Biochemistry News

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

editor: Bronwyn Carlisle

August 2010

In This Issue

Submissions of book, film, or restaurant reviews; essays on topics of general interest; news about or from alumni; notices of interesting events etc, for inclusion in the next issue of the newsletter are welcomed and should be emailed as plain text with separate image files to the editor:

bronwyn.carlisle@otago.ac.nz

Neurosurgery protest

Keep neurosurgery in Dunedin

Friday 6th August

12:00 - 13:00

Location: Ring around Dunedin Hospital (meet by Dental School).

View from the Corner

Welcome to the first edition of the 2010 Biochemistry newsletter! In it you will find departmental news, a listing of recent papers from our members and alumni (with summaries), upcoming events, and news from each of our units, both academic and general staff. Each newsletter will include a blurb from me, but I would like to invite contributions from throughout our community. The main thing I am hoping to gain from reviving the newsletter is a way to help us connect with each other and to reinforce a sense of community and a common bond between us.

Our department is an exciting place to work, and milestones both personal and scientific are best when shared with friends and colleagues. This is certainly the golden age of biochemistry as the tools are now in place to ask the most fundamental questions in biological sciences. Because of this we have some amazing research going on in each of our labs. But due to the silo formation that often takes place in departments we can lose track of what others are working on. For example, does anyone know which postdoctoral fellow in our department carried out their research at night in a gorge simultaneously in front of two TV film crews last month? Someday soon one of us will be the first to have their own genome done or a full SNP analysis completed! Hopefully we will read about it here.

Its not just the research that is first-rate in our department we have some amazing people with talent in all areas, both work-related and non work-related. Amongst our staff we have qualified machinists, dancers, bridge experts, gardeners and musicians, etc. The newsletter is a great way to learn about hobbies, vocations and other skills practiced by our community. For example we have someone in the

front office who has won several NZ wide junior riding competitions and is qualified in showjumping! I would enjoy reading a story about those competitions and I bet I am not alone. I have grown to understand that New Zealanders don't always like to draw attention to themselves by talking about their accomplishments. The same is true where I grew up. In Texas, you might brag about the land but you would never brag about yourself. However, I think contributing to the newsletter is not really bragging as we are a kind of a family and always keen to hear about the good things people have going on. No tall poppy syndrome.

Speaking of exciting science, bridge experts and great talent, this month Associate Professor Kevin Farnden will be retiring following nearly 37 years at Otago. Kevin has been a tireless worker for the Department, fulfilling so many roles including Deputy Head of Department, Convenor of the PBLI program, Sector Manager and many more. In four and one-half years I don't

cont'd over …

think I have heard a cross word from Kevin, he is an inspiration and a role-model. In this issue you will hear a bit about the departmental tea and Kevin's retirement dinner. I hope you will be able to make both. I am gutted that I will be at a meeting in Europe arranged long before the dinner date was set, but I'll be there in sprit and I know Kevin will be in good hands.

This month I have the bittersweet task of announcing the impending retirement of another staff member, Dr. Mary Thompson. I am happy to celebrate Mary's years of service and hard work. but sad to lose her valuable input to the Department, especially in Med teaching and our key first year paper, BIOC 192. Fortunately Mary will be with us until the end of the year so we will have plenty of time to learn about her retirement plans.

Finally in 2010, I worry that newsletters may be passé. We are a generation now involved with Facebook, Twitter, Google and even the new Cheeked! We are postgenomic, proteomic, next-gen, metabolomic and just plain busy. Having said that, for me nothing quite compares to picking up a newsletter that contains lots of inside info and photos about people and projects with which you are acquainted. I hope you agree and will join in the celebration of all things Biochemistry at Otago.

July Publications

As found by PubMed search. Scopus and Web of Science find more 2010 papers than PubMed, but classify them all as being published on 1st January. Please advise the editor if your publication has been left out and we'll include it in the next issue of the newsletter.

Joanna M Risk, Rebecca E Laurie, Richard C Macknight, Catherine L Day.

Plant Mol Biol (2010) vol. 73 (4-5) pp. 493-505

FRIGIDA and related proteins have a conserved central domain and family specific N- and C- terminal regions that are functionally important.

