University of Otago
Te Whare Wananga o Otago

Centre for Gene Research

NEWSLETTER

Volume 1 Number 1 February 1994

Editorial

Greetings

Welcome to first issue of the Centre for Gene Research Newsletter – vol 1 number 1. When the Centre was set up three years ago one of its functions was to act to increase communication amongst people interested in gene research in its widest sense on campus. We anticipate that the Newsletter will become the major channel for communication amongst our members. To be successful, however, it needs to be owned by the members. That is we need your input into its preparation. We need information to be included in the various sections as in this edition. We need feedback about the structure and suggestions for other sections.

It is proposed that regular sections will form the basis of the Newsletter. Already Craig Marshall has offered to edit our Computer Corner (apologies to TIBS for pinching their name) and Sue Galloway and Murray Broom have agreed to edit the Technical Tips and the Prickly Problems. Group profiles will be chosen not entirely at random and you are unlikely to be able to escape forever. We want to list recent publications from members of the Centre – that means you need to send us reprints as they come available. We want to list recent grants obtained by members of the centre – dont be bashfull – let me know. We want to include conference reports. Please volunteer these because I dont know who goes to which conference. We want to know of any Brilliant Breakthroughs – let me know and then they can displace the Egotistical Editorials from the front page. The bottom line is that it is your Newsletter.

This year is the first that Centre has had a budget. We are pleased to report the Division of Health Sciences has largely covered the technical salary we require. Our other major source of income is the sequencer charges. These have been kept as for last year but are under regular review. Here the bottom line is that the more the service is used the more efficient it is. Please see section on p3 by Allan Crawford.

As part of our budget, we have included an expenditure item labelled Visiting Lecturers. This is to enable us to bring people to Dunedin – mostly people who might be passing through Northern centres and who can contribute talks of general interest to members of the Centre. These talks are not meant to compete with nornal departmental seminars and possibly may be combined with the seminar program of one or other of the departments represented in the Centre. The main reason for this fund is to provide flexibility so that invitations can be sent out and meetings set up rapidly. Members who wish to nominate a speaker should contact me or any member of the committee [Allan Crawford (AgResearch); David Jones or Clive Ronson (Microbiology); Jean Fleming (Physiology); Brian Monk or Howard Jenkinson (Dental School) or Kevin Farnden, Warren Tate or myself (Biochemistry)] and we should be able to make a decision within 48 hours. Our first contribution from this fund is to a meeting on the Molecular Biology of Hypertension (see notice attached). Please feel free to come to this meeting.

Finally, I am pleased to acknowledge sponsorship from SciTech for the printing and distribution of this Newsletter.

Murray Grigor

Next Newsletter

Our next newsletter should be circulated around the begining of May. Any copy for this will be greatly appreciated. We should also have space for letters to the Editor if you want to sound off about something. Please send items to me or to one of the column editors - preferably on disk (any format is OK) or by email. My email address is grigor@sanger.otago.ac.nz.

Computer Corner

Want to learn about internet, gopher, GCG or other software to run on your Mac or PC? This is the section for you. Please contact Craig Marshall (Biochemistry) with any suggestions or requests.

Software review: Amplify Amplify is a Mac based software for designing PCR primers. It takes target sequences in their Genebank format – these can be loaded in as GCG files FTP'd to your Mac or as text files. You can select trial primers, obtain the reverse complement for the 3' primer and run your "PCR" in a matter of minutes. There is a good graphical display of the likely products and primer dimers are detected (in red if you have a colour monitor!) and can be displayed. There are four windows – the target sequence, the primer list, a graphical result window and an information window that shows the primer binding regions etc. It is easy to detect where your primers bind to the target gene and to select and copy using the mouse regions of the target sequence into the primer list window. There are one or two annoying features in that some commands can be given from the keyboard and others require use of the mouse. Also the information window lists % primability (identity of primer sequence to target sequence) and % stability which appears to relate to the GC content of the primer. Melting temperatures have to be calculated by hand. However, these criticism are minor especially as Amplify is Freeware. It was written by Bill Engels at the University of Wisconsin and distributed via bionet. So for a program that has already saved me several hundred dollars avoiding dud primers I have no problems. If you would like to try Amplify, please mail a blank disk to me and I will copy it and mail it back to you. There is a short manual (MS–Word) included with the application.
Murray Grigor

