

THE INSIDE STORY *Issue 32, June 2017*

In this issue ...

- we catch up with some of our students - past and present - and find out what wonderful things they are doing;
- we reveal the amazing muscle-man and;
- share some tips on how to apply for impairment in internal assessments and final exams.

A happy graduation!



Alumni - where are you now?

We've had some great feedback from our Alumni who are scattered around the country and around the world, but we still want to hear from you!

Whatever you are doing we'd like to know where you are, what you are doing, and how you got there.

Get in touch with us anatomy@otago.ac.nz, and update your details on the University's Alumni page ... <http://www.otago.ac.nz/alumni/index.html>

The Department shared in the celebrations of its graduates at the recent University of Otago May graduation ceremony. It was a small but excited group of Anatomy graduands who gathered in the Department to mark the occasion.

Graduation is a special time, a milestone event for all our students, their friends, whānau, and the staff who have educated and supported them. It represents formal recognition from the University of their hard work (and that of their support people!), and marks the beginning of a host of new and exciting journeys.

The happy group pictured are (L to R):

Back row: Dr Joanna Williams; Maddie Kyrke-Smith (PhD)

Middle row: Professor Hallie Buckley; Monica Tromp (PhD); Zsuzsanna Barad (PhD); Professor Lisa Matisoo-Smith

Front row: Professor Neil Gemmell; Savana Woodcock (BSc); Andrea Du Toit (BSc); Olivia Buchanan (BBiomedSc).

Postgraduate research opportunities

The Department of Anatomy is offering a number of exciting research opportunities for ambitious research students to undertake PhD study in the Department. We provide an environment that allows students to undertake research into globally relevant questions under the supervision of internationally recognised scientists, and in a diverse and vibrant postgraduate environment.

Enthusiastic and suitably qualified students are encouraged to apply. PhD scholarships may also be available.

Research projects offered are:

- The role of prolactin in the onset of paternal behaviour
- Clinical anatomy of peripheral nerve blockade
- Neuronal adaptation in the hypothalamus
- Keratin composite hydrogel for dento-pulpal regeneration
- The molecular genetics of parasitic mind control
- Population genomics of the New Zealand lamprey
- Hip joint neuromechanics - on the influence of the capsule in hip pathology
- Experimental biomechanics in musculoskeletal trauma orthopaedic surgery
- Evolution of the New Zealand bird fauna
- Evaluating marine biodiversity in New Zealand
- The role of prolactin receptors in the paraventricular nucleus in driving increased food intake and leptin resistance during pregnancy
- The molecular and cellular basis of childhood absence epilepsy
- Changes in the expression of receptors and other proteins at synapses in normal and diseased brain
- Cerebrovascular dysfunction in Alzheimer's disease
- The urea cycle in neurodegenerative disorders
- A whole new body in only 8 days
- Dynamics of hormone transport into the brain during pregnancy

The closing date for application is midnight, Sunday, 18 June 2017 (NZ time).

More information and application details are available on the Department's website ... otago.ac.nz/anatomy/study/postgraduate/opportunities

