**Laboratory guide:**

**Heart Valve Development and Regeneration Group**

Last updated: 4/7/2025

Dear lab member,

Welcome to the Heart Valve Development and Regeneration Group!

I am very happy to have you with us and will do everything I can to ensure that you feel safe and supported during your time here.

This lab manual was developed to address common concerns lab members might have and to create best practices for our lab. If there is anything else you need to know or wish to clarify please feel free to ask me. This will be an evolving manual – suggestions for changes are welcome!

Best,

Renee

This guide was inspired by others, and burrows from them. Lab guides that inspired this one include:

* Francine Marques’s Hypertension Research Group Lab Manual
* Richard Maraia’s Welcome Letter
* Lab values & expectations page of the Laskowski Lab
* Srikrishnan Group Lab Manual

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# Lab vision, mission and core values

Our vision is to better quality of life by improving heart health.

Our mission is to perform excellent research on heart valves, which are essential to proper heart function. We are committed to discovering the fundamental mechanisms underlying heart valve development and regeneration, and transforming this knowledge into practical applications.

The lab is founded on three core values:

* **Kindness**
* **Integrity**
* **Innovation**

These three values underlie both our approach to research, and the way we treat each other in the lab.

## 1.1 Kindness

We always remember the people we are trying to help. Heart valve disease can lead to significantly lower quality of life. Heart valve replacement surgery is expensive and not accessible to everyone. We recognise that we have been entrusted by others to apply our time and skills to help others by doing research. Even when research gets stressful, we never lose sight of this greater goal.

We treat other people in the lab with kindness. We make sure that everyone feels safe, respected, and included.

We are kind to ourselves too. We take care our health – both mental and physical.

## 1.2 Integrity

We believe in doing the right thing, even when it’s difficult or when no one is watching. We are honest with our mistakes, and don’t ever lie about our data. We take the time to understand and adhere to ethical guidelines. We are accountable for our work. We respect and acknowledge the work of others.

We treat lab members with integrity. We are sincere, truthful and open in our communication. We value each other’s privacy and respect each other’s time. We strive to be reliable and to demonstrate fairness in all interactions.

## 1.3 Innovation

We are committed to pursuing novel ideas and solutions that push the boundaries of what is possible. We ask open-ended questions, question assumptions in the field, get outside our comfort zone, and are receptive to new ideas and change. We actively nurture our curiosity for the human body and the natural world, and, most of all, we maintain that drive to learn, learn, learn.

We believe that true innovation stems from a culture of respect and empathy, collaboration and inclusivity, and psychological safety. We provide each other the courage to challenge the status quo. We are open-minded to other people’s ideas, and provide constructive feedback when we can. We actively look for ways to help others in the lab to develop new knowledge and skills.

# Diversity, equity and inclusion statement

The Chow Lab is committed to creating a culture that actively recruits and supports people of diverse racial, ethnic, sexuality, gender, socioeconomic, and other backgrounds. We strive to create an environment that is free of bias, discrimination, and bigotry; an environment that promotes anti-racist thinking and actions; and an environment where all members are comfortable with speaking out and are dedicated to self-improvement.

We require all new lab members to take the online modules “Ethics and Professional Conduct”, “Modern Slavery” and “Queer 101”.

# My responsibilities to you

As your lab head, I am here to help you grow as a scientist and as a person. I cannot guarantee that you will always be happy during your time here – in fact, it is almost certain that there will be times where you will feel stressed, frustrated, and sad. However, I will do everything I can to make you feel that the time you spend here is worthwhile, that you are learning about yourself and about what makes good science, and that you are positively contributing to the scientific endeavour and the wider community.

You can expect me to:

* Uphold our lab’s core values
* Care about you as a person and not just a scientist
* Maintain a vision of where the lab is going
* Be passionate about our work
* Provide you with a safe work environment
* Seek funding to support lab activities, purchase reagents and equipment, and cover publication fees
* Come up with new project ideas to keep the lab going
* Meet with you regularly to discuss your research
* Inform you ahead of time if I will be away from the lab for a substantial amount of time (eg. to attend a conference or to work overseas)
* Make time to give feedback on drafts of your manuscripts, theses and presentations. (I always try to give feedback as fast as I can, but during busy periods this may take up to 3 weeks. Please plan accordingly.)
* Give you my perspective on science and advice on pursuing a career in academia
* Support your career development. For students and postdocs, this may include introducing you to other researchers in the field, and promoting your work through talks. For lab managers and research assistants, this may include providing opportunities for you to attain new skills.