Membership update Thank you to all who had sent in your forms. If you have not, please do so soon. For additional forms please phone Murray Grigor (479 7840). The information has been entered into our database. Rather than print out hardcopy of the database and photocopy it for everyone, we have decided to give the trees a reprieve and make the database available electronically. From mid–March it will be released as a Claris Works database file, an Excel file (Mac or PC) or a text file (Mac or PC). To get your copy please just send Murray Grigor a 3.5 inch disk and make sure you specify just which format you want. We will get these back to you as soon as we can. The database will list names, phone and fax number, email addresses, interests and expertise. Subsequently we hope to get the database up on our unix decstation so that you will will be able to FTP it to your account. We will let you know when this is available. This will mean that you can have access to the most up to date membership list at any time.

The Archives The Centre has been in operation since 1990. We would like to assemble a list of the publications of members of the Centre since its inception. Please send reprints or just titles of appropriate papers published since you have been a member of the Centre to Murray Grigor and we will see that they are listed in the archives of the Centre. In addition, we intend to publish titles of new papers in the Newsletter. Please make sure that we are top of your reprint distribution list!

Research Grants

This column is to record recent grants recieved by Members of the Centre. This month we note HRC and FRST successes last year.

Health Research Council

Cliff Abraham et al. *Factors controlling the induction of long-term depression in the hippocampus.* (3 years) $293,386

Gil Barbezat and Murray Grigor *Somatostatin receptors in the gut* (3 years) $147,458

Mike Denton *Molecular genetic analysis of pedigrees from the Indian subcontinent with autosomal recessive retinitis pigmentosa* (2 years) $175,136

David Green and Cathy Allen *Monoclonal antibodies against the mammalian sperm head* (3 years) $339,136

Craig Marshall and Warren Tate *A structural investigation of polypeptide chain release factors* (3 years) $164,480

Ian McLennan *Panacrine regulation of skeletal muscle formation* (3 years) $139,256

George Petersen *Intron structure in the human dydtrophin (Duchenne muscular dystrophy) gene* (3 years) $280,234

John Tagg and Clive Ronson *Potential role of salivaricin A in prevention of streptococcal pharyngitis* (3 years) $165,000

Dave Loten Liver insulin sensitive cyclic nucleotide phosphodiesterase (1 year) $37,687

Research grants contd.

Postgraduate scholarships have also been awarded to David Ackerley and Ellen James both to work in Iain Lamont's lab.

Last year's FRST grants to Otago included the following:

Glen Buchan et al. *Cytokines in bovine tuberculosis research.* $120,000

Kevin Farnden *Nitrogen metabolisnm in legumes* $110,000

Murray Grigor *Reproduction in the possum* $95,000

Diana Hill *Molecular genetics of rye grass* $101,000

Jim Kalmakoff *Microbes and sustainable agriculture* $66,000

Please keep us informed about any successes you have from other sources.

Technical Tips and Prickly Problems

Any neat little tricks you have developed recently? Please tell us about them. Write or email Sue Galloway or Murray Broom (both AgResearch, broomm@agresearch.cri.nz or galloways@agresearch.cri.nz) and we will include them in our next Newsletter. As for the Prickly Problems, dont just bash your head against a brick wall. Let us know, we will list them in the next Newsletter and then you can just sit back and wait for the phone calls or email messages.

News from the DNA Sequencer

1) First of all a very big thank you to Tracee Lawrence who helped us maintain a sequencing service over the summer. Tracee had six weeks training with Deirdre Dobson before being thrown in at the deep end. She coped extremely well. Its also valuable to know that we now have someone else within the department who could possibly help out in emergencies. Our thanks also to the Biochemistry Department for giving Tracee leave to help us.

2) Dye Labelled Primers

Over the last half of 1993 we noticed a gradual reduction in signal strength from the dye labelled universal and reverse primers donated to the facility by AgResearch. In December we abandoned using them and began purchasing dye-labelled primers from ABI. This is much more expensive than getting our own made so we have had a new set of dye labelled universal primers made. Even if these only last another 8 to 9 months it will still be much cheaper than the ABI source. If we had continued to use the ABI primers our charges for dye primer sequencing would have had to increase.

