Biomed Benchmark
News from Biomedical Science at Monash
August 2009, Issue 8

VC says farewell and tours new buildings

On 24 June, Vice-Chancellor Professor Richard Larkins visited the School and met our talented researchers. He was accompanied by Chancellor Dr Alan Finkel; NHMRC CEO, Professor Warwick Anderson; Deputy Director of Florey Neuroscience Institutes, Professor Geoffrey Tregear; Faculty Dean, Professor Steve Wesselingh; Head of School of Biomedical Sciences, Professor Christina Mitchell; and researchers Professors Rob Pike, James Whisstock and Stephen Bottomley.

The guests toured the 'Crystal Palace', home to the largest fully-integrated crystal production facility in the world.

"The RIGAKU Crystalmation robot can deliver incredibly small volumes of protein and quickly screen thousands of samples for the growth of crystals for structural studies," says Associate Professor Matthew Wilce, Director of the Crystal Production Unit. "The results are available to researchers remotely via a web-based interface."

The $4 million instrument, which was funded by the Australian Research Council, Australian Regenerative Medicine Institute, Grollo Ruzzene Foundation and Monash University, will shortly open for business and support Monash scientists initially and external clients later.

Professor Bottomley then led guests through the Protein Production Unit. His staff produce and purify recombinant proteins for biophysical and structural studies, antibody production, and targets for vaccine trials.

With the move to the new home in building 16, the facility staff can increase production output and now purify proteins in a low-temperature environment. They will also provide a high-throughput cloning service, and express proteins in insect and mammalian cells.

The guests also met staff in buildings 76 and 77. School Infrastructure Manager Dr Isabel Roberts hosted a tour of the central administration area. The Vice-Chancellor praised the shared-services model, which he proposed for the School and actively supported. He also met with the following scientists, who discussed their research: Professor Tony Tiganis, Associate Professor Moira O'Bryan, Professor Julian Rood, Dr Dena Lyras, Dr Fasseli Coulibaly and Dr Travis Beddoe.

Following the tour, Vice-Chancellor Professor Larkins attended his farewell party, which was hosted by the Dean.

Superbug debugged

An international team of scientists led by Monash researchers have uncovered how a superbug kills hospital patients worldwide. And, in doing so, they've upturned prevailing dogma. Of the two toxic proteins produced by the bacterium *Clostridium difficile*, they have shown that toxin B, not toxin A, causes intestinal disease.

For their efforts, team leader Professor Julian Rood and lead author Dr Dena Lyras from the Department of Microbiology have had their work published in the prestigious journal *Nature*.

The research focuses on *C. difficile*, a superbug that infects hospital patients undergoing antibiotic therapy. The antibiotics destroy the 'good' bacteria in the gut and allow this 'bad' bacterium to thrive in the colon, where it triggers an immune response and chronic diarrhoea, which is difficult to treat.

In the US, more people die from *C. difficile* associated disease than all other intestinal infections combined, with most deaths involving elderly people. If this superbug invades Australian hospitals and replaces less aggressive strains here, it will seriously threaten our healthcare system.

C. difficile produces two toxic proteins, toxins A and B. In their study, the Monash team constructed genetically-engineered mutants of *C. difficile* that produced only toxin A or toxin B, which colleagues in Chicago injected into animal models.

The results showed that bugs that made toxin B still caused disease, unlike mutants that made toxin A. This disease causing protein is also detected in infected patients.

Why do these findings contradict previous studies? Dr Lyras explains: "We work with whole bacteria, which reflects what really happens in an infection, rather than working on purified toxins alone as most of our peers have done."

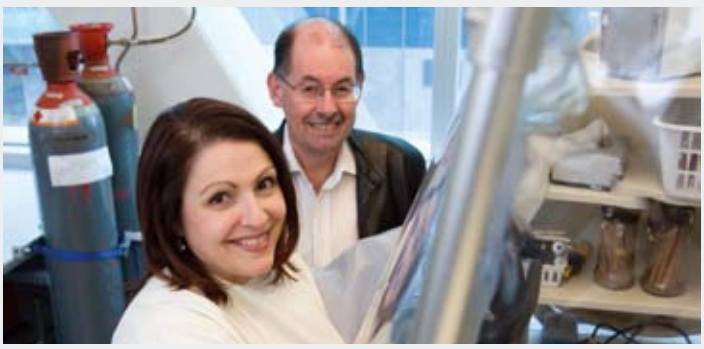
"We're one of only three labs in the world that can do these complex experiments."

