

Volume 52 Number 1 March 1998

ISSN 1171-0195



New Zealand Journal of

# Medical Laboratory Science

Official Publication of the New Zealand Institute  
of Medical Laboratory Science Incorporated

# 1

# Med-Bio Enterprises

*is pleased to announce*

*they will now be the NZ*

*distributors of*



**AVL Medical Instruments have a wide range of Blood Gas and Electrolyte Analysers, to meet any need, economical or price requirements, a laboratory or critical care area may have.**

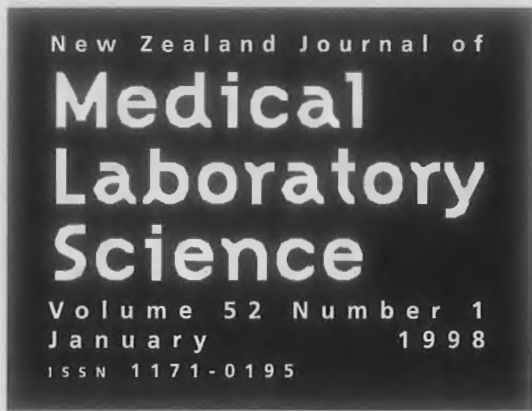
For more information about these exciting products, please contact:

**Med-Bio Enterprises Ltd**

Rose-Marie Daniel - Technical Representative, North Island

Nicola Egerton - Technical Representative, Wellington South

◆ Ph: 0800 733 599 ◆ Fax: 0800 101 441 ◆ email: [jvincent@medbio.co.nz](mailto:jvincent@medbio.co.nz)



**TH Pullar Memorial Address**

Training for paradise.

*Michael Lynch*.....3-5

**Letter to the Editor**

Safe usage of gluteraldehyde

*A Pickford*.....9

**Boehringer Mannheim Clinical**

**Biochemistry Award Article**

Implementing the RHA draft national quality standards for medical testing laboratories for glucose near patient testing.

*Clare Murphy*.....6-9

**Regular Features**

Annual Scientific Meeting, 1-4 Sept 1998.....13-15

Advertisers in this Issue .....40

Council News.....17,19

Fellowship Regulations and Application Forms.....23-28

Index to Volume 50, 1997 .....12

Instructions to Authors.....2

New Products and Services .....10-11

NZIMLS Awards .....36-39

Special Interest Groups .....33-35

QTA Examinations Application Forms.....29-32

**Report**

NZIMLS Annual Scientific Meeting Survey.

*Tony Mace* .....19

# NEW ZEALAND JOURNAL OF MEDICAL LABORATORY SCIENCE

## Editor:

Rob Siebers. Wellington School of Medicine

## Editorial Board:

Jan Nelson. Department of Molecular Medicine, University of Auckland.  
Shirley Gainsford. Valley Diagnostic Laboratory, Lower Hutt.  
Les Milligan. Otago Regional Blood Transfusion, Dunedin.  
Harold Neal. Canterbury Health Laboratories, Christchurch.  
Keith Harrison. Editor, Australian Journal of Medical Science.  
Trevor Forster. Editor, Australian Journal of Medical Science.  
Grant Goodman. Haematology Department, Taranaki Base Hospital.  
Steve Henry. Auckland Institute of Technology.  
Michael McCarthy. Diagnostic Laboratory, Auckland.  
Warren Dellow. Med.Bio Enterprises, Christchurch.

## Statistical Adviser:

Gordon Purdy. Wellington School of Medicine.

The New Zealand Journal of Medical Laboratory Science is published quarterly (March, May, August & November) on behalf of the New Zealand Institute of Medical Laboratory Science (Inc) by Institute Press Ltd, Auckland.

The Journal is indexed in the Cumulative Index to Nursing and Allied Health Literature (CINAHL).

## Subscriptions:

Subscriptions to the Journal for non-members requiring delivery in New Zealand is \$NZ33.00 for 1 year surface mail paid. Subscriptions to the Journal for non-members requiring delivery overseas is \$NZ39.60 for 1 year surface mail paid. All subscriptions except for single issues are due in February. Single issues are \$NZ12.00 Surface mail paid. Members of the NZIMLS should send their enquiries and address changes directly to the Executive Officer of the NZIMLS, PO Box 3270, Christchurch.

## Advertising:

Advertisement bookings and enquiries should be addressed to the Advertising Manager: Trish Reilly, 48 Towai St., St Heliers, Auckland 5. Phone: (09) 575 5057.

## Editorial:

All editorial matter, including submitted papers, press releases and books for review should be sent to the Editor: Rob Siebers, Department of Medicine, Wellington School of Medicine, PO Box 7343 Wellington South. Phone: (04) 385 5999 (Ext: 6838). Fax: (04) 389 5725, E-mail: rob@wnmeds.ac.nz.

Contributors and advertisers are responsible for the scientific content and views. The opinions expressed in the Journal are not necessarily those of the Editor or Council of the NZIMLS.

## Information for Contributors:

The Journal publishes original, review, leading & technical articles, short communications, case reports and letters in all disciplines of Medical Laboratory Science as well as related areas of interest to

Medical Laboratory Scientists (eg) epidemiology, public & community health, education, ethics, computer applications, management, etc. All papers published will be in the form known as the "Vancouver Style" or Uniform Requirements for Manuscripts Submitted to Biomedical Journals. Concise details are listed below while full details may be found in the *NZ J Med Lab Science* 1991; 45 (4): 108-11 or from the Editor.

Papers submitted to the Journal are refereed and acceptance is at the discretion of the Editor. Papers with substantive statistical analysis and data will be reviewed for appropriateness by the Statistical Adviser. No undertaking is given that any article will be published in a particular issue of the Journal. The copy deadline for each issue is the first of the month prior to the month of publication.

## Manuscripts:

Submitted papers (**in duplicate**) should be typewritten, in double spacing throughout on one side of A4 paper. Generally each component of the manuscript should begin on a new page in the following sequence.

\* **Title of paper**, authors (including first name and qualifications), and institution(s) where the work was carried out. Address for the corresponding author should also be given.

\* **Abstract and keywords**. Abstracts should be structured and contain concise and precise information regarding the study's **Objective(s), Method(s), Result(s) and Conclusion(s)**. List up to 4 keywords using *Index Medicus* medical subject headings.

\* **Text**, in the order of **Introduction, Materials and Methods, Results, Discussion and Conclusion**.

\* **References** should follow the style adopted by the US National Library of Medicine as used in *Index Medicus*. Refer to papers in recent issues of the Journal for guidance (or see *NZ J Med Lab Science* 1991; 45 (4): 108-11). Authors are responsible for accuracy of all references.

\* **Illustrations** must be provided with a suitable legend typed on a separate sheet. Graphs should be 2-3 times larger than they would appear in the journal and contain a minimum of lettering. Legends for these should also be typed on a separate sheet. Photographs should be original sharp, glossy black & white prints. Authors wishing to submit colour photographs must contact the Editor in the first instance.

\* **Tables** should be typed on a separate page complete with a title at the top and footnotes at the bottom. The tables should be numbered as they appear in the text and must *not* contain vertical lines.

\* **Acknowledgements** should be made to people and/or organisations who have made substantial contributions to the study. Authors are responsible for obtaining consent from those acknowledged. Financial contributions towards the study from granting bodies or commercial organisations must be stated.

**Two** copies of the manuscript are to be addressed to the Editor NZ J Med Lab Science, c/- Department of Medicine, Wellington School of Medicine, PO Box 7343, Wellington South, together with a letter from the corresponding author stating that the work is original, is not under consideration for publication elsewhere, and in the case of multi-authorship that all authors have contributed directly to the planning, execution, analysis or to the writing of the paper.



# Training for Paradise – T. H Pullar Address

*Michael Lynch, MNZIMLS  
Pacific Paramedical Training Centre, Wellington*

I recently read in an international magazine that brevity is the first principle of rhetoric and perhaps the most violated. Generally, scientists obey a very important law known as The Law of Parsimony. Ian Wilmut, who recently announced his creation of Dolly the cloned adult sheep, did so in three pages in Nature Magazine. Watson and Crick announced their discovery of the structure of DNA in less than two pages of Nature. Thus Lynch, who has cloned nothing and discovered even less will, in the tradition of these great men, try to observe the Law of Parsimony during this address.

Thomas Pullar was born in Auckland in 1907.

I was born in Sydney in 1936.

Dr Pullar was appointed Pathologist at Palmerston Hospital in 1937 when I was one year old.

I first met Dr Pullar in 1954 when I was interviewed by him for the position of medical laboratory trainee at his laboratory.

Unfortunately that meeting was when my personal association with Thos Pullar began and ended because although I was successful with my application to start my training at Palmerston North I accepted an earlier offer from Dr Joe Mercer to train in Wellington.

Dr Pullar was a lifelong friend and champion of New Zealand Medical Technologists and was intensely concerned with the training of technologists and even in his retirement in Tauranga in 1963 he travelled throughout the country setting up technologists examinations and introducing new training schemes. Today I want, in honour of Thos Pullar, to take up this theme of training.

I have titled this address "Training for Paradise" and those of you with highly developed spiritual and evangelical leanings may think that I am going to talk about things heavenly and how to go about getting there. Well this is not the case and the paradise that I am referring to is not so far distant and you can't get there by accumulating sufficient fly by points or simply buying a plane ticket. Yes my paradise is a Pacific Island and my training refers to the training of medical laboratory technicians for hospital laboratories in the Pacific. I am sure that Dr Pullar from his paradise would be pleased to look down upon my paradise and recognise similarities to the early days of laboratory technician training in New Zealand. On perusal of the titles of the T.H. Pullar addresses dating back to 1967 there have been at least four concerned with the training of laboratory technicians in New Zealand and today I invite you to view the wider picture of laboratory training in the developing countries that make up the Pacific region.

In 1970, the then Prime Minister of Fiji Ratu Sir Kamisese Mara, in a speech to the United Nations General Assembly launched the term "The Pacific Way". This is not an easy term to interpret from our 20th century Western perspective and as it is a Pacific term perhaps it should only be used in the Pacific language. So in Samoan it would be Fa'a Pasifika or any other Pacific causative prefix such as Va'a, vaka faka, hak, mbaka, paka, aka Pasifika or even in the Melanesian Pidgin as "Pasin bilong ol ailan" (The Island Way). So as there was a "Pacific Way" of living and thinking in the Pacific there was also a Pacific Way of training laboratory technicians.

As you all know the Pacific has been traditionally divided up into three major zones, Polynesia, Melanesia and Micronesia and the

first two of these I further divide into English or French speaking. This morning I am going to confine my remarks to the English speaking countries, as I have no experience in the laboratory operations in the French speaking Pacific.

For a long time, medical education in the Pacific virtually meant the Fiji School of Medicine or FSM, as it is now known. This school was established in 1885 as the Suva Medicine School and between 1928 and 1995 it was called the Central Medical School. By 1995 it had graduated just over 1000 physicians and a little less than 1500 allied health workers in Dentistry, Dietetics, Environmental Health, Pharmacy, Physiotherapy, Radiography and Medical Laboratory Technology.

The laboratory training programme commenced in 1946, one year after the formation of the New Zealand Association of Bacteriologists, with the enrolment of 4 students for training as Laboratory Assistants. Up until this time all the laboratory work for the Suva Hospital was carried out by pathologists, and the assistants jobs were to assist at post mortems, and general cleaning chores. Eventually the pathologists realised that there was too much technical work for them to cope with alone and that a core of better trained assistants was needed. The philosophy of the school was "Learning by actually doing". This meant that there were very few lectures and that most of the teaching was done by demonstration at the bench. Eventually other countries in the Pacific region sent assistants to the school for training. These regional students came from Papua New Guinea, Vanuatu, Solomon Islands, Yap and the Cook Islands.

Initially study was based on learning only that which was needed to perform the work requested by the doctors and in the early 1960s 3 official subjects, haematology, microbiology and post mortem technology/histology were introduced. Nevertheless even though there was a syllabus, teaching tended to be restricted to that which the tutor (Pathologist) wanted the students to know. There was no formal theoretical examination, only a practical one, and there was no formal graduation ceremony – the Pathologist organised a party at his residence and someone from the School of Medicine presented the Certificates.

From 1963 to 1979 the training continued with the addition of Chemical Pathology and Cytology and the teaching was now carried out by the expatriate technicians from New Zealand or Australia. In 1980 the teaching programme was reviewed, Haematology and Immunohaematology were separated, the theory: practical mix was set at 40:60 and it was recommended that the course be lengthened to four years and upgraded to Diploma level. This latter point was not acted upon at that time. In 1987 laboratory technology as a topic was designed to include the basic science subjects and added to the list of subjects to be studied. In 1988 the Diploma course was resurrected, approved and the first four Diploma students graduated in 1990. All Diploma students had to complete a project which represented at least 60 hours work.