3)Email.

The MacIntosh computer that runs the sequencer is due to be hooked up to the Biochemistry Department Ethernet so that in the near future sequencing results can be Emailed to all users. This will save everyone time especially those users not near the instrument.

4) Sequencing PCR products

We have begun sequencing PCR products directly. So far we have processed 16 samples from 6 different people with 11 out of the 16 sequencing reactions giving useful results. Its a bit early to advise what the best method of template purification is but we shall keep you posted as more results come to hand.

5) Deirdre is now back from her holiday in Asia. Business is very brisk with over 200 clones sequenced in the last fortnight. Please remember that we want to know if you aren't satisfied with your results. We are always looking to improve the service and your feedback is vital.

Allan Crawford

Oligonucleotide synthesis The Department of Biochemistry has recently set up a refurbished oligonucleotide synthesis unit. We are currently running a 380B Applied Biosystems machine and can offer competitive prices for oligos synthesized within a competitive time-frame. For further information and order forms please phne Michelle French (479 9042) or Dr Mike Eccles (479 7878)

Kit Comment (We did think of keeping the trend and calling this Kit Komment but decided that was too kitch) Have you ever faced the situation of wanting to know which kit to buy, if any for the task you need to do? Or, maybe you wuld like to share a kit with someone else? This column may help you. Write to Ian Ross (Biochemistry) with your questions and comments and we will publish them here and see what develops. For the next issue, how about some comments on your experience with kits for mRNA preparation. Send these to Ian and he will collate these for us and hopefully we will clarify the situation for others wondering just which kit to use.

Conference Reports:

Third International Symposium on Insulin-Like Growth Factors

Sydney, February 6-10, 1994 - Report from Ian Morison

The IGFs, along with their receptors and binding proteins form a network of proteins, the complexity of which I did not appreciate prior to this meeting. IGF1, which is probably the primary effector of growth hormone, has similarities with insulin, and shares virtually identical actions with IGF2. The activities of IGF1 and IGF2 are modulated locally by six IGF binding proteins, most of which can both potentiate and inhibit the physiological effects of the IGFs. The mitogenic effects of IGF1 and IGF2 are mediated through the IGF1 receptor and also through the IGF1 receptor/insulin receptor hybrid receptor. IGF2 has an additional receptor, the IGF2/mannose-6-phosphate receptor which internalises and degrades IGF2.

Several areas of new research into the IGFs were reported. Trials of therapeutic, subcutaneous rhIGF1 are under way. Although the clinical utility of IGF1 has not been established, promising results have been obtained in type I diabetes, growth hormone insensitivity, and various catabolic states such as peritoneal dialysis, major surgery, HIV infection and osteoporosis.

There is considerable interest in the IGF binding proteins, although clear paradigms for their role have not been established. They play a role in fetal and placental development, locally modulating the mitogenic actions of IGF1 and IGF2.

Several new strains of mice were reported. These include IGF1 knock outs (complete and partial), IGFBP-2 knock outs, and four strains of IGF2 transgenics. The most important lessons from the IGF2 overexpressing mice, is that overgrowth manifestations are dependant on which promoter is used and which tissues that promoter is expressed in.

A few investigators discussed control of IGF2 and IGF1R transcription. It is generally believed that the Wilms tumour gene, WT1, can repress the transcription both IGF2 and IGF1R genes. In adult human liver, transcription from the liver-specific promoter is probably regulated by liver-specific proteins including C/EBP and LAP.

This meeting considerably broadened my understanding of the IGF axis, and as always provided an introduction to many workers in this area. I am happy to lend the meeting abstract book which also includes review articles on the binding proteins, receptors and IGF assays.

Sixth Lorne Cancer Conference

Lorne, Victoria. February 10-13, 1994

Organised by cancer researchers from the Melbourne area, this meeting, at Lorne's pleasant beach-side guest house, was heavily biased toward signalling, growth factor receptors, signal transduction and the cell cycle. Although now much more familiar with the complexities of this area, my reaction to this field was similar to my reaction to the cytokine soup that existed 5-10 years ago.