# General lab member expectations and responsibilities

## 3.1 Reproducible research

Conducting reproducible research is more difficult than it sounds because it requires that you are organised and possess sufficient foresight to document each step of your research process. The main thing you can do to improve the reproducibility of your research is to take extensive notes to make sure you can repeat experiments: add explanatory comments, document every step of data analysis, and ensure you have the appropriate controls for your experiment. If you are writing computer code, make sure to use version control.

Do work that you can be proud of. Double-check and triple check your work. Once work is published in a paper or submitted in a thesis, it is very hard to change the record. Remember, regardless of whether your work is world-changing or just a small stepping stone for future enquiry, your name will forever be attached to your work.

### 3.1.1 Lab notebook

Please update your electronic lab book in Lab Archives regularly (this is a Monash University requirement). Your lab book should be well organised and contain enough detail for the reader to 1) Follow your logic, 2) Repeat your experiments and get the same results. Lab book entries need to be dated. Record your “failed” experiments as well as the ones that worked. Record details of any reagent used (supplier and reagent code) and any procedures performed to make stock reagents for the lab. Record fish lines used according to the ZFIN Zebrafish Nomenclature Conventions: [https://zfin.atlassian.net/wiki/spaces/general/pages/1818394635/ZFIN+Zebrafish+Nomenclature+Conventions](https://zfin.atlassian.net/wiki/spaces/general/pages/1818394635/ZFIN%2BZebrafish%2BNomenclature%2BConventions). Take photos of your experimental setups.

### 3.1.2 Data storage

**Please keep your data on your Monash computer or on the lab’s servers, not on your personal computer.** Please read the documents in documents in S:\MNHS-ARMI\Chowlab\General Information\Computers and Software for explanation of the different lab servers. Please make sure that other people can find your raw data if needed. This includes sensible naming and organisation of file names and deletion of duplicate data. Keep your raw data. For labelling image files, please see guidelines in S:\MNHS-ARMI\Chowlab\General Information\Training materials\Microscope training materials.

### 3.1.3 Leaving the lab

To ensure that critical data is saved appropriately, and projects can continue smoothly, it’s important that your departure is well planned for.

All data files and samples need to be appropriately labelled, including with detailed meta-data. Add README.txt documents to let future lab members know how to navigate your files and folders.

Equipment that was bought with lab funds need to stay in the lab.

Stay in touch! We may need to contact you in case we have questions about the project and because we want to know what new adventures you are taking on.

### 3.1.4 Maintaining fish lines

It is incredibly important that we keep a record of what we have in the fish room, both for science, and for the health and well-being of the fish.

If you sense a problem in the fish room, even if you are unsure, please tell someone.

If you use a tank of fish, please write on a piece of tape the date that you crossed, your initials, and a tick or a cross next to the date to indicate whether or not the fish laid.

If you no longer need a particular line, please let me know! We may consider euthanising the line, which will save room in the fish facility and money.

If you become in charge of a fish line or breed new fish, please:

* Label the fish appropriately (your name, the fish’s date of birth, ethics code, the number of fish, and the name of the fish line).
* Record details in your lab book or personal database
* Update the lab database in S Drive

Please use zebrafish line naming conventions according to ZFIN. https://zfin.atlassian.net/wiki/spaces/general/pages/1818394635/ZFIN+Zebrafish+Nomenclature+Conventions

## 3.2 Be considerate of others

We are sharing a space with our lab members and with other labs, so please be thoughtful of others. Be clean and tidy. Do your share of lab chores. If you think there is a chance that your experiment may impact others, please discuss with them before you start.

If, for whatever reason, you cannot make it to a planned meeting, please notify other people in that meeting ASAP.

If we are running low on a common reagent, please ask the lab manager to order more ASAP. Reagents can take a long time to arrive in Australia, so plan your experiments well in advance. If we are out of something, or a piece of equipment is malfunctioning, please let everyone affected know.

Work safely and look out for each other – make sure other people around you are working safely too. Your safety is one of my priorities. Please note that I will not hesitate to ban anyone from the lab who does not wear appropriate personal protective equipment. This includes improper footwear!

Please share your knowledge with others in the lab. Teach other lab members techniques when required. Help each other by giving each other constructive feedback. If you develop a new technique in the lab, please write up the protocol and load it onto the shared drive.

Harassment will not be tolerated in the lab. This includes sexual/racial jokes, gendered teasing or giving inappropriate nicknames to lab mates.

Be respectful to other people outside the lab too. Remember that when you attend conferences or workshops you are a representative of the lab.

## 3.3 Lab meetings and group activities

Grad students and postdocs are expected to lead at least one lab meeting per quarter. If materials will be discussed at a lab meeting (i.e. paper, or draft) then these should be sent around to everyone at least 5 working days prior to lab meeting.

