Issue 1: Research May 2015

The Pulse

Newsletter of the Deakin Medical Student Society

Research

A Welcome from the Editors

By Sylvia Ye

Publications Co-Chair

3rd Year Medical Student

It takes the curiosity of a cat with nine lives, the tenacity of a cockroach surviving for days without its head and the suave charm of a certain 007 secret agent to be involved in research. Research is new and exciting and we hope that the new newsletter and voice of the Deakin medical student cohort is just as exhilarating.

It only feels right to Tiffany and I that we

Continued on 2

4th Year Yearbook Committee Nominations

We are now looking for fourth years keen to be on the yearbook committee. The last four years have been happy, free, confused and lonely, miserable and magical, so it's only right that you do all this justice and put it in book form!

The committee members will be involved in planning and putting together of the yearbook and liaising with the rest of the cohort. Your ideas will definitely be heard.

Please email Sylvia or Tiffany at publications@medusa.org.au to express interest!

start on a grand topic – something that has shaped our past and guides our futures as medical practitioners.

This edition, we discuss the hidden side of medical research, what to consider when choosing a project, the future of exercise in medicine and examine research from every possible angle.

In the words of Professor Elizabeth Blackburn, winner of the 2009 Nobel Prize in Physiology or Medicine for the discovery of the medical horcrux, 'Ah! This could be very big. This looks just right.'

Letter from the President

Welcome to the first edition of the MeDUSA's new quarterly publication – The Pulse! This will consist of a series of publications with articles written by current medical students and members of staff, relevant to the theme of the edition.

This edition focuses on research, a subject which will carry huge impact for the remainder of your training and medical career. A good practitioner should always turn to evidenced-based medicine to guide practice, and research, whether it be laboratory based, epidemiologic, or part of a clinical trial, is empirical to evidence-based. Additionally, it carries huge weighting in terms of acquiring skills and experience for the future, and for improving personal and professional development

I'm currently enrolled in the Honours program as part of the BMBS, completing a laboratory-based project looking at bone development in Zebrafish, and using pharmacological agents to target the Retinoic Acid and Cannabinoid pathways in the hopes of developing a new therapeutic for osteoporosis. Although such a therapeutic is a long way off, it is this kind of research that creates the first steps into developing new treatments for burdensome diseases!

I hope you enjoy the first edition of the Pulse! And I look forward to reading your contribution in the future.

Robbie Mann

MeDUSA President 2015

The Other Half of Research Data

By Rowshan Yazdani

2nd Year Medical Student

Half of all clinical data remains hidden.

Trials that seem to have positive findings are published while those beginning to show null-effect or negative effects are not completed. This type of publication bias is endemic in academic and clinical literature and is strongly affiliated with

the financial objectives of drug companies. Researchers in 2007 examined 192 trials and discovered that trials that were backed by companies were 20 times more likely to publish positive results.

Ben Goldacre, a medical doctor, journalist for the Guardian and author of *Bad Pharma: How Drug Companies Mislead Doctors and Harm Patients* is summarises the issue nicely:

"If I were to run a study, and then just remove half of my data points so that my results looked much better, well, you would laugh in my face. It ***would be obvious to anyone that it was research misconduct. You might even call it fraud. And yet we tolerate the results of entire clinical trials—a huge proportion of them—being withheld from doctors and patients. In medicine, we rely on summaries of evidence, we collate the results from many different trials. So withholding the results of whole trials is exactly the same insult to the data as fraudulently deleting data points from within individual studies."***

We are currently applying distorted evidence in our care of patients, wasting precious resources and likely causing harm. The contributions of the patients who volunteer to be in clinical trials are being wasted, and by hiding that data, their

The Heart of MeDUSA – the Pulse

We had excellent participation with many great name submissions and over 250 votes for the winner. We appreciate the enthusiasm and support to the fledgling new newsletter and hope that the Pulse will connect with the student body and that you guys feel that this is *your* newsletter and *your* voice. We want the Pulse to be informative, engaging and fun.