It is known that the organised laboratory training in Fiji commenced in 1946 with two Fijian and two Indian students. Unfortunately the names and numbers of students from 1946 to 1956 have been lost but from 1956 to 1996 there have been a total of 225

technicians graduate from the school. Of these 120 have gained the Diploma qualification including some who have updated their Certificate qualification. A further breakdown of statistics reveals that 170 were from Fijian hospitals and 55 were from other countries in the Pacific region. The Head of Department of the Medical Laboratory Programme is Rajendra Singh, a local trained technician and since the late 1970s all training has been given by local technicians.

Perhaps the most notable person to graduate from the Fiji Medical Laboratory Technician Training School was Sir Maori Kiki from Papua New Guinea. On his return to PNG Sir Maori eventually entered politics and became PNG's first Foreign Minister and was for a time acting Prime Minister.

Another notable alumni of the Fiji school is Daniel Kalorib. Daniel was for many years chief technician at the laboratory in Port Vila, Vanuatu and now holds the position of Deputy Director of Health for Vanuatu.

So there is life after training for paradise.

The next major development in the laboratory training saga occurred at the western side of the Pacific Ocean in Papua New Guinea. Initially, technicians were sent to either Fiji or Melbourne for training but as Papua New Guinea developed a small urban vocal elite, a demand for the sophistication of the developed world included a demand for more sophisticated medical care. The first certificate course for laboratory technicians was established in 1963 under the Territory of PNG. This was later upgraded in 1972 and became a part of several allied health courses which were conducted by the College of Allied Health Sciences, Port Moresby, under the Department of Health. Of the laboratory workers trained before 1963 only one remains working in the profession.

The course which started in 1972 became a 3 year Certificate Course. In the early days the tutors of this course were technologists who worked in the hospital service but as hospital laboratory workloads became heavier specific tutors attached to the College of Allied Health Sciences took over the teaching. The first year of this course was comprised of full time lectures and practicals in basic science subjects. The second and third years were spent learning the medical laboratory disciplines with 40% of the time spent in the college and 60% of the time spent on bench training in the Pathology Department of Port Moresby General Hospital. Entry qualification for this training was somewhere between the New Zealand School Certificate and University Entrance standards. The Certificate course training finished in 1991 with a total of 165 technicians graduating.

In 1975 a Diploma course was commenced which was available for certificated technicians who had had at least two years post graduate work experience. The Diploma took two years study and the lecture: bench work split was 50:50. To date 30 technologists have graduated with the Diploma.

In 1994 both the Certificate and Diploma courses came under the aegis of the University of Papua New Guinea and were combined to form a three year diploma qualification and at the end of 1996 there were 20 graduates from this course. The University hopes to develop this new course into a degree course in the near future. The Department of Health now concentrates on the training of laboratory assistants and the formal training of these workers commenced in 1976 with the institution of a 9 month certificate course held in several venues around the country. These MLA (Medical Laboratory Assistants), and to date 110 have been trained, are the back bone of the work force and perform much of the work in the 20 Provincial base hospitals.

The next level of laboratory worker is the Rural Laboratory Assistants who work at the rural health centres. Often these people are already working within the health system in positions such as nurse aid or malaria microscopist. They receive training at various centres in the country to perform a limited range of laboratory procedures. The

PPTC was involved in 1995 with the provision of training for this category of worker when Mr Gilbert Rose conducted in-country training for 20 Rural Laboratory Assistants in Port Moresby and Goroka. The PNG health authorities hope to continue this collaboration with the PPTC in future years.

By the end of 1996 there has been 507 laboratory workers trained through the Papua New Guinea training system. These fit into the following categories;

- 50 Medical Laboratory Technologists
- 165 Medical Laboratory Technicians
- 110 Medical Laboratory Assistants
- 182 Rural Laboratory Assistants

When the 1996-2000 Health Plan is implemented two new rural hospitals will be built in each of the 20 provinces and a considerable development of Public Health Laboratory capacity will be established in three regional hospitals. These developments indicate that there will be an increasing need to train further laboratory staff.

There are a number of smaller training schemes in various Pacific countries that merit mention in this review. These programmes are mainly aimed at producing trained personnel to fill the countries own needs. The ones that I will cover today are the programmes in Tonga, Western Samoa and the Pacific Paramedical Training Centre. There were other programmes set up in other countries by enthusiastic volunteers (mainly American Peace Corps) but these sadly only lasted as long as the volunteer was on the island. When their contract was completed and the volunteer returned home the training programme collapsed.

Firstly Tonga. In the early 1950s a Tongan Medical Officer returned to Tonga from Niue where during his assignment he was working in the laboratory and the radiology department as well as performing his medical duties. On his return to Tonga this doctor organised the on the job training of two laboratory assistants to perform haemoglobin estimations, white cell counts, and urinalysis.

In 1977/78 the Tongan government approved the recruitment of two laboratory assistants who were trained in a local nine month course consisting of two hours per day in lectures. No certificate was awarded at the end of the course. Unfortunately the government did not approve the recruitment for the years 1978/79 and the programme was discontinued.

In 1987 approval was given to start another course in 1988 to include all the usual laboratory disciplines plus food and water analysis. The class was divided into two groups with the first group being made up of five long serving laboratory assistants who had their training condensed to 12 months of theory lectures. The second group of 8 students started their two year course in 1989 and studied both theory and practical bench work.

At present the laboratory wishes to train a further seven assistants and although the government has approved the course funding still has to be found. The graduates of the Tongan programme are designated Assistant Laboratory Technicians.

The Western Samoan training programme started in 1989 following a review Ron Mackenzie carried out for the New Zealand Ministry of Foreign Affairs on the activities of the National Health Laboratory at Moto'otua Hospital in Apia. The outcome of Ron's investigation was that Samoa needed a programme to produce a corp of laboratory workers who could provide a competent basic service in the main laboratory disciplines. The programme to produce these workers took the form of a three year course which the PPTC designed, prepared the syllabus and the teachers reference resources. The local senior technicians prepared and taught the programme. Thus the programme was not directly reliant on expatriate teachers. Lectures are for ninety minutes each working day and the examinations until recently were set and marked by the PPTC in Wellington. From 1997, with the appointment of an enthusiastic local

coordinator, Samoa has taken over the running of year 1 and 2 examinations and the PPTC cooperates in running the finals examination by sending an examiner to Apia to run the practical and *viva voce* examination. The standard achieved is about equivalent to that of the New Zealand QTA examination. Sixteen trainees have started the programme since its inception in 1989, seven have graduated and unfortunately of these seven only two are still working at the laboratory. The retention of qualifying technicians is a problem that the laboratory is trying to improve.

The poor pass rate reflects the poor selection of trainees rather than poor training and although the training is provided mainly for Samoa's need, three of the graduating technicians have been trained for the soon to be established laboratory service in the Tokolau Islands.

The trainees graduate as Staff Technician and schemes are being developed for the Staff Technician to continue training for a further two years and become a Technical Officer.

This programme is undergoing revision at the present time and a greater emphasis is being placed on recruiting trainees with the appropriate prerequisites.

The training of Pacific Island laboratory technicians is a programme that commenced at the Pacific Paramedical Training Centre in 1981. Prior to 1980 the training in New Zealand of Pacific laboratory technicians consisted of attaching them in a New Zealand laboratory for a period of time where they worked and learnt at the bench. This did not prove to be satisfactory as often what they learnt and the instruments that they used were inappropriate for an island setting. Thus the PPTC was set up to provide training in appropriate medical laboratory technology and, development assistance for the clinical laboratory and blood transfusion services of Pacific Islands and South East Asian countries.

The teaching and development assistance set up by the centre are governed by one principle: it must be appropriate, affordable and sustainable for the health care setting in which it is used. Short term training courses of two to three months duration have been held in the main laboratory disciplines and in the laboratory aspects of specific topics such as sexually transmitted diseases, diarrhoeal diseases, acute respiratory infections, blood transfusion technology and instrument repair and maintenance. The topics for inclusion in the training programme are decided upon after consultation with the island laboratories and the World Health Organisation Regional Office. The courses have been held at the Centre in Wellington or as in-service training courses held in several countries of the region.

Since 1981 the PPTC has provided its form of training to about 400 technicians (including some repeat attendees) from the Pacific and Pacific rim countries. Evaluation of the effects of the Centre's training is carried out by sending to the countries regular quality control specimens in the four main laboratory disciplines. The excellence of the Centre's efforts in this has been recognised by the WHO when in 1990 it was designated a Collaborating Centre of the World Health Organisation.

As a tribute to those dedicated laboratory workers both local and expatriate who have contributed to the development of medical laboratory sciences in countries of the Pacific region during the past decades I say "Dr Pullar look at the good work these technicians have done for laboratory medicine in the Pacific". To the stake holders in world health such as governments of developed countries, bilateral and multilateral aid organisations, non governmental and voluntary agencies I say that laboratory medicine has come a long way in the Pacific since the 1950s and all groups of people are entitled to have access to an appropriate, affordable and sustainable medical laboratory service. Please maintain and increase your levels of support.

In conclusion I gratefully acknowledge the assistance I have received in researching the information for this address. In particular I thank Rajendra Singh (Fiji), Mike Ballinger (PNG), Sione Foliaki (Tonga), Donna Le Tagaloa Ioane (Western Samoa), Marilyn Eales (New Zealand) and Gilbert Rose (New Zealand).



representing

- CSL Biosciences** *Blood Banking Anti-Sera  
Reagent Red Blood Cells*
- Hemoliance** *Hemostasis from MLA & Ortho  
Reagents, Controls & Instrumentation*
- Trace Scientific** *single vial, liquid stable  
Amylase, Ammonia, Creatinine,  
Automated HDL Cholesterol  
Direct LDL, PBG Kit*
- BioWhittaker** *Viral Serology Reagents  
Endotoxin Testing (QCL-1000)*
- Oncor Inc** *In Situ Hybridization  
Probes, Kits & Reagents*
- Boule Diagnostics AB** *Phadebact Strep, Pneumococcus,  
Monoclonal GC Identification System,  
Staph. Aureus Kit Now Available.*
- Hybritech Inc** *Urine & Serum HCG Kit, Cal 25,  
Ostase Bone Alkaline Phosphatase*
- Labsystems Oy** *Finn Pipettes & Finn Disposable Tips  
Multiskan, Multiwash & Fluoroskan  
Fluorimeters, Plate Readers & Washers*
- MediSense Inc.** *Medisense Precision QID  
Blood Glucose Monitors  
Medisense Precision-G  
Hospital QA Data Manager  
Precision Link  
Patient Data Manager*
- Clements Aust P/L** *Bench-top Centrifuges  
Suspension Mixers  
Blood Storage Refrigerators  
Vacuum Pumps*
- SEBRA** *Blood Bag Tube Sealers  
Tube Strippers  
Blood Donor Lounge Suites*
- Medical Research** *JRH Powder and Serum-Free Media  
Endogene - Cytokines, T-Cell Receptors  
Appligene - Kits For PCR*
- Macherey-Nagel GmbH & Co.** *MediTest Combi System  
Urinalysis Reagent Strips  
UriColor Reflectometer  
Automated Urinalysis*
- BioMedix LT & M Laboratories** *Immunochromatographic test kits  
for Hormonal, Bacterial, Viral,  
Cancer, Drug & Myocardial  
Rapid Identification.*
- Trace Scientific** *single vial, liquid stable  
Amylase, Ammonia, Creatinine,  
Automated HDL Cholesterol  
Direct LDL, PBG Kit*

**Freephone 0800-106 100 Freefax 0800-688 883**  
**P O Box 102-062 NSMC, Auckland 10**  
**E-mail info@medica.co.nz**

# Boehringer Mannheim Clinical Biochemistry Award Article

## Implementing the RHA Draft National Quality Standards for Medical Testing Laboratories for Glucose Near Patient Testing

*Clare Murphy, Bsc, MNZIMLS, Quality Improvement Co-ordinator for  
Laboratory Services and the Blood Service  
Capital Coast Health, Wellington Hospital, Wellington.*

### Abstract

For some years the author and the diabetes nurse educator had seen the need to review the practice of glucose POCT/NPT at Wellington Hospital. Although the system in place was state-of-the-art when it was introduced, it was well past its prime in 1996. More important, there was no associated QC or QA programme.

An opportunity arose when a decision to replace the reflectance meters with electrochemical meters was needed. A quality improvement team of diabetes nurses, clinicians, charge nurses and laboratory staff was convened to look at the issues. The team first assessed all electrochemical meters on the market using data from literature, previous trials and knowledge of the companies involved.

The availability of smart meters with on-board QA facilities changed our whole way of looking at the project. Smart meters have lockout capabilities, which reduces the need for user compliance. The quality improvement team chose to recommend the use of the Medisense smart meter Precision G.