Arabidopsis accessions are either winter-annuals, which require cold winter temperatures for spring flowering, or rapid-cycling summer annuals. Typically, winter annual accessions have functional FRIGIDA (FRI) and FRIGIDA-LIKE 1 (FRL1) proteins that promote high expression of FLOWERING LOCUS C (FLC), which prevents flowering until after winter. In contrast, many rapid-cycling accessions have low FLC levels because FRI is inactive. Using biochemical, functional and bioinformatic approaches, we show that FRI and FRL1 contain a stable, central domain that is conserved across the FRI superfamily. This core domain is monomeric in solution and primarily alpha-helical. We analysed the ability of several FRI deletion constructs to function in Arabidopsis plants. Our findings suggest that the C-terminus, which is predicted to be disordered, is required for FRI to promote FLC expression and may mediate protein:protein interactions. The contribution of the FRI N-terminus appears to be limited, as constructs missing these residues retained significant activity when expressed at high levels. The important N- and C-terminal regions differ between members of the FRI superfamily and sequence analysis identified five FRI families with distinct expression patterns in Arabidopsis, suggesting the families have separate biological roles.

Peter D Mace, Callum Smits, David L Vaux, John Silke, Catherine L Day.

J Mol Biol (2010) vol. 400 (1) pp. 8-15

Asymmetric recruitment of cIAPs by TRAF2.

Cellular inhibitor of apoptosis protein (cIAP) 1 and cIAP2 set the balance between transcription factor and apoptosis signaling downstream of tumor necrosis factor (TNF) receptor superfamily members by acting as ubiquitin E3 ligases for substrates that are part of the TNF receptor complex. To fulfill this role, cIAPs must be recruited to the receptor complex by TNF-receptor-associated factor (TRAF) 2. In this study, we reconstituted the complex between baculoviral IAP repeat (BIR) 1 of cIAP1 and the coiled-coil region of TRAF2, solved the structure of BIR1 from cIAP1, and mapped key binding residues on each molecule using mutagenesis. Biophysical analysis indicates that a single BIR1 domain binds the trimeric TRAF2 coiled-coil domain. This suggests that only one IAP molecule binds to each TRAF trimer and makes it likely that the dimeric cIAPs crosslink two TRAF trimers.

Elizabeth J Duncan, Peter K Dearden.

Genome Res (2010) vol. 20 (7) pp. 917-28

Evolution of a genomic regulatory domain: the role of gene co-option and gene duplication in the Enhancer of split complex.

The Drosophila Enhancer of split complex [E(spl)-C] is a remarkable complex of genes many of which are effectors or modulators of Notch signaling. The complex

contains different classes of genes including four bearded genes and seven basic helix-loop-helix (bHLH) genes. We examined the evolution of this unusual complex by identifying bearded and bHLH genes in the genome sequences of Arthropods. We find that a four-gene E(spl)-C, containing three bHLH genes and one bearded gene, is an ancient component of the genomes of Crustacea and Insects. The complex is well conserved in insects but is highly modified in Drosophila, where two of the ancestral genes of the complex are missing, and the remaining two have been duplicated multiple times. Through examining the expression of E(spl)-C genes in honeybees, aphids, and Drosophila, we determined that the complex ancestrally had a role in Notch signaling. The expression patterns of genes found inserted into the complex in some insects, or that of ancestral E(spl)-C genes that have moved out of the complex, imply that the E(spl)-C is a genomic domain regulated as a whole by Notch signaling. We hypothesize that the E(spl)-C is a Notch-regulated genomic domain conserved in Arthropod genomes for around 420 million years. We discuss the consequence of this conserved domain for the recruitment of novel genes into the Notch signaling cascade.

Andrea E Donaldson, Nicole K Walker, Iain L Lamont, Stephen J Cordiner, Michael C Taylor.

International Journal of Legal Medicine (2010) pp.

Characterising the dynamics of expirated bloodstain pattern formation using high-speed digital video imaging.