Professor Rood agrees. "Taking a toxin away from the bacteria and analysing it has considerable merit," he says, "but it only tells part of the story."

"*C. difficile* diagnosis, treatment and prevention now will need to focus on toxin B."

What's next for the dynamic duo? They plan to nail how pesky *C. difficile* spores lodge in the gut and block that process — and hopefully prevent infection — a challenge they both relish.

"We work on bugs that other people think are too difficult to study, then crack their genetics and figure out how they cause disease," Professor Rood says.



Dr Dena Lyras (left) with Professor Julian Rood

Swimming for science

Zebrafish

They swim gracefully, their shimmering, striped bodies catching the light. But these zebrafish are no decoration. They are helping Monash scientists understand what happens during development and disease. And the FishCore facility where they reside is open for business.

The centre, which is managed by the Australian Regenerative Medicine Institute, is the largest of its kind in Australia. It houses 1000 fish tanks in the quarantine room and can accommodate around 5500 tanks in the main facility.

The water is also recirculated and treated with the latest filtration, sterilisation and monitoring systems to keep the fish disease-free and happy.

Professor Peter Currie, deputy director of ARMI, is a proud parent. "The facility is for everyone to utilise and take advantage of the attributes that zebrafish have, which may complement their own research," he says.

"Zebrafish breed prolifically, lay and fertilise eggs externally, and are optically transparent so you can see all the organs forming. Also, in one afternoon, you can generate all the transgenic zebrafish lines that you need from a genetically-engineered DNA construct."

In Professor Currie's case, these fish allow him to study how muscle forms normally in the embryo and in muscle diseases such as muscular dystrophy where genes are mutated. Also, with the genetic tools available, he can look at how zebrafish embryonic muscle stem cells respond to injury in real time.

"It's really amazing to see a transparent embryo growing and moving under microscope," Professor Currie says.

FishCore aquarium manager Julian Cocks. Photograph by Paul Philipson

From a practical perspective, the fish facility will allow researchers to access the latest zebrafish technologies. Scientists can either collaborate with Professor Currie's team and receive high-end technical support or use the centre independently following some training.

While the high-tech set up of the FishCore facility dazzles visitors, the stars of the show are the stunning zebrafish, growing and multiplying, swimming for science.

Drugs and stroke

Stroke is a devastating disease. In Australia, it is the second-highest cause of death after coronary heart disease and leading cause of disability. Yet there are limited treatments – other than clot-busting drugs that must be given early when stroke symptoms first strike. So the rush is on to better understand this brain disorder and minimise its impact.

PhD student Claudia McCarthy and Associate Professor Rob Widdop from the Department of Pharmacology and researchers at the University of Melbourne are closing the knowledge gap. They have shown that Angiotensin II type 2 receptor, or AT_2R, can protect the brain following a stroke, work that was published in the journal *Stroke*, and the subject of an invited presentation by Claudia to the British Hypertension Society in Cambridge.

In the landmark study, she administered molecules that inhibit or stimulate AT_2R to conscious rats five days before a stroke, and three days afterwards. They were monitored for behavioural and motor function changes throughout this period, and brain tissue was tested for abnormalities.

What did Claudia see?

"Our control animals were unable to perform motor coordination tasks 24 and 72 hours after a stroke," she says.

"However, with the AT_2R stimulation group, it's like they haven't had a stroke; there is less brain damage, behavioural symptoms were reduced, and our molecule protects neurons that would otherwise die."

"This is the first time that anyone has directly stimulated AT_2R and shown these neuroprotective effects."

Meanwhile, animals that received the AT_2R stimulator together with an AT_2R blocker fared badly on movement tasks, and sustained brain damage.