A QA program was set up which required the training of over 400 staff, including key operators, over all shifts. The diabetes nurse educators did the scheduling and Medisense/Medica Pacifica staff did the training.

The success of implementation depended a great deal on training and follow-up. This has required time and commitment from both Capital Coast Health and Medica Pacifica. The nature of the Precision G QA system means we have had no problem with QC non compliance. However, it has proved more difficult than we thought to get users to identify themselves correctly when using the meter.

Overall we have been extremely happy with the QA program and could not have achieved the success we have had in implementing the RHA Draft National Quality Standards without the Precision G System.

### Key Words

Point of Care testing / Near patient testing, Glucose, Quality Control QC, Quality Assurance QA, Crown Health Enterprise CHE, Capital Coast Health Ltd CCHL, Regional Health Authority RHA.

### Introduction

For some years the author and the diabetes nurse educator had seen the need to review the practice of glucose POCT/NPT at Wellington Hospital.

A small study on two busy wards in 1993 showed that the quality of the analysis on the meters was inconsistent. Many staff did not accurately time the test and knowledge of calibration was patchy. In the same study the ward staff were asked to analyse the same QC material used by the laboratory to monitor their meter. The laboratory meter had CVs of 4% and 3% at 2.5mmol/L and 15.8mmol/L, while

the wards had average CVs of 10% at 2.5mmol/L and 5% at 15.8mmol/L.

More importantly, there was no glucose POCT QC or QA programme. The circulation of the draft RHA Draft National Quality Standards for Medical Testing Laboratories made it apparent that QA was going to be a big issue for Near Patient Testing.

The relevant section in the draft standards states:

#### (9) NEAR PATIENT TESTING

##### 9.1 Management of Near Patient Testing Equipment

Test equipment operated remotely from an accredited laboratory shall be subject to the same maintenance, calibration and QC criteria applied to equipment located within an accredited laboratory.

##### 9.2 Training of Staff

All staff using NPT equipment shall have successfully completed a comprehensive training programme in the use of the equipment. Training records for non-laboratory staff shall be kept and should be reviewed regularly.

##### 9.3 Responsibility of Near Patient Testing

The accredited laboratory within an institution or laboratory service shall accept responsibility for the management of NPT equipment associated with that institution or service, including the training of staff using the equipment.

These standards reflect the requirements proposed by a number of societies including the NZIMLS. (1-5)

An opportunity arose to introduce QA at the time when a decision to replace the reflectance meters with electrochemical meters was made.

### Materials and Methods

#### Quality Improvement Team

A Quality Improvement Team was formed to make recommendations on a new Glucose POCT System.

The team consisted of:

Louise Roche	Diabetes Nurse Educator, Wellington Hospital
Clare Murphy	Quality Improvement Coordinator, Laboratory Services
Ann Rees Jones	Charge Nurse, Wd15
Lorna Bingham	Diabetes Nurse Educator, Wellington Hospital
Euan Galloway	Chief Pharmacist
Bob Smith	Diabetes Physician
Brenda Anderson	Diabetes Nurse Specialist, Kenepuru Hospital
Ian Tompson	Deputy PMLS, Biochemistry
Michael Crooke	Chemical Pathologist

The formation of the team was vital to the success of the project. Capital Coast Health had introduced a Quality Improvement programme and was encouraging initiatives that improved hospital processes, and therefore the project had CHE approval. The group was



multi-disciplinary and multi-talented and covered all the areas affected by changes in policy. Finally all the team members shared the common goals to:

- introduce new technology;
- improve infection control;
- improve draft RHA standards.

### QA Program and Equipment

From Pharmacy records, Biomedical Engineering records and a survey done by the team it was concluded there were anything up to 60 meters at CCHL. Although most were reflectance meters there were a number of electrochemical meters. The strip use was very high with 90,000 strips used per annum at Wellington Hospital and 20,000 at Kenepuru and Porirua.

Several approaches have been taken to designing QA/QC Systems for POCT in NZ. (6,7). These include ward operated internal QC in which the nursing staff ran QC material of known value, and a laboratory-run external QC programme in which laboratory staff sent samples or actually ran the QC samples on the equipment.

The team decided that a comprehensive internal QA program would best comply with the draft standards. The design was as follows.

1. QC material was to be analysed at least every 24 hours, each time a new lot of strips was introduced and as a means of assuring competence when a new operator was trained.
2. All staff using the new electrochemical meters would need training. For CCHL this included staff over at 40 sites. Companies marketing glucose POCT provide training for staff in the use of the meter but not necessarily the site specific QA requirements.
3. As specified in the draft standards, responsibility of glucose POCT was to be held by the laboratory. This not only meant helping to choose the appropriate meters and installing them, but also ensuring that all sites ran controls and that no one using the system was untrained.

The Quality Improvement team was given the task of choosing the glucose POCT system using criteria given below

- Assay Reliability
- Ease of Operation
- Assay time
- Cost
- Safety of System (contact with blood)
- Supplier Commitment to Maintaining System
- Supplier Commitment to Ongoing Training
- Quality Assurance package

The team was to make a decision on which meter to use, then work out how best to implement the draft standards. Four meters were evaluated but the decision was simplified by the advent of smart meters during the evaluation period. Smart meters have lockout capabilities, which reduces the need for user compliance. Of the two smart meters on the market CCHL chose Medisense Precision G marketed by Medica Pacifica.

By using Precision G it was possible to program compulsory compliance using a system of lockouts. The meter was set up so it could not be operated if:

- QC not done in last 24hrs
- QC not in range
- Operator had not done QC in previous 200 QCs
- QC not done using new strip lot
- No operator ID used
- No patient ID used

The QC material used was Medisense Glucose Control Solutions for Medisense blood glucose testing systems.

Another feature Precision G has which reduces operator error is the use of barcodes on the individually wrapped electrodes. Before

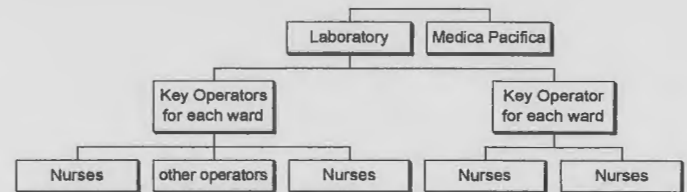
a test can be performed the Precision G reads the barcodes which contain QC and calibration information as well as lot number and expiry dates. This ensures correct calibration and rejection of out of date strips.

One of the principles of QA is to reduce opportunities for variation during an assay procedure. A smart meter can reduce the variables as follows

<b>Variable</b>	<b>Precision G solution</b>
Patient prep	
Finger pricking	
Strip loading	Cannot short sample
Strip Integrity	Individually wrapped Barcode read for indate QC lock out per strip lot
Strip calibration	Barcode recalibrated each use
Timing	Automatic
Meter Integrity	QC lock out per 24 hours System check
Operator competence	QC lock out for unaccredited operator

### Responsibilities

Even with programmable meters there needed to be a system of maintenance and QA support. The system chosen was based on each ward or unit having one or two key operators. It was designed as a hierarchical system.



The role of the key operator included sending QC results to the laboratory and carrying out any additional training required.

In addition a system was set up whereby faulty meters could be exchanged for a backup meter, available on site 24 hours a day. Faulty meters would either be fixed by the laboratory or exchanged for a new one from Medica Pacifica. Enquiries about the Precision G glucose testing system were to be directed to members of the Quality team but more specifically to the author, the on-site diabetes nurse educator and the Medica Pacifica representative.

Medisense has a computer program QC Manager™, a Windows based program that can collect data from Precision G through a simple cable connection. Medica Pacifica collected data over April and May for CCHL using this program. CCHL has recently installed an operational QC Manager™ program into a laboratory laptop. The logistics of collecting the data from all sites is yet to be determined.

### Training

Training was an integral part of the implementation program for the Precision G glucose testing system. Staff were trained in their wards at the time the old meters were replaced with the Precision G. The training timetables were drawn up by members of the Quality team in consultation with ward staff so that the maximum number of staff could be trained. Medica Pacifica provided the trainers and training material. A record of those trained was kept by the laboratory, using operator accreditation forms.

### Results

In October 1996 twenty-eight meters were introduced to twenty-seven sites at Wellington Hospital. 400 operators and 66 key operators were trained. At Kenepuru Hospital 70 operators and 26 key operators

were trained in eight sites.

1997 saw retraining and refresher courses given to 50 key operators at Wellington Hospital and to 15 key operators at Kenepuru Hospital. In November seven meters were introduced to the newborn baby units, with additional training of 50 operators and 30 key operators.

One or two page newsletters containing updates, helpful hints and QC information were sent to all key operators in February, June, and October 1997.

No matter how generous the provision of staff training it does not necessarily ensure that all users are trained. By using the operator ID lockout option on the Precision G we thought we could ensure that only those trained or more precisely those who had done QC samples could use the meters. The operator ID used was the employee number, which is unique for all CCHL employees. Non employee staff, ie agency nurses and trainee nurses, were not to use the meters. Very quickly we discovered that operators were using a token number like 1111 or 9999. To assess the non compliance for the use of true operator ID all numbers which looked like obvious nonsense were counted and an estimate 12% over all the data from the QC Manager™ was obtained. This is probably an underestimate as we are aware that some nurses use other nurses' numbers.

As demanded by the Precision G programming, QCs were run daily or on the days patients were tested. The median compliance per site for sending weekly QC reports from introduction to March 1997 was 73%. There were small improvements after newsletters were sent (eg February to March 87.5%) and after retraining but the overall figures have remained much the same (April to December 1997 was 65%). Results from these reports show that very few results fall out of the manufacturer's ranges and due to the lockout the QC must be repeated and in the vast majority of cases is acceptable.

QC Manager™ information collected from 33 meters (5845 QC results) in April and May showed 0.76% out of range. The average CV at a level of ~2.5mmol/L was 7.3% and at level ~16.0mmol/L was 5.1%. There were two batches of strips used over this period. BioRad Lyochecks assayed at the time of QC Manager data collection gave a similar overall picture. At a value of 6.0mmol/L the CV was 5.5% and at 19.5mmol/L the CV was 4.1%. One outlier has been removed from this data which was the result of a faulty meter. These results are all within a total error of +/- 15%, parameters used by researchers evaluating glucose meters for Pharmac(8).

## Discussion

Have we been successful at implementing the RHA standards and what have we learnt from the project?

### 9.1 Management of Near Patient Testing Equipment

The implementation of the RHA standards was greatly helped by the work and recognition by the CHE of the Quality Improvement Team and the purchase of the smart meters. CHE management approval ensured the use of only one type of meter. In CCHLs case it was the Medisense Precision G or in very few cases the non smart version Precision QID. It also ensured that the QA program for glucose POCT was CHE wide. Not all management decisions are welcomed by staff. However, acceptance of the new meter and the QA program was made easier by the recognised calibre of the team members and the decisions made by them.

The purchase of the Precision G ensured compliance for the internal QC and even if key operators do not send weekly QC reports the QC still have to be analysed. There is no maintenance for the Precision G, except for keeping it clean, and calibration is mandatory for operation. The program relies not only on the frequency of testing but also on acceptability of results. Allowable limits for the QC are set by Medisense and range from +/- 34% at a target of ~2.5mmol/L to +/- 25% at a target of ~16.0mmol/L. These limits are well above the

American Diabetes Association 1987 guidelines (9) of +/- 10% total error and much higher than their 1994 goal of +/-5% (10). It is fortunate therefore that the meters perform better than Medisense allowable limits would suggest. Excessively wide QC limits are not unique to Medisense. Greyson (11) suggests that all manufacturers of glucose POCT instruments should reduce their QC limits to more closely reflect ADA goals.

### 9.2 Training of staff

Although there was comprehensive initial training many staff including key operators remained unaware of some of the features of the meters and aspects of the QA program. It appears the quality of some of the training was such that key elements were not learnt, and a number of staff were not actually trained. It could explain the reluctance of many operators to use their unique identifier. Since the initial training, much work has been done by the laboratory staff and Medica Pacifica to upgrade the quality of the training material so that it more accurately reflects the practice at CCHL. The success of the training also depends on the skill of the trainers and the commitment they have to seeing staff are competent users of both the meter and the QA programme. Currently all records and accreditation forms are kept in the laboratory. Ensuring all staff are registered is an onerous task in an environment of rapid staff turnover. In contrast to the draft standards it would seem more sensible to make the responsibility for ensuring re-accreditation part of general CHE nursing education.

### 9.3 Responsibility of Near Patient Testing

Over all the system of sharing responsibility with key operators has worked reasonably well, but it does depend on the enthusiasm of the key operator. The refresher courses and the newsletters seem to have helped maintain commitment to the role. The true indicator however is the diligence of key operators at sending weekly QC reports and undertaking staff operator retraining.

