

**Medicine, Nursing and Health Sciences**

# Careers in the Biomedical Sciences

A brief guide for Biomedical Science students

**School of Biomedical Sciences**



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# Section 1: Careers in Biomedical Science



## Introduction

The aim of this booklet is to increase your awareness of the career possibilities which are open to you once you have completed your Bachelor of Biomedical Science. Two years ago we held a series of small group discussions with some first year Biomedical Science students where we asked them about their career plans. These discussions revealed that many students had a limited view of the careers available from a Biomedical Science degree. In fact, most students believed the only potential careers were graduate medicine or research. This finding prompted us to embed a professional development program into the biomedical science degree. As you progress through your degree you will undertake a series of modules, which will help you to consider different career options. As part of this program we will introduce you to past graduates and the career options they have chosen. This booklet has been designed to accompany the professional development modules and to provide you with a resource that you can return to time and time again, as you think through and make your own career plans.

Follow ups with our Biomedical Science alumni have revealed that the Bachelor of Biomedical Science trains students for a very wide and diverse range of careers. Many Biomedical Science students are interested in pursuing careers in medicine and the Bachelor of Biomedical Science prepares students well for the challenges of graduate medical school. This pathway has been streamlined at Monash University, with the establishment of the Biomedical Science Graduate Medicine pathway, in 2017. The Biomedical Science degree is also a good option for students who are interested in pursuing careers in the areas of biology/chemistry and health. The degree can be followed by further graduate study to prepare students for careers in the allied health area such as radiation therapy, dentistry, nursing or physiotherapy.

Your three-year undergraduate degree can also be followed by further study with an Honours year and a PhD. There are many high level industry positions available for Honours and PhD graduates, with research degrees providing you with a specific skill set. These positions can be found in the health and biotechnology industry as well as non-science industries such as finance where doctoral graduates are employed for their universal research and analytical skills. There are many career options which stem from your Biomedical Science degree. I hope this booklet enlightens you about your career options and that you take the opportunity to attend all the career events on offer to you, as you pass through your degree.

**Yvonne Hodgson,**

Bachelor of Biomedical Sciences Course Convenor

February, 2016

# You *Don't* Have to Know



## Rachel MacMillan and Rebecca Kovacs

From the early years of high school it is emphasised that you must know what you want to do and where you want to be ten, fifteen or even twenty years into the future. But in today's world, this can be an unrealistic expectation. It is widely estimated that students in our generation will change careers at least five times, in our lifetime. Whilst it is important to begin investigating which areas interest you, there shouldn't be any pressure to definitively know what you want to be when you "grow-up".

In many ways, the Bachelor of Biomedical Sciences is the perfect degree for any student interested in the "whys" of the human body. It will provide you with a valuable insight into the science behind the way we move, think and operate, whilst teaching you analytical skills and critical thinking. The many disciplines you will learn about could lead you down multitudinous pathways, some of which you may have never considered before. Go into your degree with an open mind; because the fact is, your dreams and goals may change so quickly and frequently, that there's no need to set your aspirations in stone.

Starting university can be a daunting experience, far from the school environment you are familiar with. And while the academic atmosphere and your social life will be shifting all the time, there's no reason your career goals shouldn't be just as dynamic. Having a set plan is sound, but your biggest mistake is being blind to all the opportunities that an undergraduate degree can offer. This new environment means you are free to choose any path or chance that comes your way. There is nobody standing over your shoulder telling you what you can or cannot do. Allowing yourself to explore these options will open your eyes; it could help you realise that your current goals are in fact the best option for you, or it could lead you to finding a completely new avenue.

There is a difference between being open to new options, and having an apathetic attitude about your future. What students often don't realise is that it is up to them to take the initiative in university. This means having the foresight to investigate which careers or areas of study interest you. Try to build a network of individuals from a range of professional backgrounds. Contact a researcher for a chat about potential lab work or discuss your options with demonstrators, tutors or fellow students. And whilst a lot of this is up to you, academic events such as industry nights or seminars are a useful tool for students, and they occur in abundance within the university. Even just reading this guide means you're already on the right track.

In most degrees there are a number of elective units you can take. Biomedical Science students are not restricted to electives in the School of Biomedical Sciences, only. You can pick something completely obscure that you have a slight interest in, for example, Ancient Cultures or Foundations of Law. There is an abundance of options and they can help you to discover what is right for you. Just be careful, and pay close attention to the unit prerequisites – if the unit has them. Even within the School, there are many electives to choose from, and with each passing year, the degree offers more chances to specialise in areas that have sparked your passion.

As well as academic exploration, take the time to do some extra-curricular lab work or even try working in an office environment. The lab work can help you to familiarise yourself with a research environment. And even if you find you don't like what you're doing, it is never a waste of time. Setbacks will bring you a step closer to where you want to be. Furthermore, don't get disheartened if you decide that the biomedical sciences are not for you. Stick it out, you'll never regret the experiences or having the degree under your belt, whether you use it or not. There are always more specialised post-graduate degrees to do afterwards.

There are so many pools of knowledge and experience available to you as a student. The skills acquired in the Bachelor of Biomedical Science will prove useful in any field, not just for medicine or biomedical research. And as you begin to recognize the versatility of your degree, new careers and job avenues will open up. If there is one thing our alumni have taught us, it is that, even if you are feeling lost and unsure of your next turn, you still don't have to know. What is important is that you use your time at university to narrow down the pathway that interests you, by experiencing different areas. As you begin this incredibly broad and exceptional degree, be ready for all the weird and wonderful things you will learn along the way and take hold of all the opportunities you can.

# Section 2:

## Research in Biomedical Sciences



### Associate Professor Tim Cole

Biomedical research is a fundamental cornerstone for the discovery of new biological knowledge that allows the development of new treatments to combat genetic conditions, infectious diseases and common social-driven diseases such as diabetes within communities. Diseases such as cancer, depression, diabetes, dementia and other neurological disorders requires research at the cell and molecular level to lay the foundation for development of novel clinical treatments. Students with an undergraduate Biomedical Science degree can undertake biomedical research at the Honours and higher degree level and participate with established research groups in this research effort. Research outcomes can be variable and sometimes unexpected. This can lead to new exciting directions and approaches to treat human disease.

Research degrees in the Biomedical Sciences allow students to use their base of undergraduate knowledge and apply this to further study the complexities of living organisms, normal biology and health, and further the understanding of the basis of abnormal genetic conditions or disease states. By undertaking the Bachelor of Biomedical Sciences you can apply to complete your research degree within any of the biomedical science disciplines. This means you can be at the forefront of developing and applying new and exciting technologies, allowing rapid advancement of knowledge in these areas.