Biological Anthropology

Unearthing our journey



Neuroscience

Discovering how we think, feel and do



Clinical Anatomy

Understanding how we work



Reproduction, Genomics and Development

Exploring how we all begin

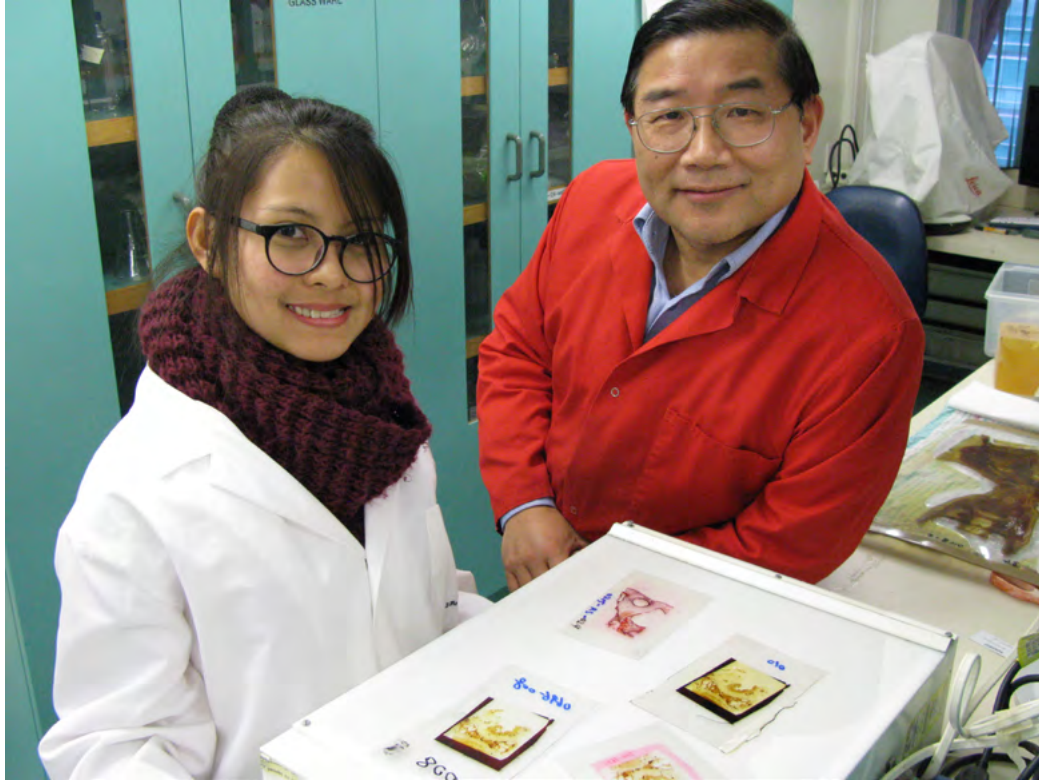


Honours research work published in American journal

Ground breaking research undertaken by Anatomy BSc(Hons) (First Class) graduate Miss Mikee Liugan has been published in the prestigious *American Journal of Ophthalmology*.

Using ultrathin epoxy sheet plastination and confocal microscopy imaging, Mikee's research has been able to clearly reveal the configuration of fibrous structures within the optic canal. These structures have previously been difficult to show through normal dissection methods as the soft tissues (meninges, nerves, and vessels) found in the narrow bony canal are difficult to dissect without causing damage.

However, by using sheet plastination in combination with various staining techniques, the configuration of the fibrous structures hidden within the optic canal have been preserved *in situ*, showing their relationship with the optic nerve, intracranial subarachnoid space, and ophthalmic artery. The structures were then examined under a stereoscope and confocal microscope.



Above: Mikee Liugan and Dr Ming Zhang view some of the ultrathin plastinations produced during the study.

subarachnoid space between the intracranial cavity and the optic nerve sheath was significantly reduced.

These findings challenge a classical opthalmic concept that the eye provides a possible window into the pressure changes in the intracranial compartment because the space of the optic nerve sheath is a continuation of the subarachnoid space and its pressure is equal to intracranial pressure.

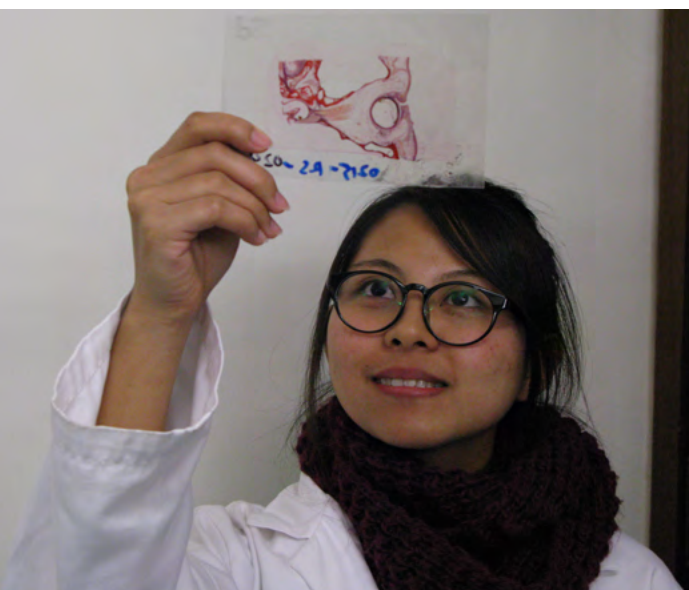
Mikee is currently studying for a Masters degree at the University of Otago. Dr Ming Zhang (Department of Anatomy) and Dr Zhaoyang Xu (Anhui Medical University, China) were co-authors of this paper.

The *American Journal of Ophthalmology* is ranked 3rd out of 109 Ophthalmology journals with a impact rating of 4.069.

Visit the journal to read the full text of this paper. ([http://www.ajo.com/article/S0002-9394\(17\)30172-1/fulltext](http://www.ajo.com/article/S0002-9394(17)30172-1/fulltext))

[Full reference: Liugan M., Xu Z. and Zhang M. Reduced free communication of the subarachnoid space within the optic canal in the human. *American Journal of Ophthalmology* 179:25-31 (2017)]

The study identified and traced the fibrous components within the optic canal and revealed their nature, architecture, and relationship with surroundings and concluded that in the human, free communication of the