A highlight of the meeting was Doug Hanahan's (UCSF) description of the development of pancreatic tumours in transgenic mice expressing SV-40 T antigen under the control of the rat insulin promoter. Although T antigen was expressed in neoplastic islets it was also expressed in normal islets, indicating that secondary events are required for transformation. Of over 40 growth factors, only IGF2 expression was associated with tumourigenesis. In addition IGF2, which is normally imprinted, was transcribed from both maternal and paternal alleles in the pancreatic tumours. This provides further evidence for our laboratory's hypothesis that disruption of IGF2 imprinting is associated with tumourigenesis.

The casual live-in environment of the Lorne Conference Centre facilitated informal discussion with other delegates and trade representatives. Many of these discussions were extremely valuable and the contacts established have already paid dividends in our laboratory.

Upcoming Conferences

Molecular Biology of Hypertension (March 29) See notice attached

Queenstown Molecular Biology Meeting (August 15-19, 1994) See preliminary notice attached. Kevin Farnden is the local representative on the standing committee for the Queenstown meeting. Contact him for more information.

New Faces (One new and two not-so-new faces)

Jean Fleming (Lecturer in Physiology) writes:
I guess you could call me a molecular endocrinologist, in that I study the mechanisms by which hormones influence growth, development and reproduction. I am a new and still overly enthusiastic Lecturer in the Physiology Department of the Medical School, with research interests in the control and expression of the genes for beta inhibin and other members of the TGFβ gene family. I also collaborate with scientists at AgResearch Invermay, studying growth factor gene expression in the deer antler. From 1987-92 I spent most of my waking hours thinking about how the Booroola fecundity gene influenced reproductive hormone gene expression in sheep and in 1990 I was the recipient of the first Zonta Award for Women in Science. However, my major achievement to date has been convening the Women's Suffrage Centennial Science Conference in Wellington last year and the award of a 1993 Suffrage Medal.

Vernon Ward (Assistant Lecturer in Microbiology) writes:
I complete my PhD at the Department of Microbiology, University of Otago in 1987 working on restriction mapping and detection of nuclear polyhedrosis and iridescent viruses of the *Wiseana* spp. (Porina). I then took up a post-doctoral fellowship at the Natural Environment Research Council, Institute of Virology in Oxford working on cloning, sequencing , and expression of tick-transmitted nairovirus proteins for use in diagnosis and detection of viruses in vertebrate and invertebrate hosts. In 1989 I moved to the Department of Entomology at the University of California at Davis as a post-doctoral researcher working on the engineering and expression of insect juvenile hormone esterase in baculoviruses for the control of insect pests. I also worked upon the expression of recombinant antibodies in *Escherichia coli* and baculoviruses for the detection of herbicide resistance in the environment. I have recently returned to New Zealand to take up a position as an Assistant Lecturer in the Microbiology Department at the University of Otago and I am hoping to pursue the development of the baculovirus systems in conjunction with other insect viruses from the expression of proteins and antibodies. Currently I am trying to get lectures together, get some grant submissions organised, and also get some research underway.

Craig Marshall (Lecturer in Biochemistry) writes:
I completed an honours degree at Otago after starting out at Canterbury and went on to do a PhD with Warren Tate on the haemoglobins of the brine shrimp *Artemia*. My post-doc was in Cambridge where I worked on the serpins, a family of proteinase inhibitors. My interests were always in the area of protein structure and function and this connection continued, and I was also introduced to an area called computational molecular biology: the application of computers to analyse data and make models which may be experimentally tested. Since returning to New Zealand I have worked on a number of phylogenetic studies examining the evolutionary relationships of several families of sequences. My primary interest in protein structure and function has continued and I have collaborated with Pat Sullivan and John and Sue Cutfield looking at the structures of two proteins from *Candida albicans*. I recently received funding to attempt to crystallize and determine the structure of bacterial polypeptide-chain release factors, a project in collaboration with Warren Tate. From 1 April my short-term funding worries are solved as I shall be joining the Department of Biochemistry as a lecturer.

Warren Tate, he can't remember why he is getting into this research, but others understand !