During forensic investigations, it is often important to be able to distinguish between impact spatter patterns (blood from gunshots, explosives, blunt force trauma and/or machinery accidents) and bloodstain patterns generated by expiration (blood from the mouth, nose or lungs). These patterns can be difficult to distinguish on the basis of the size of the bloodstains. In this study, high-speed digital video imaging has been used to investigate the formation of expirated bloodstain patterns generated by breathing, spitting and coughing mechanisms. Bloodstain patterns from all three expiration mechanisms were dominated by the presence of stains less than 0.5 mm in diameter. Video analysis showed that in the process of coughing blood, high-velocity, very small blood droplets were ejected first. These were followed by lower velocity, larger droplets, strands and plumes of liquid held together in part by saliva. The video images showed the formation of bubble rings and beaded stains, traditional markers for classifying expirated patterns. However, the expulsion mechanism, the distance travelled by the blood droplets, and the type of surface the blood was deposited on were all factors determining whether beaded stains were generated.

Rafael M Couñago, Stephen B Fleming, Andrew A Mercer, Kurt L Krause.

Crystallization and preliminary X-ray analysis of the chemokine-binding protein from orf virus (Poxviridae).

Acta Crystallogr Sect F Struct Biol Cryst Commun (2010) vol. 66 (Pt 7) pp. 819-23

The parapoxvirus orf virus (ORFV) encodes a chemokine-binding protein (CBP) that functions to downregulate the host's immune response at the site of infection by blocking the chemokine-induced recruitment of immune cells. In order to shed light on the structural determinants of CBP-chemokine binding, ORFV CBP was crystallized as part of an ongoing structure-function study on this protein. ORFV CBP crystals were obtained by the sitting-drop vapour-diffusion technique using ammonium citrate as a precipitant. The crystal quality was greatly improved through the addition of small-molecule additives to the crystallization mother liquor. ORFV CBP crystals diffracted X-rays to 2.50 A resolution and belonged to the hexagonal space group P6(1)22 or its enantiomorph P6(5)22, with unit-cell parameters a = b = 75.62, c = 282.49 A, alpha = 90, beta = 90, gamma = 120 degrees.

Pedant's Peeves

Me or I?

"In the old days when people studied traditional grammar, we could simply say, 'The first person singular pronoun is I when it's a subject and me when it's an object,' but now few people know what that means. […] The misuse of I and myself for me is caused by nervousness about me. […] But the notion that there is something wrong with me leads people to overcorrect and avoid it where it is perfectly appropriate. People will say, 'The document had to be signed by both Susan and I' when the correct statement would be, 'The document had to be signed by both Susan and me.'" (*Brians, Common Errors in English Usage*).

The easiest way to figure out whether to use "I" or "me" is to remove the other person from the statement. If you would say "me" (Dad gave me a clock), then you should say "John and me" (Dad gave John and me a clock); if you would say "I" (I am riding my tricycle), say "John and I" (John and I are riding our tricycles). No exceptions!

Oh, and btw, putting yourself (the "me" or "I") last is good manners, but not a grammatical requirement.

Science Festival Report

In early July, as part of the University's contribution to the biennial International Science Festival, a two-day Science Expo was held in the St David complex to showcase the various science disciplines studied at Otago. The expo theme "Otago feeds the mind" fell within the overall theme of the festival "Food for Thought".

The department contributed to the expo with a display entitled "Goldilocks and the Three Biochemists". We presented material around how much energy in the diet was "just right" and what happens if you get "too much" or "too little" energy in your diet. Along with some good old fashioned (simplified) metabolic pathways and information on how we process nutrients from our diet to get energy, we also had a hands-on display to give people an idea of what their daily energy requirements would look like if they had all of it as just sugar or lipid (vegetable oil in this case).

Visitors to the stand were asked to match themselves to a Simpsons character (note: Bart is a magnet for young boys) on a bottle that had been weighted appropriately for the equivalent amount of either sugar or fat that would be required to satisfy their daily energy requirements (interestingly women were quite happy to associate themselves with Marge, whereas men were much more reticent about picking up a bottle that had a picture of Homer on it - especially in front of their spouses - often encouraging their spouse to do the experiment). The bottle was placed on a set of counter-balance scales and participants had to pour either sucrose or oil into a beaker on the other side of the scales until they balanced the weight of the bottle.