A quick-step guide to plastination

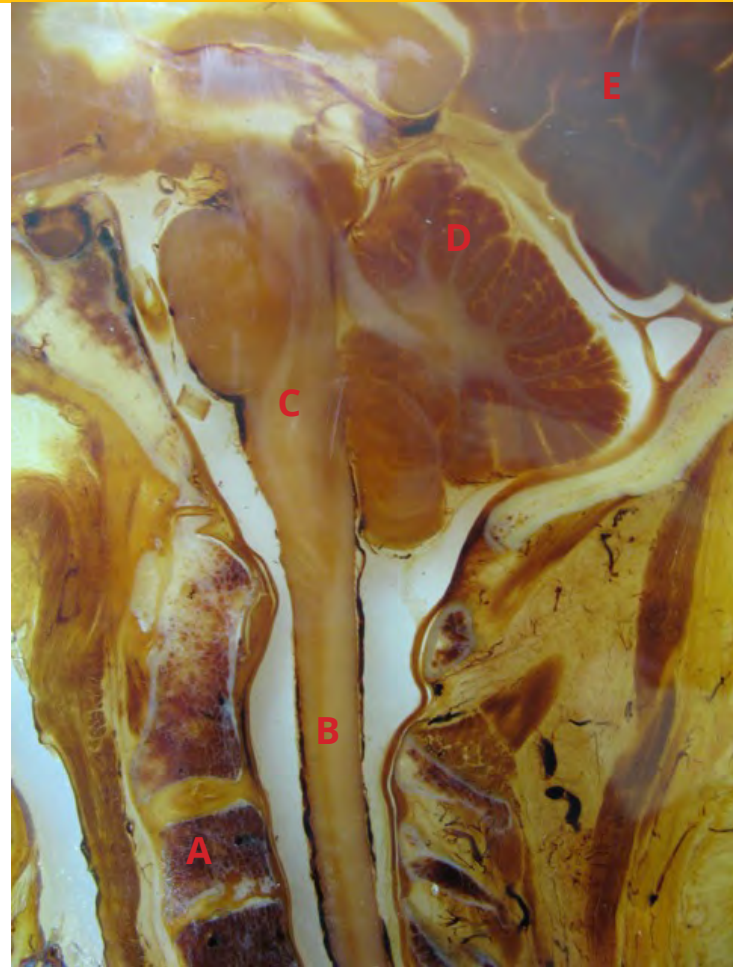
Plastination is a process where fluids are removed from a specimen and replaced with a curable polymer. The technique was invented by German anatomist Dr Gunther von Hagens in 1978.

The innovative (late) Mr Russell Barnett, Anatomy Museum preparator in the Department of Anatomy from 1979-2007, recognised the potential for plastinated material to be used in teaching and research. He set up plastination facilities in the Department, and by 1982 had produced the first batch of silicone specimens which are still in use today.

The basic steps remain the same. Current Anatomy prosector, Marlene Black, provided the following step-by-step guide to plastinating:

1. Dehydration of the specimen - We use acetone and carry this out at -25 degrees to reduce shrinkage.
2. Degreasing - Once the water is removed we remove the lipids/fat with acetone at room temperature (this process takes much longer in our winter months!).
3. Impregnation - Under vacuum, the acetone is removed and replaced with the polymer.
4. Curing - Specimens are cured according to the polymer used e.g. silicone with a gas, epoxy resin with heat, polyester with UV light.

The applications of plastination are many and varied. The dry, odourless and easy to handle specimens complement the "wet" specimens for teaching, and in research the epoxy resin slices



Above: This epoxy sheet plastination shows the vertebral column (A), spinal cord (B), brain stem (C), and cerebellum (D). A portion of the brain (cerebrum) is shown at E.

provide a detailed and accurate representation of structures in situ, enabling correlation with radiology, microscopy and histology specimens.

Anatomy Thanksgiving Service

The Dunedin Centre, Wednesday 20 September, 7pm



The Department will be holding its annual Thanksgiving Service in Dunedin on the evening of **Wednesday 20 September**, and we are looking for Anatomy students to take part as readers, musicians, singers, and ushers.

The service will be held in the Glenroy Auditorium, at the Dunedin Centre. It is an opportunity for students who have had the privilege of studying anatomy using human material to express their thanks and gratitude to the families and friends of those who so generously donated their body to the Department.

If you would like to play a part in this very touching service, please contact Kathryn McClea at anatomy@otago.ac.nz, telephone 0800 580 500 or pop into the Anatomy office to have a chat.

Exchange to Edinburgh 'the best decision ever!'



Allie Tonks swapped one Dun-Edin for another when she spent the last semester of her BSc degree on a Global Student Exchange at the University of Edinburgh in Scotland. (Dunedin is the Gaelic form of Edinburgh, and the city was named by the first Scottish settlers who settled in Otago.)

Although it took a bit of organising, she says it was the best decision she ever made at University.

"A lot of people don't realise this opportunity is open to them" she says. "It took a lot of meetings, and some plan B's, and C's, but the staff worked with me to make it happen."