However, these rats received before and after injury doses of the beneficial molecule in the brain. What happens in real-world conditions? Claudia plans to give new AT_2R-targeting drugs, which can be given peripherally, to rats following a stroke. If this benefit is preserved, these compounds could be potentially used in the future after a stroke, or in combination with blood pressure-lowering drugs as a prevention strategy.

Time will tell if this approach is viable.

For more information:
www.strokefoundation.com.au

Ms Claudia McCarthy

Sperm tales

Mention male fertility, or sperm development casually and conversations can stop. But not for two new scientists to the School of Biomedical Sciences, who study sperm development from its early beginnings as a stem cell in the developing testis to the mature and functional cell that can fertilise an egg.

Both Associate Professors Moira O'Bryan and Kate Loveland, who arrived from Monash Institute of Medical Research, are passionate about their calling and happy to talk.

"There is a general perception that female infertility is more common than male infertility," says Associate Professor O'Bryan. "It's not. If both partners are younger than 35, the infertility rate is about the same."

"And if a man is stressed, has an infection, broken limbs, or is exposed to environmental toxins, his sperm count will plummet and could take several months to recover."

While Associate Professor O'Bryan has worked with infertile men in the clinic, these days her team can be found scanning reams of microarray-generated data. The detectives at the Department of Anatomy and Developmental Biology localise mutations to key chromosomes, then scour databases for genes that cause infertility in genetically-modified mice with either faulty sperm, or none at all.

Associate Professor Moira O'Bryan

Using this approach, the team has identified two new genes with essential roles in male fertility.

The next step is to look for the mouse infertility genes in human males. To do this, Associate Professor O'Bryan's team can search a DNA database of 3000 infertile men, selecting donors who share the same sperm abnormalities as her mice. They will then check if these infertile men also harbour the same infertility genes as their mouse counterpart.

"With this information we can not only learn how sperm are made," says Associate Professor O'Bryan, "but we may be able to tell men why they are infertile, develop diagnostic tests and perhaps design male contraceptives in the future."

Associate Professor Kate Loveland is also interested in male fertility. But her main research focus is testicular cancer, a disease where there is no cure.

The established scientist, who has a joint appointment at the Departments of Biochemistry and Molecular Biology, and Anatomy and Developmental Biology, works with male germ cells – immature sperm precursors that begin life in the fetus and mature at puberty.

These germ cells are also linked to cancer. Associate Professor Loveland explains: "They can form any cell and retain a unique capacity to turn on certain genes that is unlike most cells in our body."

These attributes allow her to study the male germ cell to reveal the cause of testicular and other cancers. In particular, Associate Professor Loveland is interested in the reproductive hormone activin and its role during testis development.

Her team discovered that genetically-modified mice which lack activin have increased numbers of sperm precursors. However, in normal mice the hormone keeps this cell population in check.

"We've identified key target genes for this pathway in the developing testis, when spermatogenesis is kick-starting," says Associate Professor Loveland.