Almost invariably people were surprised (shocked in some cases) at how much sugar or oil was required. There was general consensus among the adults that never seeing the sugar or fat in their food isolated like that was a good thing, though lots of the kids said they would be happy to sit down and eat a beaker full of sugar!! Some parents didn't mind the idea of pouring their kids a cup of oil for breakfast and saying "there you go, that'll keep you going for the day, I'm not cooking today!"

These public events are not only an important part of Dunedin's town-gown relationship, they are an essential part of our role as scientists. Ultimately it is the public that funds us and our research, and it is our responsibility to communicate to them what we do, and are doing for them. A big thank-you to the following people for volunteering their time and representing the department so well: Harold Bernhardt, Lyn Dowsett, Dan Garama, Tracy Josephs, Becky Laurie, Cushla McKinney, Marilyn Merriman, Justine Murrell, Shar Rae-Whitcombe, Greg Redpath, Frances Schumacher and Kaye Wilson.

Goldilocks and the Three Biochemists

by Tony Zaharic's partner Tracie Leckie

This was given out to kids at the Science Festival for colouring-in purposes. Apparently there was some debate over which staff member corresponded to which bear - suggestions (by email, to bronwyn.carlisle@otago.ac.nz) are welcomed, and any especially witty ones will be published in the next newsletter.

Lab News

Marshall Lab

It is almost a year since we moved into our new lab but it seems like it was just a few weeks ago. The new facilities are excellent and we're very much enjoying having things arranged to our satisfaction. There are still a few things to find homes for, and one or two items of equipment that would be nice to have, but then we'd have to find somewhere to put them. Our experience of moving suggests to me that the single most useful piece of lab equipment is a label machine. Sharing with the Deardenites has worked out quite well (for us anyway), and all in all, the move has been A Good Thing.

There are a number of quite disparate projects in the lab at the moment. Michelle Liddy is working on in situ analysis of photolyase expression in sea urchins as part of an MSc in collaboration with Miles Lamare from Marine Science. Melanie Margison has just converted to an MSc in the Genetics program looking at oyster and pathogen population structure and presence. Sadly all the oysters are for experimental purposes only. James McKellar is working on expression of antifreeze proteins from a beetle as part of a Biochemistry MSc and has live specimens in the lab from time to time. Abhishek Kumar is continuing his PhD on cold adapted proteins and was responsible for the delivery of fish to Chelsea last week. Lincoln Mackenzie is a bird of passage working on a PhD examining the enzymes in green mussels responsible for degrading dinoflagellate toxins. When Lincoln is not here, he is at his real job at the Cawthron Institute. Stephen Clarke is examining proteins in an Antarctic nematode responsible for freezing tolerance in a PhD project shared with David Wharton from Zoology.

When planning a project, some thought should be given to how edible the experimental material might be.

Lamont Lab

Well, the Lamont lab has been very busy over the last month and for the coming month. Anna K has handed in her PhD thesis and is now taking a well earned 6 week holiday around the world!! Yes around the world. Andrea has been awarded a FoRST Te Tipu Putaiao scholarship for her PhD, been interviewed about her PhD for the University Postgraduate advertising campaign as well as having her second journal article from her Masters accepted for publication in the International Journal of Legal Medicine. Becky Edgar who is doing her PhD in Victoria Uni is coming back to visit us again for the month of August, while Iain is off to the US to attend and speak at a Biometals conference before returning and speaking at the QMB conference at the end of August. Other members of the team continue to work hard as per usual.

News from the Ledgerwood Lab

2010 has been a busy year for all of us. In April Liz spent 3 weeks visiting our collaborator Prof Elisabeth Cramer-Bordé at the Institut Cochin in Paris learning how to isolate and culture human hematopoietic stem cells and enjoying the Parisian lifestyle. She returned in time to see Reagan graduate with his PhD in May. Now, after 2 summer studentships, an honours year and a PhD in the lab Reagan is moving a short distance away to a Research Fellow position with Assoc Prof Magnus Thorn in the Dept of Surgery.