Joanna Williams, a brighton breezy post doc, generally makes sense, even tho' she is now into antisense

RESEARCH PROFILE: MEMORY MOLECULAR BIOLOGY SUBGROUP

The memory molecular biology laboratory is a subgroup of a multidisciplinary team headed by Dr Cliff Abraham (Psychology) studying the mechanisms of the persistence of phenomena which are thought to be representative of memory. The subgroup comprises 3 scientific staff, a postdoctoral fellow, and 2 students. It complements a team of electrophysiologist/neuroscientists with different skills. The research involves the molecular mechanisms underlying long term changes in the hippocampus of the rat brain, the centre of information processing where memory is most likely first established. As such the research is engrossed in cell signalling pathways and changes in gene expression that might be responsible for the observed long term electrophysiological changes in the neurons.

Following an electrical signal of a particular frequency there is increase transmitter released from the presynaptic cell and activation of a receptor at the post synaptic neuron which leads to influx of Ca^{2+} into the cell. We are interested in what happens then to keep the response of the postsynaptic cell to a test pulse in a potentiated state. This can last for weeks in the animal, happily playing in his natural laboratory environment. A group of genes called, the immediate early genes, are induced; these are transcription factors, and some have been recognised to be activated in other cells in response to external signals (Joanna Williams). One main focus now is to understand how an influx of calcium can cause this effect, in other words can we fill in the missing steps. Our working hypothesis is that there is an activation of a specifc kinase, CaM kinase III, specific for a protein synthesis factor, EF-2, which phosphorylates the factor transiently stopping protein synthesis, and derepressing the immediate early genes (Chris Brett, Tristan Robertson, Vida Thompson). Then we are interested in what genes these transcription factors upregulate, since it is likely that they are causing the synaptic plasticity which results and the longterm effects. For these cDNA libraries of the expressed genes are being constructed at various times, and differential screening used to identify the target genes whose expression changes in response to the signals (Becky Durtschi).

SOME REPRESENTATIVE RECENT PUBLICATIONS

Abraham, W.C., Dragunow, M. and Tate, W.P. (1992) The role of immediate early genes in the stabilization of long term potentiation. Molecular Neurobiology 5, 297-314.

Richardson, C.L, Tate, W.P., Mason, S.E, Lawlor, P.A., Dragunow, M. and Abraham, W.C (1992) Correlation between the induction of an immediate early gene zif/268, and long term potentiation in the dentate gyrus Mol. Brain Res. 580, 147-154.

Demmer, J., Dragunow, M., Lawlor, P.A., Mason, S.E., Leah, J.D., Abraham, W.C. and Tate, W.P. (1992) Differential expression of immediate early genes after hippocampal long-term potentiation in awake rats. Mol. Brain Res. 17, 279-286.

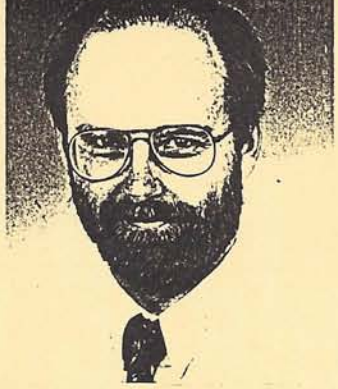
Abraham, W.C., Mason, S.E., Demmer, J., Williams, J.M., Richardson, C.L., Tate, W.P., Lawlor, P.A. and Dragunow, M. (1993) Correlations Between Immediate Early Gene Induction and the Persistence of Long-Term Potentiation. Mol. Brain Res.

Becky Durtschi, an import....ant addition to the group from Houston, recognised by her mid-summer shivering, and high humour-dity.

Vida Thompson, the flower power of the group, goes around muttering, two D or not to D, but is gelling.

Chris Brett, new student gaining neuropower for his Med future, has an apatite for columns but already generated lots of fines

Tony Zacharic, new student a gene-ial character, joining the Master's race.



Richard Cannon, an old hand with candida and recently appointed as a lecturer in the Department of Oral Biology and Oral Pathology.

Rod McNab, a canny streptophile and fanatic fly fisherman.

Greg Albertson, new to candidology and Dunedin.

Brett [illegible]n, budding ATPase ace.

Rachel Cuthbertson, finding fame in soft cheeses.

