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PROJECT INFORMATION – Project 1

Project Title:

Supporting Vaccination Services for People with Intellectual Disability: **Evidence Review and Development of Practice Resources for Pharmacists.**

Hypothesis: Evidence-informed resources tailored to the needs of people with intellectual disability will support pharmacists to implement best-practice vaccination services and improve the accessibility and quality of vaccine delivery for this population.

PROJECT ATTRIBUTES AND BENEFIT TO THE STUDENT

Brief description of project: This project forms part of the broader *Me and My Medicines* program, which aims to optimise medicine use and health care experiences for people with intellectual disability. Specifically, this project will support implementation of updated vaccination practice guidelines for pharmacists currently being developed by the Pharmaceutical Society of Australia (PSA). As part of this work, supplementary implementation resources are being created for specific population groups, including people with intellectual disability.

The student will undertake a focused review of the academic and grey literature relating to vaccination experiences, communication needs, barriers to access, supported decision-making, reasonable adjustments, and pharmacist-delivered vaccination services for people with intellectual disability. Findings from the review will be synthesised to identify key considerations for pharmacists delivering vaccination services.

Working alongside academic supervisors with expertise in pharmacy practice, intellectual disability health, the student will contribute to the development of a draft pharmacist practice guide and an accompanying case study illustrating the patient journey before, during, and after vaccination. The project will involve evidence synthesis, knowledge translation, and resource development to support implementation of best-practice vaccination services for people with intellectual disability.

Student's role in the project:

The student will:

1. Conduct targeted literature searches and review academic and grey literature relating to vaccination services for people with intellectual disability.
2. Synthesise the evidence and identify key barriers, facilitators, and best-practice approaches for pharmacist-delivered vaccination services.
3. Contribute to the development of an evidence-informed implementation resource (approximately 2-pages) and accompanying vaccination case study for people with intellectual disability.

- ***Throughout the scholarship****:* Participate in meetings with the research team
- ***Project outputs*****:** Contribute to an evidence summary, a draft pharmacist implementation resource, a draft case study demonstrating person-centred vaccination care for an individual with intellectual disability,

Student's benefit from their involvement:

The student will gain experience in:

- Literature review
- Pharmacy practice research
- Knowledge translation
- Development of professional practice resources

- Research communication and academic writing
- Working with multidisciplinary stakeholders, including professional organisations and researchers with expertise in intellectual disability health.

The project will provide exposure to applied health services research that directly informs national pharmacy practice and the delivery of equitable health care for people with intellectual disability.

Research Location Information (where the project work will be conducted)
Campus: Callaghan **Building & room number:** MS125

Supervisor's Information (primary supervisor should be in SBSP)	
Supervisor Name: Hayley Croft	**Academic Appointment at UON:** Senior Lecturer
E-mail Address: Hayley.croft@newcastle.edu.au	**Preferred Phone:** 49854263

PROJECT INFORMATION - Project 2

Project Title :

Using Wearable Biofeedback to Improve Walking After Stroke

Hypothesis: Wearable biofeedback can assist individuals following stroke to modify their walking patterns, with measurable improvements in gait symmetry, mobility and functional walking performance.

PROJECT ATTRIBUTES AND BENEFIT TO THE STUDENT

Brief description of project:

Stroke is a leading cause of long-term disability, with many individuals experiencing persistent walking impairments that reduce mobility, independence and quality of life. Common gait deficits following stroke include reduced walking speed, asymmetrical gait patterns and altered lower-limb function. While rehabilitation can improve mobility, there remains a need for accessible and scalable approaches that provide ongoing feedback during walking practice.

Recent advances in wearable sensor technology have created new opportunities to deliver real-time biofeedback outside traditional laboratory settings. Wearable systems can continuously monitor movement and provide information that encourages individuals to adopt more desirable movement patterns during rehabilitation.

This project forms part of an ongoing study investigating the use of wearable biofeedback to improve gait in people following stroke. Data collection will occur during January and February, providing a unique opportunity for a summer research student to become involved in an active clinical research project. The student will gain exposure to participant testing, gait analysis, wearable technology and rehabilitation research while contributing to a project with direct clinical relevance. The project aligns with current research priorities focused on digital health, wearable technologies and improving outcomes for people living with neurological conditions.