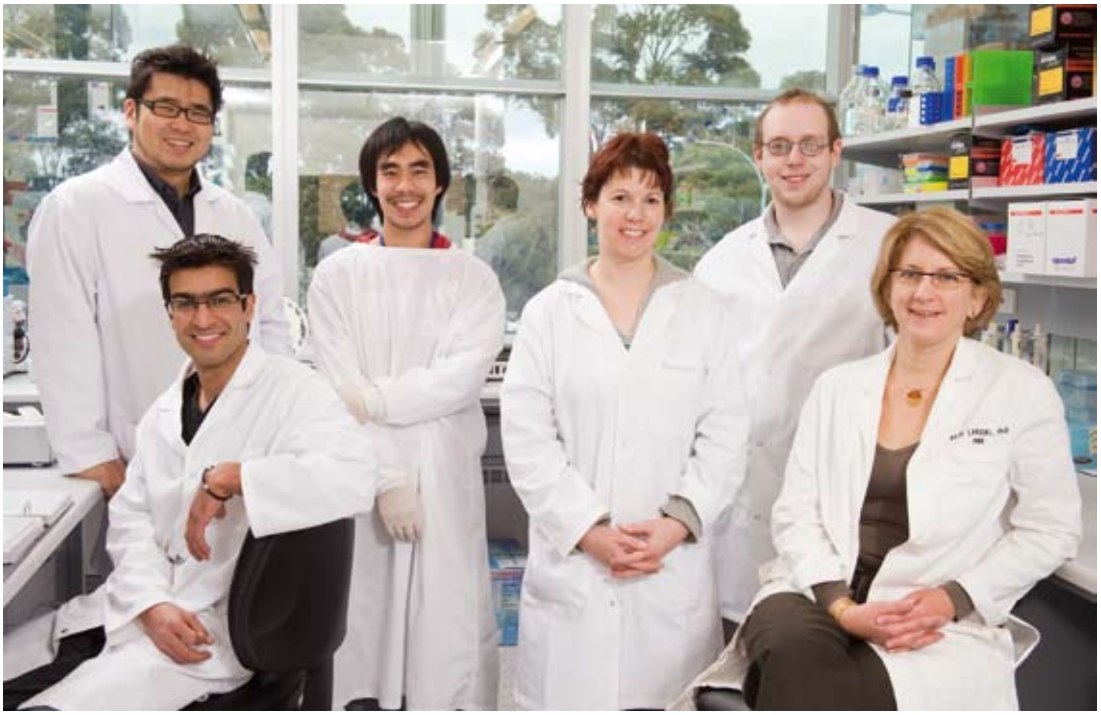
But what happens in men?

In healthy men participating in contraceptive trials, one particular activin receptor subunit is turned on when sperm development is temporarily interrupted. This also happens in the testis of men where testicular cancers are forming.

"This result is important because this particular receptor subunit allows not only activin, but some of its related family members to signal," says Associate Professor Loveland.

"We are now testing which genes that activin regulates in mice are also affected in men with diseased or dysfunctional testes. This will allow us to track the impact of this hormone in both normal development and metastatic disease."

However, the activin story doesn't end with the testis. This molecule and its partners may activate other cells, from virus-infected airways of asthmatic patients to specific blood cells in our bodies. It's Associate Professor Loveland's mission to unite research fields by revealing the common pathways by which activin works to drive key developmental switches in healthy and diseased organs.



Associate Professor Kate Loveland (far right) with her team

The fertile brain

Dr Jeremy Smith has always been interested in reproduction. He figured there were plenty of questions to answer, and infertility would remain an ongoing societal concern.

He was right. Dr Smith has spent ten years studying how hormones control reproduction, and together with Professor Iain Clarke, from the Department of Physiology, he is cementing the role of key molecules and cells in the brain that drive this complex process.

The duo have collaborated with colleagues in Scotland, the US, Spain and South Africa to highlight how a small protein called kisspeptin stimulates the reproductive system. Their work was recently published in *The Journal of Neuroscience*.

Kisspeptin acts through its receptor to stimulate brain cells that secrete gonadotropin releasing hormone, or GnRH, a chemical master switch that triggers the onset of puberty and regulates other reproductive molecules in males and females.

To prove this important function, Dr Smith and colleagues worked with inhibitors of kisspeptin. The Monash scientist administered a blocking peptide to female sheep, and showed that 'pulses' of brain and pituitary gland hormones that control reproduction were markedly reduced. Overseas colleagues showed similar effects in mice, rats and monkeys – indicating that kisspeptin plays a critical role across species.

"These data show that kisspeptin is essential for driving the reproductive system," Dr Smith says.

"However, the question that remains is what drives kisspeptin? Sex steroids, nutrition and the environment are all key candidates."

A kisspeptin inhibitor could be potentially used to suppress reproduction in the lead-up to IVF, to treat hormone-dependent cancers in men and women, and delay early-onset puberty. Second-generation kisspeptin inhibitors that can be delivered to the body as a nasal spray or skin implant rather than injected into the brain are being developed.

Professor Clarke, who has spent 30 years studying reproduction, is delighted with the research findings.

