



Inside

- 04 MIPS and GSK
- 06 Acrux licensing success
- 10 Wound care in Tanzania
- 22 Emergency department pharmacy



Introducing the Australian Centre for Pharmaceutical Innovation



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From the dean

The last six months have seen the faculty build some strategically important collaborations and linkages. As a leading education and research institution, collaboration with industry, other leading universities and successful research groups is an indicator of our impact and reputation. This edition of *Alchemy* highlights two recent important collaborations – one in research and one in education.

At the recent AusBiotech annual conference, Victorian Government Minister for Innovation the Hon. Gavin Jennings announced funding of \$3.3 million for a joint initiative between GlaxoSmithKline Australia and the Monash Institute of Pharmaceutical Sciences (MIPS). Together, we will establish an Australian Centre of Pharmaceutical Innovation to support the translation of drug discovery success into new pharmaceutical products for the local and international markets.

I am also pleased to announce the establishment of a National Alliance for Pharmacy Education, an initiative between Monash University, the University of Queensland, the University of South Australia and the University of Sydney, which will create a national platform for postgraduate pharmacy education in Australia to support the development and advancement of the pharmacy profession.

Continuing on the education front, I am pleased to report that the faculty's teaching innovations and new Bachelor of Pharmacy curriculum have been well received by the pharmacy profession.

Recently, the Victorian College of Pharmacy Foundation was honoured to receive the lead gift of \$300,000 in support of our current Excellence in Pharmacy Education fundraising campaign from the Quality Pharmacy Consortium. This generous and significant gift will enable us to further advance and enhance the manner in which we deliver engaging and inspiring education to the next generation of pharmacists.

It is a privilege for the faculty to have the opportunity to work and collaborate with so many outstanding industry, education and research partners. These strategic collaborations enhance the future of the pharmacy and pharmaceutical science professions for our students and alumni.



William N. Charman

**Professor William N. Charman
(BPharm 1981), PhD**

Partnerships for growth

In 2011, the Victorian College of Pharmacy Foundation will mark its 10-year anniversary. Since its formation, the Foundation has quietly gone about its work – building links with key stakeholders including alumni, staff, donors and industry. During that time over \$4 million has been raised to support the establishment of the inaugural Professor of Pharmacy Practice position, a series of undergraduate scholarships and innovative education initiatives such as Pharmville 3052.

As the Foundation moves closer to its milestone anniversary, the Board is considering how best to lift its fundraising endeavours and grow the Endowment Fund over the next 10 years. With the faculty's vision of excellence in teaching, learning and research clearly articulated, the Foundation must grow to support the faculty in its new endeavours.

So far in 2010, the Foundation has played a major role in the Quality Pharmacy Consortium gift (see page 9). This gift will support one of three key fundraising projects centred around excellence in:

- pharmacy education
- pharmacy practice research
- pharmaceutical science research.

The personal goodwill, advocacy and support of the faculty's family of alumni, staff, industry partners and donors have always nourished the Foundation. Every gift – individual, group or corporate – is valuable to the Foundation, especially this year.

If you would like to find out more about the series of Excellence projects, ways you can support the Foundation or ways to get involved, contact Anne Gribbin, Director of the Victorian College of Pharmacy Foundation, tel: +61 3 9903 9507.

Introducing the Australian Centre of Pharmaceutical Innovation

MIPS and GlaxoSmithKline Australia (GSK) have formed a partnership that promises significant growth and innovation in pharmaceutical discovery and production in Victoria.



Dr David Morton (MIPS).



L-R: Steven Khoo (MIPS), Louise Ho (MIPS), Margaret Louey (GSK), Jane Prentice and David Morton (MIPS) in GSK's tablet manufacturing facility.

With the support of the Victorian Government, the two organisations will establish an Australian Centre of Pharmaceutical Innovation concurrently on the Monash University Parkville campus and at the GlaxoSmithKline Australia site in Boronia.

The collaboration will combine complementary expertise, infrastructure and knowledge to pursue major medicine development outcomes. GSK's industry and manufacturing expertise, together with the research capacity of MIPS, will enable the translation of drug candidates into next-generation pharmaceutical products destined for the national and international market.

A leader in the pharmaceutical industry, GSK holds an estimated 7 per cent of the world's pharmaceutical market. With heritage companies operating in Australia since 1886, the Australian subsidiary of GSK has a reputation for innovative and flexible manufacturing practices and producing high quality, cost competitive, export-destined pharmaceutical products.

Professor Bill Charman, Director of MIPS, said the new partnership leverages the institute's unique skills in pharmaceutical science and

nanotechnology with the industrial know-how and world-class medicine development capabilities of GSK Australia. The programs at MIPS will be led by Dr David Morton and Professor Charman.

"This is an exciting and significant strategic step for MIPS," said Professor Charman. "It will be a forerunner to a long term, broad-based collaboration with GSK."

MIPS staff will provide innovative formulation design, fundamental understanding, assessment and optimisation of candidate products. GSK will focus on translating these innovations into candidates for clinical trial, manufacture and launch.

The Australian Centre of Pharmaceutical Innovation has attracted \$3.3 million in support from the Victorian Science Agenda Investment Fund. This funding recognises the potential health, financial and knowledge benefits that the GSK and MIPS partnership presents. Medicines developed within Victoria contribute to improving the health of Australians and also boost Victoria's life science export sales, which in 2008-09 generated \$1.2 billion for the state. The successful

development of medications has direct impact on the health of patients locally and internationally, potentially improving quality of life and reducing the social burden of associated medical conditions.

The establishment of a hub for knowledge generation and technology development will provide the additional benefit of enhancing the state's science and technology base. Job creation opportunities start at the GSK Boronia site, which employs more than 450 people in pharmaceutical production, but growth of technically skilled personnel in both production and development will result in the skills being embedded across the local biotech and pharma sectors. MIPS offers the opportunity for these skills to be fed back into the educational sector, attracting more high-achieving students into the industry.

National alliance for pharmacy education

Monash University has joined with the University of Queensland, the University of South Australia and the University of Sydney to form the National Alliance for Pharmacy Education (NAPE). Its vision is to support the ongoing advancement of the pharmacy profession through the provision of high quality, flexibly-delivered courses.

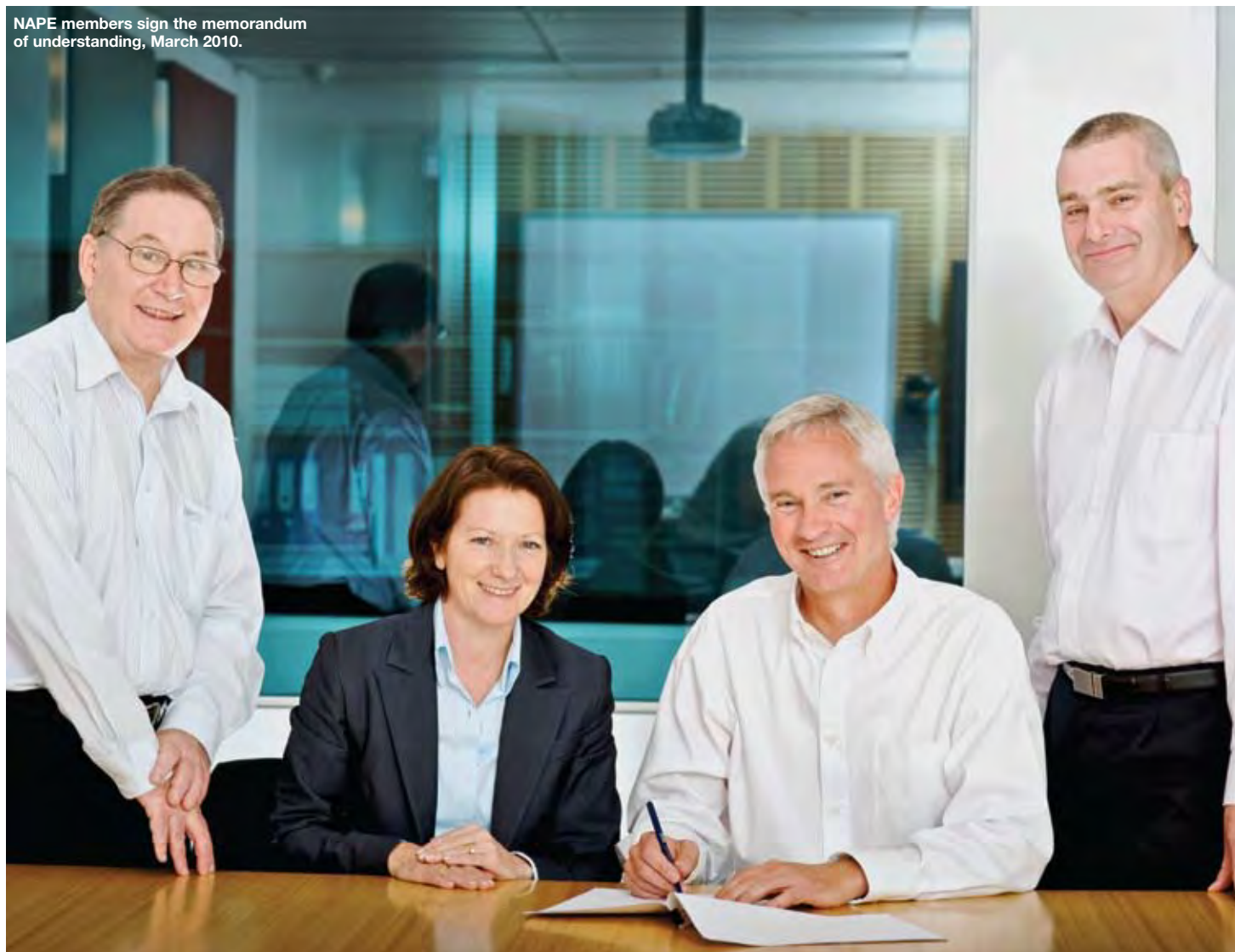
The four founding university members of NAPE are among the leading providers of undergraduate and postgraduate pharmacy education in Australia. Each member of the alliance offers integrated, research-led curricula in pharmacy.

NAPE aims to provide a collaborative national voice in pharmacy education, working in partnership with key stakeholders in the profession, other education institutions and regulatory agencies to provide the best possible education opportunities for pharmacists.

Its first priority is to take a leadership role in the development of a common vision for the future of postgraduate pharmacy education in Australia. The combination of contemporary and advanced evidence-based practice with research-informed education will allow pharmacy professionals, working in various fields of practice, to develop the knowledge and skills required for professional excellence and career advancement.