Congratulations to Steph Reid (4th Year; GCS) for winning to newsletter renaming competition! We hope you enjoy your prize – Essentials in Internal Medicine by Talley, kindly donated by Elsevier – and hope that you will make good use of it doctoring awesomely wherever you go.

Please feel free to give us any feedback or ideas for submissions as we aim to continually improve.

trust is being betrayed.

This month the World Health Organisation has put out a public statement outlining the need to register trials, past and present, at "publicly available, free to access, searchable clinical trial registry complying with WHO's international agreed standards." Systemic problems in applying the evidence from clinical trials (e.g. poorly designed trials or those with too few or unrepresentative patients) may not be fixed, however this is an immensely positive step towards fixing the institution of medical research.

For more information on this topic, readers are encouraged to check out the WHO's statement on http://www.who.int/ictrp/results/reporting/en/, alltrials.net and Ben Goldacre's very readable *Bad Pharma: How Drug Companies Mislead Doctors and Harm Patients*.

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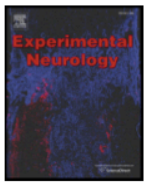


Regular Article

Regeneration of sensory but not motor axons following visceral nerve injury

Sophie C. Payne *, Philip J. Belleville, Janet R. Keast

Department of Anatomy and Neuroscience, The University of Melbourne, Victoria 3010, Australia

How to Choose a Research Project

By Philip Belleville

2nd Year Medical Student

This paper was published in February 2015 and includes my research conducted during my honours year at the department of Anatomy and Neuroscience, University of Melbourne. We looked at the neuronal response to axonal injury in a very poorly understood group of visceral neurons.

It was a tough haul but it was extremely satisfying to see the publication come through. As many medical students are hoping to be a part of a research project in the near future, I hope to share some of my experience now that I have the gift of hindsight.

My three tips for choosing a research-project:

1. Choose your supervisor carefully

This is by far the most important aspect when choosing which research project you would like to be part of. Your supervisor can either make or break your time in the project and they dramatically affect your likelihood of receiving a publication at the end of it all. Therefore, I would strongly recommend meeting with the supervisor on a few occasions to see if you get along with them, what their

demeanor is like and how their previous students have faired.

Ask for an email address or phone number of one of their previous students so you can try to gain their honest opinion on how they found working under that supervisor.

Check out the supervisor's academic reputation online. A supervisor's reputation in the academic world can alter your chances of receiving a publication from your body of work. The results you gain in your study are most important but small things make a difference. The experience your supervisor has for submitting papers for publication to a particular journal, the consistency of their publications, and their ability to continually receive funding for their projects will all play a part.

However, I would personally choose a supervisor that I got along with over a supervisor that I was more likely to get a publication.

2. Choose a project you are actually interested in.

This is a no-brainer. You will be spending an extended period of time reading hundreds of articles, sprawling through journals, getting to the department at ridiculous times in the morning, and leaving at even more ridiculous times at night... Choose something you actually like! Otherwise things will get very boring, very fast and your motivation will drop considerably.