"This is the biggest advance in 20 years. It enables us to understand how the brain regulates the reproductive system."

Dr Jeremy Smith

Of insects, mice and man

Dr Fasseli Coulibaly

Take an unconventional global health research idea, apply for funding, and the chances of success are usually slim.

Enter the philanthropic Bill and Melinda Gates Foundation, which is paying 81 scientists worldwide $US 100,000 each to test bold concepts. And Dr Fasseli Coulibaly, from the Monash Department of Biochemistry and Molecular Biology, is one happy recipient.

The 34-year-old French expatriate has devoted his research career cracking the three-dimensional structures of viruses: from birnaviruses of fish and poultry to poxviruses that affect animals and humans, and baculovirus that infects insects.

"Viruses have everything I want," Dr Coulibaly says. "You can study them at the molecular level and also have an impact on public health."

Now he is translating his passion to designing low-cost vaccines against HIV and potentially other human illnesses. But rather than use conventional vaccine vectors or carriers, Dr Coulibaly will use sugar cube-like crystals, called polyhedra, from an insect virus harmless to humans to try and coax the immune system into action, and thwart the threat when it appears.

"We want to prove that these polyhedra are better than existing ways of presenting foreign molecules to the immune system. We will be comparing polyhedra containing the HIV-1 Gag protein with soluble HIV-1 Gag alone," Dr Coulibaly says.

To achieve this goal, he has partnered with Associate Professor Johnson Mak, an HIV assembly expert from the Burnet Institute, who has supplied the HIV gag gene for the vaccine. The challenge for the Monash team is to produce in insect cells a crystalline vaccine that contains enough HIV-1 Gag for testing in mice. Associate Professor Rosemary Ffrench, an immunologist, also from the Burnet Institute, will check if mice mount immune responses to the candidate vaccines.

The stakes are high but Dr Coulibaly is cautious. "It would be fantastic if we could make a promising HIV vaccine," he says. "It's challenging and it might not happen. But it is one of our long-term goals."

If Dr Coulibaly's novel vaccine is a star performer, the health applications would be extraordinary. And future funding for ongoing research would be assured. He has a year to find the answer.

Contact us - Research content

School of Biomedical Sciences, Communication Office, Ground floor, Building 77, Monash University, VIC 3800

Telephone: +61 3 9902 9407

Email: *Biomed.Communication@med.monash.edu.au*

Website: www.med.monash.edu.au/sobs

Editor and writer: Vicki Burkitt

Teaching, students and staff

New lecturer and BMS2062 convenor: Martin Stone

Associate Professor Martin Stone is a man of many talents: biochemistry lecturer, convenor of the Biomedical Sciences unit Introduction to Bioinformatics, medical researcher and key negotiator.

He has recently helped secure an infrastructure grant for Monash's first Nuclear Magnetic Resonance spectrometer. Costing 1.5 million dollars, the NMR spectrometer constitutes the largest infrastructure grant Monash University has ever received. The instrument will be particularly useful to structural biologists as it can determine the three-dimensional structure and molecular interaction of proteins.

"It will be a state-of-the-art instrument," says Associate Professor Stone. "Compared to our current equipment, the new NMR spectrometer will provide a higher sensitivity, allowing us to study molecules at lower concentrations and obtain more information about them."

Prior to coming to Monash last July, Associate Professor Stone spent 12 years at Indiana University in the US, where he studied the inflammatory response of the body to injury and infection. This response is characterised by the build up of white blood cells which are designed to remove pathogens and damaged tissue. Excessive amounts of these white blood cells can, however, cause degradation of healthy tissue. Associate Professor Stone studies the role of a small group of proteins called chemokines which are secreted by the body at the site of infection to attract white blood cells.

"There's a great deal of interest in understanding how the movement of different types of white blood cells into different locations of the body is regulated. This could potentially lead to approaches to prevent excessive allergic or inflammatory responses in diseases such as asthma or arthritis," says Associate Professor Stone.

Associate Professor Stone's ties to Monash extend beyond his research interests as his wife, Professor Julie Stout, works in the Monash School of Psychology, Psychiatry and Psychological Medicine.