RESEARCH PROFILE: EXPERIMENTAL ORAL BIOLOGY LABORATORY

The Experimental Oral Biology Laboratory (EOB), part of the Department of Oral Biology and Oral Pathology in the School of Dentistry, currently comprises 11 scientific staff and 5 graduate students. The Unit undertakes research into oral biology and teaches oral biology to Dental students. Research at EOB applies molecular biological, cell biological and biochemical approaches to the study of prokaryotic and eukaryotic microorganisms that colonize the human body, particularly the oral cavity. Research in the unit encompasses three principal areas.

1. Microbial cell surfaces and pathogenicity

In common with many disease-causing microbes, organisms like streptococci and candida initiate infection by attaching to host surfaces. This process provides the focus for several projects headed by Howard Jenkinson, who is studying surface proteins and carbohydrates from streptococci and lactobacilli. Current projects include: i) the role of wall-associated proteins in the colonization of the oral cavity by streptococci (Rod McNab and Mike Jamieson) and in the adhesion to squamous epithelia by lactobacilli (Judith Bateup); ii) the molecular basis of oral streptococcal adhesion mediated by bacterial lipoproteins (in collaboration with Gerald Tannock and Diane Loach, Department of Microbiology); iii) adhesin-receptor interactions between candida and the complex carbohydrates of streptococci (Ann Holmes); iv) attachment of candida to saliva-coated surfaces (Richard Cannon). For example, Rod McNab has cloned and characterised a gene encoding a high molecular mass cell surface protein of *Streptococcus gordonii* in order to elucidate the molecular features of streptococcal-host cell interactions. Research on the architecture and biosynthesis of the cell wall of the important fungal pathogen *Candida albicans* and on morphogenesis of this organism (Max Shepherd, Masa Niimi, Richard Cannon and Brian Monk) has provided the basis for molecular genetic analysis of several molecules (plasma membrane ATPase, wall processing enzymes and vacuolar proteases) that may be involved in pathogenicity.

2. Drug resistance and drug targets in fungi

Richard Cannon seeks to prevent fungal infections of humans by understanding the molecular basis of resistance to current antifungal agents, and by investigating potential new drug target sites. Richard and Greg Albertson are trying to clone the genes that cause fluconazole resistance, a process which may involve multidrug resistance (*mdr*) transporters. With Kyoko Niimi, the N-acetylglucaminidase gene of *C. albicans* has been cloned and sequenced and its regulation is being characterized.

Brian Monk's group is developing the extracytoplasmic domain of the plasma membrane ATPase of *C. albicans* as a target for new antifungal agents. Chimeric ATPases, engineered using the *PMA1* genes from *S. cerevisiae* and *C. albicans* are being expressed in *S. cerevisiae* as templates for site-directed mutagenesis and antifungal screening (in collaboration with Dr D.S. Perlin, Public Health Research Institute, New York). As part of a process of rational drug design, mutagenesis of the yeast plasma membrane proton pumping ATPase is providing key structure-function information (Brian Monk), helping gauge the accessibility of individual amino acid residues within the target (Brett Mason) and facilitating the creation of an ATPase conformer suitable for crystallographic analysis (Tom Kardos). Molecular modelling studies (Craig Marshall) complement this analysis.

3. DNA-based methods for detection of human pathogens

Nucleic-acid-based kits for detection of *C. albicans* in clinical specimens (Ann Holmes) and *Listeria monocytogenes* in dairy products (Rachel Cuthbertson) are being developed in conjunction with Zenith Technology, a Dunedin biotechnology firm.

EOB molecular biology and structural biology-related expertise: Gene cloning, gene sequencing, gene expression, plasmid design, PCR-based gene engineering, site-directed mutagenesis, domain swapping, protein chemistry, membrane proteins, immunochemistry, molecular modelling, genetics of gram-positive bacteria, yeast genetics.

SOME REPRESENTATIVE RECENT PUBLICATIONS

Cannon RD, Jenkinson HF, Shepherd MG. 1992. Cloning and expression of *Candida albicans ADE2* and proteinase genes on a replicative plasmid in *C. albicans* and in *Saccharomyces cerevisiae*. *Molecular and General Genetics* 235, 453-457.

McNab R, Jenkinson HF. 1992. Gene disruption identifies a 290 kilodalton cell-surface polypeptide in conferring hydrophobicity and coaggregation properties in *Streptococcus gordonii*. *Molecular Microbiology* 6, 2939-2949.