On completion of your research degree you will be equipped with the research tools and expertise to undertake many jobs and professions. This could include the Pharmaceutical Industry where you may bring a new drug to the clinical market, Journalism, where one can communicate biomedical research outcomes to the community, and Government organisation such as CSIRO where science can be applied to all aspects of society, and finally graduates can apply their knowledge to disease-focussed research endeavours at standalone research Institutes and research-intensive Universities.

## Females in Research: the changing face of Biomedical Research

### Rebecca Kovacs

For many years now, female researchers in STEM (Science, Technology, Engineering, and Mathematics) fields have been overshadowed by their male counterparts. Even with the push for gender equity, females still face many great obstacles as they progress through careers in research. “[Females are] being paid less for the work they do, doing more unpaid work and experiencing harassment in the workplace (sic)” says Dr Danielle Horyniak, a post-doctoral fellow at the University of California San Diego and B.BiomedSci alumnus. Not only are women less likely to take up full-time research positions, they are also under-represented on research committees and in leadership roles, the National Health and Medical Research Council (NHMRC), has found.

In the past, whilst outstanding women have succeeded against the odds, the majority of women did not progress beyond the post-doctoral level of research. A University of Melbourne study, in conjunction with Biomedical Research Victoria and other industry groups, found that whilst females find themselves in academic research positions, there are very few who will transition into industry and non-institutional positions, even with the extensive skills they have acquired. A PhD is no longer restricted to the academy, but can make you competitive for a range of positions in pharmaceutical, biotechnology and other biomedical companies.

Combating the gender gap also requires a strong female research community, one where the needs of the woman are integrated into their workplace structure. The NHMRC\* believes this can be addressed by initiatives such as part-time fellowships and mentoring support. With institutions, like Monash University, opening the doors to working women, the potential to combine your career in research with family commitments is becoming a certain reality. Paid maternity schemes are high on the agenda, along with the knowledge that your positions will still be waiting for you, upon your return. Your career in research and industry is about excelling and thriving in your field, not simply to survive.

For young aspiring researchers, these issues may not be at the forefront of your mind, but the work the female research community is currently involved in will pave the way to a fair workplace environment now, and in the future. What all students should be looking towards is how they can best begin their research journeys. Horyniak believes that “[finding] a mentor who can help guide you through the challenges you will experience” is vital to any young person’s endeavours. By supporting your fellow female scientists, you are directly involved in ensuring the research world continues towards equity for women and men. A diverse working environment is extremely important when the field of research involves a population from various backgrounds and different genders.

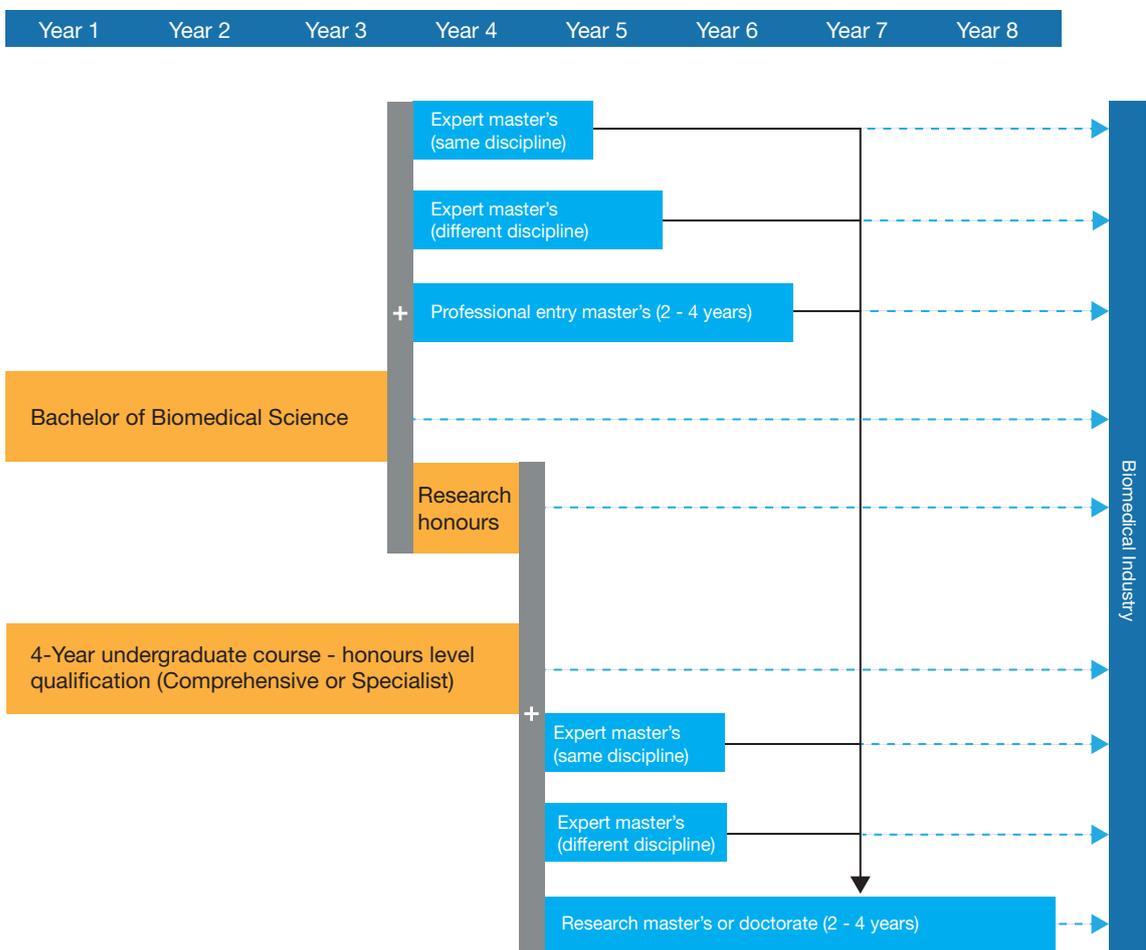
Even with all the struggles that face young women in the scientific community, organisations like “Women in Science Australia” and activities such as industry mixers provide students with the opportunity to dream bigger and experience more. As Horyniak advises, “don’t doubt yourself! ... Be confident and take chances - put yourself out there and apply for that job/grant/prize, and you will be rewarded.” The STEM fields are for every young person, and the gender equity movement is giving everyone a chance at an even playing field. In the 21st century, the only thing standing in the way of your success in research, is you.