Student's role in the project:

The student will become an active member of the research team and assist with multiple aspects of the project, including:

- Assisting with participant testing and data collection sessions.
- Setting up and operating wearable sensor systems used for gait assessment and biofeedback.
- Supporting collection of clinical and functional outcome measures.
- Assisting with preliminary analysis of walking and mobility outcomes.

The student's responsibilities will be tailored to their skills and experience, providing opportunities to develop both practical research and data-analysis capabilities.

Student's benefit from their involvement:

This project will provide the student with hands-on experience in clinical biomechanics and rehabilitation research. Unlike many summer projects that focus solely on data analysis, the student will be involved directly in participant testing and gain experience working with individuals following stroke.

The project will provide training in wearable technologies, gait analysis, research ethics, participant interaction and data management. The student will observe how biomechanics

research can be translated into interventions designed to improve health outcomes and quality of life.
Working alongside researchers, clinicians and participants will expose the student to interdisciplinary health research and provide valuable insight into potential career pathways in research, clinical practice and higher degree research. The experience will equip the student with practical and transferable skills while contributing to a project with clear clinical and societal impact.

Research Location Information (where the project work will be conducted)

Campus: Callaghan
Building & room number HPE G02

Supervisor's Information (primary supervisor should be in SBSP)	
Supervisor Name: Karen Mickle	**Academic Appointment at UON:** Senior Lecturer
E-mail Address: Karen.mickle@newcastle.edu.au	**Preferred Phone:** 43484643

PROJECT INFORMATION – Project 3

Project Title:
Constructing a database of co-occuring diseases
Hypothesis: Understanding the patterns of co-occurences of diseases will help understand their shared underlying causes. It can also uncover yet unknown relationship between diseases and act as an hypothesis generator for other researchers' studies.

PROJECT ATTRIBUTES AND BENEFIT TO THE STUDENT

Brief description of project:

This project is bioinformatics based (no wet-lab involved and can be done remotely).
It aims to construct a database of co-occuring diseases using large cohorts (>100,000 individuals). Diseases are usually encoded as ICD-10 codes. For each code pair, we will calculate statistics and construct a database based on the results, presenting users with insightful results.

Student's role in the project:

1) Cleaning up dataset
2) Calculating stratistics
3) Constructing a database
4) Presents results as relevant plots and tables

Student's benefit from their involvement:

The selected student will learn:

- The basics of computer science for bioinformatics (R or Python coding), bash, Linux, git
- The basics of statistical modelling (linears, logistic regression, statistical testing)
- The basics of plotting

Research Location Information (where the project work will be conducted)

Campus: Callaghan or Remote
Building & room number MS 515 or remote

Supervisor's Information (primary supervisor should be in SBSP)	
Supervisor Name: **Alexandre Xavier**	**Academic Appointment at UON:** Lecturer
Preferred Phone:	0481223183
E-mail Address:	**alexandre.xavier@newcastle.edu.au**

PROJECT INFORMATION – Project 4

Project Title:

Bioinformatic analysis of diet-induced molecular changes in acute myeloid leukaemia cells.

Hypothesis:
Acute myeloid leukaemia cells obtained from mice fed a high-fat diet will have altered epigenetic (DNA methylation) and transcriptomic (RNA) profiles.

PROJECT ATTRIBUTES AND BENEFIT TO THE STUDENT

Brief description of project:

Acute myeloid leukaemia (AML) is a rare but deadly blood cancer that is characterised by genetic, epigenetic and metabolic dysregulation. Dietary fat intake is known to increase the risk of an AML diagnosis, and AML cells can use lipid metabolism to fuel their growth. However, the potential benefits of reducing fat consumption after AML diagnosis remain to be defined.

We recently completed an animal study in which mice were fed either a high-fat diet (HFD) or a standard control diet for 12 weeks prior to AML initiation. Once AML cells were detected in the circulation, some mice on the HFD were switched to the control diet. Mice in the HFD group demonstrated slightly faster disease progression and decreased survival relative to mice fed the control diet.

We also collected AML cells from this experiment to determine:

(i) How HFD alters genetic regulation (DNA methylation and transcription) in AML cells.