"We feel extremely lucky about both getting positions at Monash at the same time, because when we moved to Indiana University, we both also got tenured faculty positions, so we thought we'd used up all our luck," says Associate Professor Stone.

Associate Professor Stone says the greatest consideration in making the move was how his 9 and 11 year-old girls would settle in.

"There's been a lot of readjustment, but overall I think it's been a good experience for them. Melbourne is a great city, I have family here, and the quality of research at Monash and in Australia is world class. So, it's been a very positive experience."

Martin Stone

Phillip Nagley: New Director of Education

Professor Phillip Nagley is the newly appointed SOBS Director of Education. He will oversee the establishment of a Biomedical Education Advancement Unit, (BEAU), which will focus on excellence in teaching as well as promoting staff development in the field of biomedical education.

Integral to the framework provided by BEAU for education in the School is the SOBS Education Committee which meets regularly in strategic planning and policy development across all aspects of teaching and learning in the School. Chair of the SOBS Education Committee since 2006, Professor Nagley is thrilled that education is gaining prominence within the School.

"Everybody's very excited about BEAU because it will bring education to the forefront of this faculty's activities in a much more tangible way, and give more prominence to biomedical science and related courses within the university."

Professor Nagley and staff in BEAU will work across a range of fronts in a series of special projects that include the integration of Bioscience educators at Peninsula campus into the staffing structure of SOBS, interactions with Monash College concerning the Diploma of Health Science (providing alternative entry for international fee-paying students into the Biomedical Science course), further development of the existing twinning program between Biomedical Science at Monash and the Republic Polytechnic in Singapore, and for the teaching of biomedical science units at other offshore locations.

"These are all stakeholders in the educational activities of the school," says Professor Nagley. "We're trying to enhance the effectiveness of those interactions by oversight and facilitation of those programs at a School level, with a strong emphasis on maintaining the high quality of teaching and learning in which SOBS has established its reputation".

Biomedical Science students at Monash Clayton will benefit from this development in a number of ways. The quality of teaching programs will be ensured and BEAU will advocate for the improvement of teaching spaces and resources on the Clayton campus. The vision is for an educational precinct on the Clayton campus which will house BEAU's facilities, provide good teaching spaces and common areas where students can study and interact informally. A further space within the new research laboratory buildings will provide an opportunity for high achieving students to interact with research staff. A modern student services area for biomedical science students is also a part of the vision.

"The establishment of BEAU has opened up these possibilities," says Professor Nagley. "Its joint emphasis on student learning and maximising opportunities for staff leading the teaching programs will provide a firm foundation for making Monash the top University for Biomedical Education in Australia".

Phillip Nagley

MIA Victoria signs a deal with School department

In April, the Victorian branch of Medical Imaging Australia (MIA) signed a Memorandum of Understanding with the Department of Medical Imaging and Radiation Sciences, which will build on the strong partnership between industry and academia.

MIA will fund for three years the development of a graduate entry program in Medical Ultrasound, which will mirror the existing format of the Department's graduate entry programs in Radiation Therapy and Nuclear Medicine. The diagnostic imaging company will also increase the number of radiography training places, provide up to ten clinical ultrasound training positions and encourage staff to apply for adjunct teaching positions.

"We look forward to bringing to fruition the aims and aspirations expressed in the MOU and working closely with MIA for the benefit of students and patients," says Associate Professor Marilyn Baird, Head of the Department of Medical Imaging and Radiation Sciences.

"We look forward to bringing to fruition the aims and aspirations expressed in the MOU and working closely with MIA for the benefit of students and patients."

Left to right: Mr Paul Lombardo, Course Convenor for Master of Medical Ultrasound; Mr Rod Roncari, General Manager of MIA Victoria; Associate Professor Marilyn Baird, Head, Department of Medical Imaging and Radiation Sciences; and Mr Glenn Rush, Practice Group Manager MIA Victoria Central Region

Transition activities for Biomedical Science students

Around 150 first-year Biomedical Science students attended the transition program in February.