With the co-operation of the out of hours laboratory staff and duty managers the backup system has meant there has been no problem when on the rare occurrence meters fail. Enquiries about the Precision G glucose testing system are directed mostly to the author. Initially there were a number of calls about why they had to do the QC: now they usually concern a faulty meter. The support from Medica Pacifica has been vital for the smooth running of the whole program.

With a few caveats CCHL has successfully implemented the RHA Draft National Quality Standards for Medical Testing Laboratories. Introducing the Precision G smart meters made implementing those standards easier and improved the analytical performance of glucose POCT at CCHL.

As of time of writing the RHA Draft National Quality Standards for Medical Testing Laboratories had not been ratified by the current funding agency, the Health Funding Authority.

## Acknowledgments

I would like to acknowledge the work of the Quality Improvement Team, without whom none of this would have happened. A special thanks to Louise Roche, the diabetes nurse educator and team member who pushed so hard to get the program started and who incidentally organised the initial training timetables. To Medica Pacifica staff and especially Helena Woods for their vital support, and finally Surjit Bedi of Medisense Australia who showed us the dream was possible.

## References

- 1 NZIMLS. Near patient testing recommended guidelines for hospital and general practice. *NZ J Med Lab Science* 1993; 47: 46-7.
- 2 Joint Working Group on Quality Assurance. Guidelines on Control Of Near-Patient Test (NPT) and Procedures Performed on Patients by Non-Pathology staff. *ACP News* Summer 1992.

- 3 Council of the Institute of Biomedical Science. Near Patient testing. *Biomedical Science*: April 1996.
- 4 Point-of-care in vitro diagnostic testing; proposed guidelines NCCLS Document ASTP-2; Vol. 15: No. 2, March 1995.
- 5 The American Diabetes Association position statement bedside blood glucose monitoring in hospitals. *Diabetes Care* 1998: 21: 578.
- 6 Moore M, et al. Quality assurance of capillary blood glucose measurement using gluco-card meter. Diabetes Lifestyle Centre, MidCentral Health Ltd., July 1994.
- 7 Aamodt C, Wilkinson W. Blood glucose monitoring protocol. Hutt District Diabetes Service., 26/11/91.
- 8 Johnson R J, Baker J R. Accuracy of devices used for self monitoring of blood glucose. *Ann Clin Biochem* 1998: 35: 68-74.
- 9 The American Diabetes Association, The Centre for Disease Control, The Food and Drug Administration and The National Institute of Diabetes and Digestive and Kidney Disease. Consensus statement. Self Monitoring of blood glucose. *Diabetes Care* 1987: 10: 95-9.
- 10 The American Diabetes Association. Consensus statement. Self monitoring of blood glucose. *Diabetes Care* 1994: 17: 81-6.
- 11 Greyson J. Quality control in patient self monitoring of blood glucose. *Diabetes Care* 1993: 16: 1306-8.

---

## Letter to the Editor

### Safe Usage of Gluteraldehyde

Dear Sir,

I would like to draw to your members, attention the safe usage of the chemical GLUTERALDEHYDE, which is commonly found in many professional situations (such as dentistry, podiatry, practice nursing, laboratories, undertaking, veterinary practice to name a few.)

Occupational Safety and Health have a valuable 1992 publication:

"The Safe Occupational Use of Gluteraldehyde in the Health Industries."

Many radiographers, darkroom technicians and theatre nurses are becoming ill from long-term fume inhalation (minimum 10 year work histories are reported) where the work place is inadequately ventilated, and there is perhaps little importance attached to safe handling of spills etc. The resulting illness and chemical sensitivities cause serious and unpleasant difficulties for those so affected. Nor does ACC always accept a claim for such an injury. There has been a support group formed for affected people, should you be aware of any one having difficulty.

The address is: Support Network for the Aldehyde Affected  
 c/o 48 Martins Road  
 Manakau RD 31  
 Levin

From a survey done in 1995-96 a list of symptoms was compiled, as below.

Common early symptoms —

Bad/metallic taste in mouth, bad breath, numb lips, sore throat, cold sores including nasal cold sores, gradual loss of singing voice especially upper register, intermittent irregular headaches, migraine, chestiness,

excessive fatigue, exercise intolerance under load, transient nausea for no apparent reason

Common later symptoms —

Reduced peak flow volume, very marked excess fatigue, dark circles under eyes, sore eyes, difficulty focussing, irritability, mood swings, increased anxiety, increasing memory loss particularly for material read, neuro-cognitive difficulty, dizziness 'spaced out' feelings, allergic reaction to chemistry the last to appear.

The onset of these symptoms was from months to several years – the symptoms are vague and general and can be put down to almost anything. We would like you to pass this information gathered from our professions to your members for their benefit.

Further to this we would like to advise you that the latest information received by SNFTAA is that the British Health and Advisory Committee on Toxic Substances (ACTS) has issued a Chemical Hazard Alert Notice and has recommended a Maximum Exposure Limit for gluteraldehyde of 0.05ppm (a very significant move).

The American Conference of Governmental Industrial Hygienists has also issued a Notice of Intended Change to lower the threshold from 0.2ppm to a ceiling of 0.05ppm for gluteraldehyde.

We believe that everybody dealing with this chemical should be given the strongest possible message that it is extremely dangerous. We would like to enlist your support in asking the NZ Government and OSH that the proposed safe limit for this chemical be set to 0.05ppm instead of the proposed NZ/Australian limit of 0.1ppm.

A Pickford  
 SNFTAA  
 Nelson



## New Products and Services

### Outstanding optics for training and the doctor's office - KF 2 ICS Transmitted Light Microscope

For years now, KF 2 microscopes have been used all over the world – in locations as diverse as jungle laboratories and Antarctic stations. They have proven their excellence indoors and outdoors, in conditions of high humidity and extreme dryness.

This robust and easy-to-use microscope is now equipped with ICS-infinity colour-corrected system optics, enhancing the image quality of the KF 2 even further.

Optical equipment is available for brightfield, darkfield and phase contrast. A vertically adjustable ergonomic tube and ceramics-coated microscope stages are further outstanding features not normally found in a low cost microscope.

An SLR or CCD camera can be connected for documenting observation results.

On request the KF 2 can be equipped for either 240V mains, battery operation or mirror illumination, making it ideal for the laboratory as well as field studies.

*For more information please contact:*

Carl Zeiss (NZ) Limited 9-15 Davis Crescent Newmarket, Auckland Phone: (09) 520 5626 Fax: (09) 520 5619 Email: <a href="mailto:info@zeiss.com.au">info@zeiss.com.au</a> Web: <a href="http://www.zeiss.de">Http://www.zeiss.de</a>	Carl Zeiss (NZ) Limited Suite 2, 7 Ward Street Lower Hutt Phone: (04) 566 7601 Fax: (04) 566 7501
--	---

### Routine affordability with infinity optics – Standard 25 ICS transmitted light microscope

The new Standard 25 ICS proves that even a compact transmitted-light microscope can provide optimum performance at an affordable price. Its configuration meets all the demands made on a microscope used in doctor's offices, clinical and other laboratories, and wherever high-performance routine examinations of biological specimens must be performed quickly and with high operating convenience.

The special feature of this standard microscope is its optics. The ICS (Infinity Colour-Corrected System) provides a brilliant image with pronounced contrast and high resolution. Contrasting can be achieved by brightfield, darkfield, phase contrast and polarization techniques. Photographic and CCD documentation of the specimens is also possible.

Easy operation – easily accessible controls, a conveniently low specimen stage, a luminous-field diaphragm for Köhler illumination or the insertion of filters – and the sturdy stand of pyramid design permit relaxed and fatigue-free operation for hours on end.

The Standard 25 ICS once again sets standards in routine microscopy.

*For more information please contact:*

Carl Zeiss (NZ) Limited 9-15 Davis Crescent Newmarket, Auckland Phone: (09) 520 5626 Fax: (09) 520 5619 Email: <a href="mailto:info@zeiss.com.au">info@zeiss.com.au</a> Web: <a href="http://www.zeiss.de">Http://www.zeiss.de</a>	Carl Zeiss (NZ) Limited Suite 2, 7 Ward Street Lower Hutt Phone: (04) 566 7601 Fax: (04) 566 7501
--	---

### Polarization microscopes for materials science and industry

Carl Zeiss has supplemented the line of Axiolab microscopes with two further configurations particularly suitable for training and routine applications in materials science.

The Axiolab polarization microscope is now available as a low-price transmitted light model which is ideal as a course microscope for petrography, for training in the fields of geography, geology and mineralogy. However, it can also be used for the testing of transparent materials such as fibers and films or for the examination of biocrystals. The configuration consists of: a rotary stage with gradation and a 45° stop, an analyser slider, a switchable polarizer and upgradable CP-Achromat objectives. The line of accessories includes: a ± 5° rotary analyser, a ± 5° rotary  $\lambda$  compensator, a depolarizer, and equipment for phase contrast and thermomicroscopy.

The Axiolab Pol materials microscope for transmitted and reflected light has been particularly designed for various routine applications in the materials laboratory. A favourable price/performance ratio has been achieved on account of focusing on the major points. The Axiolab Pol is ideal both for the testing of transparent materials (e.g. fibers, films, glass) and for the examination of opaque materials (e.g. metals, metal alloys, coke). The configuration consists of: a 4-position nosepiece with individual centering, a rotary stage with gradation and a 45° stop, an analyser slider, a switchable polarizer and CP-Achromat Pol objectives. These accessories are offered: a ± 10° rotary analyser, a ± 10° rotary  $\lambda$  – compensator, a depolarizer, a three-axis universal rotary stage, the MPM 200 photometer, the UltraObjective, and equipment for Mirau interference, microhardness testing, phase contrast and fluorescence.

*For more information please contact:*

Carl Zeiss (NZ) Limited 9-15 Davis Crescent Newmarket, Auckland Phone: (09) 520 5626 Fax: (09) 520 5619 Email: <a href="mailto:info@zeiss.com.au">info@zeiss.com.au</a> Web: <a href="http://www.zeiss.de">Http://www.zeiss.de</a>	Carl Zeiss (NZ) Limited Suite 2, 7 Ward Street Lower Hutt Phone: (04) 566 7601 Fax: (04) 566 7501
--	---

### New Chairman of Diagnostic Announced

New Zealand's largest single community testing laboratory – Diagnostic Laboratory – has announced the appointment of a new chairman.

He is Dr Tony Bierre, a histo-cytopathologist. Dr Bierre takes over his two year tenure at the helm of the 420 employee organisation from another partner, Dr Paul Ockelford.

Dr Bierre is also chairman-elect of the Auckland Division of the New Zealand Medical Association.

Dr Bierre will lead the team of five director partners at Diagnostic at a time when laboratory funding is under enormous pressure from Government.

"This is a huge challenge," he says. "The real difficulty is in maintaining standards of excellence in the face of increasing costs and unreasonably decreasing funding. International comparisons show New Zealand has a cheap pathology service. Yet the costs involved are similar to those of providing the same service overseas. The difficulty for New Zealanders is: high standards can only be maintained with

appropriate funding.

"Pathology has a pivotal role in diagnosis and in the health of New Zealanders. It's often essential for accurate diagnosis. Without it, disease often goes unrecognised. That's the real danger any drop in funding is threatening to create."

Dr Bierre is a widely respected practitioner who returned to New Zealand after extensive study, research and professional engagements overseas for six years.

He has held positions in the USA at Duke University Medical Centre and at Harvard Medical School and the School's attached hospital, the Brigham and Womens Hospital. At Duke he was Fellow in Surgical Pathology and Visiting Professor, in the highly respected pathology department there, which he says was rated amongst the 'top ten' in the US. At the Brigham and Womens Hospital, he specialised in gynaecological pathology and cytopathology. The Hospital is world renowned and it has a long a prestigious history of research.

"My US experience taught me the importance of excellence. On a day to day basis, I use more of what I learnt in the US in two years about maintaining high standards than from almost any other area of training I undertook," he says. "The way they approach problems, deal with them and commit to excellence is unforgettable."

Appointed as consultant pathologist to the Royal Melbourne Hospital in 1986, Tony Bierre ventured back into this hemisphere to consolidate his experience at the hospital's prestigious pathology department.

Two years later came an offer to establish a gynaecological oncology unit in Sydney with Professor Neville Hacker, gynaecological oncologist at the Royal Hospital for Women in Paddington. He is an outstanding Australian professional who in turn, had been wooed back to Sydney from UCLA. He gave Tony the opportunity of helping establish the second dedicated gynaecological oncology unit in that city.

The offer to join Diagnostic as partner in 1989 however could not be resisted, he says.

"I saw Diagnostic as a practice of excellence as good as any I had seen overseas. It provided the promise of being able to work as I had worked in North America, with control over what I did and how I did it."

Tony Bierre regards his role as one of the vital interface between referring practitioners and the practice.