Everyone should attend weekly lab meetings. This is an opportunity for you to share and learn from others. Do not be afraid to disagree in lab discussions but do it respectfully. We disagree with ideas, not necessarily with people. Keep the focus on the science, not the person.

I encourage everyone to join in lab social events. This helps with team building.

If new members join the group, please try to make them feel welcome by inviting them to join social activities. Some of the lab members may be far from home and family. Look out for each other and this would improve everyone’s productivity.

## 3.4 One-on-one meetings

When you join the lab, I will set a schedule to meet with you at least 30 minutes once weekly or fortnightly. If you don’t have anything to discuss that week, that's fine - we can use the meeting for a simple check-in. If you wish to cancel, please let me know at least a few days in advance. I will not always remember the details of your project or what we discussed at the last meeting. A couple of introductory topic sentences at the start of each meeting, or a slide introducing me to your latest experiment before showing me your data, will always be appreciated. Please keep a record of our meetings on Lab Archives and write down an action plan after each meeting.

Please be proactive in helping me help you. For example, if you want a meeting, please create meeting invitations. If you want something done by a deadline, please send email reminders. You can read more about managing up here: <https://www.cultureamp.com/blog/managing-up-importance>, and in the short article “The care and maintenance of your adviser” by H Kearns and M Gardiner (Nature 2011).

## 3.5 Conferences and seminars

PhD students and postdocs are expected to attend ARMI internal and external seminars. They are also encouraged to meet with seminar speakers, even if they don’t study something directly related to your project. Undergraduate students and master’s students are not required to attend ARMI internal and external seminars but are encouraged to do so.

Assuming the lab has money, each PhD student and postdoc will be able to attend at least one academic conference per year. Please do not submit an abstract to a conference without checking with me first, as this can lead to issues publishing data and potential fall out with collaborators.

Conferences are fun, but don’t forget that they are professional too. You are expected to prepare before you go (look up speakers and decide which posters interest you in advance), and use your time wisely at the conference (see relevant talks, network, etc). If you are asked present at a seminar or a conference, please prepare well in advance and ask to give a practice talk to the lab.

## 3.6 Taking leave from work

Please don’t come into the lab if you are not feeling well, either physically or mentally. Please let myself and the lab manager know if you are going to be out of the lab due to illness. If you need to come in while still coughing, sneezing, please wear a mask (disposable masks available near door of lab).

If there is a personal emergency, your top priority is to take care of yourself or your loved ones. Please communicate with me to let me know that you are dealing with something and approximately how much time you need off. You can share as much or as little detail about the nature of the emergency as you feel comfortable with.

All full-time staff and students are entitled to 20 days of personal leave per year (or a pro rata equivalent if you work part-time). I encourage you to recharge your batteries when you need to. Please notify me before you book a vacation. It is very, very rare that I would say “no” to specific dates. However, while academia is more flexible than most other professions, it is still a job, and you should not assume that leave is approved until I have said yes.

## 3.7 Work hours

Research work in our lab can be both extremely flexible and extremely inflexible.

Examples of inflexibility:

* In general, the fish lay best just after lights turn on at 8 am usually stop laying by 11 am – 12 pm. You will need to arrive at the lab early to get embryos on the days when you need them.
* There are limits to how much you can speed up or slow down zebrafish embryonic development by adjusting incubator temperature, and doing so always increases the likelihood of heart defects. Sometimes, you may need to perform an experiment late at night to hit the correct developmental stage.
* If you are being taught by another lab member or a collaborator, you need to work at hours that are most convenient for them. Please don’t assume they are free until you have asked them about specific dates and times.

Outside of the constraints caused by experiments and teamwork, you can generally choose your work hours. However, I recommend that you try to spend most weekdays between 11 am and 3 pm in the lab to support lab interaction.

While we value hard work, we do not value workaholism and wish to avoid presenteeism. You are trusted to manage your time productively and efficiently. Some students may choose to take on teaching responsibilities or work part-time outside of their PhD. This is ok, and in general, I would not be monitoring your hours. However, I ask that you put research as your top priority and apply consistent and professional effort to your research.

Please note that I sometimes work odd hours, which is a personal choice. If I think of something and email or message you after hours, I don’t expect you to respond until it is reasonable for you to do so.

## 3.8 Language

English is today’s de facto language of science: International conferences are held in English, the world’s top scientific journals are in English, and a lot of scientific terminology exists only in English. English is also the official language of the lab. While I recognise that this puts non-native English speakers at a clear disadvantage compared with native speakers, having a standard language in the lab facilitates collaboration and knowledge sharing, and ensures safety in the lab. I ask that all official documents of the lab (eg. your lab book entries, protocols, and memoranda) be written in English.