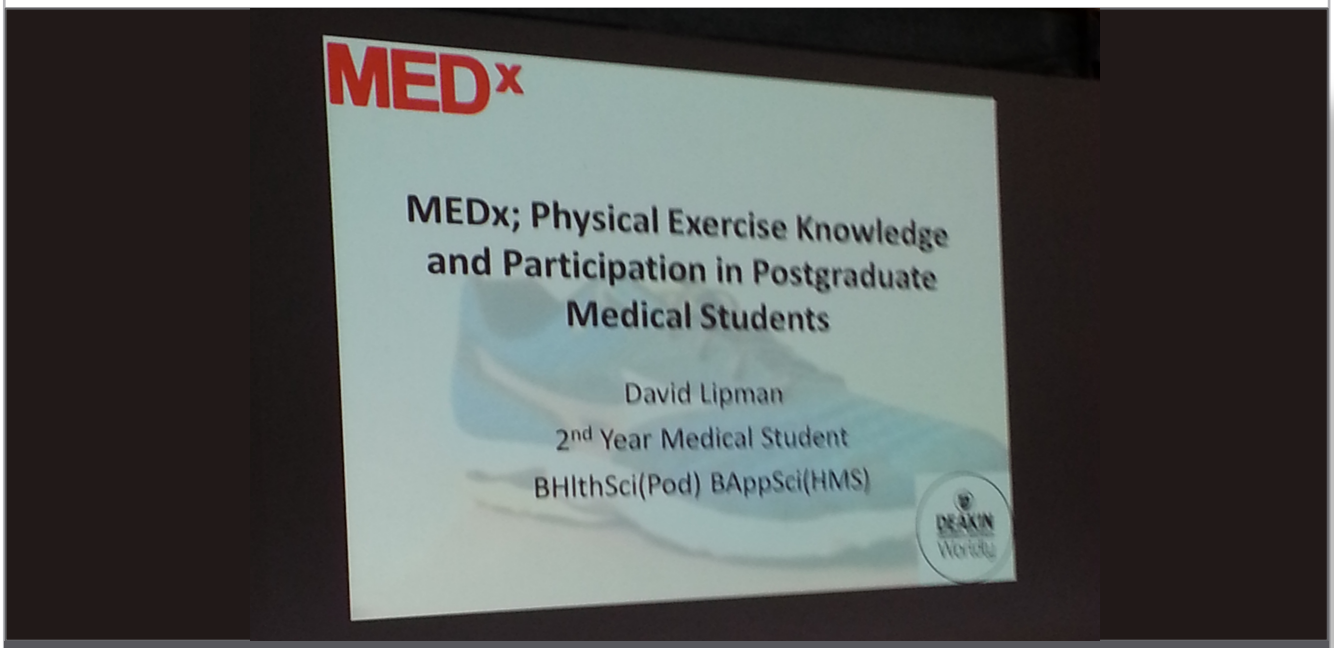
Academics seem to have an incredible passion for their work and are extremely dedicated people. For the time you spend in their department, they will expect that you will have the same dedication. On top of this, presenting your results becomes much more exciting if you understand the significance of what you're achieving, and have a passion for its place in the literature.

3. Ensure you are surrounded by others in the lab/department that you get along with.

A research year is tough, with long hours, no pay, and a lot of work inside and outside the department. You cannot rely on your supervisor to be your only means of support, and therefore I would strongly encourage choosing a lab/department with a strong support network. You will only know this by asking to meet the rest of the people in the department and having a chat to a few of them. Ask if they socialize outside of the lab, if they have been working there for an extended period of time, and if they enjoy working in that department. Though you will most likely get fabricated, cotton-candy responses to most of these questions, it gives you a good indication as to the environment you will be immersed in for a year of your life.

These three things are not everything to look for in a project, but they are a good starting point. I hope it helps you to simplify your decision in the future and allows you to have an enjoyable and satisfying research experience.

This is an opinion-piece and was based on my personal experience during my lab-based research project and talking to other honours students throughout the year.



How an Addiction to Social Media

Helped to Inspire Research to Change Medical Education in Australia

By David Lipman

3rd Year Medical Student

Having a background in exercise, both in my studies and my personal life, I very much see exercise as a crucial part of EVERY doctor's tool bag.

I found it very frustrating dealing with doctors who had little appreciation of exercise beyond the fact that it was 'good' or that it 'should be done'. I look at exercise as equal to pharmaceuticals without all the negative side effects. Prescription and understanding needs to be much more than 'do some exercise'. This is akin to doctors saying, 'you need drugs, go see the pharmacist'.