Allie spent her final semester of her third year at the University of Edinburgh studying mechanisms of brain development, clinical biochemistry, and endocrinology and physiology.

"My major at Otago was in Anatomy and Neuroscience, so I used this opportunity to find subjects diverse to what Otago offered, and to build on what I had already learned here at Otago."

"Edinburgh has a particularly strong history in anatomical teaching, and is a fantastic University, so I consider my time there to have been hugely valuable both academically and personally."

She enjoyed every aspect of her time spent there, and says that making so many life-long friends from Scotland and around the world has been a special highlight. She says the University had

a very refreshing and innovative culture. Teaching methods were varied and students were encouraged to spend time away from the lecture theatre to travel, gain diverse experiences or join clubs!

Enjoyment was a big factor in Allie's decision to major in Anatomy and Neuroscience at the University of Otago. *"I knew that a Bachelor of Science would provide me with a range of important skills such as critical analysis, presentation, and research, no matter which major I selected. With those skills secured, it was important to me to choose subjects I was truly fascinated by."*

"When things get stressful, you need to have a love of learning and passion to keep you motivated, and that's what Anatomy and Neuroscience gave me. I loved how flexible both majors were compared to other subjects. Throughout my degree I took papers in chemistry, psychology, reproduction, zoology, physiology, biochemistry, statistics, and more!"

For Allie, the opportunity to learn anatomy using real anatomical material at third year was an incredible learning experience, and she appreciated that each aspect of anatomy was so strongly represented in the papers offered.

"My favourite papers were Functional Anatomy and Reproductive Biology. Although these were very different subjects, they had such obvious individual strengths including great labs and experiments

offered in reproduction, and unique seminar-style lectures in musculoskeletal anatomy."

Having completed her BSc, Allie has now been offered a place on the Masters of Diagnostic Radiography programme at Queen Margaret University in Edinburgh.

Her advice to anyone trying to decide what course of study to take at University is to consider where their passions lie. *"If you are going to spend three years dedicated to a subject, it should be something you genuinely enjoy. It is hard to truly know which subjects are right for you until you get a taste of them, so choose a major that offers you flexibility and range, but most of all, stay true to what you want."*

Information about the Otago Global Student Exchange is available on the University of Otago website. <http://www.otago.ac.nz/study/studentexchange/>

What do I do on a snow day?



You've woken up and your flat feels colder than normal. You jump out of bed, tip toe across the floor and draw back the curtains to reveal the beautiful sight of snow falling from the sky. Of course your first thought is "Snow fight!" And who can blame you. But hopefully your second thought is "What about my Anatomy class?"

Should bad weather hit Dunedin during the coming winter months, the Department will advise all students via your student email, whether teaching will take place, be postponed, or be cancelled. Notices will also be posted on the Anatomy Student website, Med Moodle, or Blackboard.

Where a lecture is held on an affected day but some students cannot attend and their non-attendance is legitimate due to the adverse weather conditions, the Lecturer will make suitable arrangements for absent students to receive all course material relevant to the missed lecture.

We are a hardy bunch here in the Department. Unless you are notified otherwise, it is safe to assume it will be classes as usual. If you are ever in doubt, your first step is to check your email messages and the Anatomy Student website.



Semester 2 course advising

If you would like to have a chat with someone about your semester 2 paper options, or just want to have a general chat about your degree options, please contact us via the anat.evision@otago.ac.nz email address. We can provide advice via email or arrange a telephone call, a Skype session or meet you in person if you are in Dunedin.

Remember, the key to planning your degree is to include papers that you enjoy, either as a major, minor or even as general interest papers. If you plan a degree that consists of papers you feel engaged with - and make the most of the flexibility that many degrees like Anatomy offer - you are much more likely to complete your degree in a timely manner. Most of all, you will enjoy the journey as you complete it!



Amazing muscle-man a hit at open day

PhD student Josh Houlton, aka "the amazing painted muscle-man", was a hit at the recent University of Otago Tertiary Information Day. Braving the cool temperatures on a rather 'brisk' Dunedin day, Josh was a willing and jovial canvas for artist and anatomist Dr Louisa Baillie who used body paints to illustrate the bones and major muscle groups of the upper limb and torso.

Tertiary Information Day is an opportunity for Year 12 and 13 students from secondary schools around Otago, Southland, Canterbury, and further afield, to spend the day at the University, visiting departments, attending presentations and just generally getting to feel what University life is all about on a busy tertiary campus.

Over one hundred secondary students, parents and teachers attended the Anatomy presentation held in the W.D. Trotter Anatomy Museum where Associate Professor Christine Jasoni talked about the different paper options offered by the Department, and the career opportunities available to those who have a degree in Anatomy.



