLUSIONS:** This study provides the first independent replication of the association of CNVR7113.6 with CD. (*Inflamm Bowel Dis* 2011;).

Inflammatory Bowel Diseases (2011) pp.

S Nasser, H.E Cunliffe, M.A Black, S Kim.

Context-specific gene regulatory networks subdivide intrinsic subtypes of breast cancer.

BMC Bioinformatics (2011) vol. 12 (SUPPL. 2)

C.C Yeoh, M Balcerowicz, R Laurie, R Macknight, J Putterill.

Developing a method for customized induction of flowering.

BMC Biotechnology (2011) vol. 11

Helena M Cocheme, Caroline Quin, Stephen J McQuaker, Filipe Cabreiro, Angela Logan, Tracy A Prime, Irina Abakumova, Jigna V Patel, Ian M Fearnley, Andrew M James, Carolyn M Porteous, Robin A. J Smith, Saima Saeed, Jane E Carre, Mervyn Singer, David Gems, Richard C Hartley, Linda Partridge, Michael P Murphy.

Measurement of H₂O₂ within living *Drosophila* during aging using a ratiometric mass spectrometry probe targeted to the mitochondrial matrix.

Hydrogen peroxide (H₂O₂) is central to mitochondrial oxidative damage and redox signaling, but its roles are poorly understood due to the difficulty of measuring mitochondrial H₂O₂ *in vivo*. Here we report a ratiometric mass spectrometry probe approach to assess mitochondrial matrix H₂O₂ levels *in vivo*. The probe, MitoB, comprises a triphenylphosphonium (TPP) cation driving its accumulation within mitochondria, conjugated to an arylboronic acid that reacts with H₂O₂ to form a phenol, MitoP. Quantifying the MitoP/MitoB ratio by liquid chromatography tandem mass spectrometry enabled measurement of a weighted average of mitochondrial H₂O₂ that predominantly reports on thoracic muscle mitochondria within living flies. There was an increase in mitochondrial H₂O₂ with age in flies, which was not coordinately altered by interventions that modulated life span. Our findings provide approaches to investigate mitochondrial ROS *in vivo* and suggest that while an increase in overall mitochondrial H₂O₂ correlates with aging, it may not be causative

Cell Metabolism (2011) vol. 13 (3) pp. 340-350

L.M.E McCowan, R.A North, E.M Kho, M.A Black, E.H Chan, G.A Dekker, L Poston, R.S Taylor, C.T Roberts.

Paternal contribution to small for gestational age babies: A multicenter prospective study.

Obesity (2011) vol. 19 (5) pp. 1035-1039

P.T Seed, L.C Chappell, M.A Black, K.K Poppe, Y.-C Hwang, N Kasabov, L McCowan, A.H Shennan, S.H Wu, L Poston, R.A North.

Prediction of preeclampsia and delivery of small for gestational age babies based on a combination of clinical risk factors in high-risk women.

Hypertension in Pregnancy (2011) vol. 30 (1) pp. 58-73

R.P Herridge, R.C Day, S Baldwin, R.C Macknight.

Rapid analysis of seed size in *Arabidopsis* for mutant and QTL discovery.

Plant methods (2011) vol. 7 (1)

Margaret M Ryan, Sara E Mason-Parker, Warren P Tate, Wickliffe C Abraham, Joanna M Williams.

Rapidly induced gene networks following induction of long-term potentiation at perforant path synapses *in vivo*.

The canonical view of the maintenance of long-term potentiation (LTP), a widely accepted experimental model for memory processes, is that new gene transcription contributes to its consolidation; however, the gene networks involved are unknown. To address this issue, we have used high-density Rat 230.2 Affymetrix arrays to establish a set of genes induced 20-min post-LTP, and using Ingenuity Pathway network analysis tools we have investigated how these early responding genes are interrelated. This analysis identified LTP-induced regulatory networks in which the transcription factors (TFs) nuclear factor-KB and serum response factor, which, to date, have not been widely recognized as coordinating the early gene response, play a key role alongside the more well-known TFs cyclic AMP response element-binding protein, and early growth response 1. Analysis of gene-regulatory promoter sites and chromosomal locations of the genes within the dataset reinforced the importance of these molecules in the early gene response and predicted that the coordinated action might arise from gene clustering on particular chromosomes. We have also identified a transcription-based response that affects mitogen-activated protein kinase signaling pathways and protein synthesis during the stabilization of the LTP response. Furthermore, evidence from biological function, networks, and regulatory analyses showed convergence on genes related to development, proliferation, and neurogenesis, suggesting that these functions are regulated early following LTP induction. This raises the interesting possibility that LTP-related gene expression plays a role in both synaptic reorganization and neurogenesis. © 2010 Wiley-Liss, Inc.

Hippocampus (2011) vol. 21 (5) pp. 541-53

J.A Hazlett, M Legge.

Scientific Letter The influence of fetal bovine serum on protein expression *in-vitro*: A proteomics approach.

New Zealand Journal of Medical Laboratory Science (2011) vol. 65 (1) pp. 10-11

R Feltham, B Bettjeman, R Budhidarmo, P.D Mace, S Shirley, S.M Condon, S.K Chunduru, M.A McKinlay, D.L Vaux, J Silke, C.L Day.

Smac mimetics activate the E3 ligase activity of cIAP1 protein by promoting RING domain dimerization.

Journal of Biological Chemistry (2011) vol. 286 (19) pp. 17015-17028

G Nixon, K Blattner, J Dawson, S Dovey, M.A Black, G Wilkins, A.C Dunn, A.D McLellan.

