Date of entry:	25-10-22
What have you done on your project this week?	**AIM – design a virtual simulation of a PCR experiment** This week I worked on the primer design aspect of the simulation To test if students understand the fundamentals of PCR primer design, one part of the simulation will allow them to pick from several different primer sequences (they must choose the correct primers to progress in the simulation)
What have you found difficult? (How do you intend to ameliorate this? How can you grow? Can you create a bullet point for your CV from this?)	Finding the best DNA sequence to use for this simulation, and the correct/incorrect PCR primers, was difficult. In the end I thought I would choose the gene encoding the ndm beta-lactamase, because students will find antibiotic resistance an important topic and so they will be able to see why it is important to do these PCRs (to detect the spread of antibiotic resistance genes e.g. by testing wastewater) Designing the incorrect PCR primers was hard too – required understanding what some of the common mistakes students might make are, and why. I think I may need to do more reading in this area, or ask some friends to test the simulation out for me, to make sure that this is working well. Bullet point for CV: able to design educational tools that emphasise relevant real-life scenarios for students
What has been a success?	I found a way to make the simulated PCR turn red and beep with an error noise when the user selects the wrong PCR primers. This should be an effective way of giving feedback to the students and helping them learn! Found a paper by Wright and Newman (2013) that describes using PCR in an undergraduate lab to dispel misconceptions about gene expression (https://journals.asm.org/doi/10.1128/jmbe.v14i1.539) – think this will be useful to help inform some of my design decisions as I finish making the virtual PCR simulation
What files/data have you produced? **(are they stored securely and labelled clearly?)**	▪ Sequence to amplify by PCR: ndm-blactamase.fasta (saved in "Documents/MyThesis/PCRsequences") ▪ PCR primers (correct and incorrect) described in – ndm-bla_primers.doc (saved in "Documents/MyThesis/PCRsequences") ▪ Made images of DNA sequence with correct and incorrect PCR primers:

	("Documents/MyThesis/PCRimages/01.jpg" through to "…/07.jpg") ▪ Updated simulation file (PCR.html) – saved in "Documents/MyThesis/PCRsimulation"
What is the objective for next week?	▪ Create graphics and text explanations of the PCR annealing and extension steps ▪ Find PDB structures for DNA polymerase ▪ Edit thesis intro – incorporate suggestions from my supervisor and discuss the Wright and Newman paper (plus any other relevant papers I find)