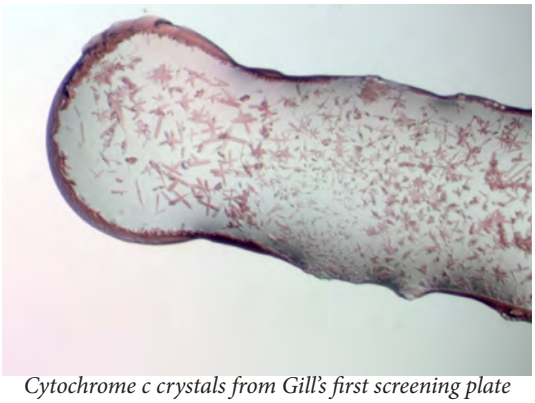
After 3 months working in the States last year, Tracy has had to lower her sights and has only managed a trip to Canterbury to do some differential scanning calorimetry. She is becoming a dedicated crystallographer, and is converting Gill who obtained some crystals on her first ever screening plate.

Moira is pleased to have successfully carried out her first cloning experiments so she now has more proteins to express and purify.

Our 2009 Honours student, Henry Hampton, visited us in May but has been lured to Sydney where he is working as a research assistant at the Garvan Institute.

Fabienne still manages to come in to the lab from time to time to do some science and escape from the world of biological compliance. She recently returned from a month in Europe showing off William to friends and family.

And finally after years of loyal work with Mike Murphy, Carolyn is celebrating her first ever 1st author paper.



Cytochrome c crystals from Gill's first screening plate

Colourful news from the Wilbanks Lab

Bright, colourful proteins help chase away the winter blues. In that spirit, Samuel has been tickling pink DnaK with biotin in an effort to nail down single molecules for detection in the TIRF microscope in the Physiology department. Also in pink Hsp70 news, Jess was excited to get from Havoc (yes, you know them from the Farmer's market) pig brains for her next purification. She is thrilled to be living every laboratory henchwoman's dream and fetching the brain. As top henchman and protein monkey, Malcolm feels that Jess is encroaching on his prerogative and is considering a switch from cysteine dioxygenase to Hsp70 just to keep in the competition.

The rest of the CDO crowd has been busy with data and writing: Eleni's new assay just came out in Analytical Biochemistry and Richard awaits word from referees on his discovery of a tryptophan radical in CDO. How can you not like a brown protein which turns blue when no longer starved of oxygen and cysteine? Egor, recently arrived from Montreal, is cranking up our ability to generate uncross-linked CDO, so we can study what this cysteine-tyrosine bond does for the enzyme.

Former and part-time lab members from within the department have been no less productive. Working at the red end of spectrum, our moon-lighting cytochrome c crystallographer, Rob, is awaiting the referees' word on the manuscript describing the high-resolution structure of reduced G41S and paramagnetic NMR from our collaborators at Rochester. Motivated rather than discouraged by lack of diffraction at the synchrotron last month, Tracy and Gill have finally got crystals of a cytochrome c variant other than the world-famous-in-Dunedin G41S. Next synchrotron run is the end of August! Finally, Peter Mabbitt is into the green and off to Beijing for the triennial meeting of the photosynthesis researchers, where he will report the phenotype of his Psb27 knockout.

Less colourfully, Biochemistry's very own Richard (as opposed to Chemistry's CDO Richard) is making strides in writing up the continuing WT1 story. David, pioneer of our most brilliantly coloured DnaK molecules, has completed his MSc write up and reports happiness as he starts an MD/PhD program at the University of Michigan. Of course, it is still summer there. Recent news from other Wilbanks lab alumni confirms Fran Short's happiness as a doctoral student in Cambridge and Colin Jackson's appointment to a lectureship at the Australian National University. There are bright futures after the chaperone lab!

Cancer Lab

The Cancer lab are very happy to welcome back Donghui after maternity leave; Oliver and family are thriving.

Merriman meanderings

The past month has been of the usual busy nature for the Merriman Lab. Usual in the sense that more babies have arrived (to Mandy Phipps-Green, twin boys, Liam and James). Good to see the boy side of the ledger getting evened up (previous two were boys as well, after six girls). Busy in the sense that the work is intensive, but in a good way, with all the recruitment for the gout genetics. We welcomed Murray Cadzow (ARF) into the lab recently and look forward to hosting Chris Jenkinson as William Evans Fellow from next week (Chris did his PhD in the Department in the early 90s).