Streptokinase antibodies in patients presenting with acute coronary syndrome in three rural New Zealand populations.

Journal of Clinical Pathology (2011) vol. 64 (5) pp. 426-429

V Hecht, R.E Laurie, J.K Vander Schoor, S Ridge, C.L Knowles, L.C Liew, F.C Sussmilch, I.C Murfet, R.C Macknight, J.L Weller.

The pea GIGAS gene is a FLOWERING LOCUS T homolog necessary for graft-transmissible specification of flowering but not for responsiveness to photoperiod.

Plant Cell (2011) vol. 23 (1) pp. 147-161

K Meredith-Jones, D Waters, M Legge, L Jones.

Upright water-based exercise to improve cardiovascular and metabolic health: A qualitative review.

Complementary Therapies in Medicine (2011) vol. 19 (2) pp. 93-103

Kathryn S Linterman, David N Palmer, Graham W Kay, Lucy A Barry, Nadia L Mitchell, Robin G McFarlane, Michael A Black, Mark S Sands, Stephanie M Hughes.

Lentiviral-mediated gene transfer to the sheep brain: Implications for gene therapy in batten disease.

Abstract The neuronal ceroid lipofuscinoses (NCLs; Batten disease) are inherited neurodegenerative lysosomal storage diseases with common clinical features of blindness and seizures culminating in premature death. Gene-therapy strategies for these diseases depend on whether the missing activity is a secreted lysosomal protein taken up by neighboring cells, or an intramembrane protein that requires careful targeting. Therapies are best developed in animal models with large complex human-like brains. Lentiviral-mediated gene delivery to neural cell cultures from normal sheep and sheep affected with an NCL resulted in green fluorescent protein (GFP) expression in neurons and neuroblasts, more efficiently than in astrocytes. Similar transgene expression was obtained from two constitutive promoters, the viral MND promoter and the human EF1 α promoter. In vivo studies showed stable and persistent GFP expression throughout the cell bodies, axons, and dendrites from intracortical injections and indicated ependymal and subependymal transduction. The sheep showed no ill effects from the injections. These data support continuing gene-therapy trials in the sheep models of Batten disease.

Human gene therapy (2011) pp.

Software Review:

SketchEl (Linux, Windows, MacOS X)

At last, a free application for drawing chemical structures that keeps double bonds parallel and exports to a vector based format. This is an excellent wee programme that is written in Java. It has a number of aromatic ring templates, although you need to draw the amino acids and larger molecules. It's easy to use however, and has a number of chemistry functions that I'm not qualified to judge (i.e. about which I am completely ignorant). Bound to be useful if you are a chemist though. Download it from <http://sketchel.sourceforge.net/>

MolPrime (iPad)

MolPrime is also for drawing molecules. It is not free, but is not hugely expensive - about \$12 as I remember (or \$812 if you need to buy the iPad as well). Being an iPad app it has the wonderful touch-screen interface that makes work fun, and it has loads of preset templates for everything from amino acids and heme groups to large multi-ring molecules I don't recognise. There are one or two limitations, for instance it has its own idea of what needs subscripting and superscripting, but these issues can be dealt with later on. After you have finished drawing your pet molecule you email it to yourself; it arrives in three different formats: .png, .mol, and .el - which happens to be the native format for SketchEl. From SketchEl you can fix any type format problems, then export the drawing as an svg vector file, which is openable and editable in Illustrator and Inkscape and infinitely scalable (i.e. resolution independant). Get it from the App Store.

Bronwyn

Notes from the Colonel – William Nunn Lipscomb, Jr.

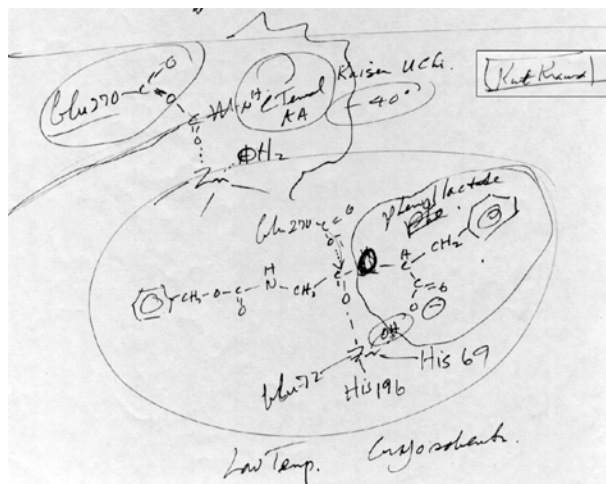
Kurt Krause
University of Otago
May, 2011

From the time I first joined his research group in 1981 I can remember that I loved getting notes from Professor Lipscomb. He was known by everyone in his group as “the Colonel”, because just like the famous Colonel Sanders, he was an officially designated Kentucky Colonel with a citation on his wall from the State of Kentucky to prove it. The Colonel loved “post-it” notes and on special days in our Harvard laboratory, which was a free standing building known as Gibbs Lab, he would leave a note for me or better yet if we had met he sometimes drew a figure for me. He did this when he wanted to illustrate a scientific point, and since I always felt a little in awe of the Colonel during my time with him, I saved these notes. Probably I wanted to preserve a piece of my contact with him, because he represented scientific genius to me. In this tribute I want to describe four types of notes I received from him and their impact on my life pre and post Harvard.