"It's important this interface is clear, well managed, and obstacle free. We are in the business of providing referring practitioners with information to aid in the management of their patients. I am dedicated to ensuring Diagnostic provides high quality information in a timely fashion.

*For more information, please contact:*

Dr Tony Bierre

Diagnostic Laboratory Auckland

Phone (09) 357 4100

### **bioMérieux-Vitek is pleased to announce the arrival of mini API**

Mini API will automatically read and interpret both ID32 identification strips and ATB susceptibility testing strips, assuring your laboratory of reliable and standardised bacteriology results. You simply place the strip on the reading tray, initiate the reading and mini API does the rest!

Mini API also allows visual reading of ID32 and SPI strips, computerised management of patient results, transmission of results to your laboratory computer and an expert system to assist in the interpretation of susceptibility results.

With its compact size, minimum maintenance requirements, ready-to-use reagents and automated reading and interpretation of results, mini API will be a welcome addition to any microbiology laboratory.

*For more information about this exciting system, please contact us.*

Med-Bio Enterprises Ltd

Ph: 0800 733 599

Fax: 0800 101 441

email: [jvincent@medbio.co.nz](mailto:jvincent@medbio.co.nz)

### **VRE detection**

Enterococci are one of the most common causes of nosocomial infections. With the emergence of Vancomycin Resistant Enterococci worldwide, including New Zealand, an important factor in managing emerging resistance in enterococci is the ability to have a proven susceptibility testing method to detect this resistance pattern.

With this in mind, bioMérieux Vitek is very pleased to announce the availability of the new

#### **VITEK GPS-TB CARD**

This card will be able to detect Vancomycin Resistance for strains of enterococci which are resistant due to the expression of the van A, van B, and van C genes.

*For more information, please contact us.*

Med-Bio Enterprises Ltd

Ph: 0800 733 599

Fax: 0800 101 441

email: [jvincent@medbio.co.nz](mailto:jvincent@medbio.co.nz)

### **News Release**

Dade International and Behring Diagnostics Unit of Hoechst AG announced at the end of last year that the merger is now complete. The new company will be known internationally as Dade Behring Inc., a company dedicated to being the highest-quality, most responsive provider of products and services to clinical laboratories world-wide.

Dade Behring's product line is exceptionally broad. We serve needs in clinical chemistry, immunodiagnosics, automated microbiology, haemostasis/coagulation, plasma protein testing, infectious disease testing, therapeutic drug monitoring, laboratory quality control and testing for drugs of abuse.

The new company invest approximately \$100 million annually in research and development.

Dade Behring as a company is singularly focused. Our history and our future are in the field of diagnostics. We are intent on helping you in the creation of clinical information that leads directly to better patient care.



# Index to Volume 50, 1997

## Subject Index

### Biochemistry

A computer-based system to generate clinical chemistry reference intervals from hospital-based patients. *Josephine Ellis* .....49-54

Irreversible serum gelatinization during striking eosinophilia.  
*Hristo Baltov* .....55

### General

Medical laboratory technology – A regulated profession?  
*Shirley Gainsford*.....3-4

Laboratory work, pipetting and musculoskeletal ailments.  
*Marianne M Bjorksten, Ejvor S Jansson* .....12-13

Going for gold. *Marilyn M Eales* .....32-35

How to get your article published in the journal.  
*Rob Siebers*.....46-47

Why should I contribute? *Warren Dellow*.....88

Does training in science and technology need the “University” cachet?  
*Roy Geddes* .....90-91

Trichostrongyliasis – A New Zealand case.  
*Lynette C. Jones* .....128-129

### Haematology

Paroxysmal nocturnal haemoglobinuria – A review.  
*Andrea Lun, Chris Kendrick*.....5-7

Modified myeloperoxidase staining: An alternative to the Sudan Black B stain. *Kristen Kelly* .....121-123

### Immunohaematology

The incidence of Co<sup>b</sup>, and the high frequency antigens Ge2 and Sc1 in Polynesians. *Rochelle Stanton, Linda Pinder* .....93-94

### Microbiology

Potential for clinically misleading susceptibility results due to extended spectrum beta-lactamases. *Sudha Pottumarthy, Arthur J Morris, Keith P Shore, David A Brenner* .....8-11

Viral gastroenteritis testing capabilities of New Zealand clinical laboratories. *Diana Sarfati, Michael N. Bates, Nicholas Garrett, Michael G. Baker, David Featherstone* .....125-127

### Letters to the Editor

Jim le Grice award. *Penny Newton* .....55

Health and safety network. *Susan Duncan* .....144

### Reports

Reform of health sector occupational regulation statutes .....141-143

NZIMLS President's report. *Shirley Gainsford*.....144

Abstracts of the 51st Annual Scientific Meeting of the NZIMLS, Wellington, August 1997 .....147-162

### Book Reviews

Bone marrow pathology. *Bain BJ, Clark DM, Lampert IA* .....18

## Author Index

Baker MG	125
Baltov H	55
Bates MN	125
Bjorksten MG	12
Brenner DA	8
Dellow W	88
Duncan S	144
Eales MM	32
Ellis J	49
Featherstone D	125
Gainsford S	3
Gainsford S	144
Garrett N	125
Geddes R	90
Jansson ES	12
Jones LC	128
Kelley K	121
Kendrick C	5
Lun A	5
Morris AJ	8
Newton P	55
Pinder L	93
Pottumarthy	8
Sarfati D	125
Shore KP	8
Siebers R	46
Stanton R	93

# New Zealand Institute of Medical Laboratory Science



## 1998 ANNUAL SCIENTIFIC MEETING

- **Venue:**  
**Palmerston North  
Convention Centre**



- **Dates:**  
**1 – 4 September 1998**

- **Trends & Technologies:**  
**“Hello Dolly”**

- **Scientific Programme  
and Workshops**

- **Contact:**  
**Executive Events**  
**Phone: (03) 313 2097**  
**Fax: (03) 313 2098**  
**E-mail: [exevents@ihug.co.nz](mailto:exevents@ihug.co.nz)**







**INVITATION  
TO ATTEND**

---

The Organising Committee on behalf of the NZ Institute of Medical Laboratory Science, extends a warm welcome to Medical Laboratory Scientists and their colleagues to attend the 53<sup>rd</sup> Annual Scientific Meeting this year at Palmerston North between 1-4 September 1998. The meeting will be held at the Convention Centre in the heart of the developing café society in Palmerston North city.

The scientific theme for the conference is Trends and Technologies "Hello Dolly". The meeting will be lively and stimulating with keynote speakers, and hopefully a surprise or two to keep your attention. There has been an enthusiastic response from our colleagues and sponsors in the trade and a large exhibition is planned.

You are invited to submit abstracts to the meeting which will be presented in oral presentation or poster sessions. For those who are able to spend the week there will be workshops on blood morphology, WWW, the preparation of a scientific paper and for the "Bravehearts & Heartesses" a wee challenge to test your skills.

Remember - Palmerston North, 1-4 September 1998 - be there to meet Dolly in 1998.

*Chris Kendrick*  
Conference Convenor

**PROPOSED  
SCIENTIFIC PROGRAMME**

---

**Planned Topics Include:**

- Blood Substitutes
- Recombinant Technology
- Transplantation
- Microbiology/Anaerobes, Blood Sterility, Culturing
- Cancer/Haematological
- Antibiotics - Alternatives MRSA, VRSA
- Oncology/Solid Tumours
- Renal & Liver Medicine
- Medical Based Management Quality, Core Laboratories
- Occupational Safety & Health
- Values
- Autoimmunity

**Workshops**

- Haematology Morphology
- Quality Assurance for Blood Bankers.
- Preparation of a scientific paper.
- Internet - Scientific Site
- Team Building

**INVITED SPEAKERS**

---

- **Dr Cynric Temple-Camp**  
Director Medlab Central  
Histopathologist  
Chairman of ACL  
Special Interest in Renal Pathology and dermatopathology  
International expert on Cellular Blue Naeri  
Experienced red, rust removed Dihatsu driver

**INVITED SPEAKERS  
CONTINUED**

---

- **Dr Jane Parker**  
Consultant Microbiologist, Medlab Central  
General Pathologist with a special interest in Microbiology  
Sexual health and infection control  
Proud owner of 6 ducks
- **Dr Bart Baker**  
Consultant Haematologist/Transfusion Director at MidCentral Health for 5 years
- **Terry Grimmond**  
Daniels Corporation  
Microbiologist/General Manager Medical Waste Disposal Company
- **Dr Elayne Knottenbelt**  
Consultant Haematologist, MidCentral Health for 8 years
- **Dr Jan Schmidt**  
Microbiologist, Institute of Molecular Biosciences
- **Dr Paul O'Toole**  
Microbiologist, Institute of Molecular Biosciences
- **Dr Mary Nulsen**  
Director of BMLS, Institute of Veterinary, Animal and Biomedical Science, Massey University
- **Michael Henderson**  
Business Management Consultant  
True North Limited
- **Dr Jim Faed**  
Haematology Consultant  
Transfusion Medicine Specialist, Dunedin



Trends & Technologies

NEW ZEALAND INSTITUTE OF MEDICAL LABORATORY SCIENCE (INC.)  
ANNUAL SCIENTIFIC MEETING  
1ST - 4TH SEPT. 1998

**SOCIAL PROGRAMME**

**Tuesday 1 September**  
Icebreaker and official opening of the industry exhibition.

**Thursday 3 September**  
Conference Dinner

**EXHIBITION**

A comprehensive industry display is planned to allow delegates to view the latest technological advances and instruments.

Companies interested in exhibiting should contact HISANZ as soon as possible as site numbers are limited.

**SPONSORSHIP**

There are still sponsorship opportunities available. Full details of sponsorship can be obtained from the Conference Secretariat

**VENUE**

The Convention Centre and Civic Offices which are located in the heart of Palmerston North.

**ACCOMMODATION**

A range of accommodation will be available to suit all budgets within walking distance of the venue.

**REGISTRATION FEES**

**Early Bird (before 30 June)**

Member  
Full \$280.00  
Day \$100.00

Non Member  
Full \$400.00  
Day \$150.00

**After 30 June**

Member  
Full \$350.00  
Day \$140.00

Non Member  
Full \$470.00  
Day \$180.00

**CONFERENCE SECRETARIAT**

Executive Events  
P O Box 78  
Rangiora  
Tel: 03 313 4761  
03 313 2097  
Fax: 03 313 2098  
Email: exevents@ihug.co.nz

**EXHIBITION ORGANISERS**

HISANZ  
P O Box 33 1250  
Takapuna  
Auckland  
Tel: 09 486 3000  
Fax: 09 486 3500

**CALL FOR PAPERS AND POSTERS**

Please share your knowledge and experience by presenting a paper or poster.

Your contribution would be most welcome in all disciplines.

Oral presentations: 15 minutes  
Posters: 1 metre x 1 metre

**ABSTRACTS**

**Closing Date: 1 June 1998**

Please submit your abstract on a Computer Disk and one hard copy in an IBM compatible format. (WordPerfect or Microsoft Word).

Approximately length 250 words on A4 page size.

Please include:

- Presentation Title.
- Your preferred session.
- Authors with the presenter's name in bold.
- Contact address.
- References.
- Indicate whether a poster or oral presentation.

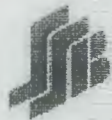
Abstract formats will be standardised for publication. No changes will be made to content.

Please post to the Conference Secretariat. Enquiries to: Malcolm Rees, tel 06 351 9530 or fax: 06 351 9509

**CLOSING DATE FOR ABSTRACTS - 1 JUNE 1998**



THANK YOU TO



**BIOLAB SCIENTIFIC LTD**

*The New Zealand Institute of Medical Laboratory Science sincerely thanks BIOLAB SCIENTIFIC for its generous sponsorship of a membership pack for every NZIMLS member.*

*BIOLAB SCIENTIFIC has agreed to provide production of these packs in 1998 and 1999.*

*We are very grateful to BIOLAB SCIENTIFIC for both their financial contribution and the help of their marketing department in the production of this membership pack.*



# Council News

Last meeting December 1997

## National Blood Service

The structure and organisation of the new National Blood Service (NBS) was discussed. The Council is concerned that the centralisation of processing could lead to a shortage of blood products in hospitals outside of the designated processing centres, that a nationally integrated IT system does not exist and that there could be problems with the training of future staff for the service with only three centres. We have written to the Transition Director of the NBS voicing these concerns and asking for his comment. A copy of this letter has been sent to all transfusion service laboratories.

## Public Health Referendum

A letter was received from the Public Health Referendum group asking for our support to the proposal "That the Government should increase its annual spending on health services to at least 7% of GDP, funded if necessary from personal income tax." The Council felt that this question could only be answered individually. If you would like to support the above referendum question, either phone 0800 428327 or write to Public Health Referendum, P O Box 12145, Wellington.