The faculty's Postgraduate Studies and Professional Development Unit (PSPDU) already offers a comprehensive portfolio of postgraduate study opportunities in pharmacy practice, clinical pharmacy and wound care as well as an internship program. The opportunity for PSPDU to leverage the expertise, experience and resources of this leading alliance, combined with its own extensive knowledge base, will ensure that the faculty continues to offer the best possible and most relevant opportunities for professional development.

NAPE members sign the memorandum of understanding, March 2010.



PEGylated dendrimers: a novel mechanism of drug delivery

MIPS researchers, in collaboration with the biotechnology company Starpharma Holdings Ltd (ASX:SPL), have developed a new method to deliver medications that may benefit thousands of patients with particular types of cancer, HIV and lymphatic conditions worldwide.

The Melbourne-based research team has shown how PEGylated polylysine dendrimers, a new type of nano-sized drug delivery system, can be altered to target either the lymphatic system or the bloodstream.

Lead researcher at MIPS and Associate Dean of Research, Professor Chris Porter, said the discovery has particular implications for the treatment of diseases that are spread via the lymphatics and lymph nodes.

"We are excited by the possibilities that this technology may provide in the improved treatment of particular types of diseases, including metastatic cancer, lymphoma, HIV and metastatic tuberculosis," Professor Porter said.

Dendrimers are precisely defined, synthetic nanomaterials that are approximately five to 10 nanometres in diameter. They are made up of layers of polymer surrounding a central core. The dendrimer surface contains many different sites to which drugs may be attached and also attachment sites for materials such as polyethylene glycol (PEG), which can be used to modify the way the dendrimer interacts with the body.

PEG can be attached to the dendrimer to 'disguise' it and prevent the body's defence mechanisms from detecting it, slowing the process of breakdown. This allows the delivery system to circulate in the body for an extended time period, maximising opportunities for the drug to reach the relevant sites.

Professor Porter's group and Starpharma have been investigating dendrimer-based drug delivery system findings for some time, but these most recent findings appear to hold particular promise.

The data, published in the *Journal of Controlled Release*, demonstrates that, by increasing dendrimer size by increasing the chain length of attached PEG chains, a dramatic increase in absorption efficiency after subcutaneous injection can be achieved and transported into the lymphatic system. Conversely, a shorter PEG chain was shown to lead to rapid absorption into the blood.

"Our work suggests that careful design of the size and surface characteristics of PEGylated polylysine dendrimers provides an opportunity to choose whether these delivery systems are absorbed and



Professor Chris Porter (left) with his research group.

distributed via the bloodstream or the lymphatic system," Professor Porter said.

"The ability to target therapeutic treatments in this way offers the potential to maximise drug concentrations at sites of action within the lymphatic system – and importantly to minimise concentrations elsewhere, potentially reducing side effects and toxicity. It's still early days, but we're confident the potential for improved patient treatment is significant."

Valuable licensing deal for faculty spin-off Acrux

Acrux has signed an exclusive global licensing deal with Eli Lilly for the commercialisation of its experimental testosterone solution AXIRON™. The deal is valued at more than US\$335 million in milestone payments, plus royalties.

"The AXIRON™ licence agreement with Eli Lilly is believed to be the largest licensing deal ever struck by an Australian biotech company," said Acrux's chairman Ross Dobinson.

Recognised for its innovative technology for administering drugs through the skin, Acrux is a spin-off from Monash University. The biotech company was established in 1998 after its spray-on drug delivery technology was discovered by faculty researchers Emeritus Professor Barry Reed (PhC 1963, BPharm 1969), Dr Tim Morgan (BPharm 1992, BPharm(Hons) 1995, PhD 1999) and Professor Barrie Finin (PhC 1967, BPharm 1969).

"This is an important step in bringing the benefits of discoveries in transdermal drug delivery made at Monash to the public at large," said Professor Finin.

The global agreement places Acrux firmly on the path of becoming the first Australian biotech company to introduce a number of therapeutic products into global pharmaceutical markets, including Ellavie™, which is used to treat menopause symptoms.

"We are delighted to build on our established relationship with Lilly," said Dr Richard Tragus, chief executive officer for Acrux. "Through Lilly's considerable global resources and leadership position in the field of men's health, Acrux now has the opportunity to achieve the full commercial potential of AXIRON™."

Currently under regulatory review by the US Food and Drug Administration, AXIRON™ is an

experimental transdermal male testosterone replacement therapy that utilises Acrux's patented delivery technology, which is being developed for the treatment of low testosterone in men (hypogonadism).

Applied to the armpit like a deodorant, AXIRON™ uses a specially designed applicator that ensures patients avoid direct hand contact with the drug formulation, and eliminates mess and stickiness. The fast-drying properties, discreet application site and 'no touch' features could make it an attractive new option for patients.

"Lilly hopes to leverage our experience in men's health to advance both science and clinical outcomes," said Bryce Carmine, president of Lilly's Bio-Medicines. "AXIRON™ has the potential to be the first testosterone solution to be applied via an underarm applicator for patients who have testosterone deficiency."

Patient focus on a global scale

After graduating, Susan Yule (BPharm 1981) turned her attention to a career in the pharmaceutical industry. The industry's diversity of career options and the opportunity to work in a field where innovative developments deliver impact and value to public health were very attractive.

As part of her degree, Susan undertook a one year traineeship in the product development laboratories of an Australian-based consumer healthcare company. This was the beginning of a varied career in the pharmaceutical industry, predominantly focused on regulatory affairs, in Australia, the UK and the USA.

Susan believes that her training in chemistry, pharmaceuticals and pharmacology prepared her well for this type of work.

"I'm very grateful to have my pharmacy degree because it is widely applicable to so many aspects of the pharmaceutical business and is well respected by most disciplines," she said. "People seem to have a bit more confidence in you when they know you have a pharmacy background."

Following her trainee year, Susan remained in pharmaceutical development for a further five years before moving to a regulatory affairs role with Glaxo Australia.

"Regulatory affairs is a combination of many sciences, project management, strategy, business and common sense. It involves quite a bit of negotiation, communication and problem solving, and I really enjoy the challenges that come with that," she explained.

"Having a grounding in pharmaceutical sciences means that I can understand and discuss the quality, safety and efficacy aspects of the medicines that we submit to regulatory authorities for review and approval."

In 1989, Susan moved to the UK and landed a job as a Pharmaceutical Assessor with the Medicines Control Agency, now known as the Medicines and Healthcare Products Regulatory Agency. Conditions in Her Majesty's Civil Service were far from luxurious, but this role gave her a fantastic insight into the other side of regulatory affairs – the reviewer's perspective – and exposure to the latest product developments. She found that the bureaucracy and processes around decision making were challenging, but provided new learnings every day.

On returning to Sydney in 1994 Susan joined a small Australian-based biotech company, where she was responsible for coordinating outsourced regulatory and clinical research activities in the Asia-Pacific region. In this role, she gained an intimate appreciation of what it takes to design and conduct clinical trials on a budget. She was

also involved with every aspect, from packaging clinical supplies to final report writing.

After three years, she returned to a more conventional regulatory role with Pharmacia & Upjohn, and over time rose through the ranks to become Associate Director, sitting on the senior management team, with responsibility for regulatory affairs and quality assurance. In 2003 she joined Schering-Plough, overseeing medical information, pharmacovigilance and regulatory affairs, then in 2005 moved with Schering-Plough to a position in the global regulatory affairs function based in New Jersey, USA.

"Moving from a country-based role to a global one was a huge change for me, and often very humbling as I grappled with the development and commercialisation of new medicines on a whole new scale," said Susan. "I was one of 50 regulatory affairs managers, working on a site of over 3500 people."

But she found being a part of the global drug development process to be rewarding. The learning she took from this experience was that innovation and speed to market are critical for the success and survival of pharmaceutical companies. While building a development program that meets global needs is complex, it ultimately facilitates a rapid pass through the regulatory procedures in all countries and faster delivery of new medicines to patients – a primary goal.

Three years later, taking this headquarter experience back to a country-based role (still with Schering-Plough but now in the UK) helped Susan to be more effective in the local setting.

"Knowing how the projects are managed at the global level helps us to anticipate and plan our local activities with more accuracy and understanding," she said. "This is really beneficial for maintaining important existing products on the market and bringing innovative products forward."

Susan believes that her Bachelor of Pharmacy has served her well.

"I remember sitting in certain lectures wondering if I would ever use all that information, but over the years it has nearly all been useful in regulatory affairs at some point. However, the most important thing is the focus that training gives us – that is, the focus on the patient at the end of the process."



"I'm very grateful to have my pharmacy degree because it is widely applicable..."

Wanted: mentors for student leaders

Graduates are needed to mentor the faculty's 2010 Student Ambassadors.

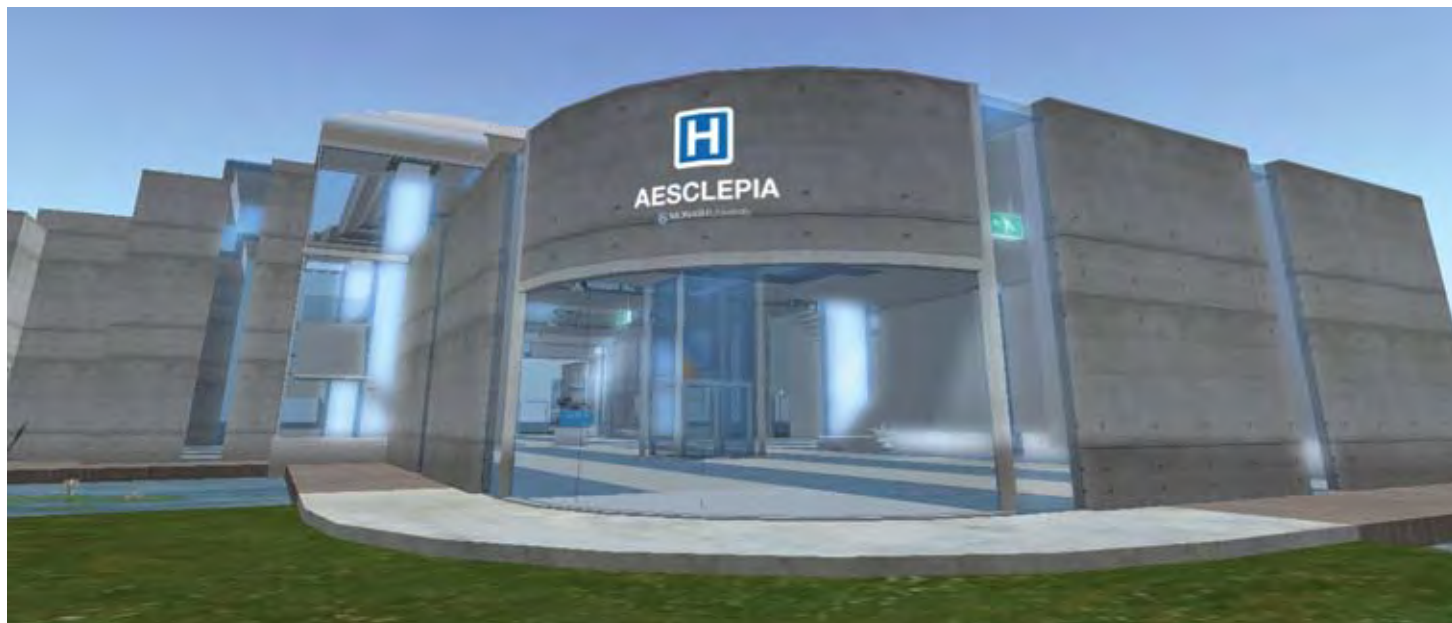
The Student Ambassador program selects students who have demonstrated leadership ability and provides them with opportunities to develop these skills and represent the faculty.