\* the leading body for health and medical research in Australia

## Research pathway



## Undergraduate Research Opportunities



## Research in Action: 3990 units

The introduction of third year research units has afforded many students the opportunity to experience an honours project without the commitment of an entire year. Undertaken, as a third year elective unit, each of the biomedical science disciplines has a specific unit tailored to research laboratories in their department. Students are challenged to complete a semester long research project within a laboratory of their preference, learning important experimental skills such as laboratory techniques, collaboration with others, presentations and report writing.

## Summer and Winter Research Scholarship – Monash University

Summer/Winter vacation scholarships are undertaken within Monash University research laboratories. These scholarships give students the chance to experience research in a particular discipline, aiming to provide students with a first-hand insight into research careers. As students are often working in state-of-the-art laboratories, with active research teams, this experience is an excellent opportunity to “get-ahead” during their holidays.

## Winter/Summer Vacation Placements – Non-Monash

Many biomedical science research institutes will have student volunteer research positions available to undergraduates. One of the main programs, UROP, is run through BiomedVic, with students offered the opportunity to undertake placements in some of Victoria’s largest institutions such as: the Burnet Institute, Peter Mac and Murdoch Children’s Research Institute. These programs are often able to be extended, based on student performance, beyond the holiday period and many students find these placements give them valuable experience in a research environment.

# Graduate Research Opportunities

## Honours

The Bachelor of Biomedical Sciences aims to provide students with a firm grounding in all the biomedical fields. As such, students will have the ability to undertake honours within any of the biomedical science disciplines, provided the minimum requirements are met. The Honours program is a prestigious research year, normally completed following the final year of the Bachelor of Biomedical Science. Students work in a laboratory of their choosing, on a year-long research project, which is concluded with a thesis.

## Masters

There are many Masters options for undergraduate and honours students, who are looking to specialise in a particular area. Monash University offers many such degrees, in areas of reproductive science, research, biomedical science and many others. Masters courses are generally completed within one to two years and can broaden both a student’s research skills and career opportunities, depending on the masters.

## PhD

With honours degree or other relevant research degree experience, students are able to undertake a Doctor of Philosophy in their chosen area of research. This program runs for a minimum of four years and requires students to work on a research task which will make a significant contribution to an area of knowledge or investigate an innovative area of research, in the faculty they are completing their course. The PhD program can be undertaken at many different universities across Australia and when completed, students submit a comprehensive thesis of their research. Not only will a PhD set you apart from other candidates, the skills developed both in and out of the lab will be indispensable for your future endeavours.

# Alumni Stories



## Dr. Danielle Horyniak – Bachelor of Biomedical Science (Honours), 2007

### How has a Monash BMS degree shaped your career?

Having a Monash BMS degree allowed me the opportunity to undertake my honours year through the Burnet Institute, which trains honours students in collaboration with Monash's Department of Epidemiology and Preventive Medicine. The Burnet Institute's mission is to achieve better health for poor and vulnerable communities opened up a whole new world of public health for me, and shaped my career.



### What skills did you develop during the Monash BMS degree that has helped you throughout your career?

Much of what I do every day involves technical skills that I first learned during my BMS degree, such as searching the medical literature and analysing epidemiological data. Most importantly, Monash taught me how to become a critical thinker, an essential skill for a career in any area.

### Did you do any further study after your initial bachelor?

Yes, I completed my PhD through Monash University's School of Public Health and Preventive Medicine in collaboration with the Burnet Institute (2011-2014).

### What is your current job?

I'm currently employed as a Postdoctoral Research Fellow in the Division of Global Public Health at the University of California San Diego (UCSD). My research here examines substance use among forced migrant populations, with a particular focus on deportees on the U.S.-Mexico border.

I also hold positions as an Early Career Research Fellow at the Centre for Population Health, Burnet Institute, and as an Adjunct Research Fellow with Monash University's School of Public Health and Preventive Medicine.

### What has been your career pathway?

2007: Honours student at the Burnet Institute/Monash University.

2008 – 2009: Research Assistant, Burnet Institute. I supported a range of projects in infectious diseases and substance use epidemiology, and developed a broad range of skills in project management and data collection and analysis.

2010: I took a break to travel around Africa and the Middle East, including a month conducting volunteer work in Kenya. Witnessing first-hand the devastating effects of HIV in Africa solidified for me that I wanted to pursue a career in public health, so upon returning home, I enrolled in a PhD.

2011-2014: PhD Student & Research Assistant, Burnet Institute/Monash University. My PhD examined the epidemiology of injecting drug use in contemporary Australian settings, and gave me the opportunity to continue building my skills in epidemiology and biostatistics.

2011-2014: Sessional Tutor, then Assistant Lecturer, Monash University. This gave me the opportunity to learn the other side of academia – teaching. I began by leading epidemiology tutorials and ended up coordinating an Introduction to Epidemiology & Biostatistics within the Bachelor of Health Sciences degree.

## What made you decide on your current career?

A career in public health research ticks many of the boxes for me – being able to pursue work that I find interesting and personally rewarding, and that also has the potential to have lasting impact on vulnerable communities, flexibility in working hours, and being part of a team of smart, passionate people. Opportunities to travel around Australia and the world to attend conferences and undertake training are also an added bonus!

## Have you had any drastic career changes since beginning your career?

Ending up in academia is probably the most drastic career change I could've imagined! I began my Biomed Degree, like many, hoping to transfer into Medicine. By the time I completed my undergraduate degree I no longer wanted to go into medicine, but had no idea what I wanted to do instead. I embarked on an honours year through the Department of Epidemiology and Preventive Medicine in order to develop some basic research skills and obtain a more advanced degree and ended up discovering a passion for public health. At the end of my honours year I said I would never do a PhD or become an academic, but somehow, here I am!

## What advice would you provide to students?

### First year

Explore and discover your passion – take that beginners French subject or the obscure sociology elective that fascinates you! It doesn't matter that you're 'wasting' your electives on subjects that aren't science or medical related. You will learn diverse skills that will increase your employability in the future - multidisciplinary skills are highly valued in a range of industries - and maybe even lead you down a career path that you hadn't known existed.

### Final year

Work hard, and go the extra mile! With many graduates each year, it's important to set yourself apart from the pack. Things like volunteer work, summer placements and building relationships with key people in your areas of interest will help you to get on the path to your dream job!

# Alumni Stories



## Dr. Bradley Edwards – Bachelor of Biomedical Science (Honours), 2002

### How has a Monash BMS degree shaped your career?

I feel completing the Biomedical Sciences Degree at Monash was critical in laying the foundations for my current career. The degree gave me a great understanding of basic science (with a particular focus on human physiology), it taught me how to think critically and how scientific research was conducted. When I started my degree at Monash, I had no idea what I was going to do when I completed the degree – I simply applied because I really liked the biomedical sciences. The best thing about completing this degree was that it helped me realize that I had a real passion for scientific research.