While it is great to chat with someone in your preferred language in private settings, speaking in front of others in a language they do not understand can make them feel socially excluded. Please do not speak in a language other than English in common areas if someone else is in the room who does not speak that language. This helps to build an environment where everyone feels they could join into a group conversation, even if they choose not to.

# Authorship

## 4.1 Authorship on papers

In general, we will follow ICMJE guidelines with respect to authorship, which is based on the following criteria:

* Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work
* Drafting the work or revising it critically for important intellectual content
* Final approval of the version to be published
* Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

According to ICMJE, “In addition to being accountable for the parts of the work he or she has done, an author should be able to identify which co-authors are responsible for specific other parts of the work. In addition, authors should have confidence in the integrity of the contributions of their co-authors. All those designated as authors should meet all four criteria for authorship, and all who meet the four criteria should be identified as authors. Contributors who meet fewer than all 4 of the above criteria for authorship should not be listed as authors, but they should be acknowledged. Examples of activities that alone (without other contributions) do not qualify a contributor for authorship are acquisition of funding; general supervision of a research group or general administrative support; and writing assistance, technical editing, language editing, and proofreading.”

In general, PhD students and postdocs will be the first author of original research publications in which they are the primary lead, and I will be the last author. If you contributed to the project in a significant way but did not lead the project, you will be a middle author and the order of authorship will be decided based on ICMJE guidelines. Postdocs may negotiate with me to be co-last or co-corresponding author if they applied for and secured the research funding themselves, or if they supervised the students involved in the research. For reviews and commentaries, if the postdoc received the invitation, they can choose their preferred position in the paper (eg. last author if a student is involved).

## 4.2 Manuscript submission

We always circulate manuscripts to our co-authors before submitting them for publication and give them adequate time (at least a week) to give feedback.

## 4.3 Acknowledgement of others’ work at conferences and in theses

If you are presenting data made by someone else in the lab at a conference, please credit them on the same PowerPoint presentation slide as the data, as well as in the final acknowledgements. I encourage everyone to share their lab meeting or conference PowerPoint presentations on our lab server. *Please make sure you have permission from the person who made that presentation before you use their slides.*

If your thesis includes work performed by others, you must include this information in your thesis. I recommend including a statement at the beginning that summarizes contributions from others, and acknowledging the other person’s work in the text of the thesis when the data is first introduced.

## 4.4 Old projects

In general, project "ownership" expires 1 year after data collection has ended (or whenever the original primary lead relinquishes their rights to the study, whichever comes first). At that point, I reserve the right to re-assign the project (or not) to expedite publication. This policy is intended to avoid situations in which a dataset languishes for a long time, while still giving publication priority to the original primary lead.

## 4.5 Collaborations

Collaborations can enrich our work immensely. However, before you enter into a collaboration, speak with me first. I encourage all participants in a collaboration to discuss authorship matters, as well as work and funding contributions, at the beginning of the project, and whenever there is a significant change during the project.

# Conflicts in the lab

In general, if you sense a conflict with myself or another lab member, it should be addressed as soon as possible. Please don’t let small problems stew and become big problems!

## 5.1 People issues

*Who used the last of the XXX reagent? Who left all their mess lying around in YYY?* These are common disputes in the lab. Please try to resolve disputes by talking to one another. Please do not leave angry, anonymous notes in the lab or be quick to jump to conclusions about who did what, where, and when.

If you have an issue with another lab member that cannot be solved by talking with them about it, please chat with myself or the lab manager. If you have a problem with the lab manager, please talk to me about it. If you have a problem with me, don't hesitate to ask the lab manager to intervene or contact another member of the Department.

## 5.2 Mistakes in the lab

Everyone makes mistakes from time to time. You may forget to do something you promised someone you would do, or do something that you shouldn’t have. When this happens, own up to it. Our goal is not to be perfect but to be honest and responsible.

Mistakes offer an excellent opportunity for growth and can sometimes help expose larger and more systematic problems (e.g. we haven’t outlined a protocol clearly enough yet) and so addressing them can be helpful for everyone in the lab. The covering up of a mistake almost always creates far more problems than the initial mistake ever would.

## 5.3 Authorship disputes

Authorship disputes between lab members are one of the most common sources of major conflict in a lab. Authorship will be discussed before the beginning of a new project so that expectations are clearly defined. However, changes to authorship may occur over the course of a project if a new person becomes involved (eg, a collaborator), someone leaves (and leaves a study unfinished) or someone is not fulfilling their planned role. In case of dispute, I will use my interpretation of the ICMJE guidelines to decide who gets to be on the authorship list and the order of the list.