## Near Patient Testing

Guidelines on NPT have been received from the International Association of Medical Laboratory Technologists (IAMLT) with a request that they be adopted by the NZIMLS. As they are not in conflict with our own guidelines adopted in 1993, Council decided to adopt them alongside our own. The IAMLT guidelines were printed in the Med Tech International Journal 1997.

## Biomedical Laboratory Science Day

The IAMLT has advised the NZIMLS that the 15th April 1998 will be Biomedical Laboratory Science Day and the theme will be "Biomedical Science - The Key to Transfusion Safety." Council has asked the Transfusion Science Special Interest Group and the Ministry of Health to promote this day.

## Medical Laboratory Science Trust

Chris Kendrick has replaced John Beattie as a trustee for the Medical Laboratory Science Trust.

## Health and Safety Special Interest Group

Sue Duncan of Wanganui Diagnostic Laboratory is to establish a Health and Safety Special Interest Group.

## Survey on Annual Scientific Meeting

The results of this survey are published in this journal. The Council hopes to meet with some of the industry companies in April and following this meeting will inform members of any changes.

## Awards/Sponsorship

Members are to receive membership packs which are sponsored by Biolab Scientific. As you receive NZIMLS material put it in the pack for future reference. Read the awards section in this issue, for details of awards that you could apply for.

## Meeting with Australian Institute of Medical Scientists

Shirley Gainsford met with Lance Chia, President of AIMS, in Christchurch. Both institutes are to examine the feasibility of sharing examiners and reviewers of dissertations for Fellowship. AIMS have a Continuing Education Library which is restricted to members only at the moment but which may be open to members of the NZIMLS in the future. Both institutes are to look at the possibility of combining journals.

Next meeting April 1998.

## NZIMLS 1998 CALENDAR

1 February 1998	Material for the March issue of the Journal must be with the Editor.
14 March 1998	Microbiology SIG Seminar, Flockhouse Hotel, Bulls
21 March 1998	South Island Seminar - Methven.
31 March 1998	Applications close for Fellowship examinations
1 April 1998	Material for the May issue of the Journal must be with the Editor.
2/3 April 1998	Council Meeting - Auckland.
30 April 1998	Committee Annual Reports to be with the Executive Officer.
30 April 1998	All accounts to National Treasurer for auditing
30 April 1998	Proposed rule changes and remits to be with the Executive Officer.
8/10 May 1998	NICE Weekend, Wairakei Resort Hotel, Wairakei.
22 May 1998	Applications close for QTA examinations.
1 July 1998	Material for the August issue of the Journal must be with the Editor.
1 July 1998	Nomination forms for the election of Officers and Remits to be with the Membership (60 days prior to AGM).
1 July 1998	Annual Staffing Survey.
23 July 1998	Nominations close for election of officers (40 days prior to AGM).
11 August 1998	Ballot papers to be with the membership (21 days prior to AGM).
18 August 1998	Annual Reports and Balance Sheet to be with the membership (14 days prior to AGM).
25 August 1998	Ballot papers and proxies to be with Executive Officer (7 days prior to AGM).
30/31 August 1998	Council Meeting - Palmerston North.
31 Aug/1 Sept 1998	Haematology Morphology Workshop.
1/4 September 1998	Annual Scientific Meeting - Palmerston North.
2 September 1998	Annual General Meeting - Palmerston North.
1 October 1998	Material for the November issue of the Journal must be with the Editor.
16/17 October 1998	Histology SIG Seminar, Dunedin.
1 November 1998	SIG budgets for 1999 to be with the Executive Officer.
4 November 1998	QTA examinations.
26/27 November 1998	Council meeting - Wellington.



SOME OTHER VIEWS YOU'LL DISCOVER



WHILST WORKING FOR CORINTH MEDICAL



In order to get the most out of your working holiday in Britain, you'll want the expert care you can only gain from Corinth. With almost thirty years experience we've grown to be the leading specialist Employment Agency in our field by helping Medical Laboratory Scientists from all over the world combine business with pleasure; giving them the opportunity to work with the UK's leading hospitals and helping them take time out to enjoy the different cultures and sights. What's more, as well as top rates of pay and an excellent package of benefits, you won't be tied to any binding contracts and you won't be charged for our services.

We'll simply offer you the widest selection of jobs and supply friendly and confidential advice on all aspects of working through an agency.

Want us to put you in the picture?

If so, complete the coupon below and send it to our Recruitment Manager, **Kate Williams** AIBMS and she will send you our FREE 'Working Holidays in Britain' Information Pack. Alternatively, you can **Call Us Toll-Free on 0800 441586** (24 hours).

I'd like to know more  
about Corinth Medical.  
Please send me your 'Working Holidays in Britain' brochure.

Name \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_

Tel: \_\_\_\_\_

Anticipated date of travel: \_\_\_\_\_ Month \_\_\_\_\_ Year BSNZ



**Corinth  
Medical**

Post to: Corinth Medical, 5 Theobald Court, Theobald Street  
Borehamwood, Hertfordshire WD6 4RN. ENGLAND  
Tel: 00 44 181 207 0234 Fax: 00 44 181 207 6894

THE PROFESSIONAL STAFFING AGENCY

# INSTITUTE BUSINESS

## Office Bearers of the N.Z.I.M.L.S. 1994-1995

### President

Shirley Gainsford  
Valley Diagnostics, Lower Hutt

### Vice President

Anne Paterson  
Lakeland Health, Rotorua

### Secretary/Treasurer

Trevor Rollinson  
Southern Community Laboratories, Dunedin

### Council

Pip Sarcich, Chris Kendrick, Les Milligan  
Tony Mace, Grant Moore

### Executive Officer

Fran van Til  
P.O. Box 3270, Christchurch  
Phone/Fax (03) 313-4761.  
E-Mail:exevents@ihug.co.nz

Please address all correspondence to the Executive Officer, including Examination and Membership enquiries.

### Editor

Rob Siebers  
Dept. of Medicine, Wellington  
School of Medicine, P.O. Box 7343  
Wellington South.  
E-Mail:rob@wnmeds.ac.nz

### Membership Fees and Enquiries

Membership fees for the year beginning April 1, 1998 are:

For Fellows – \$101.40 GST inclusive

For Members – \$101.40 GST inclusive

For Associates – \$48.10 GST inclusive

For Non-practising members – \$42.20 GST inclusive

All membership fees, change of address or particulars, applications for membership or changes in status should be sent to the Executive Officer at the address given above.

Members wishing to receive their publications by airmail should contact the Editor to make the necessary

## NZIMLS Annual Scientific Meeting Survey

### NZIMLS Annual Scientific Meeting Survey

Total received = 76

Q1 Members (M) = 53 Non Members (NM) = 17 Industry (I) = 6

Q2 Should ASM be held?

- a) Yearly 30 = 56.6% (M) 11 = 64.7% (NM) 3 = 50% (I)  
b) 2 years 22 = 41.4% (M) 5 = 29.4% (NM) 3 = 50% (I)  
c) Other 1 = 2% (M)

Q3 Do you think more people attend SIG meetings than ASM?

- a) Yes 25 = 47% (M) 5 = 29% (NM) 5 = 83% (I)  
b) No 4 = 8% (M) 2 = 12% (NM) 1 = 17% (I)  
c) Dont know 23 = 45% (M) 10 = 59% (NM)

Q4 If the ASM were other than yearly should the SIG have their meetings in the off year?

- a) Yes 24 = 45% (M) 2 = 12% (NM) 4 = 6% (I)  
b) No 27 = 51% (M) 10 = 59% (NM) 1 = 17% (I)  
c) Dont know 2 = 4% (M) 5 = 29% (NM) 1 = 17% (I)

Q5 Should the ASM be always in August/September?

- a) Yes 27 = 51% (M) 10 = 59% (NM) 3 = 50% (I)  
b) No 20 = 38% (M) 5 = 29% (NM) 1 = 17% (I)

Q6 Should provincial towns/Cities hold the ASM?

- a) Yes 41 = 77% (M) 12 = 71% (NM) 1 = 17% (I)

- b) No 9 = 17% (M) 3 = 18% (NM) 5 = 83% (I)  
No answer = 3 (M) 2 (NM)

Q7 If No to Q6 should the ASM be held in the same place every-time?

- a) Yes 2 = 4% (M) 12 = 71% (NM) 5 = 83% (I)  
b) No 27 = 51% (M) 4 = 24% (NM)  
No answer 1 (NM)

Q9 ARE SIG's fulfilling their goal?

- a) Yes 29% = 55% (M) 7 = 41% (NM) 2 = 33% (I)  
b) No 3 = 6% (M) 1 = 6% (NM)  
c) Unsure 20 = 38% (M) 8 = 47% (NM) 4 = 67% (I)

Q10 Should SIG's work?

- a) Nationally 22 = 42% (M) 6 = 35% (NM) 3 = 50% (I)  
b) Regionally 13 = 25% (M) 6 = 35% (NM) 1 = 16% (I)  
c) Locally 1 = 2% (M)  
abc 11 = 20% (M)

Q11 Should SIG's and ASM be only to Institute members?

- a) Yes 17 = 32% (M) 1 = 6% (NM) 1 = 17% (I)  
b) No 31 = 59% (M) 12 = 71% (NM) 5 = 83% (I)  
c) Unsure 3 = 6% (M) 4 = 23% (NM)



# Easier & Safer


This issue we feature products that make your lab work easier and safer. The safety features of the Carelet Lancets and MiniCollect are unparalleled as both products have sensitive locking devices. LabServ's Replacement Overcaps make lab life much easier as they can be used on both Greiner and BD tubes. Have a look below for more details.

Prices shown are valid until end of May 1998. You must quote "NZIMLS March" to qualify for special offers.

P.S. You would have received your new blue and gold membership folio recently as a NZIMLS member. The staff at Biolab Scientific enjoyed putting this together for you and we hope you like it.

**NEW** **MiniCollect®** greiner labortechnik

The Enclosed Capillary Blood Collection System for Infants and Neonates.




### No more Decapping tubes While Collecting!

- ▶ International colour codes
- ▶ Carrying tubes allow clear visual reference to patient id
- ▶ Compatible with most common centrifuges and analysers
- ▶ With optional funnel or capillary tube
- ▶ Following sample collection, removal of capillary tube or funnel automatically LOCKS the cap.

For more information on this revolutionary product - contact your local branch of Biolab Scientific today!

great safety features!


**Microtitre Plates** greiner labortechnik



- ▶ Very high optical quality polystyrene
- ▶ U,V and flat bottom well profiles available.
- ▶ Low condensation, non reversible lid available.
- ▶ Uniform dimensions (82 x 127mm) for easy stacking.
- ▶ Sterile versions available.

Cat No.	Description
GR650101	96 well plate PS U plate pk/100
GR650161	96 well plate sterile PS U plate pk/100
GR651101	96 well plate PS V plate pk/100
GR651161	96 well plate sterile PS V plate pk/100
GR655101	96 well plate PS flat pk/100
GR655161	96 well plate sterile PS pk/100

**Pipette Tips** greiner labortechnik




- ▶ Greiner manufactures an extensive range of pipette tips for most applications, fitting most common single and multi-channel pipettors
- ▶ The range includes standard pipette tips, filter pipette tips, conductive pipette tips and pipette tips for loading electrophoresis gel.

**Commonly used Pipette tips:**

GR685290	Eppendorf type yellow	1-100 l pk/500
GR739290	Yellow Gilson	1-100 l pk/500
GR740290	Blue Gilson	100-1000 l pk/250
GR739291	Universal	200 l thin wall pk/500
GR740291	Universal	100-1000 l pk/1000
GR744290	Oxford type white	1-300 l pk/1000
GR745290		1-5ml pk/250

and many more.

**New CARELET Safety Lancets / Blades**



After use blade is permanently contained within device. There is no risk of needle stick injury.


**High Quality, Single-use, Capillary Blood Sampling Devices**

GAINOR MEDICAL

Cat No.	Description:	Colour
GMI6215	Safety lancet 1.0mm blade	pink
GMI6225	Safety lancet 1.5mm blade	green
GMI6235	Safety lancet 2.0mm blade	blue
GMI6255	Safety lancet 2.25mm needle	orange

For further details contact your nearest Biolab Branch

**New LabServ Replacement Overcaps for Greiner and BD Collection Tubes.** LabServ



- ▶ For 13mm x 16mm Tubes
- ▶ Fits Glass and plastic tubes
- ▶ Flexible and easy to fit and remove
- ▶ NZ made, lower prices
- ▶ Sample packs available

Cat No.	Description	Price
LBSBC13	For 13mm tubes	\$18.00/1000
LBSBC16	For 16mm tubes	\$18.00/1000



**3M Tapes and Attest**



Purchase Attest and receive a **FREE** sterilisation Post it note pad and pen.