### What do you believe are the strengths of the Monash BMS program?

- The degree educates you about a variety of different fields in the biomedical sciences.
- A lot of the courses are taught by researchers actually working in the field – thus you are exposed to the most cutting edge research.

### What skills did you develop during the Monash BMS degree that has helped you throughout your career?

As mentioned above the major skill I developed during my degree was how to think critically and how scientific research is conducted.

### Did you do any further study after your initial bachelor?

Yes, I completed a PhD (2005-2009).

### What is your current job?

I am now a Senior Research Fellow at Monash University, leading a small research laboratory/team in the Department of Physiology focused on understanding the physiology causing common sleep disorders.

### What has been your career pathway?

After completing my BMS degree, I became a research assistant working at the Ritchie Centre for Baby Health Research which I did for 2 years. This job really gave me a taste for research and encouraged me to undertake a PhD so that I could drive my own research. I completed my PhD in respiratory physiology at Monash University in 2009. In particular, my work focused on understanding the causes of respiratory instabilities that often occur during sleep in the newborn.

In late 2009, I was invited to undertake a post-doctoral fellowship at Harvard Medical School in Boston, USA which focused on understanding the pathogenesis of obstructive sleep apnoea (OSA). While at Harvard, I obtained 2 successive fellowships (2010-12: Allen and Hanbury's Respiratory Research Fellowship awarded by the Thoracic Society of Australia and New Zealand; and 2012-16 CJ Martin Overseas Fellowship awarded by the National Health and Medical Research Council of Australia) which saw me promoted to Faculty in 2012. After a highly productive six years in the United States, I have now returned to Australia to establish a sleep and respiratory physiology research program at Monash University focused on continuing my research investigating the causes of OSA, and using this information to aid the development of novel treatments.

## **What made you decide on your current career?**

Both the experiences I had during BMS (in particular my Honours year) and working as a research assistant for 2 years post degree, I realized that I really enjoy scientific research - thus the choice was pretty easy.

## **What advice would you provide to students?**

### **First year**

Have fun! – While the major aim of obtaining a university degree is to become educated, it is really important that you also enjoy the experience.

Start thinking about what you would like to do after you complete your degree. Chat with people that work in those areas to gain some insight into whether or not you might actually like to do that work.

### **Final year**

Work hard. If are interested in a career in research, make sure you do the work required in the 3rd year to obtain the necessary marks to get you into the Honours year.

# Section 3:

## Post-graduate Medicine



Many students enter the Bachelor of Biomedical Science with a desire to continue on to a graduate medical program. Before committing to this pathway, read the following section, outlining all the nuts and bolts of a career in Medicine/Surgery and what it takes to get there.



### The Good, Bad and the Ugly: A lifetime of medicine with Associate Professor Christopher Wright

It's likely that a number of you are undertaking a Bachelor of Biomedical Science (BMS) as a “stepping stone” to entry into Medicine. The following piece of writing is a personal opinion and gives you an insight into the reality of medical practice. You will find it beneficial to try and get similar information from as many different sources as possible.

I have spent nearly 30 years as an Intensive Care specialist, in an environment that looks something like this:

It's a highly technical environment that mixes advanced engineering, teamwork and intense personal communication with families. Most of the improvement in survival has come from better engineering. If you want to “make a difference”, there is a very strong argument for working on the science and the devices, not “doing medicine”!

Working as a full-time specialist has particular challenges, whether that specialty be General Practice, Intensive Care, Psychiatry, Medical Administration or Public Health. In all of these disciplines, you will be required to deal with angry and upset patients and their relatives; you will be accused of making serious mistakes (and you will make mistakes); sometimes you will have to choose between your family and your work – this is a very very serious matter. Usually, you won't make as much money as your friends who have gone in to other fields of endeavour.

There's no maths and little physics in most disciplines... there are exceptions – Intensive Care, Anaesthesia, and a number of fields of active research. If you see the beauty in  $e^{i\pi} + 1 = 0$ , you might find medicine to be a bit lacking.

Medicine is a satisfying and rewarding career. You just need to be completely certain that you are entering it for the right reasons. “Getting a good GAMSAT score” and external pressures are not good reasons. You need to decide that medicine, warts and all, is for you. It's a service industry, where the patients come first. Please make a good decision, and good luck!



**Chris Wright**

**MBBS, FRACP, FCICM, GradDipSc(Physics)**

**Academic Director, Clinical Programs. MBBS**

## From Biomedical Science to Medicine: A student's perspective with Jacob Coleman-Bock

Jacob Coleman-Bock completed his Bachelor of Biomedical Science in 2011, and gained a place in Monash University's graduate MBBS (Hons) program for 2012-2015. He is currently undertaking an internship with the Royal Melbourne Hospital.



### Time as an undergraduate

I started my Bachelor of Biomedical Science with a very open mind. For most of my Year 12 I avoided thinking about what I wanted to do; all I knew was I was interested in the human body and science. Biomedical science seemed an obvious fit, and I feel my undergraduate degree has helped my career in many ways. On a personal level the life experience I gained during those three years has been incredibly beneficial in helping me manage the work load of medicine, to assume the professional responsibilities of a doctor, as well as aid my ability to communicate and empathise with my patients. In a more professional sense, the knowledge I gained from my undergraduate degree has meant that I have a very strong scientific foundation of knowledge from which I have built upon in my further studies; it has definitely made the workload of medicine much more manageable.

I made the decision to undertake Medicine after carefully considering what I valued and desired from a career, as well as speaking to people working in the areas I was contemplating.

### Time as a graduate

Graduate medicine challenged me more than I had been previously. Something to keep in mind is, in comparison to studying biomedical science the semesters run about one and a half times longer, and the semester breaks are shorter. Moreover the lectures are incredibly information dense. The pressure that you will experience during your studies is quite great at times, however this is a necessary burden, as you will inevitably experience the same whilst working as a doctor.

If I were to change anything about my time as a University student it would be to spend a little less time studying, and more time embracing new and different life experiences (for example going on exchange, travelling, working different jobs, volunteering, playing sport at a high level).

### Life as Doctor

One of our professors often repeated that she believed that in all aspects of life, your character was most responsible for determining your destiny. In your interactions with patients, who you are, as a person, is the single most important thing in determining a patient's perception of your care. Patients who have clinical relationships in which they feel empowered, which are built on mutual respect and trust, are more likely to be satisfied with their care, to comply with treatment plans, and have better health outcomes in the future. As a doctor it is your responsibility to try to be the person who whom they can share this relationship.