Recently, the WHO set goals to reduce physical inactivity by 10% by the year 2025; doctors play a crucial role in this. It may sound idealistic, but public perception of doctors allows us to have great power to create change in society. This challenges the current generation of medical students with a significant load to carry in the area. Coupled with the growing burden of NCDs it is very clear that we may be ill equipped to do what is needed for our patients unless we change.

There is a current tidal wave of support in this area with the recent 'Exercise is Medicine' initiative and associated publicity. This is particularly prominent in the twittersphere. It was through twitter that I became involved in a UK initiative to integrate teaching surrounding exercise as medicine into undergraduate medical curricula and now allied health curricula. I'm hoping, through the support of this group and my research, to bring these changes to medical schools in Australia.

This was the first time I'd ever considered research as an option for myself. To this end I think an important point is illustrated; many are doing research that they are not passionate about and I would certainly advocate for this not to be the case. The commitment required in order to produce meaningful and quality

research is significant and thus one's topic should definitely be something that you find interesting and are passionate about. This will improve the quality of the research itself as well.

In way of advice, beyond making sure you are passionate about what you are researching, I would say that patience is essential and your supervisor and their support is paramount. Resilience and persistence are two more things I feel I have needed to exercise (pun intended) whilst being involved in my project and I am sure I am not the only researcher experiencing this.

The end goal? I am hoping that through my research, as part of a larger change in mentality and medical education, future doctors will be able to prescribe exercise as they do drugs, including route and dose. It would prevent surgery, improve surgical outcomes and have a significant impact on NCDs. Additionally it would play a role in the prevention and management of a range of disorders including obesity and mental health issues. Not to mention that it would ensure all doctors are personally physically active, as this has been shown to have significant benefits to their patients!

For more information, questions or general exercise excitement, David can be followed on twitter @DJ_Lipman for email via dlipman@deakin.edu.au.

David would also like to thank everyone who has participated in the surveys and we encourage everyone to continue doing so to support David's research and goals.

MEDx: Physical Exercise Knowledge and Participation in Postgraduate Medical Students

Introduction: Facing a growing burden of non-communicable disease, are today's medical students adequately prepared for the changing disease burden? This study explores medical students' attitudes and exercise levels as it is known that role modelling and physicians' exercise habits greatly influence their exercise prescription.

Methods: A survey of Medical students at Deakin University was undertaken with regards to their exercise habits as well as their perceptions and beliefs surrounding exercise.

Results: 49.3% of students believe medical school hinders their exercise. If exercise increased since beginning their studies, over 70% cited mental and/or physical health as a driver. If it decreased over 80% cited time and university commitments as the reason. All students believe that prevention was important in conditions related to physical inactivity, 89.4% believe exercise counselling is important for their future field and 91% believe that role modelling is essential. However 68% discuss exercise with their doctor less than sometimes.

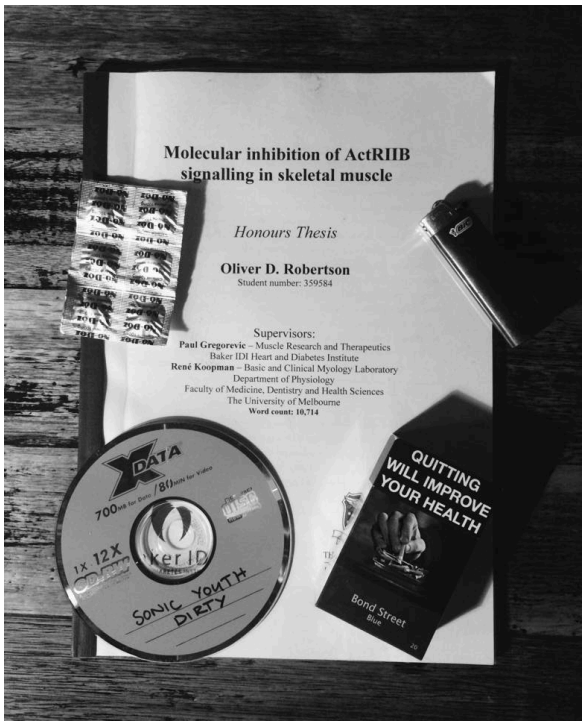
Discussion: The discrepancy between the views of the medical students and the medical school environment as well as the reality of their interactions with their own doctors is clear. Interestingly, of those that have increased their exercise since beginning medical school over 70% cite mental health as a problem, it is not unlikely that this may be as a result of the medical school environment.