Smart notes

When I first met with the Colonel to discuss possible research projects for my thesis, he described several choices. This was in 1981 or '82 and I remember that the path I followed in deciding to work with the Colonel was a bit convoluted. Originally I came to Harvard to study with Professor Martin Karplus and Professor Chris Dobson, who was on leave from Oxford. They were renowned NMR scientists and I had wanted to choose the popular joint NMR/theory program. But when I arrived, I learned that Chris Dobson was returning to Oxford. Needing to find a mentor, I met with various faculty members in chemistry and described my interest in structural biology. No one ever mentioned the Colonel; they all mentioned Professor Don Wiley and another professor named Steven Harrison, who were both crystallographers. It was as if the Colonel was a big secret in the hidden Gibbs lab. Fortunately, I took a course called “Enzymes” from him. During his lectures, he had a knack for making enzymes come alive. In addition he had mastered the ability to use two 35 mm slide projectors with polarizing lens to project three-dimensional structures of enzymes into the classroom. Once he started those 3D projections of enzymes, I was hooked. He would put up slides in which the active sites would appear dangerously close to our heads. The whole thing was awesome, and I knew I wanted to work on the structural basis of enzyme action with the Colonel. Still puzzled about the lack of comments on the Colonel's program from the chemistry faculty I wanted an outside opinion. I hunted down Don Wiley and he said good things about the Colonel's lab, so I decided that the Harvard Chemistry Department was a very competitive place. When we met about my thesis project, I asked

the Colonel if I could join his group. Fortunately he said I could and then proceeded to sketch out several projects I could pursue. In the figure shown here, the Colonel illustrated a point involving the mechanism of carboxypeptidase A (CPA).

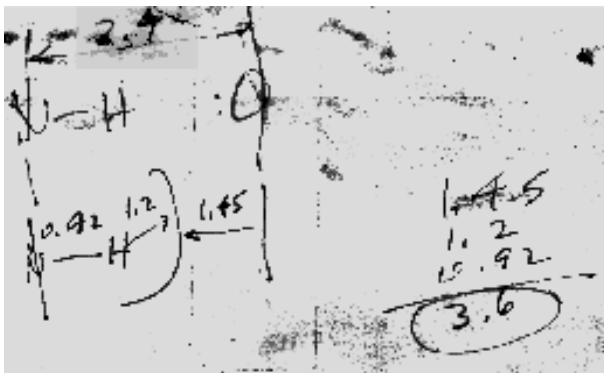


Jean Evans, the Colonel's wife was the *official* Gibbs artist, and she had a knack for protein illustration and calligraphy, but so did the Colonel. As you can see in the Colonel's sketch, the relationships within the active site and how CPA was thought to interact with the substrate are depicted perfectly. Prof. Kaiser's work out of Chicago was mentioned at the top along with the then recent low temperature work noted at the bottom of the sketch. This was enough to get me started and I began into a project that was designed to trap a post-cleavage product in complex with a CPA inhibitor isolated from the potato. The CPA inhibitor was an interesting molecule whose structure had just been solved by Douglas Rees, who is now a professor at California Institute of Technology, during his thesis with the Colonel.

Quick notes

The second note I am mentioning from the Colonel arose from a discussion we had about hydrogen bonds. After reviewing a treatment of hydrogen bonds in a book on Quantum Mechanics by *Linus Pauling and E.B. Wilson*, I was interested in the crystallographic proof of their existence. So I had a 9pm meeting at Gibbs lab about hydrogen bonds with the Colonel. These late night meetings were commonplace and are my most fond memory of my time in his group. This relatively late hour, 9pm, was the best time to meet with him. The Colonel kept a regular schedule in the 80s He would arrive at 10am everyday and immediately had meetings or classes or phone calls all day. I never bothered him during the day, unless we had a paper that we were working on. Papers had priority and during his life he published about 660 articles. At 5pm he would leave for dinner or tennis. After tennis he would return to work, and about 9pm he was generally available to talk. We mostly talked science, but not always. We often discussed medicine, as he had a keen interest in medical

matters. We sometimes discussed music. Sometimes he would reminisce about noted scientists like his thesis advisor Linus Pauling, or Dorothy Hodgkin, or a major rival, such as Professor Howard Schachman from UC Berkeley. In these meetings, the Colonel always seemed to know everything, and he could explain things in a way that graduate students like myself could understand. Although I was a physical chemistry student, I was certainly not a theoretician! After a few minutes of discussing the math involved in H-bonds, he peeled off a post-it note and drew an elegant illustration of their existence based on the van der Waals radii of the involved atoms and the covalent radius of a nitrogen-hydrogen bond. Other scientists, like Wolfram Sanger, have rejected this simple illustration as not providing real proof, but this is still my most favorite figure explaining H-bonds and I used it almost every year in undergraduate lectures in Houston and now in Dunedin, New Zealand.



Blue notes

Crystallography has certainly changed since I left Gibbs lab. I don't mean just technically, which is predictable and almost always good, but also sociologically. In the 80s, it seemed like protein crystallographers comprised a small elite club, where everyone knew everyone. The Colonel brought visitors in almost every week and often we would get to go to lunch or dinner with his guests. For example I recall when Professor D.C. Phillips from Oxford came by Gibbs Lab with his camera and seemed very friendly. Although he was the leader of the group that solved the first structure of an enzyme, lysozyme, he seemed pretty normal to me. Noted crystallographic pioneer Lyle Jensen came as well and he and the Colonel took us to dinner where they described how far computing had come in the prior decades. They had to hand-wire a lot of their own computer back planes, and even used incredibly laborious methods to perform Fourier summations by hand. The students at the dinner were grateful to be able to use VAX 11/780 computing power and "modern" Optronics scanners to read films, which we had at Gibbs – but which now are hopelessly obsolete. Another graduate student inquired on the way back to Gibbs about what "Beavers-Lipson strips" had to do with crystallography!