An integral part of this program is linking Student Ambassadors with graduates who can offer an insight into working life and tips on achieving career objectives.

Mentors and students are encouraged to meet approximately four times over a 12-month period.

If you are interested in becoming a mentor contact Maxine Day, tel: + 61 3 9903 9119 or email maxine.day@pharm.monash.edu.au.

Aescleпия – a new space for inter-professional teaching and learning



Building on the success of high-tech teaching tools Pharmville and Pharmatopia, the faculty is set to introduce a new virtual space for inter-professional teaching and learning.

Aescleпия medical centre is the latest addition to the faculty's state-of-the-art teaching options designed to support pedagogy and create stimulating learning experiences. Like Pharmatopia, it will be part of an internet-based 'virtual world', where students will be able to assume an online identity and interact with each other.

Aescleпия (ass-cleep-ia, from the Greek god of medicine and healing) is being developed in collaboration with Monash University's Faculty of Medicine, Nursing and Health Sciences and several UK-based schools of medicine and pharmacy – King's College London, the University of London and Imperial College London.

The project's main focus is on inter-professional learning opportunities in health, where collaboration is becoming increasingly important due to a shortage of healthcare professionals. It aims to develop key graduate attributes such as teamwork, especially the ability to jointly solve problems and understand the clinical roles of other health professionals.

The initial Aescleпия project is an aged care unit. The unit's clinical setting will provide significant opportunities for learning in an area that is experiencing strong growth, as an ageing population shifts the nature of care from acute to chronic. Pharmacy and medical students will be faced with virtual patients who have various poly-pharmacy issues and together they will be required to devise a treatment.

Aescleпия is not attempting to replace real life experiences. Instead, it provides a safe environment for final year pharmacy students and fifth year medical students to practise patient diagnosis and treatment skills, and learn with and about each other and their respective disciplines as they practise together.

Students will be teamed in small groups through a comprehensive process of diagnosis and treatment plan development. Learning will begin with preparatory reading and lectures containing the knowledge and information required for patient treatment.

After an initial briefing, they will individually approach the virtual patient to obtain a patient history. Then they will come together with fellow students to review the patient's history, propose provisional diagnosis and decide on any additional information required. Further testing can also be undertaken online. Once a diagnosis has been determined, students develop and communicate a management plan. At each stage they are required to reflect individually and as a group on the diagnosis and treatment options.

While initially Aescleпия will focus on opportunities for medical and pharmacy students, it is hoped that the scope will broaden and that other health science disciplines will take part in this shared practice approach to learning. The faculty is planning to introduce Aescleпия into learning programs in 2011.

Asclepius

Asclepius was the Ancient Greek god of medicine and healing. His father, Apollo, took him to be raised by centaur Chiron, a master of medicine.

In his pre-celestial life Asclepius excelled in medicine and healing, drawing sufferers long distances to visit him. He is said to have cured the blind, reversed ageing and brought the dead back to life. The details of his death vary but most stories involve another god, usually Zeus, striking down Asclepius for being too skilled for his own good.

Martyrdom only increased his status. Worship of Asclepius began in Thessaly, but the most famous temple was at Epidaurus, where patients slept overnight and treatment was based on their dreams.



\$300,000 gift to support education excellence

The lead gift in support of the Victorian College of Pharmacy Foundation's Excellence in Pharmacy Education project has been donated by the Quality Pharmacy Consortium.

This significant gift will support the teaching and practice of pharmacy by enabling the faculty to deliver its Bachelor of Pharmacy in a leading and contemporary manner. The faculty is already in the process of rolling out its new curriculum, which is designed to engage and challenge students. This curriculum is supported by revolutionary teaching technology, the development of which has been driven by best practice pedagogy. Future improvements include the development of an integrated practice, dispensing and learning environment to lead the education of the next generation of contemporary pharmacists.

"Education should inspire, engage and extend students. Our recently transformed Bachelor of Pharmacy curriculum leads the way in identifying, developing and utilising contemporary learning experiences," said Professor Bill Charman.

"We are proud of the innovative and practical learning programs we have developed, including Pharmville 3052 and a web-based virtual tableting lab. Support from a like-minded group such as the Quality Pharmacy Consortium allows us to provide more than just a basic education experience."

The Quality Pharmacy Consortium, lead by Charles Khallouf (BPharm 1976), is made up of the Quality Pharmacy Group, Willach+Heise, Rose Health, Genepharm and Abbott Diabetes Care. The first of a series of gifts, to be made over five years, was presented by Charles Khallouf to Professor Charman and the Chairman of the Foundation, Alistair Lloyd AO RFD ED (PhC 1956), in February.

On behalf of the Consortium, Charles spoke of the partners' belief in investing in education.

"True leaders are known for how they advance the communities they serve, and educating future generations is a tangible example of this," he said. "The faculty is one of the leading pharmacy schools in the world, it has a contemporary view of the future of pharmacy and it provides an outstanding education for young pharmacists, who we are proud to employ."



In thanking the Consortium, Professor Charman commented on the commitment of the five partners and the many pressures that businesses face today.

"Every dollar you give is a dollar of profit. Irrespective of this, you are investing in us, in the education of the next generation of pharmacists and in the profession," he said. "Your gift is very special, and for this we are truly appreciative."

Supporting education innovation

The faculty's Education Innovation Grant Scheme provides small grants to encourage teachers to make practical and innovative changes in order to enhance learning.

Five education innovation grants valued at over \$43,000 have been awarded to teaching topics ranging from cardiovascular disease states and disease state management to functional chemical groups and pharmaceutical solutions.

- Animated resources are being sourced for teaching cardiovascular disease states, with a focus on pathophysiology and the pharmacology of cardiovascular drugs. These animations will be integrated with Pharmville to give theory a real-life context.
- A similar project will develop a video presentation on contextualising the concept of functional groups and highlighting their importance in drug action and efficacy.
- A self-directed, online learning program will be developed for Bachelor of Pharmacy students. The program will be designed to enhance blood pressure management and smoking cessation counselling skills prior to undertaking their Professional Experience Placements. Case scenarios based around Pharmville characters will be reviewed to identify key counselling points and pharmacist roles.

- Students will receive more feedback on their learning progress in pharmacokinetic units with the introduction of a series of online quizzes designed to provide formative feedback prior to the assessment.
- New virtual laboratory classes will revolutionise practical classes that demonstrate the physicochemical properties and formulation principles of solutions. Some current classes are limited by safety restrictions on chemicals and by outdated equipment. The new resources will involve video demonstrations to be used in small group problem solving workshops, then students will be able to access a computer-based interactive learning module that will allow them to virtually formulate and test a variety of pharmaceutical solutions.



Wound care in Tanzania



On safari.



When Claire Penny-Hughes enrolled in the Master of Wound Care at Monash, she explained that her situation was a little bit different to that of the faculty's average students. She wasn't kidding! A recently graduated nurse, Claire is the only westerner working at Dar Es Salaam's Aga Khan Hospital.

"I studied a Bachelor of Nursing in Perth and graduated in 2007. After undertaking a 12-month graduate program at Fremantle Hospital, I worked in the ICU for six months and really enjoyed it. Around that time my partner Ryan found a job as a pilot in Tanzania for a safari company, and I decided to go with him to live in Dar Es Salaam.

We arrived in Dar in June 2008 and my first thought was 'What have I done?' It was all confronting – the heat, humidity, poverty, and huge gulf between rich and poor. But it's also home to some of the nicest, friendliest people in the world and that makes all the difference. I wanted to work with local people, so I got a job as a nurse at the Aga Khan Hospital.

Nursing in Tanzania is vastly different to nursing in Australia. The system here is frustrating, intense, understaffed and very under resourced. As the only foreign nurse, I'm often called on to teach others, even though I don't have a lot of experience myself. Most of our patients have HIV, tuberculosis or hepatitis, but there is no protective clothing issued. So last time I was in Australia I bought heaps of goggles from Bunnings for our staff.

I was worried that being here would mean I wasn't keeping up with my profession in Australia, so I decided to undertake postgraduate study in wound care. I chose to study at Monash because the Master of Wound Care covers everything a professional needs to know about caring for wounds. And being a distance learning program, it's perfect for me.

Support from Monash is fantastic. They are very understanding of my situation. When we had a five-day power cut, and I had work due in, I ran around to a friend's house with my computer and sent an email to explain that these things were beyond my control. There were no problems. Sometimes I struggle a bit during the online tutorials though. My current work is totally removed from my studies – I read what the other students write and it's just so different. For example, they talk about products and services that I don't have access to, so it's sometimes hard to contribute.

In first semester I learned about wound care basics, applied them immediately at work, and taught my colleagues what I was learning with the blessing of hospital management. Wound care

skills are incredibly important here and as soon as I learn something, I'm passing the knowledge on to others.

The Aga Khan Hospital is around 10 years old. We have 60 beds, 20 maternity beds and seven ICU beds. The nurses generally speak Swahili between themselves. Many of our doctors are from India or Pakistan, so they speak Urdu. But officially it's an English-speaking hospital, so all our documents are in English and staff communicate professionally in English. People are all surprised when I tell them I can only speak one language. It's a bit embarrassing really.

The hospital has a serious lack of resources and everything is driven by money. It's the largest private hospital in the city but if you don't have the money, you don't get the care. So if a patient needs to be in the ICU and can't afford it, they die on the wards. I still struggle with that but I make sure I do what I can.

Being the only westerner on staff, everybody knows me. At first I was a bit of a novelty. When they've had overseas nurses here before, they've been students from the UK on a placement for a month or two. The fact that I live here, come to

work every day, get the same pay as the other nurses and do the same shifts was something very different. Actually, I don't do the same shifts now. The working week here is 52 hours, with 12-hour shifts. I did that for a while but found it exhausting. So I negotiated with management and now I do three 12-hour shifts a week – in local terms, I work part time!