Ultimately, I highly recommend medicine as a career, however I strongly encourage a significant amount of thought be put into this decision. There is a long road of study ahead, before you become a specialist, with long work hours and shift work. But whilst it is a big commitment which will require you to make sacrifices, for me, the benefits have far outweighed the negatives.

## GAMSAT: Graduate Medical School Admissions Test

The GAMSAT is a graduate entry exam which assesses the abilities and skills gained in undergraduate degrees and prior experience. This six-hour long test is split into three sections; section one assesses your reasoning in humanities and social sciences, section two evaluates your written communication, and section three tests your reasoning in biological and physical sciences. The overall focus of the GAMSAT is to test a student's ability to reason and problem solve, across a wide range of questions and concepts.

Many graduate medical schools across Australia (excluding Monash University) require you to undertake this lengthy (and expensive) exam. Students interested in attending post-graduate medical school should research their options before undertaking this exam

<https://gamsat.acer.edu.au/gamsat-australia>

## Monash University Graduate-entry Pathway

The new graduate entry medicine pathway is tailored to Bachelor of Biomedical Science students wishing to progress to graduate medicine. The redesigned course format builds upon the basic biomedical science concepts taught previously and the program focuses on an integrated interdisciplinary curriculum.

Monash University's graduate MBBS (Hons) has a relatively small cohort, with 50 of the 75 domestic places offered to students undertaking the Bachelor of Biomedical Science. The new pathway involves a multi-mini interview (MMI) and a situational judgement test (SJT). Applicants for this course do not have to sit the GAMSAT. Further information can be found at the Graduate entry MBBS (Hons.) homepage.

<http://med.monash.edu.au/medicine/admissions/grad-entry/>

### How do I become a Doctor?

Two main postgraduate courses exist in Australia for students wishing to pursue a career in medicine; Doctor of Medicine (MD) or Graduate Entry Bachelor of Medicine/Bachelor of Surgery (MBBS). There are a range of universities across Australia which offer these graduate programs with varying selection processes. Many universities will require you to sit the GAMSAT and undertake an interview, in combination with a relatively high GPA. It is important to determine what medical school interests you most and how their application process works, with each school different slightly. Further information can be found on respective university websites, along with information sessions conducted by Monash University and the Monash Biomed Society.

# 04: Biomedical Industry and Further Studies

The Biomedical Sciences is a growing industry, particularly in Victoria. Many companies will value employees who have a firm grounding in a wide array of disciplines within the biomedical sciences. Various alumni have moved on to careers outside the traditional two; researcher or medical practitioner. We find our graduates in administrative roles, as private company consultants, sales representatives, as project leaders and in management positions. These career opportunities are not limited to a particular discipline or science, and can allow you to transfer your skills to other areas of industry. Whilst you are an undergraduate student it is important you explore these different avenues; you may find a new career path to follow.

## The Importance of Industry Placements

### Rachel MacMillan, Rebecca Kovacs

The world outside of university is competitive, with multiple candidates all fighting for the same graduate job you are. Therefore, it is important that you do what you can to set yourself ahead while you're in university. One opportunity of significant value is an industry internship or placement. The biomedical sciences industry is both expansive and diverse, including areas not just in research but all aspects of business, thus you don't have to limit yourself to laboratory work.

Quite often it is a drastic shock going from university into working life. At university everything is set out for you; in the workplace you need to determine your own deadlines and complete tasks on your own accord. Doing a placement or internship in the industry helps smooth this transition. This experience means you will be more comfortable once you begin your full-time career, rather than being surprised by the challenges of working life.

Placements have more benefits than just helping you land a job, though. They can help you trust your own abilities to complete a task in an autonomous way – without being guided along every step. An industry placement in research shows that you are competent in your laboratory skills, as well as problem solving and critical thinking abilities. This is relevant even if you decide research is not your cup of tea.

If you decide to try a research placement, remember each project focuses on a particular niche. Therefore, it may even be worthwhile completing placements in multiple areas of research. You might just find the one you are most passionate about, or discover what areas of research you wouldn't consider pursuing.

You may also want to complete a business related placement. The commercial aspects of the biomedical industry are just as important as the research side. It is, however, important to note that you can complete placements in areas outside the biomedical sciences. It might be worthwhile to complete an internship in a consulting company, or marketing, public relations perhaps? Any of these, although different, will help you with determining what you want to do after your degree. Pick an area that interests you – this doesn't necessarily have to be in the biomedical sciences.

If you find yourself enjoying your placement, then you're likely to have entered an optimal networking environment. Make a good impression on supervisors and management that you interact with and these connections could help you find the perfect career path. Furthermore, a recommendation from someone in your desired job industry is a great advantage when it comes to securing future employment.

Internships also allow you to increase your relevant experiences; this can be important for your growing resume and potential job interviews. Your involvement in various fields of the Biomedical Science industry shows you have dedication, professionalism and have a proactive attitude to furthering your career. In an interview, your responses will be based on the experience you attained in a workplace environment. This provides a much more valuable answer to employees as it shows skills relevant to the work environment, your professionalism, initiative and dedication.

Finally, don't get hung up on whether or not the internship or placement is paid. If so, wonderful. If not, the opportunity to learn new skills and have such a valuable addition to your resume is worth more than its monetary value. You might find your passion and at the minimum you will gain valuable experiences and expertise, distinguishing you from other graduates.

# Opportunities for Industry Involvement

## Undergraduate Research Opportunities Program (UROP)

This research placement program is available to students in their penultimate or ultimate year of the Bachelor of Biomedical Science. This program places students in a research lab for a minimum of one semester and students learn laboratory skills, how to work in a cooperative manner and how to present at conferences.

## Commercial/Private Companies

Other companies in the biomedical science industry accept student applications made directly to them. This can mean students are able to apply to companies they are directly interested in. Positions range from medical or research related to administrative or marketing, even business and engineering.

Some of these companies include:

GSK (GlaxoSmithKline)

Cancer Council Victoria and Peter Mac

CSIRO

## Volunteering

Volunteering is also a wonderful opportunity which allows students to immerse themselves in a particular area of work. Whilst these positions are normally unpaid, there are many areas such as hospitals, communities and businesses which have volunteer positions available. What's more, many of these workplaces offer students some real-life experience in a prospective work area.

# Alumni Stories:



## Ms Kate Eddie

Bachelor of Biomedical Science, 2008

### How has a Monash BMS degree shaped your career?

Studying the Bachelor of Biomedical Science reinforced my love of science, particularly biology. It confirmed that although I did not want to go into research, I did want to pursue a career in the scientific field. This led to my application and acceptance into the Master of Business (Science and Technology) which allowed me to combine my passion for science and my desire to work in business.