Conclusions and take home message: There is a clear disparity between the perceived importance of exercise amongst students, their exercise habits and the actions of their doctors. It is also clear that the medical school environment negatively impacts this.

Caffeine Tablets, Cigarettes and Sonic Youth

By Oliver Robertson

2nd Year Medical Student



Honours… it's not an easy thing to put into words. The experience is so varied. At times it's exhilarating and at others it's more frightening and confusing than puberty. In order to do it justice, I think it would be best to recount both a high and a low from a turbulent year.

While the thesis is your bread and butter, the final honours talk is the true measure of your success as an honours student. It's a chance to sore above your competitors or disappear from academic relevance like an over-head projector. Twelve minutes to either convince the faculty that you were a worthy investment of time and resources or expose to them that you weren't.

As it was, after ten months of mind altering hard work, the day of my final talk had come. At 6:45 that morning, I met my supervisor in a non-descript corridor of the medical building to run rehearsals of the presentation. A mere two hours before I was due to present we were putting the finishing touches on my slides and deciding upon the optimal phrasing of my closing statement. This may sound like the definition of disorganisation but I can assure you that it wasn't. I'd been working on the talk for months and could have presented a week prior with great success. But we were striving for perfection. I'm not sure that we reached it but the talk went well regardless.

The reason I remember this experience as a *high* is not because I am a lunatic who thrives on anxiety and lack of sleep. It's because for the first time in my life as a student I had a mentor who was so committed to my development that he was sitting there, in the corridor, helping me at 6:45 in the morning. The confidence that you gain from such an interaction is intoxicating. Walking into the lecture theatre for my presentation I felt like David Bowie, ego palpable and failure impossible. This would not have been the case if it weren't for my supervisor's commitment to my cause.

The *low* came ten days later. The evening before my thesis submission date was essentially an exercise in stress induced psychosis. By the time that the last of my colleagues left me alone in the lab with thousands of words still to write, there was less than twelve hours until the submission deadline. Make no mistake; this was the definition of disorganisation. I remember the early hours of the morning with fondness. I was wired and alert following the ingestion of multiple caffeine tablets and the words were flowing freely. However, four to five hours

and the entire Sonic Youth discography later I was starting to struggle. I think the combination of caffeine tablets and 24 hours fixated on a computer screen in a fluorescently lit room was taking its toll. I remember hearing voices and hitting my knee on the leg of my desk multiple times while whirling around to confront an intruder (there wasn't one). It wasn't long after this that I decided to go and get some cigarettes. I don't even smoke… The night culminated in me sitting in the gutter at the nearest 7/11 smoking and crying on the phone to a friend in New York. He was the only person I knew in the world who was awake in my hour of desperation.

It's pretty incredible what lack of sleep and anxiety can do to someone. You'll be happy to know that I got my thesis in on time and it went well despite its haphazard construction. There's a spelling mistake on the first page, which I only noticed after printing it on the most expensive paper possible. But hey, that's how it goes. Like I said at the beginning, honours is a year of highs, lows and everything in between. In saying that, it was the best experience of my academic life and if offered the chance to do it again I would jump at it immediately. If you're thinking about it, do it. It'll make you better at whatever it is you decide to do.

Oliver completed pre-clinical honours in the Muscle Research & Therapeutics Laboratory at the Baker IDI Heart and Diabetes Institute under the supervision of Dr. Paul Gregorevic.