It was very confronting to come from an Australian ICU, where I was the lowest of the low, to the ICU here, where everyone looks to me for guidance. But I've learned a lot, and had to think on my feet. Here there's no training for working in the ICU, no policies and procedures. They just learn on the job. Often people will see me doing things a certain way and ask why I do that. Then I can explain. Or if I see someone doing something really wrong, then I'll step in and say 'I learned to do that a different way'. I need to be diplomatic and I'm careful to always be respectful.

Our nurses are amazing to do what they do with what they've got. To qualify, they need to study for seven years. But while they have all the theory and knowledge, they don't have the practical experience. For example, we got a new cordless kettle in the kitchen and none of the nurses could figure out how to use it. I can't imagine them working in a high-tech environment like an Australian ICU.

Here doctors do all the wound care, because nurses don't have the knowledge or skills. But they want to learn, and doctors are happy for them to take on that responsibility. I'm really

excited because soon I'm going to meet with a wound care supplier to see the products on offer and possibly to purchase some for the hospital. Until now, all we've had is re-used gauze that's been soaked in Betadine.

Everyday life in Dar is a different experience too. The weather is hot and humid all the time. In July and August, it's possible to sleep without the air conditioner, but the rest of the time we really need it. And the food is truly horrible – I've had enough beans and rice to last me a lifetime!

We have a basic apartment in a complex. When there's no power, which is often, we have no water. So we have a camping shower and 10-litre bottles of water on hand all the time, just in case. The power can be off for days at a time, there's no way of knowing. I've had lots of candlelit dinners, but not particularly romantic ones – it's just better if you can see your food. After the first six months, we adjusted and now we just take it as it comes.

There is a huge expatriate population here. Because the country is so poor, there are a lot of non-government organisations, United Nations workers and embassy staff. We get invited to a lot of places that we wouldn't get invited to if we were back in Australia, which is great. At the same time, it's difficult to make friends. There aren't many young women in the expat community and the ones who are here are usually only on short-term contracts.

We've gone on quite a few safaris through Ryan's job, which takes him to places like Zanzibar and

Rwanda fairly regularly. No matter how many times I go, I never get tired of seeing giraffes and lions in the wild. It's awesome. Because living in Dar can be challenging, it's great to get out and see what else Africa has to offer.

Ryan's contract is up in June but there may be other opportunities here. It would be nice to return home, but I also enjoy the adventure of working in Africa and the fact that I can make a real contribution. I feel so much richer for the experience.

If I stay in Tanzania, I'd like to move more into a wound care role. If I go back to Australia, I'd really like to work in a remote Aboriginal community. There are lots of jobs for pilots in remote areas, so I'm hoping. Further into the future, I'd like to work more in hospital-based wound care; I'd be like a kid in a candy store, working back in a well-resourced Australian hospital!"



Claire handing out soccer balls to children in an HIV orphanage.



Over the last few months, several of the walls around campus have undergone a major makeover.

Feature walls on pharmacy, pharmaceutical sciences and postgraduate studies have joined the previously-installed research wall. These walls have been designed to capture the career outcomes and study focus of the faculty's courses. They are best viewed in person, but those who are unable to visit the campus can enjoy a 'sneak peek' here.



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DRUG EVALUATION / FORMULATION
SPECIAL CHEMISTRY / EXPERIMENT / QUALITY BY DESIGN / PRODUCT IDENTIFICATION

Research > Opportunity

Collaborative > Impact

drug & medicinal and drug action medicine use and

New analysis and screening facility

The installation of a new high throughput analysis and screening facility at MIPS heralds a new era of drug discovery for Monash University.

Leading researchers from the Faculty of Pharmacy and Pharmaceutical Sciences and the Faculty of Medicine, Nursing and Health Sciences – including some of the biggest names in Australian biomedical research – recently received a major National Health and Medical Research Council (NHMRC) equipment grant to complete outfitting of the cutting-edge facility that forms part of the Drug Discovery Biology theme in MIPS.

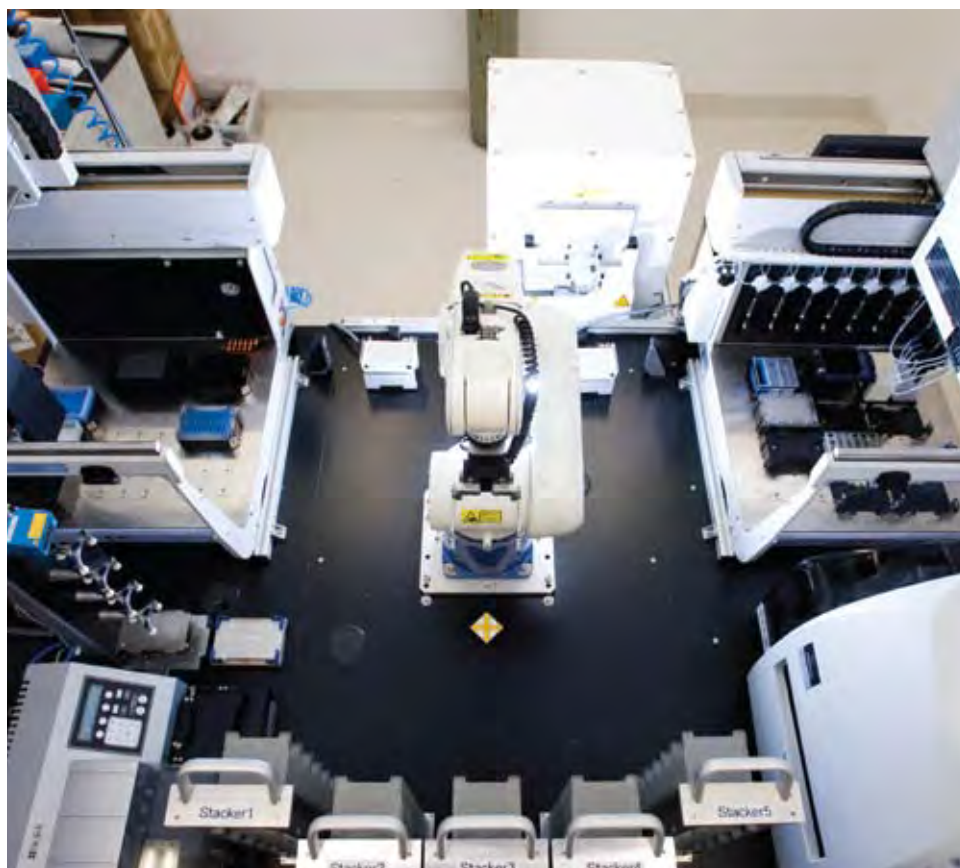
In addition to the two biomedical faculties and MIPS, other Monash institutions that will directly benefit from the facility include the Monash Institute of Medical Research and the Centre for Biotechnology and Human Diseases.

Chief Investigator Professor Arthur Christopoulos (PhD 1999), co-theme leader of Drug Discovery Biology at MIPS, explained that this new technology platform will usher in a new era of collaboration.

“The facility provides us with a novel opportunity for collaborative, translational research through the interaction of biological sciences laboratories with medicinal chemistry laboratories, and collaboration with biotechnology companies and even big pharma partners,” he said.

The new facility will fill a gap in Monash University’s technology platforms. Providing state-of-the-art robotics and liquid handling, it will enable the automation of a wide variety of pharmacological, biochemical and immunological assays, and facilitate rapid structure-activity relationship analyses of lead-compound series. Faster and more accurate testing will aid in the search for new medications.

The facility differentiates itself from existing screening facilities currently used by MIPS through its capacity to screen small to medium libraries, of up to 20,000 compounds, in a focused way. This approach to screening is gaining support in both the pharmaceutical industry and academia as a very fertile method to facilitate novel drug discovery in a timely manner while still allowing for more detailed compound characterisation than would be normal for much higher throughput (eg 100,000+ compound) screening campaigns. Another advantage of the facility is the ability to develop new assays in-house that can be readily transferred to partners for use in larger screening facilities, such as those within industry.



MIPS attracts \$1 million in ARC grant funding

Dr Martin Scanlon (MIPS), Dr David Chalmers (MIPS), Professor Michael Parker, Dr John Deadman and Dr David Rhodes

New approaches to inhibition of activity of HIV integrase

More than 33 million people worldwide are currently suffering with HIV. This project aims to assist in developing new anti-HIV drugs used to slow down the process of infection in patients. The project will utilise state-of-the-art approaches in structure-based drug design to identify and synthesise compounds as leads for the development of anti-HIV drugs.

Professor Barrie Fininn (MIPS), Professor Roy Robins-Browne, Professor Robyn Guymmer, Dr Russell Tait, Dr Florian Graichen, Dr Penelope Allen, Dr Michael O’Shea and Polyactiva Pty Ltd

Study the utility of novel drug polymer conjugates

This research will involve the production of novel drug polymer constructs to provide sustained release of drugs. Investigations will involve the measurement of release from constructs specifically designed to control the rate of release of model drugs. While this technology has many potential applications, one involves use in delivery of drugs direct to diseased organs, such as the eye.

Dr Ben Boyd (MIPS), Dr Dennis Rylatt, Dr Ronald Chatelier and Universal Biosensors

Novel self-assembled particle systems as a key to next generation biosensor technology

Current devices for the diagnosis of disease are being revolutionised by nanotechnology, resulting in significant increases in their sensitivity, speed and reliability.