Nastaha Austin has left to travel for a little bit followed by a stint of English language teaching in Japan after completing her MSc last week. Cushla has been paper writing, so it is great to have her back part time. Ani has returned back to Malaysia after being here for four years and completing her PhD. Ani has been getting settled back in Malysia with her family and will be teaching Human Genetics there.

Tony was invited to Hong Kong to present two talks on our work at the Asia Pacific League Against Rheumatism conference. Tony describes Hong Kong as an 'interesting and busy place', which he enjoyed a lot.

Those of us not involved in lectures and labs and other presentations, have been busy dealing with incoming samples, and large amounts of bioinformatic data, or writing papers/theses. We have also had a few people with birthdays recently, which has been a good reason to go out for lunch.

Brown lab

Chris has recently returned from Research and Study Leave on a round the world trip. He visited collaborators in Virginia, Freiburg and Basel. He had just three months away (too short) but packed lots into that trip and only managed to catch a few days of holidays in the South of France.

His first visit was to the Cell Biology/Cell Signaling Lab of Prof Ian Macara at the University of Virginia where he discussed integration of the Brown groups bioinformatics with wet experiments, then by Amtrak to Washington DC, to meet with the RefSeq curators at NCBI. Fortunately the airports reopened after the ash scare to get him by plane, train and ferry to participate in an RNA Bioinformatics workshop in a small village in beautiful Corsica, France. There he caught up with the European leaders in the field, later visiting some of their groups in Southern Germany and Switzerland. He spent most of his time in Basel on the upper Rhine working in a yeast Lab (Prof Anna Spang) at the University, in Switzerland but very German in character. Nice to be in a compact European city for spring, then back in time for mid-winter in New Zealand.

The Laboratory for Evolution and Development

This year the lab has grown considerably to a total of 15 permanent members. We have welcomed two new Masters students, two new PhD students, one to start this month, and one honours student. We have a number of students who to and fro between our lab and others around campus also – including Zoology and Anatomy.

Earlier this year we all learned exactly how much noise we make normally, when we made a vow of silence on the 27th and 28th of May. 'The Silence of the Lab' raised a total of $2039 for UNICEF's Undercover project which aims to get thousands of children under mosquito nets and protected against malaria.

Our lab members have been busy this year carving a path of destruction around the world; in April, PhD student Sarah Morgan attended the Drosophila Research Conference in Washington D.C. In June Liz Duncan, Megan Wilson, Nathan Kenny, Rosannah McCartney and Peter Dearden attended the Euro Evo Devo conference in Paris, France. Peter has also given talks in London, Cambridge, England; and Düsseldorf, Germany. PhD student Rosannah McCartney stayed on from the conference in Paris to spend a month in Düsseldorf in Professor Martin Beye's lab learning techniques that will help her with her research. She will meet up with Liz Duncan in Copenhagen, Denmark for the International Union for the Study of Social Insects conference starting on the 8th of August. The remainder of the lab left in Dunedin will be attending the National Research Centre for Growth and Development's Symposium, to be held in Auckland the first week of August.

Members of the lab were also part of Science Fest in early July. As part of the Science of Honey presentation members of the public could look at bee specimens underneath microscopes, try on beekeeping suits and try their hand at extracting honey from beehive frames, all while learning about the science behind honey and more importantly bees. The lab also hosted the visit of Tom McFadden (c/o Genetics Otago and the Otago Institute) Science Rapper Extraordinaire, filling him with coffee and good Dunedin associations to stand him in good stead upon his return in the new year.

In February the Genome paper for the Pea Aphid was published in PLOS Biology with various members of the lab involved: Peter Dearden, Elizabeth Duncan, Megan Wilson and previous member James Smith being part of the International Aphids Genomics Consortium. In addition these members were also authors on accompanying paper/s published alongside the genome paper. Megan W and Peter also published two papers in Development Biology regarding the embryonic development of the Honeybee, Megan Liz and Peter published a book chapter on Honeybee techniques, James and Peter published an upcoming paper on Rotifer ovaries and in June Liz and Peter published a paper in Genome Research on the Enhancer of split gene complex in Drosophila.

The Dearden lab takes Paris by storm.

Above: Nathan Kenny, Megan Wilson, Peter Dearden, Rosannah McCartney, Robert Drewell (collaborator).