HCN Channels and their Role in Epilepsy

By Andrew Awad

3rd Year Medical Student

Andrew was a part of a research team at the Florey Institute looking at the anti-seizure effects of HCN Channels.

Epilepsy is neurological disorder characterised by seizure activity, 10% of the population are at a risk of experiencing a seizure in their lifetime, while 3-4% will be diagnosed with epilepsy(1). It is the most common chronic brain condition in Australia and affects around 50 million individuals worldwide and is associated with a mortality rate 2-3 times greater than the general population.

The cause of epilepsy is thought to be related to the interaction between genetic and environmental factors, with genetics thought to be involved in the bulk of cases. However, in about 60% of cases the cause is unknown(2). Epilepsy in essence cannot be cured, but seizure activity can be controlled with current anti-epileptic medication. However, around a third of sufferers do not respond to current treatment options(3).

Hyperpolarisation-activated cyclic nucleotide-gated channels (HCN) are one of the brain's pacemaker channels and help maintain neural rhythmicity. They are broadly expressed in the hippocampus and thalamus and are thought to contribute to neuronal hyperexcitability states such as in epilepsy(4). HCN are also located in the sinoatrial node cells of the heart, where they help contribute to sinus rhythm generation.

Previous studies of animal mice models with epilepsy showed that HCN gene deletion produced an increased rate of spontaneous absence seizures. These mice also showed a cardiac sinus arrhythmia, consistent with HCN's role in sinus rhythm generation(5). It is also interesting to note that several reports have suggested that some current

anti-epileptics such as lamotrigine and gabapentin up-regulate HCN function(4), aiding in our understanding of their mechanism of action and allowing for the development of a new and novel anti-epileptic drugs.

Over the summer, I was involved with a research team at the Florey Institute of Neuroscience and Mental Health, where we were looking at the potential anti-seizure effect of HCN antagonists in primarily animal models of epilepsy. We hoped to determine if these channels would make good drug discovery opportunities for the treatment of epilepsy.

The basis of our experiment was simple; we would compare the time taken for a seizure to develop in a stimulated environment with animal models injected either with a HCN antagonist or normal saline. Our experiment showed promising results and highlighted the potential for the role of HCN as a possible anti-epileptic drug.

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Australian Medical Student Journal

What is the AMSJ?

The Australian Medical Student Journal (AMSJ) is a national peer-reviewed biomedical research journal written by students, published for students. It allows Australian medical students to publish their work and share ideas with their peers.

What is published in the AMSJ?

A variety of articles are published in the AMSJ including student research, articles about medical topics not typically addressed in core curricula, discussions of current medical issues relevant to medical students and much more. It is an excellent medium for students to publish academic work.

Where can I get the AMSJ from?

The ASMJ is printed in hard copy and will be distributed by your AMSJ reps, or you can access it online at www.amsj.org.

How can I get involved?

Email your work or questions to deakin@amsj.org.au and your friendly reps will get back to you! Your reps are Jake Sanders (clinical rep) and Jacqueline Fraser (pre-clinical rep).

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Social Report

By Dylan Dunn

Social Chair

2nd Year Medical Student

The MeDUSA Social Calendar kicked off with soccer and tug-of-war for the Preclinical Sports Cup, the sports, sunshine and team spirit was enjoyed by all but both wins were taken home by the second years! The week concluded with Cocktail Night at Mrs Hyde, a wonderful evening of great cocktails and even better company. This was followed by an epic weekend at MedCamp to welcome the new first years! For the remainder of the semester, look forward to Netball for the Preclinical Sports Cup and the After Exams Party!

Write for the Pulse

If you have an article or a topic of interest, we want to hear about it.

Email submissions to publications@medusa.org.au

Students who contribute to two or more submissions a year receive a signed certificate from the MeDUSA Preseident.

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