### What skills did you develop during the Monash BMS degree that has helped you throughout your career?

My BMS degree taught me valuable skills in critical thinking, data/information analysis and problem solving as well as time management skills.

### Did you do any further study after your initial bachelor?

After my initial BMS degree I completed the Master of Business (Science and Technology), also at Monash University.

### What is your current job?

I am currently the Asia Pacific Marketing Manager at Optos, a leading provider of retinal imaging devices to optometrists and ophthalmologists worldwide. I provide marketing support to both a direct sales team in Australia and an extensive network of distributors throughout the Asia Pacific, the Middle East and Africa. As part of the global marketing team I also lead and contribute to various global marketing projects.

### What has been your career pathway?

After completion of my Masters degree I was offered a role as marketing coordinator at a company called Opto Global in Adelaide. I relocated to Adelaide and after one year at Opto Global, the company was bought by Optos, a larger Scottish based company with offices in the UK, Europe and the US. I continued as marketing coordinator for Asia-Pacific until being promoted to marketing manager in 2014. Optos is in the process of being acquired by Nikon, a global leader in digital imaging and optics known for their digital cameras.

### What made you decide on your current career?

I chose a career in marketing as it allows me to combine my creative and analytical skills and there are many areas of marketing which offer a lot of flexibility. I enjoy working in the medical industry as the field is always changing and evolving and knowing the technology you market can make a difference to patients live is very rewarding.

### What advice would you provide to students?

#### First year

Take a variety of subjects both within the scientific faculty but also explore other faculties. Once you have started working, it's much more difficult to get a taste of other fields.

#### Final year

Don't underestimate the power of networking. I believe this brings about many more opportunities than waiting for a job to be advertised.

## Ms Marianna Parry

### Bachelor of Biomedical Science, 2001

#### How has a Monash BMS degree shaped your career?

I believe the BMS degree has given me the confidence to open a business – Jack Parry Animation Studios – that specialises largely in 3D visualisations for biomedical and pharmaceutical companies. My husband and I have been running it since 2003.

#### What skills did you develop during the Monash BMS degree that has helped you throughout your career?

I developed very strong analytical skills, abstract thinking and perseverance. As well as a deep appreciation of the scientific method and scientific thinking encompassed in Descartes' Method of Doubt.

#### Did you do any further study after your initial Bachelor?

I have completed a Bachelor of Laws (earning a University Medal for Law from Monash) and Masters Qualifying in Critical Studies (earning John Monash award for Excellence from the Faculty of Arts).

#### What is your current job?

I am a Disputes Lawyer at Herbert Smith Freehills and a co-founder and Company Secretary at Jack Parry Animation Studios.

#### What has been your career pathway?

While completing my BMS degree I received a summer scholarship at the Australian National University, where I worked for a few months alongside the scientists and PhD students at John Curtin School of Medical Research. I remember being quite proud of the fact that it was the same laboratory where Nobel Laureates Rolf Zinkernagel and Peter Doherty had made their ground breaking discovery. It was an unforgettable experience and it left no doubt in my mind the lab work is not for me.

After graduating in 2001, I enrolled in a Masters Qualifying in Critical Studies to write a thesis on the poetry of Joseph Brodsky (another Nobel Laureate!), while working as a medical receptionist in various Melbourne hospitals. Soon after I got married, my husband and I founded Jack Parry Animation Studios, which we have been running ever since. Our past and present clients include several large ASX-listed Australian Biomedical companies (including Cochlear Ltd. and CSL Ltd.), as well as many other highly regarded biomedical and pharmaceutical companies and organisations such as the Bionics Institute. We also love collaborating pro bono with Professor Graeme Clarke – the inventor of the bionic ear.

Since our business required an understanding of contract law and I enjoyed drafting contracts, I went back to Monash to learn more about it. Ironically, lawyers find it quite surprising that someone would go into Law because they love drafting contracts! But I do love it and I love Law so I ended up working as a Disputes Lawyer.



# Continue your studies and broaden your career opportunities



Many of our alumni have also chosen to continue beyond their Bachelor of Biomedical Science and complete further degrees to better their employment opportunities. The following areas of study are just some of the degrees that complement a Bachelor of Biomedical Science.

**Note: there may be additional requirements for entry into certain degrees; aim to investigate these areas in advance**

## Business Person/Manager

Corporate positions are found in many different fields, and a background in biomedical sciences opens many doors for graduates, such as in administrative positions, consultancy and, in particular, management. A business manager is responsible for coordinating an organisation or division in a company. Their role can involve a range of things; decision making, management analysis and strategy, team leading and logistics. The wide array of business related careers means there are numerous opportunities for potential employment.

### How do I become a business person/manager?

**Undergraduate:** Bachelor of Business/Commerce

**Postgraduate:** Master of Business Administration (MBA)

## Clinical Embryologist

Clinical Embryologists are primarily involved in assisting with in vitro fertilisations and other clinical tests at IVF clinics. They work with physicians to improve the reproductive outcomes of patients and support them in this delicate procedure. Some of the roles often undertaken by clinical embryologists include: embryo evaluation, cryopreservation (preserved at sub-zero temperatures), and micromanipulation. Clinical embryologists are also involved in researching new technologies for embryological application, as well as assessing the effectiveness of current treatment options.

### How do I become a clinical embryologist?

**Postgraduate:** Master of Clinical Embryology

## Dietitian/Nutritionist

The role of dietitians/nutritionists is to improve the health and wellbeing of both individual patients and the general public through optimising dietary intake and nutrition education. Dietitians and nutritionists are employed in areas such as hospitals, private clinics, health food companies, and often work for government bodies, formulating nutrition policies and food regulations. Many dietitians and nutritionists are also active researchers, aiming to improve health outcomes through improved diet or food composition.

### How do I become a dietitian/nutritionist?

**Undergraduate:** Bachelor of Nutrition and Dietetics

**Postgraduate:** Master of Nutrition and Dietetics

## Dentist

The role of dentists is to prevent, diagnose and treat diseases and injuries of the teeth, jaws and mouth. They are involved in repairing tooth decay, preventing teeth and gum diseases, and extracting teeth. Many dentists choose to work in private practices and work with many different groups in the community, building up relationships and teaching the importance of good oral hygiene. Dentists can also specialise into fields such as orthodontist, endodontist, prosthodontist, among other areas.