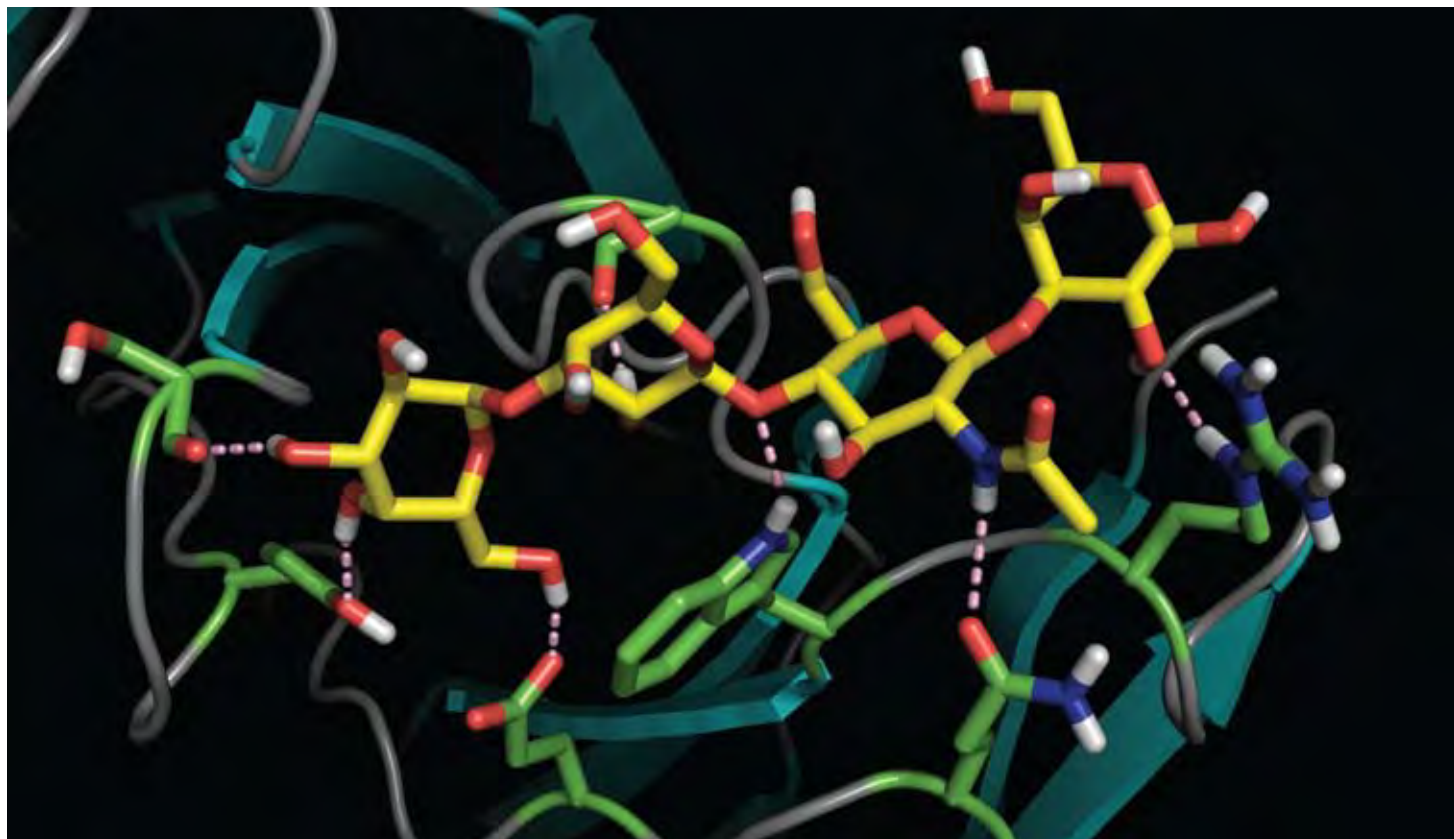
This research will investigate the behaviour of stimuli-responsive nanoparticle systems and their interaction with biological ligands to understand how to design particles to respond to specific blood-borne antigens. Results may potentially be used to design new biosensors for disease diagnosis technology for the doctor’s surgery/hospital to improve disease diagnosis and treatment, which in turn will lead to more economical and timely therapy.

Dr Bim Graham (MIPS), Professor Leone Spiccia and Professor Yitzhak Tor

Metal complex – aminoglycoside conjugates for sequence-specific cleavage of RNA

This research will focus on the design of novel compounds that can bind to and cleave specific ribonucleic acid (RNA) molecules found in bacteria and viruses. These compounds will serve as potential leads for the development of potent new ‘catalytic drugs’ (drugs that can destroy more than one copy of their target). They will also find application as useful biochemical tools for studying the structure of RNA molecules in vitro.

Computer-based design: key to unlocking transplant secrets



A pig carbohydrate in complex with an anti-pig antibody, as determined using *in silico* methods.

A third-year MIPS PhD student involved in cutting-edge research relating to organ transplants from pigs to humans has had his work recognised in major international journals.

Mark Agostino (BMedChem(Hons) 2008), together with his supervisors Dr Elizabeth Yuriev, Dr Philip Thompson and Dr Paul Ramsland and collaborator Professor Mauro Sandrin, is using computer-based molecular modelling to understand the interaction of carbohydrates and antibodies in the rejection of organ transplants from pigs to humans.

Organ transplants have been clinically successful for some time. However, there are almost 2000 people in Australia on organ transplant waiting lists and some will die before they receive a suitable donor organ. This shortage has led to reflection on the possibility of animal organ transplants for the treatment of disease damaged organs in humans – a process known as xenotransplantation.

Pig organs are generally considered to be the most favoured for transplant into humans. However, all humans have naturally occurring antibodies that are reactive with specific carbohydrates located on pig cells. This reaction is the cause of transplant rejection.

At the end of last year, the NHMRC decided to lift the moratorium on clinical trials in xenotransplantation. Taking into consideration concerns over the potential for the introduction of infection and questions of animal welfare, the NHMRC felt research in this area was acceptable in Australia under robust regulation. With the moratorium lifted, Australian researchers can now begin to make greater progress towards clinical xenotransplantation.

Antibody-carbohydrate interactions are difficult to study experimentally using X-ray crystallography or nuclear magnetic resonance due to the high flexibility of carbohydrates.

“*In silico* or computer simulation techniques have allowed us to develop an understanding of the structural basis of pig xenograft rejection,” said Mark. “Knowledge of the interaction between pig carbohydrates and anti-pig antibodies can be used to aid in the structure-based design of novel anti-rejection drugs.”

The results of Mark’s studies have been published in highly respected peer review journals such as *Molecular Immunology*, *Journal of Chemical Information and Modeling*, *Glycobiology*, *Biopolymers: Peptide Science* and *Expert Opinion on Biological Therapy*.

Carbohydrates are considered to be important disease and cell type markers, where each cell is marked or identified by the carbohydrates it carries.

“Mark’s work has relevance to the adverse immune reactions that impede organ transplants, blood transfusions and the use of therapeutic antibodies for cancer treatment,” explained Mark’s supervisor, Dr Elizabeth Yuriev. “It is also relevant to the role of such interactions in autoimmune diseases. An understanding of how antibodies identify carbohydrates could be exploited to create more targeted therapies and diagnostic techniques for these diseases.”

Rural students log into postgraduate study opportunities

Over 20 per cent of the faculty's postgraduate coursework students are from a rural or regional area, a clear sign that off-campus study options make postgraduate study accessible to more people.

The faculty has students enrolled from places around Australia, including Townsville, Warrnambool and Cobram, as well as from overseas. Pharmacists completing postgraduate study gain a tertiary qualification and earn continuing professional development points.

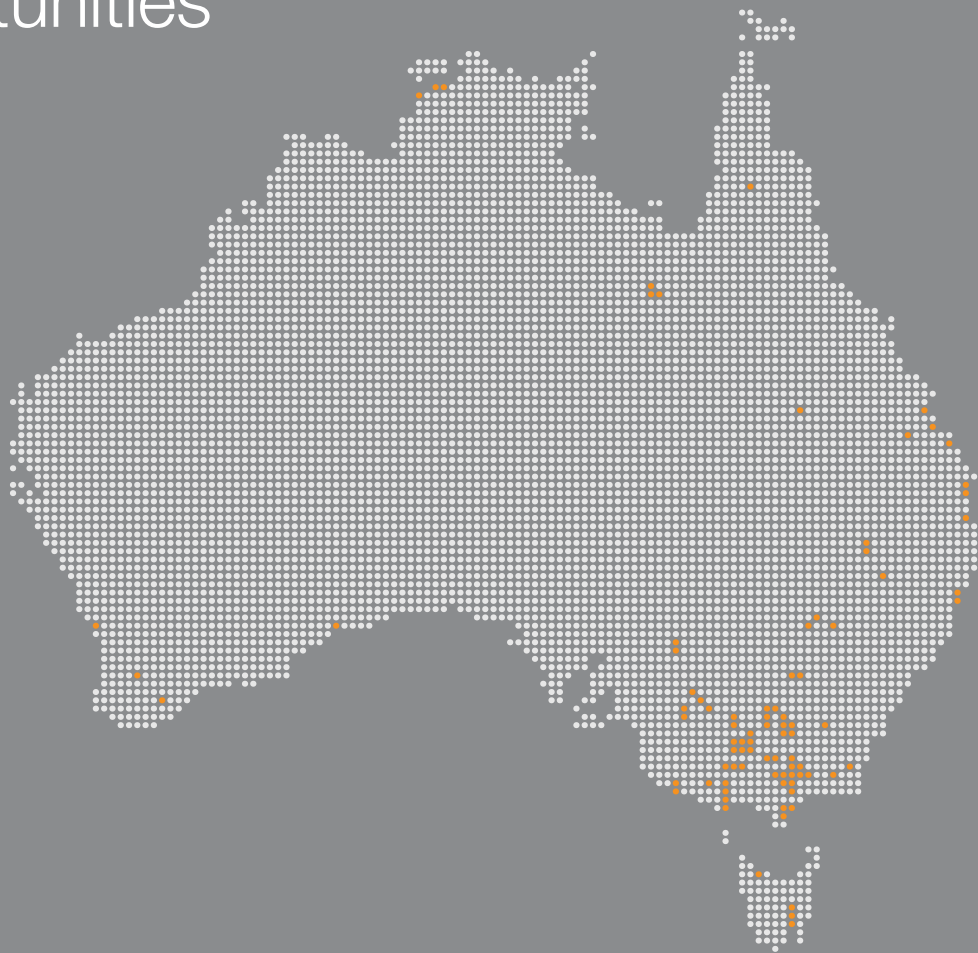
Kitty Turner started her Graduate Certificate in Wound Care while living in New Zealand and has since moved to Australia. Finding that she was well supported in her off-campus studies and that she was able to readily apply the practical course content, Kitty enrolled in the Master of Wound Care.

"I found the online study environment easy. Monash offered plenty of support, through online or hard copy tutorials, or over the phone assistance. I also found it really easy to access the library," said Kitty. "Staff have been amazing – always responding quickly to requests for online documents or sending out books. I'd encourage anyone to attempt the online learning experience."

Now a registered nurse in Australia, Kitty says her study has enhanced her practice. "The course content was very clinically based and very practical. I also found it extended me academically, which I consider an important aspect of postgraduate study."

Frederika Frost, from Hervey Bay in Queensland, was attracted to the Graduate Diploma in Wound Care as a result of a patient who suffered from wounds related to diabetes. In studying her diploma, Frederika has focused on the diabetes-related subjects.

"I enjoy being able to investigate a topic on my own, taking the time to read up on it using online and library resources. The course has helped to make me a very employable specialist in wound care."