Other noted protein crystallographers Professors Paul Sigler and Brian Matthews were both honored guests and the latter helped set the stage for the "blue note" I include here. In collaboration with noted bioluminescence expert, Professor Woody Hastings of Biology, we had started a collaboration to study the first light-emitting enzyme called "luciferase". Projects took so much effort at that time that no one wanted to compete with each other. Before starting, the Colonel made sure I spoke personally with everyone that he knew was involved in luciferase crystallization research in order to make sure they were no longer pursuing that structure. That meant speaking with Paul Sigler and Brian Matthews, among others. We were given the go ahead on this project and by 1985, Manfred Kurfürst, a graduate student with Woody, and I had succeeded in growing crystals that diffracted to 3Å, but were subject to decay. As we were making preparations to collect a native data set, I came to work to find a note on my desk announcing that Brian Matthews was again working on luciferase and that he had already collected native data.

Kurt
 Call me private (22nd)
 Brian Matthews is going ahead on the
 Luciferase crystals with the very long
 axis.
 The Colonel
 It may be important for us to
 do this study!

We were disappointed but we stopped our work and waited on the structure. Over the next several years I was told that at many large bioluminescence meetings the impending arrival of the luciferase structure was announced. But years passed and no structure appeared. Finally after a gap of about eight years, I jumped into the race once more, this time in collaboration with Professor David Tu at the University of Houston. Once we entered the race, the rapid solution of the structure was assured, but unfortunately not from my group! Professors Ivan Rayment and Tom Baldwin, from Wisconsin and Texas A&M scooped us. I guess the Colonel was right all along. For what its worth, we later were able to announce the structure of the β_2 homodimer of luciferase, but our paper appeared almost simultaneously with Ivan Rayment's! In structural biology today the competition is so fierce; I sometimes feel that we have lost some of its former civility.

True notes

No discussion of notes from the Colonel could end without mention of the notes he produced from his beloved clarinet. On many evenings after dinner and tennis, he would return to Gibbs Lab to practice the clarinet. The piece I recall most from those years was the Mozart clarinet concerto in C major. The Colonel was preparing for a concert where he performed this piece during my tenure at Harvard. I suspect this piece must have been a favorite of his, because I remember hearing bits and pieces on and off at Gibbs Lab, even after the concert. The Colonel played well and with such spirit that he was inspiring. He carved his own reeds, and he would head off to music camp every summer to sharpen his skills. This was illustrative of his nature, certainly of his virtuosity, and also of his appreciation that life outside of science was important. He knew that art was as valuable as science, and he often told me that science and art were very closely related and that the best science was art and the best art was science.



Notes from New Zealand

As I reflect on my time at Gibbs Lab from the Department of Biochemistry in New Zealand, I am profoundly grateful to the Colonel for my years in his group and for his support of my research in his laboratory. My years at Gibbs lab were among the most exciting years of my life, certainly the most fun and challenging! Whatever we try to accomplish in my own group, I am always thinking about how the Colonel would approach this problem or interpret this result. He was the best mentor I could have imagined. I am saddened by his passing and I think about him, his wife Jean and the Gibb's Lab every day.

Film Review

Être et Avoir

This is an evocative documentary of a schoolteacher in the Auvergne. The school is in a deeply rural area with M Lopez as the lone teacher. He is a very calm and strong man, with a dedication to teaching that makes you wish you had had him as one of your primary school teachers. His pupils range in age from 4 to 11 and are treated individually by Lopez. Although a small school, they go on trips such as a picnic trip by train to the next station. When M Lopez takes the 10 and 11 year old children to the nearest town to visit their next (middle) school, the whole school has to go along. One of the scenes shows Johann trying to do his homework and being "helped" first by his mother and then gradually all the family is there "helping" him.

My bookclub watched this film this month, as our present book, "A History of the World in 100 Objects" by Neil McGregor, is taking longer than we anticipated to read. We are not aligned with any of the national bookclubs but meet for a meal in December and contribute two titles for the coming year. Once a month we meet to discuss the book for that month but very seldom talk for the entire evening about that one book, as we are all avid readers. We read an extensive range of books, both fiction and non-fiction. One of the great reasons for this style of club is that we have all extended our range of authors but do not have the pressure of monthly reports; a greater flexibility.

What I thought would be interesting was to see what we thought were some of the history-making objects. For myself, I think the invention of the clothes peg is one that is worth consideration. Such a useful item and moved clothes drying from adjacent bushes to a secure position on a line. The peg, in all the many forms that it occurs, can be used to hang stuff, to hold, to fasten etc. On Google, there are 729,000 results from searching for clothes pegs!

Lyn

[A History of the World in 100 Objects is also being broadcast on National Radio at ~3pm on Sundays. I have listened to bits of it and it is fascinating. - Ed]

The PhD student/Mother

An interview with Annika Bokor, who recently finished her PhD in Russell Poulter's lab. Hopefully this will be the beginning of a series of interviews with students and staff who have made their lives just that little bit more difficult by combining study or work with some other time- and energy-consuming activity. Suggestions for future interviewees are very welcome.

Did you always plan to have your first child while still a student? If so, what things did you take into account when making the decision?