### How do I become a Dentist?

Undergraduate: Bachelor of Oral Health/Dental Surgery

Postgraduate: Doctor of Dental Medicine/Surgery

## Forensic Scientist

Forensic scientists aid legal proceedings by using scientific techniques to examine potential evidence. The role of a forensic scientist is very diverse. They may be required to analyse bodily fluids to identifying plant matter or even ammunition. This involves having a broad wealth of knowledge to draw on in different circumstances; it also means that throughout your career you will be constantly learning. This is just a small snapshot of the interesting aspects of being a forensic scientist. Forensic scientists may specialise in an area of expertise such as document identification, toxicology, biochemistry, pharmacology and more. You never know what will happen when you come into work each day as a forensic scientist as no case is the same as the last.

### How do I become a Forensic Scientist?

Undergraduate: Bachelor of Forensic Science

Postgraduate: Master of Science (Forensics)

## Genetic Counsellor

A genetic counsellor aims to assist individuals and families to comprehend and manage the medical and familial implications of genetics on particular health conditions. This can involve interpreting medical histories and the chance of disease recurrences, counselling to ensure individuals make informed decisions, and supporting individuals whilst they learn to understand their genetic information. The services of a genetics counsellor are needed at all stages in life, with many working with prenatal couples, teenagers and even middle-ages individuals with rarer conditions. With the field of genetics growing every year, the health implications are widespread and it is vital that patients can discuss their concerns with a trained professional.

### How do I become a Genetic Counsellor?

Postgraduate: Master of Genetic Counselling

## Lawyer

Law is a competitive and fast-paced area. As a lawyer you will be responsible for providing legal advice, conducting court hearings, drafting documents and much more. Law has many facets which allow you to find the niche area that you are passionate about. Within the law profession there are a number of roles to be fulfilled – these being a judge, solicitor and magistrate. However, a bachelor of law/JD can also give you more than just a career as a lawyer, with many graduates involved in not-for-profits, government positions or commercial businesses.

### How do I become a Lawyer?

Undergraduate: Bachelor of Laws

Postgraduate: Juris Doctor (JD)<sup>\*</sup>

<sup>\*</sup> may need to sit the LSAT

## Medical Scientist

The role of medical scientist can involve a range of occupations within pathology, including: working in a hospital, private clinic or for a research facility. They perform laboratory diagnostic procedures for patients and can also be involved in research focused on improving the clinical understanding of disease prevention and treatment. This applied area of science is a challenging and rewarding career, which is at the forefront of human health and medicine.

### How do I become a Medical Scientist?\*

Undergraduate: [Bachelor of Medical Science \(Pathology\)/ Bachelor of Medical Laboratory Science](#)

Postgraduate: [Master of Laboratory Medicine](#)

\* look for accredited courses

## Midwife

A midwife guides women through their pregnancy, labour and after birth. They both educate and assist women during these times. It may be necessary for a midwife to administer medications, prepare the mother and child for surgery and detect any complications that may arise. A midwife may work on a rotational roster or they may mould their work to suit the needs of the women they are looking after. This often involves being on call. Midwives tend passionate about their work and go above and beyond the call of duty to care for both the child and the mother. This job is incredibly rewarding and fulfilling.

### How do I become a Midwife?

Undergraduate: [Bachelor of Midwifery](#)

Postgraduate: [Master of Midwifery](#)

## Nurse

Nurses play one of the most important roles in society. As a nurse you will be required to assess patients and plan out their care. Nurses provide important support to families and patients during times of injury and illness. It will be your responsibility as a nurse to monitor patient's vitals and administer medications, as well as to prepare patients for surgery. These are just a small part of a nurse's role; it is constantly changing and faced-paced. No patient is the same as the last; therefore, you will learn strong personal skills in this career. As a nurse you will be constantly moving both mentally and physically. This career pathway is gratifying with challenging aspects. Often what the patients remember most about a hospital stay is their nurses and the amazing care that they give.

### How do I become a Nurse?

Undergraduate: [Bachelor of Nursing](#)

Postgraduate: [Master of Nursing](#)

## Occupational Therapist

An occupational therapist aids people who due to injury or illness are unable to complete tasks in everyday life. Occupational therapists plan therapies that are designed to improve an individual's ability to be independent. It is possible to specialise in a particular area as an occupational therapist, such as paediatrics, aged-care, psychiatry or general medicine. The range is not limited to these and is very expansive. Occupational therapists are able to work with patients one-on-one over a period of time, thus developing a bond with the patients as you help them achieve independence. This job area is fulfilling and exciting. Learning about unique cases and having to develop equally unique treatment plans allows you to utilise a broad range of knowledge and techniques. This job is also a mixture of practical and office work meaning that you are never sitting still for too long.

### How do I become an Occupational Therapist?

Undergraduate: [Bachelor of Occupational Therapy](#)

Postgraduate: [Master of Occupational Therapy](#)

## Optometrist

Optometrists are involved in the basic care of the eye, detection and diagnosis of eye diseases. They will perform regular tests on patients and work closely to improve and maintain the optical health of patients. Their main focus is often on prescribing spectacles, contact lenses or simple advice to care for their eyes. As optometry is a primary health care profession, optometrists are vital to preserving the health of a patient's eyes, throughout their lifetime. Additionally, optometrists can also be involved in clinical research, a dynamic field of study, applicable to clinical care.

### How do I become an Optometrist?

Undergraduate: Bachelor of Optometry/Vision Science

Postgraduate: Doctor of Optometry

## Orthotics/Prosthetics

Prosthetists and orthotists care and assist people who need an artificial limb (prosthesis) or a device to support and control part of their body (orthosis). Prosthetists and orthotists design and fit these devices to patients and help them in getting used to controlling a new device. As a prosthetist or orthotist you will be exposed to many different types of injury and reason for a patient to require these devices, with each patient having unique and specific requirements. This makes this job incredibly diverse as you may deal with infants to the elderly.

### How do I become an Orthotist/Prosthetist?

Postgraduate: Master of Clinical Prosthetics and Orthotics

## Paramedic

Paramedics predominantly provide emergency care in potentially life-threatening situations before hospital admission. Paramedicine is a profession that will constantly keep you on your toes. Paramedics respond to many incidents, such as major disasters, motor accidents, domestic emergencies and many others. A paramedic can be called to an incident at any time of the day or night. As a paramedic you will be trained in anatomy, physiology and pharmacology to enable clinical decision making to keep the patients alive. This fast-paced, dynamic job will keep you on your toes and ensure that you are continuously learning – both in clinical skills and people skills. No two days are the same when you're a paramedic.