**Attest**

- ▶ First self-contained biological indicator
- ▶ Cannot be accidentally contaminated
- ▶ Easy to use, reliable system



**Indicator Tape**

- ▶ Reliable
- ▶ The indicator tape will turn dark brown when exposed to a steam sterilisation process.
- ▶ The tape also serves as a closure to seal sterilisation packs.

Cat No.	Description	Price
LABT012	Autoclave tape 12mm x 55	\$5.80
LABT018	Autoclave tape 18mm x 55	\$8.90
LABT024	Autoclave tape 24mm x 55	\$11.60
LAB3M1261	Attest Biolog. pk/100*	\$315.00
LAB3M1261P	Attest Biolog. pk/25*	\$87.00
LAB3M1262	Attest Biolog. brown pk/100*	\$315.00
LAB3M1262P	Attest Biolog. brown pk/25*	\$87.00

\*sterilisation indicators

**NEW FROM CONTHERM Biocell Series 1000 Culture Incubators & Series 2000 Ovens**

Make your lazy, hazy, stress free days of Summer last all Winter long with Contherm's new range of unique, world-class incubators & ovens

- ▶ **Biocell** Series 1000 incubators feature revolutionary Thermoguard electronic air flow management system.
- ▶ This gives you precise temperature control even when incubating close to ambient.
- ▶ Without Thermoguard technology other brands lose temperature control near ambient.
- ▶ Unique **Biocell Tropicool** model incubators give you the capability to incubate down to 8°C below ambient and the thermoelectric cooling module is whisper quiet.



All **Biocell** Series 1000 Incubators and Series 2000 Ovens feature the latest European styling with programmable microprocessor control & LCD display.

**Biolab Scientific Ltd**

invites you to visit

our Homepage.

<http://www.biolab.co.nz>

You'll be glad you

did if you

**WIN!!**

Look at our specials

page at the advert

titled NZJMLS

March Promo

Call us today for more info

**0800 807 809 National**

**0800 806 974 Christchurch**

**Or Email**

[orders@biolab.co.nz](mailto:orders@biolab.co.nz)

[info@biolab.co.nz](mailto:info@biolab.co.nz)

*Biolab Scientific Ltd*



# NEWS RELEASE

Dade International and Behring Diagnostics Unit of Hoechst AG announced at the end of last year that the merger is now complete. The new company will be known internationally as Dade Behring Inc., a company dedicated to being the highest-quality, most responsive provider of products and services to clinical laboratories world-wide.

Dade Behring's product line is exceptionally broad. We serve needs in clinical chemistry, immunodiagnostics, automated microbiology, haemostasis/coagulation, plasma protein testing, infectious disease testing, therapeutic drug monitoring, laboratory quality control and testing for drugs of abuse.

The new company invests approximately \$100 million annually in research and development.

Dade Behring as a company is singularly focused. Our history and our future are in the field of diagnostics. We are intent on helping you in the creation of clinical information that leads directly to better patient care.

Locally the company is called Dade Behring Diagnostics Ltd and will operate out of offices in Newmarket, Auckland.

CONTACT DETAILS FOR THE NEW COMPANY ARE:

**Dade Behring Diagnostics Ltd,  
49 George Street,  
Newmarket,  
Auckland**

**Phone: 09 366 4784, 0800 807 982**

**Fax: 09 379 8308**

**P O Box 4079, Auckland**

**e-mail: [info@dadebehring.co.nz](mailto:info@dadebehring.co.nz)**

# Fellowship Regulations

## 1. Introduction

- 1.1 Fellowship of the New Zealand Institute of Medical Laboratory Science is the highest academic category of membership and carries the right to use the letters FNZIMLS.
- 1.2 Resignation from the NZIMLS entails forfeiting Fellowship and all privileges associated with this membership category.

## 2. General

- 2.1 Fellowship of the NZIMLS may be gained:
  - (a) by examination, or
  - (b) by submission of a thesis, or
  - (c) by publications
- 2.2 Applicants must:
  - (a) be financial members of the NZIMLS at the time of application and examination
  - (b) have been a Member of the NZIMLS for not less than two (2) years, or
  - (c) are exempt as approved by the Fellowship Committee
- 2.3 An examination fee, which Council from time to time shall determine, is payable by all candidates at the time of application.
- 2.4 Applications must be made on the prescribed application form and sent to the Executive Officer of the NZIMLS together with the examination fee.
- 2.5 Three copies of prepared work in English (thesis, dissertation or publication summary) must be submitted (laser quality).
- 2.6 The NZIMLS will not accept material that has been submitted or accepted for any other qualification. Such material may be used only as supportive data.
- 2.7 All income accruing from the commercial use of any original work shall remain the property of the author.
- 2.8 Any further applications will not be accepted from candidates who have previously made three (3) unsuccessful attempts.

## 3. Examination

- 3.1 Applicants must forward their application together with the fee by March 31st in the year they intend to sit.
- 3.2 At the time of application an applicant shall supply satisfactory evidence of at least one year's postgraduate experience in the subject nominated for the examination.
- 3.3 The examination will consist of two parts:
  - (a) Part 1: Two written papers each of three (3) hours duration.
  - (b) Part 2: Upon successful completion of Part 1 (or qualification under subsection 3.12) a dissertation of 3000 - 5000 words which directly relates to the Part 1 examination.

- 3.4 The subjects available for Fellowship by examination shall be those approved by the NZIMLS as major disciplines in the Medical Laboratory Sciences. The NZIMLS reserves the right not to offer all subjects in any one year.
- 3.5 Part 2 must be submitted within three (3) years of completing Part 1. Extensions may be granted in special circumstances.
- 3.6 The dissertation may take the form of:
  - (a) a review
  - (b) development of an hypothesis
  - (c) any other presentation which meets with the approval of the Fellowship Committee.
- 3.7 The title and synopsis of approximately 250 words shall be forwarded to the Fellowship Committee by March 31st in the year following successful completion of Part 1.
- 3.8 The dissertation shall be original, in English and be approximately 3000 - 5000 words.
- 3.9 Candidates are referred to the instructions for authors in the New Zealand Journal of Medical Laboratory Science 1991; 45 (4) 108-11.
- 3.10 To pass Part 1 candidates must gain a minimum of 50 per cent and for Part 2 candidates must gain 'a pass'. In the event of a candidate failing Part 2, candidates may be given the opportunity to revise and resubmit their dissertation for reassessment, at the discretion of the Fellowship Committee.
- 3.11 The Institute reserves the right to publish in the NZIMLS Journal any dissertation submitted.
- 3.12 Medical Laboratory Scientists who hold a Specialist Certificate are exempt from sitting the Part 1 examination. This clause will be effective for a maximum period of three (3) years after the adoption of these regulations.
- 3.13 The final date for applications under clause 3.12 will be March 31st, 2000.

## 4. Thesis

- 4.1 The candidate must nominate a senior medical laboratory scientist or a specialist medical practitioner, or a suitably qualified university biomedical scientist to act as supervisor for the work. The candidate must submit regular reports signed by the supervisor to the Fellowship Committee. The Committee reserves the right to appoint an additional supervisor.
- 4.2 At the time of application, the applicant must submit to the Fellowship Committee the title and synopsis of the thesis.
- 4.3 The thesis is required to be submitted no later than three years following acceptance of the synopsis. Extension may be granted in special circumstances.
- 4.4 Normally the thesis should not exceed 20,000 words.
- 4.5 The thesis must be the original work of the candidate. The extent of work contributed by collaborators must

- be indicated in writing and suitably acknowledged.
- 4.6 The thesis must be based on the style of Master of Science by thesis requirements of Universities in New Zealand.

## **5. Publications**

- 5.1 A minimum of five peer reviewed articles published in international or discipline acknowledged scientific journals may be submitted for consideration. A review of the submitted articles of 3000 - 5000 words must also be submitted.
- 5.2 The articles must be submitted to the Fellowship Committee prior to the commencement of the review article together with a synopsis of the review.
- 5.3 The candidate must state the contribution he or she made to the publications. Written statements from the other contributing author are required.

## **6. Fellowship Committee**

- 6.1 The Fellowship Committee shall consist of three members appointed by Council with at least two of the appointees being Fellows of the NZIMLS. The committee will be reappointed annually.
- 6.2 The Fellowship Committee has the power to appoint examiners and assessors as necessary for the conduct of examinations.
- 6.3 The Fellowship Committee shall submit the examiners/assessors recommendations to Council.
- 6.4 The Fellowship Committee may use any reasonable means of establishing the bona fides of a candidate. Any enquiries so instituted shall be regarded as confidential.
- 6.5 The Fellowship Committee reserves the right to request further reports on a candidate as necessary.
- 6.6 The Fellowship Committee shall from time to time make recommendations to Council on changes to the Fellowship regulations.

# FELLOWSHIP



*by* **examination**

includes Part one and Part two

*applications close*

**31st March 1998**

Contact the **Executive Officer**  
**NZIMLS**  
**P.O. Box 3270**  
**Christchurch**

for application form & information booklet

# FELLOWSHIP BY EXAMINATION – PART ONE

## APPLICATION FORM

SECTION A To be completed by Candidate

Name: Mr

Mrs.....  
Miss (Surname) (First Names)

Laboratory.....

Laboratory Address.....

Examination Subject.....

I certify that I am a member of the NZIMLS in the membership category of MEMBER and have been so for at least 2 years or am exempt as approved by the Fellowship Committee.

Signed .....

Date .....



# FELLOWSHIP BY EXAMINATION – PART ONE

## APPLICATION FORM

SECTION B                      To be completed by the Charge Medical Laboratory Scientist

I certify that the Candidate has completed at least one year's post registration experience in the subject nominated for the examination.

NAME .....  
(Block Letters)

Signed.....

Date .....

Please state the name and address of the person responsible for receiving the papers and supervising the examination in your laboratory.

Name .....

Laboratory Address.....

.....  
.....

# FELLOWSHIP BY EXAMINATION – PART TWO

## APPLICATION FORM

Name: Mr  
Mrs.....  
Miss (Surname) (First Names)

Laboratory.....

Laboratory Address.....  
.....  
.....

Title of Dissertation .....  
.....  
(Please attach a copy of synopsis to this application form)

**PREREQUISITES: You must complete Part A or Part B**

Part A:

Date passed Part One Fellowship .....

Subject .....

Part B:

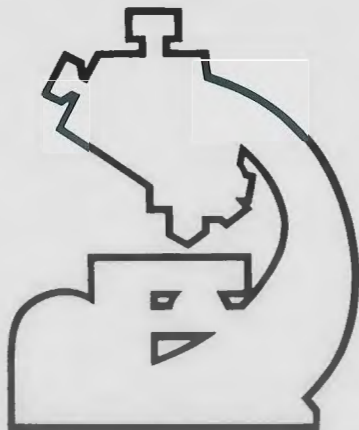
Date passed Specialist Certificate .....

Subject .....

I certify that I am a member of the NZIMLS in the membership category of MEMBER and have been so for at least 2 years or am exempt as approved by the Fellowship Committee.

Signed .....

Date .....



NEW ZEALAND INSTITUTE OF

---

MEDICAL

---

LABORATORY

---

SCIENCE

---

***EXAMINATION LIFTOUT***

---

**Q.T.A. Regulations  
Q.T.A. Examination Application Form  
N.Z.I.M.L.S. Membership Application Form**

---

The New Zealand Institute of Medical Laboratory Science offers to medical laboratory assistants the qualification known as the Certificate of Qualified Technical Assistant (QTA).

The Examinations Committee is based in Christchurch and all correspondence should be addressed to:—

**Executive Officer  
N.Z.I.M.L.S.  
P.O. Box 3270  
Christchurch  
Phone (03) 313-4761  
Fax (03) 313 2098  
Email: [exevents@ihug.co.nz](mailto:exevents@ihug.co.nz)**

**NEW ZEALAND INSTITUTE OF MEDICAL LABORATORY SCIENCE  
CERTIFICATE OF QUALIFIED TECHNICAL ASSISTANT**

**EXAMINATION SUBJECTS**

Clinical Biochemistry  
Haematology  
Histological Technique  
Clinical Cytology  
Immunology

Transfusion Science  
Transfusion Science - Blood Products  
Clinical Microbiology  
Clinical Mortuary Hygiene and Technique

**PREREQUISITES**

1. Candidates for the examination must be employed as medical laboratory assistants in an approved laboratory in New Zealand and have worked continuously in the subject for 18 months prior to the examination or accumulated not less than 18 months practical experience in the examination subject.

Upon completion of two years continuous or accumulated practical experience in the subject, the certificate of Qualified Technical Assistant will be awarded.

2. Candidates who have passed a Qualified Technical Assistant examination and who wish to sit a second Qualified Technical Assistant examination must fulfil the above criteria but need only to have worked continuously or accumulated experience of one year in the examination subject.
3. Candidates must be financial members of the NZIMLS at the time of sitting the examination and be a financial member or have submitted a valid membership application form at the time of applying to sit the examination.