Not initially, but then yes. Most students would probably agree that one first expects to finish off ones studies, start off a career and only then start a family. However, doing a PhD takes time and the years will go by fast. Following my undergraduate studies I realised that I didn't want to wait that long (completing a PhD and then start off a career) to start a family as I always wanted to complete my family before getting 'too old'. More importantly, if I had my family completed by the end of my PhD, I could immediately start off my career without any 'interruptions' further down the track. I would perhaps also have a slight advantage, as a future employer would know that I'm not going to be away due to a pregnancy followed by maternity leave. (Although such a thing should never influence one's possibility to be employed but I'm sure it still does in some places!).

Was it a scary thought?

No, not at all, both my husband and I both really looked forward to it.

Did you find it easier or harder than you expected?

Much harder! If you haven't had a child before, you think you will be able to cope with the tiredness and find time to do other things. I quickly realised that this was not the case. I loved caring for my newborn but there was no extra energy to do anything else. Later, it was also difficult when one had to leave at a set time to pick up Neo from the nursery, when one really needed one more hour to finish off an experiment. Then there were the numerous times he got sick or injured at the nursery and one immediately had to take off to pick him up leaving an experiment behind to be ruined. The flexibility one normally has in PhD studies does no longer apply. Attending conferences also becomes difficult! Although I did bring a 10 week old Neo along to the U.S.A. for a conference, it was difficult to attend all the talks I wanted (feeding, nappy changes and crying is quite disruptive!).

For me, it was also difficult not having any family around to help even with the simplest little tasks and to give me an occasional break.

You've recently had your second child, what was it like working, caring for Neo, and being pregnant all at the same time?

Hectic! I was lucky and had two easy pregnancies so my pregnancies themselves didn't really affect my work. Every working mother knows that it's hard work to juggle work and caring for a young child. However, for me it was a bit more frantic. I not only did a job that I just had started and never done before, but at the same time I also went through the examination stages of my PhD which needed to be completed before my second child was born.

What advice do you have for anyone else contemplating parenthood while studying?

My spontaneous response would be: Don't do it! However, if parenthood is what you want while studying, make sure that you have an overall plan, be prepared and have other things in your life under control. Make sure your PhD is going well and to have a good relationship with your supervisor to avoid any extra stress.

I also think it helps a lot if your partner is working, because as a student without an income it is difficult to manage economically already as it is. Having family around to help with simple tasks would also be very beneficial.

Anything else you'd like to add?

Having two children while doing a PhD and also work through half of it was very difficult but I wouldn't have wanted it any other way. If one wants something one will have to work hard for it; now I have finished my studies as well as completed my family and I'm looking forward to start of my career.



Book Review

The Very Hungry Caterpillar

by Eric Carle

Peter K Dearden.

Some books are redolent of your childhood, steeped in long summer days, percolated in the smell of banana, and infused with the sharp sting of skinned knees. For me such books are Proust's "Le Temps retrouvé", Hobbes "Leviathan" and Eric Carle's classic "The Very Hungry Caterpillar". It does us good to return to these childhood classics in our later lives to reminds us of all that we failed to become. And so, with a feeling of profound nostalgia (or neuralgia) I recently opened "The Very Hungry Caterpillar" and plunged into its depths.

The book tells, in taut, spare, pithy, phrases, the childhood story of a caterpillar born on the wrong side of the tracks. It is Carle's genius that allows him to make the social situation of the caterpillar clear, without ever directly referring to the nightmare of a dysfunctional caterpillar family life. The book starts "In the light of the moon, a little egg lay on a leaf...". Clearly this egg's mother did not care, leaving its offspring in an exposed position, obvious even in moonlight, to the hungry eyes of the world. Butterflies lay their eggs most often in clutches hinting, again subtly, that this egg's siblings have already been eaten in this bird-eat-caterpillar world.

Next the caterpillar begins a constant search to assuage its hunger, clearly a metaphor for its search for love. It is in this section of the book that the savage twist in this tale occurs; the caterpillar happens upon a picnic. The next pages, cropped and holed to emphasize the horror contained within, describe how the caterpillar feasted on forbidden fruits, sausages and the like, while an

unseen force, the owners of the picnic, lurk like a hint of God, never seen- but very much felt. The tension rises as we stagger thorough the food eaten, building, as we contemplate the possible outcomes. Will 'God' squash the caterpillar with a cry of 'there's a bloody caterpillar on my sausage'? Will the caterpillar find maternal love? Will the poor creature escape the twin evils of diabetes and obesity?

It is this that is the key message of the book. A poor start to life, an inappropriate, mismatched diet, a need to feed! All of this gives rise to a Gluckmanian nightmare that only finds resolution when the caterpillar renounces its flesh eating ways and turns to veganism.

The final pages try to recreate this tension, but fail, as the caterpillar pupates and finally hatches as a frankly unrealistic butterfly. This ending, I feel, lets down the reader, I am waiting for Carle's "The Return of The Very Hungry Caterpillar", to learn of this butterfly's encounters with sex and death.

The book has is downsides; often it is simplistic; and its treatment of seasonal polyphenisms is disturbingly non-existent. Despite this, this is a cracking read, a real page turner, an embodiment of all that can be achieved with the modern treatment of insect metamorphosis. You'll laugh, you'll Cry, you will not put it down until the end. Especially if you are reading it to small people.