Below: Scott F Gilbert (Famous Textbook writer), Elizabeth Duncan, Rosannah McCartney

Some bees, Meagan Leask, Abi Romeril, Sarah Morgan, Tamsin Jones.

The Krause Lab

The Krause laboratory currently comprises eight keen scientists including three postdoctoral fellows, two technicians, one graduate student, one honours student and Kurt. We started out the year with a barbecue at Kurt's house following a Flagstaff/Pineapple Track tramp, pictures of which are shown on this page.

New arrivals include Sylvia Luckner who joined us from the University of Würzburg where she used structural biology to develop new drugs for tuberculosis and has become our group's thermofluor expert, and Karen Yates who is a postdoctoral fellow that joined us from the University of Leipzig where she used structural biology methods to study proteins involved in adenosine signalling. She is the only member of the department who knows how to "supercharge" a protein.

Miriam Sharpe holds a FRST postdoctoral fellowship and is studying the molecular basis of bioluminescence in the glowworm. Last month she was interviewed on the radio three times, appeared in two newspapers and was filmed by crews from TV3 and TV1 studying glowworms at Nichols Creek. Miriam is rumoured to be the best dancer in the group, by far.

Michele Krause has been nurturing and transfecting HEK 293 cells in our incubator in Microbiology. She is now planning to expand into insect cell work and eventually dog kidney cells. She maintains these cells to use in making recalcitrant proteins for our mad scientists to try to crystallise.

Yang Li, fresh from his Master's degree, has been working on screening compound libraries from Chemistry for activity against bacterial pathogens and has become an expert and MICs, IC50s and Therapeutic ratios. In the background he is scoping out bioenergy labs around the world to join for his Ph.D.

Emma Scaletti was recently awarded a Maurice Wilkins PhD Fellowship and is working in earnest on her drug discovery project. She just survived her first PhD committee meeting and seeks larger more ordered crystals. All this on only one package of biscuits a day.

Helen Kim Opel-Reading is working very hard on her Honours project and breaking down experimental obstacles with alacrity. In addition to having great lab skills and an enviable work ethic, she has the best-looking cat picture in the Department, which she uses as the wallpaper on her laptop.

We have had one departure this year, Rafael Couñago, who left us for a warmer climate in Brisbane. He will be joining Bostjan Kobe's group at UQ. We are sad to lose him but the great news is that Rafael solved two new structures before he left and he wrote a neat crystallisation paper describing nice results from an additive screen called, Silver Bullets.

As for Kurt well there is really no hope there. Most days he and Sigurd dress alike but Kurt is the heavy one!

Office News

Robyn has recently returned from her cruise holiday, for two weeks in June she was soaking up the sun and sights of the South Pacific aboard P & O Cruises, Pacific Sun. Visiting Suva, Port Denarau, Vila and Mystery Island (where the snorkeling was amazing), unfortunately she didn't make it on to Norfolk Island as the swells were too big for the tenders, but they did spend the day circling the Island close enough to see the old penal colony.

Last weekend Chelsea managed to get away to Naseby and tried the Naseby Ice Luge - 360 metres of pure adrenaline (as copied from their website), or sheer terror as Chelsea put it! She has now decided that luging is not the sport for her, she did about half a dozen part runs under the direction of four time Olympian instructor, Latvian luger Guntis Rekis before understanding why so many people break bones and deciding she makes a much better spectator.

Teena has been helping the NICU Support Trust (Otago) this year and attended the first annual charity ball and auction on Saturday 24 July at the Savoy along with ~140 other people. A good evening which included a delicious meal, wine/beer and band. The Trust provides support to families of premature and sick full term babies as they make their journey through NICU, the transition home, and onwards.

and from Frances:

Mid June Russell and I headed off for a three week break in the States. This covered Los Angeles, Las Vegas, New York, Miami and Hawaii. A holiday of a life-time. I also got to catch up with old friends as I had lived in the States twice before. Both catch ups were in NYC. The whole trip really went without a hitch, just some minor ones mainly with the travelling part. We would thoroughly recommend every city we visited, but in particular, NYC was just incredible.

Temperatures hot, up to 100 degrees Fahrenheit a few days. I am currently making a scrap-book of the 380 "essential" photos I have reduced our collection to. Here is a picture of me at the Everglades holding a two year old alligator.