They enjoyed a fun-packed day of activities with second and third-year students supporting the group. This included a "speed dating" session for students to meet new peers in a relaxed environment.

The orientation program is run each year to help the first-year students form new friendships, meet senior students, interact with teaching staff, and find their way around the Clayton campus before classes begin. Lecturer Dr Janet Macaulay co-organised the event with third-year Biomedical Science students Whui Lyn and Matthew Lam.

The first-year students enjoyed interacting with the senior student leaders and the opportunity to meet their peers. Hopefully, some of the participants will become Transition leaders in next year's program.

Speed dating in the Buffet room

Traffic jam activity

Winners of the 'Best Film' competition

Orientation activity

Colleen D'Arcy: Mixing medicine and research

Colleen D'Arcy

As the first student to simultaneously complete a Bachelor of Medicine /Surgery (MBBS) and a PhD in Biochemistry, Colleen D'Arcy is a trailblazer.

The origin of Colleen's unique course began while she completed an optional Bachelor of Medical Science research project in the fourth year of her medical degree. She worked at the Alfred Hospital's Department of Anatomical Pathology under the supervision of Professor Catriona McClean, and studied paediatric inflammatory muscle disorders. When Colleen returned to her medical degree her enthusiasm for laboratory research lingered.

"I went back to med for six months, and although I enjoyed studying clinical medicine in the hospital, I missed the research and lab environment," Colleen says.

"So I asked if I could keep doing some research on the side and Professor Ben Canny, Deputy Dean, MBBS Curriculum, suggested that I should begin a PhD thesis.".

Following some administrative hurdles Colleen began her PhD under the joint supervision of Professors Catriona McClean and Christina Mitchell, Head of School of Biomedical Sciences.

"There was no precedent or paperwork in place; there wasn't even a MBBS/PhD course code, because by law, you cannot be simultaneously enrolled in both at the same time," Colleen says.

"Medicine and PhD are different courses that I'm trying to do concurrently. However, my timetable is designed so that I am never doing both at once. I have to defer and reenrol between medicine and the PhD every year, depending on the progress of my studies. It's not ideal because there are times when I have lab work to complete when I'm enrolled in medicine, and vice-versa.

"But clinicians do research while they're practising or completing specialty training, so I don't see my situation as being any different."

Although Colleen had some lab experience during her honours year, the transition to, as she says, "hardcore molecular lab work", was a challenge.

"I felt like quitting after the first few weeks because I felt incompetent and ignorant. I thought, 'I don't know how to genotype mice or run a luciferase assay,' [while] others in the lab did because they'd done it in their biomedical Honours year or as an undergrad student. So it was frustrating for me at first, learning and trying to apply my new skills at the same time. Now that I'm more competent I can look back and say, 'it wasn't so bad.'"

For her PhD, Colleen studies the role of a novel protein called FHL1, which promotes skeletal muscle growth and increased muscle strength in muscular dystrophies.

"We have a mouse model of Duchenne muscular dystrophy, a genetic disease which causes muscle degeneration and wasting, and there are no effective treatments or cure," Colleen says

"I'm looking at whether FHL1 can improve the disease by rescuing the muscular dystrophy phenotype."

While temporarily postponing her medical career, Colleen hopes her PhD will help her when she applies for specialisation training in pathology.

"[Pathology interests me as it combines my interests in medicine and research]. Pathologists need a broad-based knowledge and understanding of many diseases and pathology also involves lab work, so there is scope to pursue research. So that's where I'm hopefully heading," Colleen says.

Now after recently completing her PhD confirmation, Colleen is keen to acknowledge the open-mindedness shown by Monash in allowing her to attempt the combined MBBS/PhD degree.

"It's good that Monash and the Medical Faculty allows students to extend themselves if they have the ability and desire to learn and do more than what is outlined in a standard course curriculum. The emphasis is on trying to let students develop themselves, which hopefully will encourage more students to complete combined or postgraduate research degrees."

> "Medicine and PhD are different courses that I'm trying to do concurrently."