My rating *****



Three minute thesis competition



Lab News

Krause Group

April and May this year has seen lots of activity in the Krause laboratory. To start we have two group activities to report. On 18 May we held a group dinner at the world famous Japanese bistro, Yuki on Bath street. Everyone enjoyed sushi, saki and the finer points of Makuuchi sumo, including salt purification, the famous shiko leg stomp and the multiple false tachi-ai, which occur before the wrestlers actually grapple. This was a fun evening in a traditional Japanese setting, enjoyed by all. But when we learned from Yoshio that the owner is Korean and not Japanese, we were somewhat nonplussed! But no matter, we regrouped to put together a team for quiz night this past Friday. To round out our group of six, Sylvia, Ashley, Helen and Kurt joined with Craig Marshall and Abhishek. Craig was our all-rounder, an erstwhile dux with ample NZ quiz experience, while Abhishek, a cricket fan was our sports specialist. Despite this plan, Friday started with a fright as we learned that Abhishek had to leave for India on short notice and would not be able to participate. This caused some sporting angst to grow amongst us, but we had cool heads, and with great teamwork we hung together to come away with a win. The prize turned out to be two bottles of wine for each member of the winning team. This was very cool indeed.

Apart from the group activities, there are some individual moments to report as well. First off the mark was Miriam who while still on maternity leave was able to shepherd her first KKL group publication into BMC microbiology. She received a ceremonial tee-shirt at group meeting to honor this accomplishment. Karen Yates is making great progress on her Orf virus project although she learned this month that she is staring down a Sword of Damocles in the form of a possible pseudo-fourfold screw axis! This struggle is occurring while she is pursuing in earnest her parasailing qualification. Michele just keeps getting better and better at tissue culture. Not content with transfecting HEK cells alone, she is now infecting insect cells with baculovirus and preparing to infect dog kidney cells with the flu! Tissue culture rocks! Ashley Campbell, our honors student is working with Helen and Michele to get enough neuraminidase from influenza to purify for biophysical studies, while Master's students Victoria Stock and Hugh McGillan are working with Karen on projects relating to innate immunity in HIV. Emma Scaletti is zooming ahead as she tries to finish her first structure paper with rapidity. Her secret? A combination of yoga, meditation and enzyme kinetics. Hot kinetics but not hot yoga - take that Bikram! Helen Opel-Reading is working to master the purification of streptococcal surface antigens in anticipation of the arrival of a special guest for the month, Milya Davlieva. Milya is a research fellow from Rice University in Houston, Texas with a passion for careful lab work and the ability to purify and crystallize

any protein in two weeks. Drop by to visit her in June if you can, she will enjoy getting to meet you. Last but definitely not least, Sylvia is moving in with a special partner in Biochemistry, a BiaCore X100. Sylvia and the BiaCore will be living across the hall next to the ground floor cold room for the duration of the BiaCore demonstration, which we hope will be a big success.

Kurt acting like he is allowed has an opinion



Yuki



Michele and Ashley getting kitted up to assay neuraminidase in Microbiology

The Day Lab

There's been a lot of changes in lab 223 in the past few months

Firstly, we would like to welcome (somewhat belatedly) Gabby and Josh to the lab. There you go, Gabby! Now you're a legitimate member of the lab (LOL! :-). Josh, who has been with us since last summer, is now doing a new project. Both of them are doing some experiments on some "exotic" E3 ubiquitin ligases and are currently getting super-interesting results ...

Catherine has been away overseas to attend a conference, visit some labs and have a great time in general. In the meantime, Bodhi has been the lab manager, keeping everybody in line while keeping stocks of reagents full and doing his own experiments!! That's right! A man can multitask! This skill is going to be very useful when a new member of your team arrives, Bodhi ;-) ...

If you have problem with LaTeX (or don't even know what LaTeX is), Fran is the person to go to. This high quality typesetting system will make document preparation a breeze! ...

There were some hair-pulling moments in the lab involving a multitude of computer problems (They all came at the same time!!!). The IT team has done their best to cater to our needs and answer to our endless questioning. Yoshio has also been really good with getting information from our broken hard drive and installing a new scanner. He's now busy doing a lot of paperwork as well as running back and forth from Biochemistry to Microbiology ...

Puja felt like she just won lotto. Well, it's not exactly lotto but a Glassons shopping voucher is pretty damn good too! ...

Rhesa has been eating a lot (read: A LOT) of Feijoas. They're super tasty!! Did you know that Feijoas were named after a Brazilian-born Portugese botanist, João da Silva Feijó? and, apparently, Feijoas are native to Brazil, Colombia, Uruguay and Argentina (Thanks Wikipedia). You can go to www.feijoa.org.nz/promotion.html for some nice Feijoa recipes.

That's all for now from lab 223. Take care!



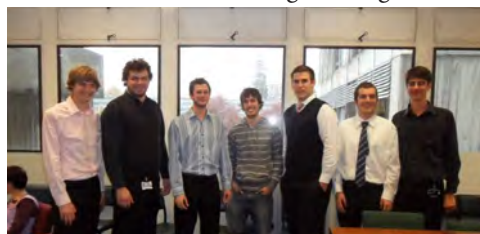
Simon Cabout's house

News from JER 308

As I wondered what to write about for this edition of the newsletter, the lab has exploded into laughter and I can only guess what it may be about. Being the only female in our group of 15, the topics of conversation up here are dubious at best - well that's when they're not talking about coffee breaks and when lunch is.

The science being applied in the lab is pretty astonishing! From making cyanobacteria battery packs (so we can run the lab off the national grid) to ordering weapons of mass destruction ... aka rust! We are all kept on our toes, I tell you!

Jared Fudge (in the Macknight group) had 308 and others celebrate his birthday before Easter, with "Dress like Fudge Friday". The lab was looking very sharp that day. Soon after this, it was graduation and our fourth year Jake Lamb graduated along with Jared. Congratulations to you both. The graduation party that Jared threw is still discussed at great length.