(ii) Whether the molecular effects of HFD can be reversed by reducing lipid intake at the time of diagnosis.

Student's role in the project:

The successful student will work alongside a Post-doctoral Scientist and PhD student to complete bioinformatic analysis of sequencing data sets.

Student's benefit from their involvement:

This project offers an opportunity to see medical research in practice. The successful student will join a team of 7 staff and students, and gain insights into cancer biology, genetic regulation and bioinformatic analysis. The following skills will be developed:

1. Sequencing data quality control
2. Analysis of sequencing data using specialist software
3. Trouble-shooting strategies
4. Data presentation and interpretation
5. General coding skills (R)
6. Teamwork and communication skills
7. Time management and professional skills

The successful student will also have an opportunity to observe or assist with other research projects including cell and molecular assays as well as mouse experiments.

Research Location Information (where the project work will be conducted)

Campus: John Hunter Hospital Campus
Building & room number Hunter Medical Research Institute, Level 2 West

Supervisor's Information (primary supervisor should be in SBSP)

Supervisor Name:	**Academic Appointment at UON:**
Heather Lee Heather.lee@newcastle.edu.au	Associate Professor and NHMRC Research Fellow

PROJECT INFORMATION – Project 5

Project Title:

Targeting cholesterol-related processes for improved therapy in acute myeloid leukaemia.

Hypothesis:
Co-treatment with geranylgeranyl transferase inhibitors (GGTIs) enhances hypomethylating agent efficacy in acute myeloid leukaemia.

PROJECT ATTRIBUTES AND BENEFIT TO THE STUDENT

Brief description of project:

Acute myeloid leukaemia is a rare but deadly blood cancer that is characterised by genetic, epigenetic and metabolic dysregulation. Standard treatment involves cytotoxic chemotherapies, which are highly toxic and can be dangerous for older patients or those with additional health concerns. Alternatively, low-intensity epigenetic therapies called hypomethylating agents (HMAs) can be used. We have discovered that cells surviving HMA treatment have increased dependence on cholesterol-related processes and can be targeted by co-treatment with cholesterol-lowering medications (statins) (Bond, Burnard *et al.* Leukaemia 2025). Furthermore, recent experiments suggest that increased cholesterol processing supports cancer cells via the prenylation pathway which can be blocked by geranylgeranyl transferase inhibitors (GGTis). This project aims to further refine AML treatment strategies by testing HMA and GGTi co-treatment in human cancer cell lines.

Student's role in the project:

The successful student will work alongside a PhD student and Research Assistant to conduct experiments in human cancer cell lines.

Student's benefit from their involvement:

This project offers an opportunity to see medical research in practice. The successful student will join a team of 7 staff and students, and gain insights into cancer biology, genetic regulation, and metabolic processes. The following skills will be developed:

1. General laboratory skills
2. Cancer cell culture and drug treatments
3. Analysis of cell growth and cancer-initiating capacity (colony-forming assays)
4. Experiment design and trouble-shooting
5. Teamwork and communication skills
6. Time management and professional skills

The successful student will also have an opportunity to observe or assist with other research projects involving mice and bioinformatic analyses.

Research Location Information (where the project work will be conducted)

Campus: John Hunter Hospital Campus
Building & room number Hunter Medical Research Institute, Level 2 West

Supervisor's Information (primary supervisor should be in SBSP)

Supervisor Name:	**Academic Appointment at UON:**
Heather Lee Heather.lee@newcastle.edu.au	Associate Professor and NHMRC Research Fellow

PROJECT INFORMATION - Project 6

Project Title:

Lights, Camera, Scalpel!

Aim: To create a video series developed collaboratively by plastic surgeons and university anatomists to provide clear, anatomically accurate and clinically relevant explanations of selected plastic surgery procedures, supporting learners' understanding of the relationship between surgical anatomy and operative technique.

PROJECT ATTRIBUTES AND BENEFIT TO THE STUDENT

Brief description of project:

This project will develop an educational video series demonstrating selected plastic surgery procedures through collaboration between plastic surgeons at John Hunter Hospital and anatomists at the University of Newcastle. The videos will combine procedural demonstrations with explanations of the relevant anatomy, key operative steps and anatomical considerations underlying surgical decision-making.