### How do I become a Paramedic?

Undergraduate: Bachelor of Emergency Health or Bachelor of Paramedic Science

Postgraduate: Master of Emergency Health

## Pharmacist

There is more to a pharmacist than what you see at your local chemist. They have a vast knowledge base which enables them to make significant beneficial differences to community health. A pharmacist supplies, dispenses and even develops medicines. A pharmacy degree allows you to not only be involved in the community pharmacy area but also in business or even development. One exciting area is compound pharmacy. This involves the creating of products that are uniquely developed to fit a patient's specific needs. As a pharmacist you have the ability to work all around the world and meet new people daily in a job that is never exactly the same. As new drugs are developed the job will continue to evolve and you will be constantly learning throughout your career.

### How do I become a Pharmacist?

Undergraduate: Bachelor of Pharmacy/Pharmaceutical Sciences

Postgraduate: Master of Pharmacy

## Physiotherapist

A physiotherapist assesses, diagnoses and treats a range of musculoskeletal conditions. They primarily use techniques to strengthen muscles and manipulate joints to improve mobility. Physiotherapy is a broad area ranging from assisting patients in relearning how to walk to being involved with a sporting team to treat players. Along with this, physiotherapists are able to work in private practice as well as a hospital environment and everything in between. This diverse area offers room for specialisation and movement while remaining in the same career.

### How do I become a Physiotherapist?

Undergraduate: Bachelor of Physiotherapy

Postgraduate: Master of Physiotherapy

## Psychologist

A psychologist is involved in evaluating and studying the behaviour and mental progressions of patients, from children to adults. They can work in a range of environments from hospitals to schools or workplaces and even aged-care facilities. Psychologists can either be involved in applied or research-oriented careers, with many different divisions of psychology in existence. The primary role of a psychologist is to provide mental health care and support to individuals at any stage of their lives and requires good communication and interpersonal skills to interact well with patients.

### How do I become a Psychologist?

Undergraduate: Bachelor of Psychology (Honours)\*

\*look for accredited courses

## Radiographer

Radiographers are responsible for operating medical imaging machinery such as X-rays, MRI machines and many others. They facilitate the production of diagnostic images which enable clinicians to treat injuries or diseases. Radiographers also work closely with patients and clinicians and should have high interpersonal skills and be able to work as part of team; the patients' health and welfare is the main priority for all diagnostic processes. Radiographers can also specialise in particular fields such as: trauma radiography, angiography, mobile radiography. No injury is exactly the same in a body as the last; so you have the ability to see new things constantly throughout your career.

### How do I become a Radiographer?

Undergraduate: Bachelor of Radiology or Bachelor of Medical Imaging^

Postgraduate: Master of Medicine (Radiology) or Master of Medical Radiology^

^Course titles may change based on the offering university

## Speech Pathologist

There are various reasons that a speech pathologist may be drawn upon for help. These include overcoming a stutter, aiding in learning difficulties or hardship in communication due to disability. A speech pathologist may also be required when a patient needs to relearn to communicate due to neurological injury. Due to the diverse reasons why a speech pathologist may be required you will have to be able to plan unique and different therapies based upon the individual cases. This job will teach you an in-depth knowledge of anatomy as well as the psychology behind speech impediments.

### How do I become a Speech Pathologist?

Undergraduate: Bachelor of Speech Pathology

Postgraduate: Master of Speech Pathology

## Teacher

Teachers are integral to the functioning of society. They may teach students ranging from ages five till late in life. As a teacher you will be responsible for guiding and assessing students through the creation of lesson plans and assessments. Teachers often work on a personal level with their students and encourage them individually and as a whole to achieve academically thus giving student's greater life opportunities. Being a teacher can be both challenging and extremely rewarding. To become a teacher in a specific area it is possible to major in a study area such as science, health, geography or many more.

### How do I become a Teacher?

Undergraduate: Bachelor of Primary or Secondary Education

Postgraduate: Graduate Diploma of Education or Master of Education

## Veterinarian

The health of all animals is important to society, and veterinarians are involved in diagnosing, preventing and treating the illnesses and diseases seen in animals. This can include undertaking tests, prescribing medication or therapy, or even performing surgery. Veterinarians also work closely with owners to ensure the health of their pet or live stock is adhered to and the care is of a continual high standard. In addition, veterinarians are able to specialise in a particular field of animal medicine, and this presents a wide variety of career paths following completion of the degree.

### How do I become a Veterinarian?

Undergraduate: Bachelor of Veterinary Science/Biology

Postgraduate: Doctor of Veterinary Medicine

# Section 5: Further Information

## Useful Websaites

### Australian Health Practitioner Regulation Agency

Their education site has an extensive list of accredited and approved health related courses in Australia. The system allows you to search all your options for further study, based on your current qualifications.

[www.ahpra.gov.au/Education.aspx](http://www.ahpra.gov.au/Education.aspx)

### Findamasters.com

A directory which allows you to search for masters programs all around the world. This website provides a way for you to think outside the box, showing you all the avenues your Bachelor Biomedical Science can take you down.

[www.findamasters.com](http://www.findamasters.com)

### Monash Courses

A search engine for all degrees Monash University offers. Helping you to sort out which degrees you qualify for and how you should go about applying.

<http://www.study.monash/courses>

### Women in Science Australia

A website aimed at connecting women within STEM (Science, technology, engineering and mathematics) disciplines in Australia. Focused on connecting women in education, research, industry, academia and government.

<http://womeninscienceaust.org/>

## Monash Career Connect

Monash career connect is an excellent, free service, available to all Monash students. They assist students in gaining casual/part-time employment, offer career advice and are the central point of call for volunteering, internships and all other things career related. Throughout the year, career connect also conduct training and skills workshops for interviews, leadership programs and general employability. You can even organise a quick drop-in session with one of their career education consultants.

<https://www.monash.edu.au/students/career-connect/>

## Past Students

Many students in the Bachelor of Biomedical Science may not be aware of the infinite resources available to them. One of these is the strong alumni community, with many past students willing to offer their assistance and mentorship to current and future students. Many of these individuals will be your tutors and demonstrators; don't be afraid to ask those questions, chances are they went through the same thing as you, and they're more than happy to help.

## Monash Biomed Society

Sometimes, asking advice from strangers can be daunting, so why not contact the Biomed Student Society? This group of students is here to help, with many of them aspiring to the same goals as you. They also run some helpful information sessions throughout the year including: the "Biomedical Sciences and Beyond" industry event and electives information session.

E-mail: [clubbiomed@monashclubs.org](mailto:clubbiomed@monashclubs.org)

Website: <http://monashbiomedociety.weebly.com/>

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Bachelor of Biomedical Science Alumni featured in this guide