New practical class in cardiovascular physiology

First semester 2009 saw the introduction of a new practical class in cardiovascular physiology, which will replace an animal laboratory class.

An instrument called the Finapress system allows students to measure their heart rate, blood pressure and cardiac output via a finger pressure cuff, and then analyse the recorded data. The Office of the Deputy Vice-Chancellor (Education), funded the purchase of ten Finapress recording systems, each costing about $33,000.

The new practical class was trialled by third-year physiology students, who enjoyed using the new instruments. They appreciated the immediacy of the recordings and the interactive nature of the equipment, which improved their understanding of cardiovascular physiology. Students could see biological variability within and between subjects, and better understand the sources of experimental variation when collecting cardiovascular data. All students said that they would recommend the new equipment to their peers. They also used the instruments in their research projects later in the semester.

Academic staff will assess whether the new Finapress system can also be used by second-year science and medicine students as part of their laboratory training and education in cardiovascular physiology.

Students and staff using the new Finapress equipment

New teaching lab space

This year saw the opening of a new teaching laboratory in Building 16, the first new development of its type for the School of Biomedical Sciences at Clayton in over 30 years.

With the completion of buildings 76 and 77 for research, the Faculty is now turning its attention to the provision of modern and flexible teaching spaces for students studying Biomedical Science.

Immunology was the first department to use the new facility, moving teaching from the Alfred Hospital campus to the new laboratory in first semester this year. The laboratories were used by third year Immunology students. In second semester, Developmental Biology will also use the laboratory for its practical classes.

It is envisaged that the laboratory will be used by other departments for wet laboratory teaching in disciplines such as biochemistry, molecular biology and human pathology.

Building 16 Laboratory – pre-practical briefing

Building 16 Laboratory – post-prac tutorial

Sharon Ricardo: Building bodies and minds

On the surface, the disciplines of medical research and body building might not seem to have much in common.

Lifting weights and peering through microscopes aren't usually thought of as related activities, even though they both take the body as their subject of interest. However, in the spirit of good science Associate Professor Sharon Ricardo hasn't let an outdated concept hinder her from becoming a successful amateur body builder and a leading scientist in the field of stem cell research.

A group leader at the Monash Immunology and Stem Cell Laboratories, Associate Professor Ricardo says her interest in both science and body building originated from a lifelong fascination with human anatomy.

"I've been surrounded by bodies my whole life, from my PhD in the Anatomy Department at the University of Melbourne to my appointment at Monash in 2000," she says.

"I've always had a fascination with human anatomy and musculature. In body building it's an art to know how one muscle works against another and how you can actually sculpt that muscle."

Associate Professor Ricardo has found that body building shares many of the motivational and leadership skills required to supervise her research lab.

"In body building, the key is learning what motivates a person to achieve their goals, because everyone's different. This is the same with my PhD students. How can we get them to be motivated about the research project and remain focused for three years to complete their PhD?"

It is this emphasis on self-discipline which originally attracted Associate Professor Ricardo to body building,

"I've always [enjoyed] mentally disciplined exercise. I used to do classical ballet and while I was doing my post-doctorate at Penn State University in the US, I was in a dance conservatory. So I've always needed something physical to balance my intellectual work," she says.

In April 2008, Associate Professor Ricardo came second in a national amateur body building association competition.

Sharon Ricardo

Associate Professor Ricardo explains: "For me it's less about my placing and more about achieving my own goals. It's a journey of mental and physical discipline; that's an achievement in itself."

Associate Professor Ricardo is continually building up to the next competition. Far from being a burden, the petite dynamo says that the structured nature of her lifestyle is the thing that helps her maintain it.

"If I didn't have body building I don't think I'd have the energy to work full-time and have a family at home. I need the mental discipline and structure that body building provides as an outlet and for balance."

Contact us - Student and teaching content

School of Biomedical Sciences, Ground floor, Building 13C, Monash University, VIC 3800
Telephone: +61 3 9905 9713
Email: *Yvonne.Hodgson@med.monash.edu.au*
Editor and writer: Dr Yvonne Hodgson
Writer: Thomas Dillane