The aim is to create an accessible, structured educational resource for students and surgical trainees. The project will involve planning the video content, developing scripts, observing surgery, and supporting anatomical explanations, assisting with video production, and refining the resources through review by the supervising surgeons and anatomist.

Student's role in the project:

The student will contribute to the planning, development and production of the video series under clinical and academic supervision. Their role will include researching the relevant surgical anatomy, assisting with procedure selection, preparing scripts and storyboards, and helping to organise and produce the videos. This will include observing surgical procedures and operating a camera. They will also contribute to editing and incorporating anatomical labels, illustrations or narration to clarify key concepts.
Throughout the project, the student will work closely with the plastic surgeons and anatomists, incorporating feedback to ensure that the completed videos are accurate, clearly presented and appropriate for the intended learners.

Student's benefit from their involvement:

The student will develop their understanding of applied surgical anatomy and plastic surgery through direct collaboration with specialist surgeons and anatomists. They will gain practical experience in educational resource development, including literature review, translating complex anatomical and procedural information into clear explanations, and producing digital learning materials.

The project will strengthen the student's communication, teamwork, critical appraisal and project management skills while providing insight into clinical and academic approaches to surgical education. Their contribution will result in a tangible educational resource that can demonstrate their skills and achievements within an academic or professional portfolio.

Research Location Information (where the project work will be conducted)

Campus: John Hunter Hospital & Callaghan campus
Building & room number
John Hunter Hospital, WFH & MS509 (office of supervisor)

Supervisor's Information (primary supervisor should be in SBSP)	
Primary supervisor Name: Dr Matt Farrow	**Academic Appointment at UON:** Senior Lecturer in Anatomy
Preferred Phone: +61 2 405550229	
E-mail Address: matthew.farrow@newcastle.edu.au	
Secondary supervisor Name: Dr Adel Fattah	**Academic Appointment at John Hunter Hospital:** Senior Staff Specialist (Plastic Surgery)

PROJECT INFORMATION – Project 7

Project Title:

Fighting Cancer, Protecting the Heart: Uncovering the Molecular Secrets of Safer Cancer Treatments

Hypothesis:
Novel drug combinations protect the heart from cancer therapy-induced damage by modulating molecular pathways involved in cellular injury and survival.

PROJECT ATTRIBUTES AND BENEFIT TO THE STUDENT

Brief description of project:

Cancer treatments have transformed survival outcomes for millions of patients worldwide, but many powerful anticancer drugs can also damage healthy organs, particularly the heart. This creates a major challenge: **can we develop cancer treatments that kill cancer cells without damaging healthy tissues?**

The ***Cardio-Oncology Centre of Excellence*** is tackling this challenge by investigating innovative drug combinations that maintain anticancer activity while protecting the heart. Our research team has already identified promising combinations, but the molecular mechanisms responsible for their protective effects remain unclear.

In this laboratory-based project, the student will investigate what happens inside heart cells when they are exposed to cancer therapies and protective drug combinations. Using molecular biology techniques, they will explore changes in genes and proteins involved in cellular stress, injury and survival to help uncover how these treatments work at the molecular level.

By investigating the biological pathways behind these promising drug combinations, the student will contribute to research aimed at identifying new strategies to make cancer treatments safer and more effective.

Student's role in the project:

The student will become part of an active cancer and cardiovascular research team, gaining hands-on experience investigating how anticancer drugs affect healthy cells and how innovative drug combinations may prevent these harmful effects.

Working alongside experienced researchers, the student will learn to extract RNA and proteins from experimental samples and use molecular biology techniques, including quantitative PCR (qPCR) and Western blotting, to investigate changes in genes and proteins involved in drug responses.

The student will also analyse experimental results, create scientific graphs and help interpret what their findings reveal about the mechanisms of cancer therapy and cardioprotection. They will have the opportunity to participate in laboratory meetings, discuss their findings with researchers and experience the process of scientific discovery firsthand.

Student's benefit from their involvement:

This project offers a unique opportunity to experience cutting-edge research and discover how laboratory findings can contribute to the development of better treatments for patients.
The student will gain practical experience in molecular biology techniques, including RNA and protein extraction, qPCR and Western blotting, while developing skills in experimental design, data analysis, problem-solving and scientific communication.