The Pacific Sun

Teena and her sister dressed for the ball

Teena's son Mitchell (a graduate of NICU) learning about oil from Tony Zaharic at the Science Festival.

Videoconferencing suite

Many of you will have noticed the two large television screens and associated camera, speakers, and other paraphernalia in room 208. These are all part of our new videoconferencing suite, which has been paid for by the Department with considerable assistance from the National Research Centre for Growth and Development.

When fully operational this facility will be available for use with any videoconferencing software you like. Skype, EVO, Scopia (through the KAREN bridge) Mirial, and iChat will be installed, and if you prefer a different set of tools, let Darren know and he will do his best to accomodate your wishes.

In addition to videoconferencing, the televisions can be used as ordinary computer screens for presentations at lab meetings etc. Anyone who has booked the room will be able to use the facility. Videoconferencing needs will be given preference as far as possible, but early booking is strongly advised.

Instructions for the operation of the hardware will be posted on the wall of Room 208, and if you require tuition, see Darren.

Science in the kitchen

Zingiber officinale and osmotic pressure

Or, "How to make your own preserved ginger".

Buy (or harvest - does anyone know if ginger will grow in Dunedin?) some nice young ginger. 500g is a good amount.

Peel or scrub the ginger, and cut it into ~~preserved ginger-sized bits~~ approximately $2cm^3$ pieces.

Cover the ginger in H_2O and leave to soak O/N at 20°C. Incubate the ginger in H_2O at 100°C for 5 mins. Decant the supernatant and save it. Submerge the ginger in more H_2O and repeat the 100°C incubation. Decant the supernatant and save. Repeat this extraction process several times, each time extracting more of the volatile oils (zingerone, shogaols and gingerols) that give ginger its characteristic odour and flavour[1]. Pool and and refrigerate the supernatants. The final 100°C incubation should be continued until the ginger is tender.

The ginger now needs to be permeated with a solution of sucrose. The problem is that if the ginger is immersed in a strong sucrose solution, osmotic pressure will cause H_2O to leave the ginger, rather than allowing sucrose to enter it. The answer to this problem is to increase the sucrose concentration gradually over several days.

The ~~ginger~~ precipitate

For each each 500g ginger you started with, dissolve 500g sucrose (food quality) in 200ml H_2O. Raise the temperature to 100°C and pour it over the drained ginger. The ginger must be submerged in the syrup. Incubate at 20°C for 24 h.

Decant the supernatant and concentrate it by boiling for 5 mins. Pour the concentrated supernatant back over the ginger and leave to incubate at 20°C for 24 h.

Concentrate the supernatant again by boiling, with the ginger still submerged, for 10 mins. Incubate at 20°C for 48 h.

The ginger should be plump and translucent. If it is not, repeat the last step. Bring the ginger to the boil in the syrup, and either:

a) aliquot the ginger into sterile jars, concentrate the supernatant by boiling until it is thick and syrupy, then fill the jars with supernatant and seal with screw lids, or

b) spread the ginger on a rack and dry briefly at 50°C or O/N at 20°C. Roll in fine sucrose crystals and dry again.

The product of process b can be sampled in room 214 for a short period.

The supernatant

Pool all supernatants, including any of the sucrose solution left over from the final steps of the ginger protocol. Concentrate by boiling until samples taste appropriately gingery but not too hot. Add the grated rind and juice of two lemons, two teaspoons of CH_3COOH, and sufficient sucrose to make a syrup. Dissolve. Make 200ml of a 1:10 dilution of the syrup in 80°C H_2O, or a mixture of 80°C H_2O and 40% ethanol product of your choice. Taste it - you may wish to concentrate it further by boiling, or add more sucrose. Store at 4°C and use as a restorative cordial.

[1] Wikipedia article on ginger

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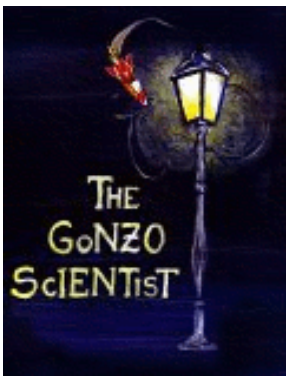

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