Simon Cabout was left homeless and sleeping under the George St. bridge after last month's wild winds blew a tree on his house, rendering it inhabitable. He is finally allowed back after his few weeks of hobo existence.

Amongst the hilarity there have been some serious research performed, with our fourth year students Asher, Josh and Jake, generating loads of data and we will look forward to hearing all about it in a couple of months when they give their Departmental talk. Ryan Hill has sent off a manuscript on his butanol-producing bugs and will save the world with his biofuel. Rob Fagerlund is on a publishing role, with a couple of papers in the line. Look out for them. In April, Julian attended the ESF-EMBO Symposium on Molecular Bioenergetics of Cyanobacteria: From Cell to Community. This was held in Spain no less! Talk about lucky!



Tonight is Quiz night, and everyone is in a buzz about it. There has been team name stealing, the building of a team has been very strategic and the studying going on for it is outstanding! I am sure one of the 308 teams will get a 1st, 2nd or 3rd placing ... maybe?!

That's all for now.

Macknight Lab News

The first half of 2011 has been an eventful one for our lab. Mau has submitted her thesis and has moved to Auckland with her husband and baby. We will certainly see her again when it comes time for her oral exam. Chris has settled in well and is closing in on the finish line for his PhD, although that will have to wait until he gets back from Perth in a few days. The lab is especially quiet at the moment with Rob being in England for a holiday, and Richard also in Europe for a conference. As if it wasn't quiet enough already Jared will be travelling to Malaysia for a bridge tournament in June, and Rowan is away to the USA for a conference in June as well. This will leave Robyn and Jane to keep things moving in the lab, and of course look after our precious plants.

Rowan, Robyn and Jane recently teamed up with Julian, Martin and Rob from the Eaton-Rye lab to form the successful "Weeds and Pond Scum" quiz team. The team came second, scoring themselves a Thermo-Fisher goody bag each, and a free morning tea from Everday Gourmet. Jared's quiz team didn't fare quite as well, but they are certainly richer for the experience.

Recent events in the Carne Lab.

We've had some security issues of late with the occasional object disappearing, which has left some lab members feeling a little off-key...

Alan has been busy, running 2D gels and speaking.

Brad has recently returned and it's been good to see him in his seat.

Calum has been sitting a bit much lately, including on car windows, which I hear doesn't work out so well.

Jodi and Dan have been busy preparing presentations and quizzes and are about to jet off to Poland.

Chris remains in the lab... still... but has yet to be here as long as Sam J was.

Minh is enjoying his time as a Prep room lady, and occasionally pops into visit/bring us the prep room gossip.

May in the Wilbanks Lab

To the best of our recollection, April was not the cruellest month, but perhaps the least memorable. May was much more lively. We kicked off with another all night session of watching remote video of an Australian robot chilling. What could be more exciting? The late night effort yielded X-ray diffraction data sets for Tracy (cytochrome c), Aimée (DnaK), Egor (cysteine dioxygenase) and Madhu (lumazine synthase). Analysis is ongoing. All this crystallization burned through a lot of consumables on the liquid handling robot; if your costume for Fashionomics at QMB could use a pair of angel wings or a hedgehog motif, apply to Sigurd for the spent strips of tips.

Immediately following data collection we shifted gears for Samuel's graduation. Even the uncooperative weather could not dampen the spirits of our graduand and his proud parents. Richard Ahokovi Tukia is not far behind for his own graduation with a draft of his MSc thesis on WT1 practically ready to submit. Also in submissions, Eleni and Malcolm have a manuscript on cysteine dioxygenase maturation ready for submission, awaiting only Guy and Sigurd putting their imprint on it. Aimée delivered a talk rather than manuscript this month, representing the department at the OMRF summer research fellows talks.

Others' progress this month has been in generating results rather than reporting them. Peter has cloned plasmids for about a dozen mutants of Psb27 and must now wait for transformed *Synechocystis* to segregate their polyploid genomes. Jess has not made so many mutants but those she has represent sweeter victories for her. In her quest to plumb the depths of the sheep brain, she is also coming to grips with the pleasures of unannotated genomic sequence. While Malcolm has toyed with cloning, he and Yohan are mostly sticking to protein purification and analysis – Yohan for an alternate DnaK FRET pair, Malcolm for an Hsc70:Tau interaction. He is just about ready for the arrival of the Biacore. Watch this space for results.



Quiz night

Dearden Lab News

Like the rest of the world – wondering where our Raptors are from the weekend? We must have been left off the delivery list.

Doc Megan (1 of 3) has been appointed the newest lecturer to join the illustrious Anatomy ranks and shall be leaving us in early July. We are weeping bitter, sad and lonely tears at the loss of our most brilliant (only) research fellow, but are comforted by the fact that we shall retain both her honours student and her technician, so all is not lost.

Our one and only postdoc, the obliging and amiable Liz Duncan, got her Marsden application through to the second round. After a few weeks of frantic typing and barely leaving her office it is all in, and now the lap of the reviewers. All of our collective lab fingers are crossed pending the outcome.

Megan (2 of 3)'s partner has sold his house and is moving up to Dunedin in a couple more weeks AND she got a Western Blot to work and to cap of the brilliant month – her birthday is tomorrow. Rejoice!

We welcomed Cris to our lab this quarter, a research assistant currently employed on the miRNA in honeybee body patterning project, with Doc Megan and Peter. He has managed to integrate seamlessly and we are enjoying the added dynamic to our group.

Peter has been invited to a conference in China in early June, and shall be leaving us for a week to be brilliant on a different continent for a change. Photos next quarter, perhaps.