Rae Saunders (nee Teape) (BPharm 1982), from Yackandandah in Victoria, is completing a Graduate Certificate in Pharmacy Practice. Already an experienced registered pharmacist, Rae returned to study to refresh and enhance her knowledge and skills.

"Computers were not used the way they are now when I did my bachelors degree," says Rae, "I was a bit terrified of how I would go with the online learning, but once I started and found I could do it – it was fantastic."

"Returning to study took a bit of adjusting for the family, but I love doing the course. Being able to study online has been a huge advantage," explains Rae. "Like most people, I have a busy life and there's no way I could travel to Melbourne on a regular basis. Studying off-campus allows me to fit it in around my other commitments."

Rae also speaks highly of the benefits of postgraduate study.

"The course has increased my knowledge hugely. I use it extensively in the workplace and I know my employer is pleased with that. The benefits are broader than this though. Pharmacists have such an important role in healthcare that enhanced practice from postgraduate study will help improve the whole healthcare system. I enjoyed and benefited from the experience so much it has made me wonder why more practising pharmacists aren't doing it!"

Nicholas Mills from Shepparton is currently completing his Postgraduate Certificate in Pharmacy Practice.

"After finishing my internship last year, I decided to go on to complete the elective units and obtain a postgraduate certificate that will give me a competitive edge as a clinical pharmacist," he said.

Undertaking postgraduate study can be daunting but it can be done, and each year over 1000 postgraduate

students complete a course with Monash University via off-campus learning.

The university offers a wide range of support to off-campus students, including:

- tools to get organised
- assistance with learning skills
- library resources
- online resources including email
- support to tackle issues related to health, wellbeing and development.

"In addition to giving you access to a university course, off-campus learning increases your options," said Alison Whitley, Director of the Off-Campus Learning Centre at Monash. "You can organise study around your existing work, social and family commitments."

For more information on postgraduate study options tel: +613 9903 9635 or visit www.pharm.monash.edu.au/courses

Student wins spot at Cheiron Synchrotron School, Japan



L-R: Tine Straaso (Sweden), Jordan Thurgood (Australia), Melissa Basil-Jones (New Zealand), Wye Khay Fong (MIPS) and Talitha Santini (Australia). Kinkaku-ji (金閣寺, Temple of the Golden Pavilion) in Kyoto.



SPring-8 Synchrotron.
Copyright: SPring-8, RIKEN/JASRI

Wye Khay Fong (BFormSci(Hons) 2008), a PhD student at MIPS, was selected to attend the prestigious Cheiron Synchrotron School in Japan last November.

Synchrotrons produce an intense beam of light, known as synchrotron radiation, that allows scientists to obtain detailed structural information about a wide range of materials, from nano-sized protein crystals to detailed images of the human body. MIPS researchers use synchrotrons for high resolution structural studies of drugs and the complexes formed with proteins, enzymes and receptors; imaging of drug-pathogen interactions; physicochemical characterisations of drug candidates; and structural studies of drug delivery systems.

"My first reaction on being accepted was to cheer in excitement and dance around my office...and the office next door...and the lab next door to that," says Khay. "I applied in the hope that going to Cheiron would enhance understanding related to my research and the research of others.

"The school certainly provided me with ideas to further my project. I now appreciate the science behind the synchrotron more and have a deeper understanding of the research that comes out of it."

Held at the SPring-8 synchrotron facility in Japan, the largest third-generation synchrotron facility in the world, the school's main aim is to provide useful knowledge and perspectives on synchrotron radiation science and technology for graduate students, postdoctoral fellows, young scientists and young engineers who wish to

pursue their career in a field requiring synchrotron radiation in the Asia-Oceania region. The program is held under the auspices of the Asia-Oceania Forum for Synchrotron Radiation Research and supports airfares, accommodation and expenses. It comprises an intensive series of lectures and practical training sessions over 10 days across the full range of synchrotron techniques.

"SPring-8 is very much larger, more powerful and more established than the Australian Synchrotron. Inside it is similar, but you need bikes to get from one end to another!" exclaimed Khay. "We were given the opportunity to use the beamlines (the end stations in the synchrotron) and learn from the experts. It was good to experience the unusual environment and I felt very honoured to have discussions with the very experienced and respected beamline scientists."

Khay's PhD project involves understanding and manipulating the properties of materials to invent novel drug delivery systems. Nanostructured self-assembled lipid systems are gaining attention as potential controlled release drug delivery systems. The focus of Khay's project is to investigate the possibility of using external triggers, for example a light source such as a laser, to change the nanostructure of liquid crystals and control drug release.

Before attending the Cheiron Synchrotron School, Khay had already won two merit-based beamtime allocations at the Australian Synchrotron to complete small angle X-ray scattering studies. The Australian Synchrotron is located adjacent to Monash University's Clayton campus and is one

of fewer than 40 similar facilities around the world. Before the Australian Synchrotron opened in 2007, MIPS scientists had to travel overseas to utilise synchrotron facilities.

"Khay's exposure to other techniques in Japan will broaden the application of synchrotron techniques to her project," said Khay's supervisor Dr Ben Boyd, from the Drug Delivery, Disposition and Dynamics theme at MIPS. "It will also lift the profile of MIPS at the Australian Synchrotron."

Khay went on to explain that the most challenging part of the school was the physics.

"My undergraduate study was in formulation science and my course focused on chemistry and physiology, so the physics behind the synchrotron were really advanced for me," she said. "However, I did get the hang of it and managed to understand most of the lectures."

As well as being exposed to cutting-edge science, Khay also had the chance to experience Japanese culture.

"Highlights were day trips to Himeji and Kyoto. Japanese history and culture is amazing, the people are friendly and the food is good," she said. "I think the most interesting part of my trip was language – English and Japanese aren't entirely necessary to communicate and portable dictionaries are a lifesaver!"

"I learnt a lot about synchrotron science. But more importantly, I made friends from around the world and I'm sure these contacts will enhance my future career."

Where are they now?

**What are you doing now?
We'd love to hear your story.**

**If you would like to be included here,
email alumni@pharm.monash.edu.au
with your name and a short description
of what you've done since graduating.**

50s

Born in Poland, David Prince (PhC 1958) graduated as a pharmacist from Munich University in 1949. He arrived in Australia in 1950 and enrolled at the Victorian College of Pharmacy. David managed to avoid the standard further training for overseas trained pharmacists and completed the two-year course in a year. He worked as an unqualified assistant to Bob Whalley, who generously supported him during his studies. In 1959 David purchased the leasehold of a pharmacy in Bridge Road, Richmond. His son James joined the business in 1973, and two years later they incorporated Wheeler's Pharmacy, then the oldest existing pharmacy in Richmond. In 2009, after 49 years, the business was sold. Even though he no longer practises, David retains his registration. His special interest and passion is the Holocaust Museum in Elsternwick, where he regularly works as a guide.

60s

David Meller (PhC 1967), married Denise Meller (nee Grieve) (PhC 1963) and they have three sons. David began his pharmacy career doing locum work. Gaining overseas experience was considered the 'thing to do' and so he departed for England from Station Pier in 1967. A little over three years later, David returned to Melbourne and eventually purchased his first pharmacy in North Fawkner. After 10 years he moved on to a pharmacy in Pascoe Vale and eventually sold his pharmacy in 2001 after 20 years in community practice. David was secretary of Guild District No.2 for 20 years, a founding member of the Rotary Club of Fawkner and has been a member for 35 years. He is presently a member of the Rotary Club of Strathmore. He has been involved with the Rotary project 'Donations in Kind' and has seen four cardiac catheterisation labs find new homes in Sri Lanka, Nepal and Mongolia. David is an assistant web master for Rotary and is a recent convert to the challenge and fellowship of lawn bowls with the Strathmore Bowls Club.

After graduation, Margot Young (PhC 1961) worked as a locum before travelling to the UK in 1963. While overseas, she spent time dispensing in both French and English at a pharmacy on Jersey, a small Channel Island off the coast of Normanby, France. On her return to Australia in 1966, Margot worked as a locum pharmacist, later securing a position as staff pharmacist at the Royal Children's Hospital. She then undertook full-time locum work for six years at a number of Melbourne teaching hospitals. Changing direction, she went on to work as pharmacy administrator/section manager at the Victorian Hospitals Association for over five years. Margot's career has also included positions with companies such as McDonnell Douglas Info Systems, Paramedical and iSOFT. She currently undertakes locum work at North Yarra Community Health Centre.

70s

Jo-Anne Rumpff (nee Griffiths) (BPharm1974) married Michael Rumpff (BPharm1969) in 1973 and lived in Sale until July 2004, bringing up three children and working part time and as a locum. From 1988 until December 2002, she worked as the sole pharmacist at the RAAF base, East Sale, and was awarded a Base Commander's Commendation in 1998 for her work. In 2003, she completed a postgraduate diploma in pharmacotherapeutics. In 2005, she was contracted to develop *Guidelines for the Management of ADF Pharmacies*, a consolidation of Defence policies relating to the practice of pharmacy within the Defence Force. Today she is semi-retired, working as a locum pharmacist for Defence Force pharmacies in Victoria. Jo-Anne is a Fellow of the Australian College of Pharmacy Practice.

80s

Since putting aside her career as a practising pharmacist, Donna Danielle (nee Flynn) (BPharm 1989) has focused on system improvements, embarking on a mission to find out who makes the healthcare decisions in Australia. To this end she has held lobbying, researching, business analysis, policy development, project management, marketing and media management positions for government, small business and not-for-profit organisations. From 2000 to 2003, she was the senior policy advisor to two federal health ministers advising on portfolio areas including health finance, electronic health, immunisation, chronic disease, pharmaceuticals and privacy. Since 2006, Donna has been the Chief Executive Officer of Palliative Care Australia, the national peak body for palliative care. Attending an international forum on palliative care in Nairobi and sitting at a table with 100 people, all working together to improve how well people die, was a career highlight for Donna.

80s

Jennifer McDowell (BPharm 1985) completed her traineeship at St Vincent's Hospital and worked at The Austin before travelling overseas. She held community and hospital pharmacist roles in London before returning to Australia. After undertaking locum work, she was employed at the Royal Children's Hospital for 12 years where she did rotational work before becoming editor of the hospital's *Paediatric Pharmacopeia*, a reference book advising prescribers, pharmacists, nurses and other healthcare professionals on doses for paediatric patients. Subsequent to that, she worked for Therapeutic Guidelines. Jenny is currently a research officer in the Faculty of Pharmacy and Pharmaceutical Sciences at Monash, where she works on a variety of projects including development of the Pharmville community and virtual patients. She holds a graduate certificate in editing and communication from the University of Melbourne.