Holmes AR, Cannon RD, Shepherd MG and Jenkinson HF. 1993 Detection of *Candida albicans* and other yeasts in blood by polymerase chain reaction. *Journal of Clinical Microbiology* 32: 228-223

Jenkinson HF, Terry SD, McNab R and Tannock GW. 1993. Inactivation of the gene encoding surface protein SspA in *Streptococcus gordonii* DL1 affects cell interactions with human salivary agglutinin and oral actinomyces. *Infection and Immunity* 61: 3199-3208

Mason AB, Buckley HR and Gorman JA. 1993. Molecular cloning and characterization of the *Candida albicans* enolase gene. *Journal of Bacteriology* 175: 2632-2639.

Monk BC, Niimi M and Shepherd MG. 1993. The *Candida albicans* plasma membrane and H^+-ATPase during yeast growth and germ tube formation. *Journal of Bacteriology* 175: 5566-5574.

Monk BC, Feng WC, Marshall CJ, Seto-Young D, Na S, Haber JE and Perlin DS. 1994. Modeling a conformationally-sensitive region of the membrane sector of the fungal plasma membrane proton pump. *Journal of Bioenergetics and Biomembranes*. In press.

MOLECULAR BIOLOGY OF HYPERTENSION

A One-day Symposium to be held in Dunedin, New Zealand on 29 March 1994

Session 1: 10.45 to 12.30 Pharmacology Demonstration Room (Rm 308), Adams Building, Medical School
The problem; blood vessels and blood pressure

M.J. Mulvany, Aarhus, Denmark
Pathophysiology of resistance vessels in essential hypertension
M. Hamada, Wakayama, Japan
Growth characterisitics of vascular smooth muscle cells in gentically hypertensive strains of rats
J. Ledingham, Dunedin
Effects of ACE inhibitors on blood pressure and the morphology of mesenteric resistance arteries in New Zealand GH rats
E.L. Phelan & M. Cross, Dunedin
Effects of antihypertensive drugs on the development of high blood pressure and the structure of resistance arteries in New Zealand GH rats

Session 2: 2.00 to 3:30 Seminar Room, Department of Biochemistry (Rm 221) Biochemistry Building, Cumberland Street.
Molecular genetics of hypertension

D. Brown, Boston, U.S.A.
Genetic Identification of Rf-1, a gene responsible for renal failure in a rat model of hypertension
Y. Nara & Y. Yamori, Kyoto, Japan
Linkage analysis in Stroke-prone Spontaneously Hypertensive Rats (SPSHR)
E.L. Harris & M.R. Grigor, Dunedin
Genetic basis of hypertension in the New Zealand GH rat

Session 3: 4.00 to 5.30 Seminar Room, Department of Biochemistry
Gene expression in hypertension

B.C. Berk, Seattle, U.S.A.
Smooth muscle cell hypertrophy: roles of kinases and phosphatases
B.C. Low & M.R.Grigor, Dunedin
Regulation of substrate uptake in cultured vascular smooth muscle cells
D. Naot, Auckland, New Zealand
Could hyperamylinaemia be a mechanism that directly links insulin resistance with essential hypertension, obesity and atherogenesis

This meeting is organised by the Centre for Gene Research and Departments of Pharmacology and Biochemistry at the University of Otago. There is no formal registration nor registration fee.

Support from the Centre for Gene Research, Roche Products (NZ) Ltd, Bayer (NZ) Ltd, Merck Sharp & Dohme (NZ) Ltd, and the Otago Pharmacological Association is gratefully acknowledged.

After the meeting there will be a social hour (5.45 to 6.45) followed by an informal dinner both at the University of Otago Staff Club. The cost of the dinner will be $35 and partners are welcome. During the social hour we wish to acknowledge the retirement of Dr Lin Phelan. People wishing to make contributions to a retirement gift should send them direct to Dr R. Laverty, Department of Pharmacology, University of Otago.

Should you require further information concerning the meeting, accommodation in Dunedin or wish to register for the dinner, please contact: Dr M.R. Grigor, Department of Biochemistry, University of Otago, Box 56, Dunedin. (phone (03) 479 7840: fax(03) 479 7866)