One of our brilliant honours students from last year, Gemma Palmer, graduated on Saturday and has secured a job with AgResearch. We wish her well.

Our assistant on the “Epigenetics and Cell Fate Decisions” project, Tamsin Jones visited the USA in April. Tamsin visited a couple of schools and labs she was considering joining for her PhD and finally settled on Harvard! This visit furnished a lab meeting with many pictures, American candy and high expectations for the future. Congratulations Tamsin!

Genetics Otago is sponsoring a student Poster Competition in early June, organized by Megan L, with the added twist of it being virtual – posters will be projected from a computer and students will have the opportunity to improve their posters before QMB/conf attendance.

And in Breaking News: We had three students entered in the departmental Three Minute Thesis competition and we are happy to report Meaghan (3 of 3) won Not-First-Equal, for her talk entitled “Aphids: not just a pain in your grass”. Go Dreaden Lab!!

A relatively quiet quarter, how you doin'?

Peace Out.

Merriman Lab

Our lab has heaps going on over the last while so here are a few of the happenings in 315 recently. Mandy is back with us part time, and we have also welcomed Mansour from Iran, whom has been wondering how cold it gets in Dunedin. We also welcomed Hoang from Malaysia (PhD candidates) and Aimee whom is working towards her MSc.

Mohan is busy finishing his MSc writing. Jade has already begun her first lot of exams through Med. School; Tanya and Murray next up for exams. Sara has recently returned to NZ after presenting her PhD work at the International Congress for Pre- Diabetes in Madrid, Spain. This was followed by a quick trip home to Pakistan to see her family and organize her wedding (she managed to do this in two weeks) for later in the year. Ruth is turning into a bioinformatics guru and looks like she enjoys it. Angela is in the final phases of her bench work before writing up her MSc. We have been processing ~250 samples for a Collaborator in the Psychology Dept so this has been keeping Murray and Tanya particularly busy.

Tony has been busy writing papers whenever he gets the chance and in between time seems to have been doing lots of lectures etc and attending various meetings. He has also been to Brisbane to present four posters for us and speak at the Australian Rheumatology Conference. The sugary drinks poster was also highlighted at the European League Against Rheumatism Meeting in London, which is on right now. For those of you who consume more than three servings of sugary drinks per day (yes, that includes fruit juice), you have a greater than 300% increased risk of gout, regardless of your ethnicity. However if you eat fruit instead you are protected from gout.... if only it was that simple. Come and have a look at our posters on the third floor.

The next lot of babies (n=3) are in their final trimester, with the first due in two weeks. After a run of boys, it seems girls are going to tip the gender balance in the Merriman Lab again.

Keep warm. The Merriman Lab.

Marshall Lab

Some things seem to be verities and destined never to change: the rising and setting of the sun, the phases of the moon and Stephen's presence in the lab. But one of these things is not like the others, and Stephen has just moved back to Hokitika where he has a job with Westland Milk Products. There is the small matter of a thesis and a few papers, but these will be resolved over the next few months. It's been good to have Stephen in the lab and it is good to see him move to pastures new.

Abhishek is also absent for the week as it seems his signature is required in India and nothing but his presence will do. It must be important to fly all that way for just a few days. Abhishek's LDH structures are looking good he is also looking to putting this work together in a paper.

Since we've mentioned two members of the lab, we should mention everyone. James is in the midst of some heroic experiments looking at how antifreeze proteins from *Tenebrio* might affect the viability of *E. coli* during freezing and Melanie is making progress with a great many oyster samples. What a shame she doesn't like oysters! Michelle is in and out of the lab working on carbonic anhydrase and on RNAi in nematodes, and Lincoln is living his other life in Nelson but is due back for a few weeks this month.

We tidied the lab for our inspection and will know later today if that was successful. Wouldn't it be good if compliance and safety were two sides of the same coin: we can only live in hope.

CGL

Congratulations to Soroush for submission of his PhD thesis investigating the initiation of diffuse gastric cancer.

We welcome Lucia Alonzo-Gonzalez, a self-confessed 'refugee' from shaky Christchurch who will be working with us for a few weeks – lovely to have you! We also warmly anticipate the return of Anita Dunbier who completed her PhD in this lab in 2004. After a number of years overseas, Anita is returning to take up a lecturing post within the department.

Our 4th year students seem to be learning some science in amongst the giggling. Other lab projects are progressing nicely and the decision as to 'lab pet' species is still ongoing.

Ledgerwood Lab News

We ended 2010 with a productive visit from Yasmine, a PhD student from our collaborators lab in Paris. 2011 then got off to a busy start with Eiren and Jo completing their summer student projects before moving on to their next challenges. Liz and Tracy thoroughly enjoyed their February sojourn to the Lorne Protein Conference, learning plenty and marvelling at the spectacular Melbourne thunderstorms. Tracy returned to the lab fired up and has at last been rewarded for her persistence with crystals that diffract - now she just has to solve the structure and write the paper. She is also pleased to have found something useful to do with our so far phenotype-less knockin mice. Moira's recent focus has been isolating hematopoietic stem cells to culture megakaryocytes, and after a few false starts we are on track - blood donations gratefully received! She also found time to sell her old house, buy a new one and move in all in a couple of weeks. Gill has been working with our new super-expression system to get even pinker *E. coli* pellets and continues to grow many litres of insect cells. Carolyn is pretty happy with some of her work for Mike Murphy being published in *Cell Metabolism*. Liz celebrated getting her new job in the department and now is being kept busy writing lectures, designing labs and somehow fitted in writing a Marsden grant. Fingers crossed!