PhD student Josh Houlton shows us what he is made up of (above), with Dr Louisa Baillie (left) and in the W.D. Trotter Anatomy Museum (below).

The group then had the opportunity to wander around the Anatomy Museum and talk with staff and postgraduate students.

But it is fair to say it was the amazing painted muscle-man who made the biggest impression and perhaps even stole a few hearts!



Teaching Anatomy in Samoa

Associate Professor George Dias recently spent two weeks at the National University of Samoa (NUS) teaching anatomy. His visit was part of the ongoing development of the undergraduate medical programme at the University.

George is a member of the University of Otago Advisory Group to the NUS Faculty of Medicine. His visit involved mentoring Faculty of Medicine staff, and lecturing to first, second and third year medical students.

His teaching followed the NUS medical curriculum, focusing on head and neck clinical anatomy for the first and second year students, and surgical anatomy in relation to ENT for the third year students.

This was George's second visit to the University. In 2016 he spent a week in Samoa with the medical students. That visit was so successful, the Faculty asked him to come back this year to spend two full weeks with the students and staff.

The Faculty of Medicine at NUS was established in 2014, and the Bachelor of Medicine and Bachelor of Surgery (MBBS) programme was officially launched in 2015. The six year programme aims to graduate doctors with the skills and knowledge to practice medicine professionally and effectively in Samoa and the Pacific.

The intake of students is relatively small, with approximately 10 - 12 students studying each year.

The University of Otago has a commitment to support teaching in the Pacific, as part of its Pacific Strategic Framework.

The Department of Anatomy has a strong relationship with medical schools in the Pacific. Professor Hallie Buckley has previously visited the National University of Samoa, and Dr Latika Samalia and a team from the Department visited the Umanand Prasad School of Medicine in Lautoka, Fiji in 2013, and the Fiji National University College of Medicine (Suva) in 2012.



Above: Assoc Prof George Dias (left of centre) with medical students of the National University of Samoa (NUS).

Below: Assoc Prof George Dias with faculty staff members of the NUS, and the medical students.



ALUMNI PROFILE...

George Connolly, BSc

Talking to postgraduate students about their research fostered George's passion to learn more about Anatomy.



"I want to contribute a piece to the puzzle"

When he began his undergraduate studies at the University of Otago, George knew he wanted to study a subject in the medical sciences. He just didn't know which one. So he immersed himself in the Health Science First Year programme, and after completing the two Human Biology Systems papers (HUBS191 & HUBS192) he found it was an easy decision to major in Anatomy.

To George, Anatomy stood out from the other science subjects. The scope of topics taught in the Department really appealed to him.

"Anatomy is more than just the names of structures. It incorporates different disciplines. The inter-disciplinary approach to studying biology in both health and disease really appealed to me, along with the quality of the lecturers and the opportunity to study reproductive and developmental topics which are touched on very little in other departments."

George particularly enjoyed the hands-on experience of undertaking experiments in 300-level practical labs, and understanding how experimental science actually works.

He says the calibre of the teaching staff, along with talking to postgraduate student demonstrators about their own research, fostered his passion for Anatomy and contributed significantly to his decision to continue into postgraduate research.

"For the past three years I have been learning about anatomy and learning how to use scientific techniques and now I want to apply these skills and contribute a piece to the puzzle."

To gain more hands-on experience before beginning his Honours research, he completed a summer research scholarship in the Department, something which he says was an invaluable learning experience.

For his Honours project he will be using DREADDs, a new form of technology which enables the activity of specific neurons to be selectively manipulated, to investigate the role of metabolically-involved AgRP neurons in fertility.

How's that for an exciting step-up from studying first year biology!

Life as a fourth year student ...



Maddie McIntyre Wilson is a 4th year Honours student. After completing a double degree at Victoria University, she has come to Otago to complete a research year studying Biological Anthropology. Here, we spend five minutes with Maddie, finding out how she developed her love for science, why she came to Otago to study, and how she has settled in to life as a postgraduate student.

What interested you in pursuing an Honours degree at Otago?

I completed a Bachelor of Biomedical Science (majoring in Molecular Pathology and Human Genetics) and a Bachelor of Arts (majoring in Cultural Anthropology) at Victoria University and, as part of that degree, completed a six-month exchange at McMaster University in Hamilton, Ontario. McMaster offered several courses in Biological Anthropology – two of which I took – and this introduced me to the field. I saw biological anthropology as a perfect combination of my two interests and became determined to pursue it in my postgraduate study. Both Auckland and Otago offer postgraduate courses in BioAnth but I found my interests lay more in the work being undertaken by Professor Lisa Matisoo-Smith and Dr Michael Knapp from Otago's Anatomy Department (also, who wants to live in Auckland??).

When you were a first or second year student, what did you think you would end up doing at the end of your degree? Was research always in your focus?

