My research explores how biological patterns emerge, using a mix of experiments, computational models, and theoretical work. At the core, I am looking at lab-grown structures that mimic early embryonic development. Generating experimental data, analysing how their patterns form, while also developing artificial intelligence models (called neural cellular automata) to simulate these processes. Our goal is to find interesting connections between how the biological and artificial patterns emerge, hopefully offering some insights into both natural development and computational self-organization.

At first glance, my research might seem free from major ethical dilemmas – there are no human subjects, no controversial medical trials, and (I promise you) no mice missing from the basement freezer. But even in a field like mine, where we work with cells and simulations, there are still important ethical questions to consider. Who owns the data? Who gets credit for discoveries? A third thing? As the textbook notes, questionable research practices are often not about outright misconduct, but about navigating grey areas where the right path isn't always obvious. To bring two examples to the table, I will start out by a small thought experiment that I foresee might become a problem, and then indulge in a short personal anecdote from my time as a master student where I found myself facing one.

**The Ethics of Sharing Data**

A big challenge in research like mine is figuring out when and how to share data. Science thrives on openness, but it also depends on recognizing individual contributions. The datasets I generate from experiments are valuable, not just for my own work but potentially for others in the field. The question is: when should I share them, and with whom? If I release them too early, another researcher could use my data before I’ve had the chance to publish my own findings. On the other hand, if I keep them private for too long, I might slow down progress that could benefit the broader scientific community or maybe generate mistrust on my previous findings.

One way to handle this is to share data in stages. At first, it might only be accessible to close collaborators, like the AI researchers I work with. Later, once our core findings are published, the data can be made public. This approach strikes a balance – protecting my work while still supporting open science. The textbook emphasizes that data sharing increases research visibility and credibility but also acknowledges that many researchers hesitate due to fears of losing their competitive advantage [Popkin (2019) page 56]. From my naive perspective, I feel like I could share anything, as all my collaborators seem way too busy to even steal my work, so I have so far leaned very much in the ‘open’ direction. But I might get burned at one point and learn the hard way why this is one of the main topics of RCR.

**The Challenge of Authorship**

This is a story from real life (I also mentioned it when discussing the authorship-case in class).

When I was a master student, my lab was collaborating with a group of biologists. They needed help with data some analysis and asked us to help them. I made a bunch of code and helped make some figures including statistical methods their lab was unable to perform by themselves. As I was not getting cash-money, and I put in quite a lot of work, I simply assumed I would get authorship.

The scale of their project changed, and they started ignoring my emails, but I could see that they had looked at my code (which I had previously shared with them). I did not know how to navigate this, so I had to ask my supervisor to contact them and initiate a discussion. The problem stopped being “furthering research” and turned to politics (and furthering ones own prestige).

This is a thing I will keep on having to be watchful of. My current work combines physics, experimental biology and computational modelling, all contributions from different directions. The people who generate the experimental data play a crucial role, but so do the people who apply the statistics that analyse it and those that develop our models. The challenge is deciding who gets credited for what and, importantly, how authorship is to be arranged. Rather than making these decisions at the last minute, we can document contributions as the project progresses, ensuring fairness for everyone involved. The problem is, that you don’t know what you don’t know – sometimes you will not even realize that there is a disagreement before it is too late. As [Richard et al. (2014) page 52] advises, preparing a draft authorship agreement early on can prevent disputes later. So rather talk about too much than too little, spending the extra time to avoid getting future regrets – for any of the parties: The textbook highlights how “research environments shape ethical behaviour, not just individual choices” [p. 25]. So starting to have these kinds of talks more often might in turn make it more common/acceptable.

An additional note: We are just PhD-students, which means we are in the lower end of the pecking order, and, I believe, have a heightened risk of getting exploited.

Ethical dilemmas like almost never have clear-cut solutions, but they are an inevitable part of working in interdisciplinary research. If the only problems on your radar are the Penkowa-type, you might think that you are in the clear, but “Compared to the more serious cases of research misconduct, questionable research practices are much more widespread” [(Martinson et al. (2005; Fanelli (2009) p. 21]. The real issue comes from the fact that research is never done in isolation – it depends on a whole network of people working together. If any part of the the fabric of collaboration is eroded, research will grind to a halt. We are all standing on the shoulders of giants, but, as any teambuilding-exercise shows, no one wants to stand on the shoulders of someone they have no trust in.