After graduation, John Pisasale (BPharm 1987) worked at and later managed Chandra Pharmacy in East Doncaster before heading overseas to work and travel. He spent two years as a locum for Paydens Pharmacy in Kent, UK, where he met his wife Karen, a pharmacist from New Zealand. On his return to Australia in 1991, John returned to Robinvale on the northern Victoria/NSW border (where he grew up) and joined his father, who owned and operated the town's Amcal pharmacy. A year later he became a partner, taking full ownership of the business with his wife when his father retired. He is an active member of the Robinvale Development Association, a group that aims to grow local businesses and improve the town, and he spends much of his time coaching young children in cricket, tennis and football. John is also a Justice of the Peace.

90s

In 2000, Jay Calder (BPharm1999) became partner in Orbost Pharmacy in East Gippsland, where he worked for three years. He subsequently became a partner in two other pharmacies in Melbourne. After working in rural Victoria, he returned to manage one of his Melbourne pharmacies. In 2005 Jay headed to the UK, where he was a locum for independent pharmacies and major groups. Still abroad in 2007, he was employed as Regional Manager for Boots in Dubai and managed their flagship store at the Mall of the Emirates. Jay returned to Australia and currently works as Victorian and Tasmanian Solutions Consultant for WillachGroup, manufacturer of CONSYS robotic dispensing machines. Jay finds the ability to utilise his knowledge as a pharmacy owner to consult other pharmacists on dispensary design really satisfying.

00s

After Carlotta Standen (BPharm 2003) graduated, she moved back to Bendigo to do her internship with the Healthworks complex. Carlotta found practising pharmacy in a medical centre a nice mix between hospital and community pharmacy. She has stayed on and is now employed as the pharmacist in charge at Healthworks Pharmacy in Kangaroo Flat where, as well as performing the regular responsibilities of a pharmacist, she is running a large opioid substitution program that attracts patients from as far as 45 minutes away. Carlotta is also qualified as a Consultant Pharmacist and accredited to perform Home Medication Reviews, a role she considers to have allowed her to contribute a lot of clinical information and improved her professional relationship with doctors and other health workers in the area. Still enjoying her chosen profession, she would like to own a rural pharmacy in the future.

After graduating in 2007, Nicola King (BPharmSc 2008) was lucky enough to start working almost straight away at IDT Australia Ltd. Nicola had enjoyed an industry placement with IDT in her second year and believes it helped her gain her permanent position. Nicola has now been at IDT for almost two years. For the last six months she has been working as a Quality Assurance Associate and prior to this she held a role in the Pharmacy Services Department as a formulation scientist. She has been involved in all aspects of clinical packaging projects and really enjoys the organisation and attention to detail that is required to ensure that a trial is able to run successfully. In the future, Nicola would like to learn more about clinical trials.

Julia Gilmartin (BPharm 2009) registered in November last year. During her internship, Julia particularly enjoyed primary care diagnosis and eagerly anticipated positive results from her suggested treatment options. She has enjoyed the added responsibility that has come with her registration and is eager to live up to the high regard that the community has for their pharmacist. Currently working as a community pharmacist, Julia is looking forward to returning to study with the faculty this year, when she will begin a PhD in the area of pharmacy practice. Julia will be examining the errors associated with patient medication aid packing for nursing home patients and formulating ways to reduce them.



Faculty invests in the future of research excellence

The Faculty of Pharmacy and Pharmaceutical Sciences offers annual research awards that recognise the excellence of staff.

2009 Research award

Professor Roger Nation

PhC (1971), MSc (1974), PhD (1977)

Professor Nation is recognised for his outstanding research record – a combination of sustained research performance, consistent research within the vision and objectives of the major MIPS research themes and his ability to combine this with an outstanding publication record, an impressive research grants income performance, and leadership of a large team of staff and research students.

He undertook his postdoctoral training at the University of Illinois. Before joining Monash University in 2001, his positions included Professor of Pharmacy, School of Pharmaceutical, Molecular and Biomedical Sciences and Director, Centre for Pharmaceutical Research (both at University of South Australia), and visiting scientist at Glaxo Inc. Research Institute (North Carolina).

Currently co-director of the Centre for Medicine Use and Safety, Professor Nation also leads the MIPS Facility for Anti-infective Drug Development and Innovation. He is recognised for his contributions to research in the safe use of medicines and to the discovery, development and optimisation of antimicrobial chemotherapy for management of infections caused by multidrug-resistant pathogens. In 2006, he was awarded the Australasian Pharmaceutical Science Association Medal.

2009 Young investigator award

Dr Joseph Nicolazzo

BPharm (1999) BPharmSc(Hons) (2001)
PhD (Monash 2005)

Dr Nicolazzo is recognised for his work in establishing, within MIPS, a new research program that investigates drug delivery to the central nervous system.

Following completion of his PhD, Dr Nicolazzo worked as a research scientist at the Centre for Drug Candidate Optimisation at Monash, implementing platforms for assessing blood-brain barrier (BBB) transport of preclinical drug candidates, and in preclinical pharmacokinetic analysis. In 2007, he was appointed lecturer in pharmaceuticals, concentrating on oral drug absorption, pharmacokinetics and biopharmaceutics.

His research focuses on understanding the mechanisms involved in drug transport across the BBB; novel approaches to improve drug transport into the central nervous system; and the impact of Alzheimer's disease and epilepsy on the permeability of the BBB. He has various collaborative projects within the faculty and at the Florey Neurosciences Institute and University of Bari, Italy.

2009 Young investigator award

Dr Johnson George

BPharm (1996) MPharm (1999) PhD
(Monash 2005)

Dr George is recognised for building an impressive research track record early in his career and contributing as key investigator on several large research grants within the Centre for Medicine Use and Safety.

He held a postdoctoral position with the Prescribing Research Group in the School of Pharmacy at the Robert Gordon University, Scotland, after completing his PhD. His work focused on prescribing initiatives by pharmacists in the UK and medication use and safety issues among the elderly.

Returning to an academic position at Monash University in 2007, Dr George is a member of the major research programs in the Centre for Medicine Use and Safety. His research focus is medication adherence, quality use of medicines in the elderly and non-medical prescribing. He also has a research interest in smoking cessation and complementary and alternative medicines.

Sir Edward 'Weary' Dunlop's medicine chest on display

In memory of Sir Edward 'Weary' Dunlop's (PhC 1927) connection with the Victorian College of Pharmacy, Peter MacCallum Cancer Institute has loaned his wooden medicine chest to the faculty. The case was unveiled at a morning tea on 23 April and is on display in the Sissons building foyer.

Born in 1907 in country Victoria, Sir Edward completed pharmacy studies at the college before studying medicine, going on to excel as a doctor and surgeon. He rose through the ranks of the Australian Army Medical Corps to become Deputy

Assistant Director of Medical Services. Sir Edward was among thousands of prisoners of war to work on the Burma-Siam railway and maintained a lifelong concern for the welfare of former prisoners of the Japanese.

After retirement from service, Sir Edward continued to practise medicine and lecture, becoming an ambassador for Australia-Asia relations. In 1977 he was named Australian of the Year and in 1988 one of the 200 Great Australians.



Graduate receives Sanofi Aventi Medal for Excellence in Pharmacy Practice



Dr Jenny Gowan (PhD 2001) was recently honoured by the University of Sydney Pharmacy Practice Foundation and awarded the Sanofi Aventi Medal for Excellence in Pharmacy Practice.

Dr Gowan's career in pharmacy has spanned many different areas, from community pharmacy to hospital, education and consultancy work. After completing a Graduate Diploma in Community Pharmacy at the Victorian College of Pharmacy and a fellowship with the Australian College of Pharmacy Practice, Dr Gowan completed her PhD in pharmacy practice in 2001 when this was still a new field.

Over 18 years at the Pharmaceutical Society of Australia (Victorian branch), she was responsible for the pre-registration training year of over 3000 interns. In this role she also assisted overseas trained pharmacists to obtain Australian registration.

Dr Gowan is now consultant pharmacist to the Northern and North East Valley Divisions of General Practice in Victoria, and she conducts her own consulting company which contracts over 20 pharmacists. Recognised as an expert nationally and internationally, she has assisted Malaysia and Taiwan to develop pharmacists' medication reviews. She has published over 280 papers and educational articles, one book and three book chapters.

As well as working seasonally as a practising pharmacist, Dr Gowan lectures on pharmacy practice at the faculty. She believes that, as the employment landscape changes in the pharmacy profession, innovative pharmacists will find new roles in consultation, information management, education and numerous quality use of medicine activities, without involvement in the business model of supply.

Australasian Pharmaceutical Science Association Medal

Professor Susan Charman, Director of the Centre for Drug Candidate Optimisation at MIPS, was awarded the 2009 Australasian Pharmaceutical Science Association Medal for significant contributions to the pharmaceutical science field. The award recognises her highly productive research career and contributions to the Australasian Pharmaceutical Science Association (APSA).

Professor Charman has been instrumental in providing lead optimisation expertise to the Australian biotech community and regularly consults for the industry on matters related to lead optimisation, candidate selection and development. Internationally recognised for her work in this area, Professor Charman has attracted significant funding from industry as well as international competitive grants, and has published over 150 peer-reviewed manuscripts, patents and scientific communications. She served as President of APSA from 2002 to 2004, is a member of two international editorial boards and serves on several national and international advisory bodies.

The medal is the association's highest recognition of excellence and lasting contribution to the pharmaceutical sciences and pharmacy practice in Australasia.



Lecturer of the Year

In late 2009, the Monash Parkville Student Association surveyed faculty students in search of the Lecturer of the Year.

Congratulations to lecturers nominated by students at each year level:

- First year: Dr Daniel Malone
- Second year: Dr Joseph Nicolazzo
- Third year: Associate Professor David Taylor.

Overall Lecturer of the Year was awarded to Dr Daniel Malone.

Sessional staff required

The faculty's new integrated Bachelor of Pharmacy curriculum has created an opportunity for practising pharmacists to contribute their experience to teaching. The use of pharmacists as sessional teaching staff provides students with context for the theory they are learning.

The experience may also benefit practitioners by renewing enthusiasm and providing access to a wide variety of resources to assist in fulfilling continuing professional development. Background reading provided prior to classes is useful for 'brushing up' on old topics or adding new knowledge.

Sessional staff may tutor, demonstrate in practical classes or assist with the assessment of assignments and examinations. Payment is based on university sessional salary rates.

For information on teaching students on a sessional basis contact the Education Programs Manager, email Deborah.Horne@pharm.monash.edu.au.

Emergency department pharmacy

An early interest in critical care led Dr Simone Taylor (BPharm 1993, GradCertClinResMeth 2002) to complete a PharmD in the USA, before returning to Australia and piloting a nationally-recognised emergency department pharmacist program. Today, Dr Taylor shares her extensive knowledge and experience with Monash students through mentoring and sessional lecturing.