Growing up I never thought I would study science at all. I struggled with maths and wanted to be a writer. When I was sixteen my school sponsored me to go on an Outward Bound Leadership course at Anakiwa. We had to complete a 2-day hike and I was partnered with a young man who had cystic fibrosis. Half way through the first day his health started deteriorating and by the time we set up camp for the night he was in a bad state. The weather was pretty terrible and our guide was unable to call a helicopter to come and get him. I spent the night sitting up with him, giving him water and Powerade, and by the

time they managed to airlift him out the next day I knew that something had changed for me. I had watched my friend suffer and had been unable to do anything about it. I didn't want to feel that helpless ever again. I went back to school the following year, as a Year 13, and voluntarily enrolled in Year 12 science subjects. It was a struggle for me at first. I was used to getting good grades in my arts subjects and science, particularly physics, didn't come naturally to me.

I started studying life sciences at Victoria with the intention of applying for a medical school program as a postgraduate. So, if you had asked me in my first or second year what I thought I would have ended up doing, I would have said medicine. My third year, and my exchange to Canada, changed my perspective again. While I still wanted to help people, and had grown to love the sciences which I had originally found so hard, I began to see that medicine wasn't my only option and that research, particularly that which combined the social and biological sciences, was something that I loved. I decided to give myself a year to experience research as a postgraduate and see what it had to offer instead of immediately applying to medical school. I'll let you know how it turns out!

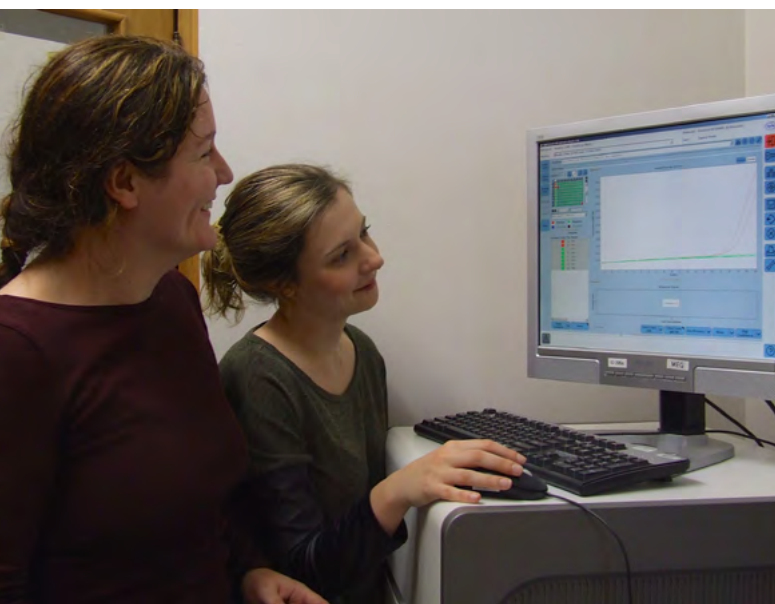
Dr Michael Knapp is your Supervisor. How did you decide what area/supervisor you wanted to work in/with?

When I was researching the different Biological Anthropology postgraduate programs offered in New Zealand I sent out a couple of general emails to the postgraduate administrators for those programs. Otago was the first to reply. They mentioned

that because I was interested in biological anthropology, but also loved genetics and microbiology, my research interests would be compatible with Michael's broad scope of expertise which includes conservation genetics, zoology and biological anthropology.

What is your Honours research project about?

I am undertaking a project as part of the Department's wider 'Tuberculosis (TB) in New Zealand' project. There have been recent implications in the literature that pre-colonial indigenous populations may have contracted TB from close contact with pinnipeds – that is, members of the seal and seal lion family. It has been proposed that this strain of 'seal TB' (*Mycobacterium pinnipedii*) was less virulent in indigenous populations than the strains brought over by Columbian colonialists (*Mycobacterium tuberculosis* and *Mycobacterium bovis*) and so was rapidly displaced after the Columbian settlement of the Americas. So far this hypothesis has only been tested using the ancient remains of South American native populations but the discovery by Professor Hallie Buckley and her team of pre-European Māori remains from Wairau Bar with TB-like lesions suggests that New Zealand may prove to have a similar bioarcheological history of TB.



Maddie and Christy Rand view research data on the LightCycler machine

In order to test this hypothesis several different steps need to be taken – including the extraction and phylotyping of modern strains of *M. pinnipedii* in order to construct a phylogenetic tree of modern strains to compare with any ancient strains that might be identified.

We are lucky here in Otago to have access to a very large collection of Southern Hemisphere and New Zealand fur seal samples collected by Professor Neil Gemmell and his team in the early 1990s for population studies. While these studies were not carried out with TB in mind, there is a small chance that some of the samples (superficial biopsy samples of fur, skin and blubber) might have TB DNA within them – particularly if the animal sampled was ill enough to have superficial TB lesions.