Working within a multidisciplinary research team, the student will gain insight into the exciting field of translational cancer research, where discoveries in the laboratory are helping shape future treatment strategies. The experience will provide valuable preparation for Honours, postgraduate research or a future career in biomedical science.
Research Location Information (where the project work will be conducted)
Campus: Hunter Medical Research Institute **Building & room number** HMRI Level 2 East

Supervisor's Information (primary supervisor should be in SBSP)	
Supervisor Name: Prof Doan Ngo Dr Amanda Croft Dr Nikhil Awatade	**Academic Appointment at UON:** Professor Post-doctoral research fellow Senior research assistant
E-mail Address: **Doan.ngo@newcastle.edu.au**	**Preferred Phone:** **0240420608**

PROJECT INFORMATION – Project 8

Project Title:

Beyond the Tumour: Investigating the Hidden Effects of Cancer Treatments on the Heart

Hypothesis:
Cancer therapies cause structural and biochemical changes in the heart that can be reduced by novel cardioprotective drug combinations.

PROJECT ATTRIBUTES AND BENEFIT TO THE STUDENT

Brief description of project:

Cancer therapies are designed to target and destroy cancer cells, but their effects can extend far beyond the tumour. Some treatments can cause significant damage to healthy organs, particularly the heart, potentially leading to serious cardiovascular complications. Understanding these hidden effects is essential for developing safer cancer treatments.

The ***Cardio-Oncology Centre of Excellence*** is investigating innovative strategies to protect the heart during cancer treatment without compromising anticancer efficacy. While promising drug combinations have been identified, understanding how these treatments affect the structure and health of the heart in preclinical models is an important step towards their future development. In this laboratory-based project, the student will investigate how cancer therapies and protective drug combinations affect the heart using samples collected from an experimental mouse model.

Through histology, microscopy and biochemical techniques, including ELISA, they will examine changes in cardiac tissue structure and measure markers associated with inflammation, cellular stress and tissue injury.

By exploring the effects of cancer treatments beyond the tumour, the student will contribute to research aimed at understanding treatment-related cardiac damage and evaluating new strategies to protect the heart during cancer therapy.

Student's role in the project:

The student will become part of an active cancer and cardiovascular research team, gaining hands-on experience investigating how anticancer drugs affect the heart and how innovative drug combinations may prevent these harmful effects.

Working alongside experienced researchers, the student will learn to prepare and stain heart tissue sections for histological analysis, use microscopy and image analysis techniques to investigate changes in cardiac tissue structure, and perform biochemical assays, including enzyme-linked immunosorbent assays (ELISAs), to measure markers associated with inflammation, cellular stress and tissue injury.

The student will also analyse experimental results, create scientific graphs and help interpret what their findings reveal about the effects of cancer therapies and cardioprotective treatments. They will have the opportunity to participate in laboratory meetings, discuss their findings with researchers and experience the process of scientific discovery firsthand.

Student's benefit from their involvement:

This project offers a unique opportunity to experience cutting-edge research and discover how laboratory findings can contribute to the development of better treatments for patients.

The student will gain practical experience in histological and biochemical techniques, including tissue preparation, staining, microscopy, image analysis and ELISA, while developing skills in experimental design, data analysis, problem-solving and scientific communication. Working within a multidisciplinary research team, the student will gain insight into the exciting field of translational cancer research, where discoveries in the laboratory are helping shape future treatment strategies. The experience will provide valuable preparation for Honours, postgraduate research or a future career in biomedical science.

Research Location Information (where the project work will be conducted)
Campus: **Hunter Medical Research Institute** **Building & room number** HMRI Level 2 East

Supervisor's Information (primary supervisor should be in SBSP)	
Supervisor Name: Prof Doan Ngo Dr Amanda Croft Dr Nikhil Awatade	**Academic Appointment at UON:** Professor Post-doctoral research fellow Senior research assistant
E-mail Address: **Doan.ngo@newcastle.edu.au**	**Preferred Phone:** **0240420608**

PROJECT INFORMATION – Project 9

Project Title:

A break in the case: Supporting research on Femur Fractures

Hypothesis / project aim:

To identify, critically appraise and synthesise published evidence relevant to an ongoing PhD project on femur fractures at John Hunter Hospital.