**SYLLABUS**

Copies of the syllabus are available from the Executive Officer of the NZIMLS, P O Box 3270, Christchurch.

**EXAMINATIONS**

1. The examinations will be held annually in New Zealand in November.
2. Candidates must complete the application form and forward this, complete with examination fees, to the Executive Officer of the Institute before the closing date. No late applications will be accepted.
3. Candidates must be financial members of the NZIMLS at the time of sitting the examination.
4. The examination consists of one written paper of three hours duration. Candidates for the Clinical Cytology examination are also required to complete a practical examination.
5. To pass the examination candidates must obtain an overall mark of 50%. Clinical Cytology candidates must pass the practical and theory examinations.
6. The results of the examinations will be awarded the NZIMLS QTA Certificate in the appropriate discipline.
7. The candidate's script will be returned upon receipt of a written request by the candidate. No copy will be retained and no correspondence relating to the marking of the script will be entered into.
8. Candidates who have disabilities or injuries at the time of the examination may request the Examinations Committee of the NZIMLS to allow them a scribe. Details may be obtained from the Executive Officer of the NZIMLS.



NEW ZEALAND INSTITUTE OF MEDICAL LABORATORY SCIENCE

Application to sit the Examination of Qualified Technical Assistant

4 November 1998

**SECTION 1 - TO BE COMPLETED BY THE CANDIDATE**

Name: Mr  
Mrs  
Miss (Surname) (First Names)

Laboratory .....

Laboratory Address .....

.....

Subject (Haematology, Microbiology, etc) .....

EXAMINATION FEE: \$125 (GST Inclusive)

**The full examination fee must be paid with the application.**

**SECTION B - TO BE COMPLETED BY THE PATHOLOGIST OR CHARGE TECHNOLOGIST**

Date candidate commenced work in examination subject .....

“I certify that the above candidate meets the requirements of the Q.T.A. Regulations”

Signed .....

Designated .....

Please state the name and address of the person responsible for receiving the papers and supervising the Examination in your laboratory or centre.

Name .....

Address .....

.....

.....

Office use only

**APPLICATIONS CLOSE FRIDAY 22 MAY, 1997**

Please forward application forms accompanied by fees to: Executive Officer, NZIMLS, PO Box 3270, Christchurch.

**NO LATE APPLICATIONS WILL BE ACCEPTED**

**Special Note to Applicants**

*If not already members of the NZIMLS applicants to sit this examination must submit a valid membership application along with this examination application.*

**THE NEW ZEALAND INSTITUTE OF MEDICAL LABORATORY SCIENCE (INC.)**

**Application for Membership (For use with Examinations only).**

(Please Print Clearly and Tick Appropriate Box)

I, \_\_\_\_\_

SURNAME \_\_\_\_\_

MR, MRS, MS, MISS \_\_\_\_\_

INITIAL(S) \_\_\_\_\_

FIRST NAME(S) \_\_\_\_\_

OF, \_\_\_\_\_

WORK ADDRESS \_\_\_\_\_

Hereby apply for membership of the New Zealand Institute of Medical Laboratory Science in the category of:

Member       Associate

AND Certify That I Have:

Not Previously Been a Member       Previously Been a Member (State Category: \_)

Resigned (Date: )       Did Not Resign

I am employed as: \_\_\_\_\_

in the Speciality Department of: \_\_\_\_\_

Highest Professional Qualification: \_\_\_\_\_ Year Obtained: \_\_\_\_\_

Nominated By: \_\_\_\_\_  
(Current Financial Member N.Z.I.M.L.S.)

Please forward payment with Application for Membership, to the Executive Officer, NZIMLS, P.O. Box 3270, Christchurch.

Current Membership Subscriptions are:

MEMBER \$101.40 (GST include.)    ASSOCIATE \$48.10 (GST include.)

Member — any person who is registered by the Medical Laboratory Technologists Board

Associate — any person engaged in Medical Laboratory Science who is not eligible for any other class of membership.

***The appropriate membership subscription must accompany this application for this to be a valid application.***

This long awaited revision of the well known 'Standardisation Document' has been upgraded for use at the microscope.

67 Colour photographs are positioned alongside text descriptions of normal and abnormal red cells, inclusion bodies, white cells and platelets.

The book also contains recommendations for standard units for reporting, nomenclature, and a guide to the reporting of *degree* of abnormality.

*Consistency* in reporting, *Clear Guidelines* for morphology reporting

**Price \$50 (including GST)**

**Special Student price \$40 (20% discount, one copy only, with Student ID)**

How to get your copy  
Photocopy this order form

Name:

Position Held:

Address for delivery:

Number of copies required:

Receipt required: Yes  No

And send with payment (Cheques Payable to NZIMLS)  
to

L Glogoski — Secretary Haematology Special Interest Group, Haematology Laboratory,  
Middlemore Hospital, Private Bag, Otahuhu, New Zealand.  
Phone (61)(9) 276 0167 ext. 8542, Fax (9) 270 4706

Stuart Duncan  
Convenor HSIg

Welcome to another exciting year for haematology. For a start we have the Palmerston North Conference to look forward to on the 2nd, 3rd and 4th of September and we are looking at running a Morphology Workshop on the 31st August and 1st Sept '98 also at Palmerston North. If anyone would like to present a paper at Conference the person to contact is Chris Kendrick

Dept Microbiology & Genetics

Massey University

Private Bag

Palmerston North

Fax 06 356 9099

Ph 06 350 5637

Email C.J.Kendrick@Massey.co.nz.

Because of the positive feedback to the Journal based self assessment questionnaires we are hoping to have at least 3 more this year. For those who may not be aware of what is involved please see the HSIg section of this issue of the NZIMLT Journal. Remember these are easy MOLS points to gain. Anyone wishing to recommend subjects or refer journal articles for inclusion please contact the HSIg secretary

Lee Glogoski

c/- Haematology Laboratory

Laboratory

Middlemore Hospital Private Bag

Otahuhu

Auckland

We will have more on the haematology timetable of events in the next issue.



**Haematology Self Assessment Journal Reading for MOLS Questionnaire prepared by Soakimi Tai Po'uhila using true/false format**

**Reference article: Acute Promyelocytic Leukemia: Biology and Treatment**

**Authors: Fenaux, Chomienne and Degos**

**Journal: Seminar in Oncology Feb 1997 24(1)p 92-102**

Please circle your choice of correct answer

- |     |  |      |       |     |  |      |       |
|-----|--|------|-------|-----|--|------|-------|
| 1.  | APL is characterised by the morphology of blast cells according to the FAB classification of AML                                 | True | False | 14. | Disseminated intravascular coagulation (DIC) is one of the complications associated with APL   | True | False |
| 2.  | Cytogenetically APL involves translocation between chromosome 15 and 17 in most cases  | True | False | 15. | Intensive platelet support during chemotherapy is a major factor in reduction of incidence of haemorrhagic deaths in APL   | True | False |
| 3.  | APL cells are usually CD35-, CD11a, and CD15-  | True | False | 16. | ATRA therapy has no major side effect  | True | False |
| 4.  | The discovery of the differentiation of APL blasts by all-transretinoic acid (ATRA) has changed the therapeutic approach of APL  | True | False | 17. | ATRA treatment and intensive chemotherapy have been proven to prolong remission in APL patients  | True | False |
| 5.  | Each APL patient is characterised by a specific fusion transcript ber1, ber2, or ber3  | True | False | 18. | Addition of low-dose chemotherapy and leucophereses are used to reverse ATRA syndrome  | True | False |
| 6.  | PML protein in normal cells is not specifically bound to a nuclear body  | True | False | 19. | The ATRA syndrome is due to leukostasis and/or thrombosis  | True | False |
| 7.  | All transcripts ber1, ber2 and ber3 are easily detectable on northern blot analyses  | True | False | 20. | Cells that harbour translocations resulting in rearrangements of the retinoic acid receptor alpha gene (RAR $\alpha$ ) but involving chromosomes other than 15, do not differentiate in the presence of ATRA | True | False |
| 8.  | The APL specific fusion transcripts can all be observed in all cases by reverse transcriptase polymerase chain reaction (RT-PCR) | True | False | 21. | Early reports showed that failure to achieve complete remission was due to central nervous system bleeding   | True | False |
| 9.  | Morphological variants of APL are never observed   | True | False | 22. | Presence of tumour necrosis factor alpha (TNF $\alpha$ ) significantly reduced the efficacy of ATRA to differentiate APL cells   | True | False |
| 10. | Other reported cases of APL showed translocations involving chromosomes other than 15 and 17                                     | True | False | 23. | Significant coagulopathy, present at diagnosis of 80% cases of APL is worsened by the onset of chemotherapy  | True | False |
| 11. | APL is distinguished cytologically by an arrest at the promyelocytic stage of myeloid differentiation.                           | True | False | 24. | Relapse is often associated with blasts acquiring resistance to chemotherapy and to ATRA   | True | False |
| 12. | Retinoids are successfully used to induce the differentiation in vitro of APL cells to polymorphonuclear cells                   | True | False | 25. | G-CSF reduces the differentiating effect of ATRA on APL cells  | True | False |
| 13. | Differentiation of APL cell by retinoids is reduced with the addition of cytokines   | True | False |     |  |      |       |

A copy of this article can be obtained by contracting  
Soakimi Pouhila  
Haematology Dept  
Greenlane & National Women's Hospital  
Ph (09) 638 9909 Ext 3060 Fax (09) 630 9996

# NICE WEEKEND

8-10 May 1998

**A Transfusion Science education opportunity  
organised by the TSSIG**

**Please register me for the 1998 NICE Weekend**

Surname:	First Name:
Address:	
Address:	
Address:	
Phone:	

Paper or Poster: (circle) Title:

**A brief abstract of your presentation must be forwarded by 17 April 1998.**

I have attended the NICE Weekend	times before.
----------------------------------	---------------

Registration Fee	-\$230	
or <b>for NZIMLS</b> members	-\$200	\$
Either: Private Room surcharge	-\$120	
or: Accompanying Person Surcharge	-\$190	\$
Late Registration Fee (payable after 17 April)	-\$150	\$
<b>I enclose a cheque, made out to 'NICE WEEKEND' for the amount of:</b>		\$

Applications received after Friday 17 April 1998 can only be accepted if accompanied by the late registration Fee.

The Private Room Surcharge is payable only if you wish to have a room to yourself.

The Accompanying Person Surcharge is payable only if you wish to bring an accompanying person who is not registering as a NICE Weekend delegate.

Signature:

**Please send form and cheque to Sheryl Khull, Transfusion Medicine,  
Palmerston North Hospital, Private Bag, Palmerston North,  
before 17 April 1998.**

## Advertisers in this issue

Biolab Scientific .....	20-21
BMG Associates .....	40
Corinth Medical .....	18
Coulter Electronics .....	Inside Back Cover
Dade Behring Diagnostics Ltd .....	22
Med Bio Enterprises .....	Inside Front Cover
Medica Pacifica .....	5
Ortho Diagnostics .....	Outside Back Cover

---

### MEDICAL SCIENTISTS COME AND WORK IN THE UK!

#### Our free service gives you:

- A superb choice of locum assignments throughout England
- Top rates of pay, paid weekly
- Free Professional Liability insurance
- Meet and Greet service on arrival at London airport
- Accommodation arranged from your first night on
- Exclusive orientation program at our associate's offices in the centre of London
- Access to our local experience in helping New Zealanders arrange UK visas, professional registration, airfares ...

Find out why so many New Zealanders like you have chosen us to help them find the right job overseas.

Call Catherine Olsen  
on  
0800 803 854 -  
61 Malvern Road,  
Mt. Albert,  
Auckland 1003





**Power  
at your  
fingertips  
to be more  
productive**



**COULTER** GEN•S

**COULTER® GEN•S™ System**  
*Your next-generation haematology analysis system*



**COULTER**  
SCIENCE SERVING HUMANITY

Coulter Electronics (NZ) Ltd: PO Box 109518 Newmarket Auckland  
Free Call 0800 442 346 Free Fax 0800 442 347  
Internet: <http://www.coulter.com>

HAEMATOLOGY

WINDOWS NT™

CD4/CD8

AUTOMATION

RETICULOCYTES

INTELLIKINETICS

FLAGGING

LINEAGE SPECIFIC

FACULTY™

SLIDE MAKER



# "Time is on your side"



**VITROS** Systems

- Simple operation
- High quality assays
- Increased productivity
- Chemistry & Immunoassay
- Systems available 24hrs a day
- 24 hour Hotline
- Lower operating costs
- Low maintenance

Vitros Systems provide intelligent solutions to help you standardise, integrate and automate your chemistry and immunodiagnostic tests, delivering consistent and high quality results every time.

For further information please call:

**0800 VITROS**

Ortho-Clinical Diagnostics

a *Johnson & Johnson* company