This year I am taking a sample of the Southern Hemisphere samples (there really are a lot of them) and testing them for the presence of *M. pinnipedii* DNA using qPCR and two different strain-specific probes. My objectives are to assess the viability of these samples as a potential source of modern *M. pinnipedii* in southern hemispheric seals and to determine how this technique could be improved to increase DNA yield (if we successfully identify TB) or to detect TB DNA in the first place (if we don't find anything).

Are you using any techniques you learnt in your undergraduate studies?

Absolutely. I am working under the supervision of Christy Rand in Dr Jo Stanton's lab and I am on my way to becoming the New Zealand's Next Top qPCR Queen (I have pipetting callouses to show for it). Funnily enough the most important technique I've used so far is my ability to read critically and quickly. My project has the potential to be more literature-heavy than other Honours projects in the Department and being able to determine whether a paper is going to be useful or not within a short time frame has been very helpful.

How have you settled into life as a postgrad?

Choosing to study postgrad down here in Dunedin has been one of the best decisions I've ever made. The University as a whole has just blown me away – its facilities, administrative staff (shout out to the Enrolments Office and Annette in Anatomy's reception) and positive attitude towards students and learning are incredible. I'm not sure whether it was more the change of university/city or the change from undergrad to postgrad but I've gone from feeling like a tax payer's burden to thinking that I might actually be a valuable, contributing member of society. Everyone has been very welcoming in the Anatomy Department and it has really made all the difference.

What do you do during a typical day in the Department?

I get bored easily, so I tend to spread out my time between the 4th year Hercus Offices, the Anatomy Museum, the Health Sciences Library, the Central Library, the Marsh Study Centre and random cafes that have free wifi. I will usually aim (read: not always succeed) to be up and productive by 10 at the latest, though my start time is somewhat...flexible. Some days I'm up early...especially when something is due, while others I might hit the snooze button one too many times. Once I get into uni, however, it is usually full on – with classes (I study ANAT490, ANAT458 and BIOA401 this semester), readings, assignments and lab work. I get to spend every second week in the lab with my lab supervisor, Christy, and we aim to run through at least two qPCR plates a session – resulting in roughly six plates a fortnight.

What does the future hold for you?

I am tossing up a few different options at the end of this year. It all really depends on how well I do. I definitely want to continue study, I'm not ready for the adult world yet, but am unsure whether I will try to pursue a PhD in my current field or jump into something completely different.

Virtual reality a reality for Dental students

Second year Dental students taking the first semester Anatomy paper have been using 3D virtual reality (VR) technology to reinforce their knowledge and understanding of the neuronal pathways of the head and neck. Some pathways in the small skull zones, such as the pterygopalatine and infra temporal fossa, contain numerous nerves which pass and branch in different axis', and travel through different holes in the skull. Having a good understanding of these pathways requires good perception and understanding of 3D organisation.

"Virtual reality is such a powerful teaching tool and could revolutionise anatomy learning for students in the future. It just ties together everything that we learnt in lectures and helped us organise our thoughts."

Student Jamie Marra said he wasn't looking forward to learning anatomy as part of his second year dentistry training because he didn't know what it would be like. But he has found the course, and the learning tools available in the Department, nothing short of amazing.

"The Department has a wide range of learning tools to facilitate deep understanding of the material. The best tool of all is the virtual reality lab."

"It was such a cool experience to put on the virtual reality helmet and step inside the human skull. Using hand controllers, you can trace neural pathways from the brainstem through complex regions in the face to understand so much more than just the name of the nerve and nuclei."

"Before you go in you think 'I know this stuff', but when you come out you have so much more understanding to add to your base and a desire to build more."

"I think I'll have a lifelong interest in neuroanatomy after this paper!"



Dental student Geeny Moon demonstrates drawing the neuronal pathways using 3D virtual reality technology.

Using the VR technology, students have been able to draw the neuronal pathways themselves. Their drawings are recorded and checked by senior lecturer Dr Yusuf Cakmak. The results are then discussed in a tutorial, with the aid of the VR system. Dr Cakmak has also used this technology to provide students with a better understanding of the conduction pathways of complex nerves which have multiple functions.

Student response to this new technology has been extremely positive. Dental student Geeny Moon says the class loved their visits to the VR lab, and they were amazed at how much they learnt in such a short amount of time.

"It's a totally different learning experience and is different to toté learning all the nerves and muscles. Physically seeing the structure in front of you gives you a greater appreciation for what you are learning about."

Dr Yusuf Cakmak has a keen interest in developing new technologies for use in his teaching and research.

He has developed an interactive avatar app using 3D technology to mimic a user's hand and finger movements onto a laptop screen; he is a member of a team exploring the potential use of a portable non-invasive camera-based device to measure indicators of heart disease; and is part of a US-registered clinical trial using a non-invasive neuromodulation stimulation device to alleviate the symptoms of Parkinson's disease.