PROJECT ATTRIBUTES AND BENEFIT TO THE STUDENT

Brief description of project:

The student will support an ongoing PhD project on femur fractures at John Hunter Hospital, working with university anatomists and specialist trauma surgeons.

The project will focus on literature searching, critical appraisal and evidence synthesis, including assistance with literature review and systematic review writing. The student will help summarise existing research, identify evidence gaps and prepare written material relevant to the PhD. Activities will be tailored to the student's experience and the stage of the research.

Student's role in the project:

Under the supervision of university anatomists and a specialist trauma surgeon, the student will work alongside a PhD candidate. Tasks may include:

- Helping refine the review question and database search strategies.
- Screening titles, abstracts and full texts against agreed eligibility criteria.
- Extracting study information and preparing structured evidence tables.
- Assisting with critical appraisal and assessment of study quality.
- Synthesising findings and drafting literature review and systematic review sections.
- Revising written work in response to feedback from the research team.

Student's benefit from their involvement:

The student will develop practical skills in literature searching, critical appraisal, systematic review methods and academic writing. Working with university anatomists and specialist trauma surgeons will provide insight into the relationship between anatomy, trauma research and clinical practice.

The experience will support preparation for Honours, postgraduate research or a career involving clinical research. Opportunities to contribute to presentations or publications will depend on project progress and the student's contribution.

Research Location Information (where the project work will be conducted)

Campus:

WFH, John Hunter Hospital, & University of Newcastle Callaghan Campus

Building & room number:

MS509

Supervisor's Information (primary supervisor should be in SBSP)	
Primary supervisor Name: Dr Matthew Farrow Matthew.farrow@newcastle.edu.au	**Academic Appointment at UON:** Senior Lecturer in Anatomy School of Biomedical Sciences and Pharmacy
Secondary supervisor name: Professor Zsolt Balogh	**Academic Appointment at UON:** Professor of Surgery School of Medicine

PROJECT INFORMATION – Project 10

Project Title:

From evidence to impact: Supporting polytrauma research

Hypothesis / project aim:

To identify, critically appraise and synthesise published evidence relevant to an ongoing PhD project on polytrauma at John Hunter Hospital.

PROJECT ATTRIBUTES AND BENEFIT TO THE STUDENT

Brief description of project:

The student will support an ongoing PhD project on polytrauma at John Hunter Hospital, working with university anatomists and specialist trauma surgeons.

The project will focus on literature searching, critical appraisal and evidence synthesis, including assistance with literature review and systematic review writing. The student will help summarise existing research, identify evidence gaps and prepare written material relevant to the PhD. Activities will be tailored to the student's experience and the stage of the research.

Student's role in the project:

Under the supervision of university anatomists and a specialist trauma surgeon, the student will work alongside a PhD candidate. Tasks may include:

- Helping refine the review question and database search strategies.
- Screening titles, abstracts and full texts against agreed eligibility criteria.
- Extracting study information and preparing structured evidence tables.
- Assisting with critical appraisal and assessment of study quality.
- Synthesising findings and drafting literature review and systematic review sections.
- Revising written work in response to feedback from the research team.

Student's benefit from their involvement:

The student will develop practical skills in literature searching, critical appraisal, systematic review methods and academic writing. Working with university anatomists and specialist trauma surgeons will provide insight into the relationship between anatomy, trauma research and clinical practice.

The experience will support preparation for Honours, postgraduate research or a career involving clinical research. Opportunities to contribute to presentations or publications will depend on project progress and the student's contribution.

Research Location Information (where the project work will be conducted)

Campus:

WFH, John Hunter Hospital & University of Newcastle Callaghan Campus

Building & room number:

MS509

Supervisor's Information (primary supervisor should be in SBSP)	
Primary supervisor Name: Dr Matthew Farrow Matthew.farrow@newcastle.edu.au	**Academic Appointment at UON:** Senior Lecturer in Anatomy School of Biomedical Sciences and Pharmacy
Secondary supervisor name: Professor Zsolt Balogh	**Academic Appointment at UON:** Professor of Surgery School of Medicine