After graduating in 1993, Dr Taylor worked at the Royal Children's Hospital and then Geelong Hospital in a variety of roles that included ward and dispensary duties and provision of drug information.

"Postgraduate study opened a lot of doors. There was a limit to how much I could teach myself and I could see that there was still a lot I didn't know," said Dr Taylor. "I wasn't going to improve my input to patient care without undertaking formal postgraduate studies."

She decided to seek a course that involved experiential training under a specialist pharmacist, similar to that involved in medical training. As this type of course was not available in Australia, she enrolled in a PharmD at the University of Pittsburgh, followed by a Critical Care residency program. She believes that studying overseas gave her a different perspective as well as knowledge about a different way of doing things.

"Professionally, the residency program was the best year of my life," said Dr Taylor. "I came back much better equipped to work in critical care and very adept at critical care therapies that were much less common in Australia. For example, at the Austin Hospital, I've seen two gunshot wounds in eight years. During my trauma rotation in Jacksonville, Florida, I dealt with 10 within the first two weeks."

At first, the University of Pittsburgh faculty was hesitant about Dr Taylor's inclusion in the PharmD course. While she had completed a Bachelor of Pharmacy, it was a three-year course and in the USA at the time, pharmacy was a five-year program (it is now a compulsory six-year PharmD).

"In some ways, our undergraduate course was stronger," said Dr Taylor. "In our third year

pharmacology exam, we could be asked anything about physiology or any aspect of pharmacology we'd learned across the whole course. But in Pittsburgh, students generally learnt a topic, were examined on it, and then they moved on to something else.

"I cursed the cumulative nature of our assessments at the time but it stood me in really good stead when I got to the USA. Also, the fact that I had practised as a pharmacist for a few years prior to undertaking postgraduate study gave me a breadth of knowledge and context that I wouldn't have had otherwise."

On her return, Dr Taylor worked at the Royal Melbourne Hospital as a clinical pharmacy coordinator, spent some time as a self-employed clinical pharmacy consultant and then, in 2001, was approached to develop and evaluate a model for delivery of clinical pharmacy services in the Austin Hospital emergency department. On completion of the project, ongoing funding was secured, the model was adapted by others across the country and Dr Taylor was recognised by the profession for her work.

"It was a great honour to win an Australian Clinical Pharmacy Award in 2005 from the Society of Hospital Pharmacists of Australia for that work," she said.

Today, Dr Taylor has a senior role in the emergency and pharmacy departments at Austin Health, working as a clinical pharmacist in the emergency department, and helps coordinate a very active national network of emergency medicine pharmacists. She is also raising a young family.

Dr Taylor shares her knowledge through sessional teaching and research supervision, contributing



to improved practice in Australia. As a lecturer at Monash, she delivers sessions on emergency medicine in the faculty's Master of Clinical Pharmacy. She also supervises undergraduate and postgraduate students at the Austin Hospital.

"In the future I'd like to find a good balance between career and family, and continue in the field of emergency medicine pharmacy practice," said Dr Taylor. "It would be a real advantage to our healthcare system to have more emergency medicine pharmacists in Victoria and nationally, with improved career paths and better training, and I'm keen to contribute to that."



2010 Grimwade Prize in Industrial Chemistry

MIPS researcher Associate Professor Bernie Flynn has been awarded the 2010 Grimwade Prize in Industrial Chemistry.

Established in 1905 by the Honourable Frederick Sheppard Grimwade, a drug wholesaler and part owner of Felton Grimwade & Co, the prize recognises a high degree of originality, chemical knowledge and scientific ability.

Associate Professor Flynn received the prize for inventing the MultiCore® synthesis platform, a proprietary set of divergent synthetic methods

used in the discovery and optimisation of BNC105 (anti-cancer agent) and BNC210 (anxiolytic), both of which are undergoing clinical trials.

"Some of Australia's most outstanding chemists have received this major award during their careers," said Professor Chris Porter, Associate Dean (Research). "The award is a clear and well-deserved recognition of the quality and impact of Bernie's work."

The prize is made through the Faculty of Science, the University of Melbourne.

Exhibitions and awards for academic merit 2009

The faculty would like to thank all donors who supported the 2009 academic prizes.

	Recipients	Donated by	Prize
Bachelor of Pharmacy			
First year exhibition	Jian Hui Lew	Pharmaceutical Defence Ltd	\$500
Second year exhibition	Olivia Pellicano	Pharmacy Guild of Australia	\$500
Third year exhibition	Catherine Downey	Society of Hospital Pharmacists of Australia (Victorian branch)	\$500
Fourth year exhibition	Marianne Tran	Guild Group	\$500
Bachelor of Pharmaceutical Science			
First year exhibition	Sue Yean Tan	CSL	\$500
Second year exhibition	Michael Lee	Australian Society of Cosmetic Chemists	\$500
Third year exhibition	Briana Davie	ACCORD Australasia	\$500
Gold Medallists			
Bachelor of Pharmacy Gold Medal	Adam Shannon and Marianne Tran	Pharmaceutical Society of Australia (Victorian branch)	\$500 each
Bachelor of Pharmaceutical Science Gold Medal	Briana Davie	GlaxoSmithKline	\$500
Overall excellence			
Neil Naismith award	Adam Shannon and Marianne Tran	Therapeutic Guidelines	Subscription
Monash Pharmacy Internship prize	Hadley Bortz	Pharmaceutical Defence Ltd	\$500
Master of Wound Care prize	Siew Yeng Tang	Mölnlycke	\$500
Faculty Honours prize	Tracey Huynh and Jane Love	Symbion Pharmacy Services	\$500
Monash Jubilee Scholarship	Monika Szabo and Joan Kha Tu Ho	Monash University	Scholarship
Monash Vice-Chancellor's Honours – PhD Scholarship	Briana Davie	Monash University	Scholarship
Dean's Commendation for Doctoral Thesis Excellence	Benjamin Roberts	Faculty of Pharmacy and Pharmaceutical Sciences	Certificate
Mollie Holman Doctoral Medal	Yao-Da (Charlie) Dong	Monash University	Medal

Scholarship support for excellence

In 2010, Monash University will award more than 1000 new coursework scholarships and bursaries totalling over \$10 million.

In February, Jackson Philips and Erin Bloye began their university education with the support of Faculty of Pharmacy and Pharmaceutical Sciences Scholarships. These scholarships are for the length of their undergraduate courses and are awarded to highest achieving Year 12 students from a regional or remote area. With increased government pressure to include more rural and regional students in higher education, scholarships such as these aid academic success.

A tour of the Parkville campus of Monash University mid-2009 showed Jackson that the Bachelor of Pharmaceutical Science was for him.

"Meeting course directors confirmed that

pharmaceutical science was the direction I wanted to take," he explained. "I also liked the feel of a smaller campus."

Jackson enjoyed organic chemistry during his VCE studies and is looking forward to studying the various aspects of chemistry and biology in his pharmaceutical science course.

"The Bachelor of Pharmaceutical Science has plenty of chemistry content. I'm looking forward to trying out all the different kinds of chemistry over the next 12 months before I decide if medicinal chemistry or formulation science is for me."

Erin grew up in Wodonga, and she intends to make the most of living in college and the first year of her Bachelor of Pharmacy.

"Winning the scholarship was really unexpected," she said. "It's going to be a big help with my living expenses at college."



Biology and chemistry were Erin's favourite subjects at school. "I always knew I wanted to work in health," she said. "Pharmacy combines my passion for chemistry and biology with this interest."

Upcoming events

Retired Pharmacists group

29 June

11am–1pm

Mr Bill Suen (BPharm 1981)
Branch Director, Pharmaceutical Society of
Australia

PSA in 2010

20 July

12.15–3pm

Hon. John Delzoppo OAM

Special tour of Parliament House hosted by the
Hon. John Delzoppo OAM, with lunch in the
Parliamentary Dining Room

Cost of lunch \$19.50 per person (numbers limited)

31 August

11am–1pm

Ms Susie Shears

*Tour of the University of Melbourne's Medical
Museum hosted by Ms Susie Shears*

28 September

11am–1pm

Mr Alan Woodley (PhC 1959)

A sporting life, a healthy life

26 October

11am–1pm

Mr Dipak Sanghvi, President, Pharmacy Guild of
Australia (Vic branch)

Update from the Guild

23 November

11am–1pm

Associate Professor Louis Roller
(PhC 1963, BPharm 1969)

Christmas lunch

Reunions

The Foundation is keen to work with graduates who would like to plan and conduct a reunion during 2010. No matter when you graduated, we warmly encourage you to contact us to find out how we can support you.

For details of reunions or the Retired Pharmacists group contact Iliana Findikakis, email Iliana.findikakis@pharm.monash.edu.au or tel: +61 3 9903 9087.

2010 Professor Barry L. Reed Distinguished Lecture

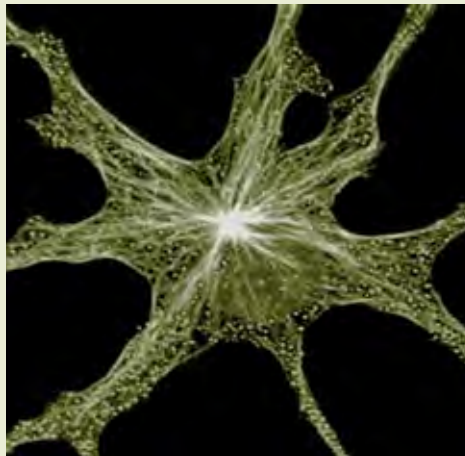
The faculty invites you to hear Dr Rodney Pearlman (BPharm 1973), biotechnology entrepreneur from San Francisco, USA speak on *Human growth hormone: pharmaceuticals, delivery, biotechnology and clinical impact.*

When: 5.30pm, Wednesday 7 July 2010

Where: Faculty of Pharmacy and Pharmaceutical Sciences, Monash University (Parkville campus)

Refreshments will be served following the lecture.

RSVP by Wednesday 30 June at
www.pharm.monash.edu.au/events
or tel: +61 3 9903 9635.



A melanophore cell; the focus of Professor Reed's impressive research career.

Alchemy, the alumni magazine of the Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, is published twice a year. The next issue is due for publication in November 2010.

The magazine is published for the faculty community, which includes alumni (both pre and post the Monash amalgamation), current and former staff, students and their families, and friends of the faculty.

To contact *Alchemy*, tel: +61 3 9903 9504, email alumni@pharm.monash.edu.au or write to *Alchemy*, Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, 381 Royal Parade, Parkville VIC 3052.



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