Visit Dr Cakmak's website to learn more about his research. <https://www.cakmaklab.com>



From the mailbag ...

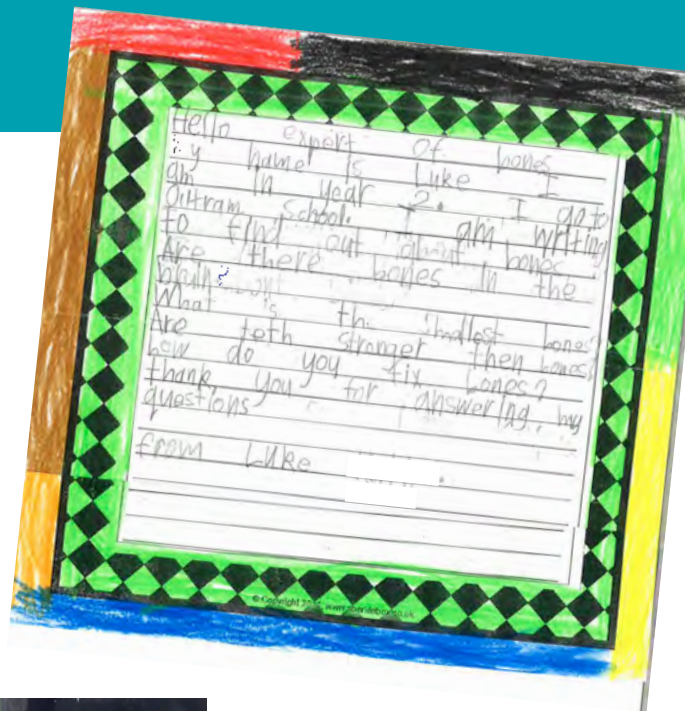
It's not unusual for the Department to receive phone calls and letters from people around the country, asking interesting, unusual, and sometimes down-right wacky questions about anatomy.

This letter, from a boy in Year 2 at a local primary school, was a particularly charming letter, and we wonder if he could be a future medical student in the making.

We were able to answer all of Luke's questions. Are you able to answer them?

1. Are there bones in the brain?
2. What are the smallest bones?
3. Are teeth stronger than bones?
4. How do you fix bones?

Answers:
 1. No, but bones do protect the brain. (Bonus points for knowing there are 8 bones in the skull, 14 bones in your face, and 3 bones in each ear).
 2. The ossicles. Individually they are known as the malleus, incus and stapes and are found in your middle ear.
 3. Yes. The enamel on teeth is the hardest substance in the body. Dentine, the substance underneath the enamel, is also very hard.
 4. If you're lucky the bone will heal itself, with the help of a plaster cast to immobilise the limb. However if you're unlucky, a metal plate and pins may be required to fix the bone in place.



The malleus, incus and stapes are so small they can easily fit on a 10c coin.

Applying for impairment in ...

Internal Assessments

If you are unable to complete an internal assessment or feel your performance was impaired, you can apply to the Department for special consideration.

Applications must be submitted to the Anatomy office (2nd floor, Lindo Ferguson Building) **within five days** of the date of the assessment. Supporting documentation, such as a medical certificate, or supporting letter from a family member or sporting body, must be provided.

The Department will consider all the information you provide on your application, and you will be notified of the outcome via your student email.

If your plea for impairment is accepted, and you completed the assessment, an adjustment to your mark may be made.



If your plea for impairment is accepted, and you were unable to complete the assessment, you will be awarded a mark based on your overall average mark for all assessments in the paper, and the class average.

Application forms are available from the Anatomy office.

Final Exams

It is important that you are aware of the University's procedures for applying for Special Consideration in a final exam. Full details are available on the University of Otago website <http://www.otago.ac.nz/study/exams/otago062916.html>

Special Consideration is available to students who are:

- prevented from sitting an examination due to unexpected circumstances beyond their control;
- significantly impaired in their examination performance;
- significantly impaired in their preparation for an examination (within 14 days of the examination concerned).

It is important to note that Special Consideration is not always granted. Impairment must be **significant**. Mistaking the time or date of an examination is NOT accepted as a significant enough reason to apply.

Application for Special Consideration is made through your eVision student portal. Don't forget to attach appropriate supporting documentation with your application!



Anatomy t-shirts... still just \$15!



**Be quick -
Limited stock
available!**

The lovely ladies from our ANAT 331 class went public with their devotion to Anatomy by wearing their Anatomy t-shirts to class throughout the semester.

Have you purchased yours yet? We have a limited supply left! Hurry, don't miss out!

If you are interested in purchasing a t-shirt please email t-shirts@anatomy.otago.ac.nz.

www.otago.ac.nz/anatomy

