



I am a Biochemistry master student at the Ludwig-Maximilians University in Munich and conducted my master's thesis in the Kirkeby group at the University of Copenhagen's Department of Neuroscience. I had already done a three-month internship in Edinburgh, however wanted to additionally conduct my master thesis abroad. I chose Copenhagen since my grandfather was Danish and I still had distant relatives in Copenhagen. So I had some connection to Denmark and wanted to explore that more. In addition, the University of Copenhagen has a good reputation. Therefore, I looked at research groups on the University of Copenhagen website. Upon reading a few papers of each research group, I found interesting, I wrote them an email showing my interest in their research. Some group leaders did not reply, one said that they didn't have any vacancies, but one replied wanting to set up a skype meeting. I prepared for the skype meeting by writing down my experience including my bachelor thesis project. I talked to the group leader and my potential supervisor. They were very nice and asked about my lab experience and they told me about the project. When we ended the conversation, they said they would get back to me in two days. They agreed to have me in their lab and then I started the paperwork. Firstly, I registered my master's thesis at the student office. This involved writing a proposal. I asked my external supervisor for some help and he gave me a few notes which enabled me to write a one-page proposal. Basically, the proposal entails my information as well as of the research group and describes the project. I needed to have this document signed by an internal supervisor, who needed to be competent in the field of my research. Therefore, I asked a Professor at the LMU's Department of Biology and she agreed to be my internal supervisor. After she had signed the proposal, I sent the document to the student office of the gene centre registering my master's thesis. Next, I applied for Erasmus and since I had done this before, I knew how the process worked. I sent them an email to receive all the necessary information and documents. I needed to write a motivation letter, ask for the coverage confirmation of certain insurances and have my external supervisor fill out a document. Next, I had to look for an apartment. I joined a few facebook groups (Accommodation in Copenhagen and Roommate Copenhagen) and wrote people that were offering a room. The market in Copenhagen is very competitive so it was difficult to find something in my price range. It was also more difficult for me since I wasn't in town and I couldn't meet my prospective roommates in person. However, after posting in some of the groups I got a few responses and had faceted with some of them. I eventually signed a contract with a guy from Guatemala and once the contract was signed, I transferred the deposit. Until I moved in, we stayed in contact and started to build a friendship. In January I flew over to Copenhagen with a big suitcase. Once I landed in Copenhagen, I bought a metro card so I could take the metro to my new home, cleaned the room a little and unpacked my bags. I went to fotex in a nearby shopping mall and bought some things such as storage boxes. Additionally, I was in facebook groups where people give away or sell stuff they don't need anymore, such as 'Free your stuff Copenhagen' or 'Give-Buy-Sell-Rent for students by ESN CPH'. So I kept a look out for things that I still needed or posted in the groups and was able to get some stuff for free. In addition, it is helpful to join groups such as Germans in Copenhagen or international students in Copenhagen since they give



helpful advice, or you can ask questions you might have. I flew to Copenhagen a few days earlier to do some sightseeing before my internship started. I walked around the city centre and saw Nyhavn (the famous picture on all the postcards) some castles (Christiansborg Palace, Amalienborg), the little mermaid etc. Since Copenhagen is not that big it only takes about a day to see most of the city centre. Before my internship my roommate managed to get me a bike since he worked in a bike shop. Having a bike has many advantages (1) Copenhagen isn't a very big city meaning you can cycle pretty much anywhere (2) the city is equipped with good bike paths and (3) public transportation is expensive. However, the traffic rules are a bit different, so you need to familiarize yourself with them and there are a few crazy cyclists which you need to be aware of. To note is that the public transportation is very good, it is well connected, and the metro comes very often.

In preparation for my first day at the internship I read a few papers of theirs, researched their topic online and arranged a time and place to meet my supervisor. On my first day I met all the people in the lab and my supervisor showed me around as well as explained and demonstrated their equipment such as the cell culture room, microscope and the pipetting robot I-DOT. They had just moved to the new Maersk tower which was only about three years old. The building and the facilities were very nice however like every new building there were some malfunctions. For instance, you need a key card to gain access to the building as well as to the laboratories. It took a lot of running back and forth to the information and other people to get my card to work. The problem was however just some missing link which eventually someone discovered. Most of the time I was in the lab by 9 and left at 5 or 6 o'clock. This was also dependent on the experiments since I sometimes had to stay even later. It was nice because you could really plan your week yourself and some weeks weren't very stressful. Basically, you could come and leave whenever you wanted you just needed to get your stuff done so it was up to you. Additionally, in Denmark full-time is 37 hours compared to Germany it is 40 hours.

Nevertheless, my first two weeks I was taught all the techniques and showed how to work sterile in the cell culture room. They showed me a certain technique once or twice, I tried it with supervision and then I did it on my own. I thought this was a good way to teach me the correct technique of an experiment. Next step was to find surface markers expressed in a certain neuronal cell population from single cell RNA sequencing data embedded and represented in UMAP. I found three surface markers expressed in the neural crest population and together with my supervisor we wrote up my project outline. Firstly, I established a protocol for generating neural crest cells from human embryonic stem cells. This was achieved by researching other protocols and adapting or optimizing their protocols according to the techniques used in the lab. This was at the time very frustrating as the cells were very sensitive and died. However, I managed to establish two different protocols and analysed the resulting cells four different ways: (1) qRT-PCR (2) immunocytochemistry (3) migration assays (scratch and transwell migration assay) and (4) flow cytometry. I had regular meetings with my day to day supervisor and I always informed him of my progress. I routinely discussed my experiments and my progress with my supervisor and made a plan on how to proceed. I researched the topic and experiments in the literature



and wrote a detailed experimental procedure. I had this checked by my supervisor and then I would conduct my experiments. I learned to be a lot more independent however it is important to discuss your experimental approach with your supervisor since they are a lot more experienced and can offer helpful advice saving you a lot of time. Nevertheless, certain things did go wrong as my cells kept dying. I discussed this problem with my colleagues and their suggestions helped me solve the problem. We had lab meetings once a week and one member of the lab would present their research and could discuss problems they were having or just receive input from the other lab members. In addition to my thesis project I taught another student the basics in the lab and showed her what I was doing since she would be doing a similar project to mine. I enjoyed showing another student the ins and outs of the lab but it did take up a lot of my time.

The social life at the University was very good and you had numerous opportunities to interact with other lab members and students. In addition to the weekly lab meetings, the department of neuroscience had breakfasts together after which someone would present their research once a week. In addition, you could join a journal club, where someone would present a paper or attend the monthly Friday beer club. Furthermore, students (PhD, Master and Bachelor) would get together once a month and discuss if they had problems for example with their supervisors or about anything else and have a beer together afterwards. There were also board game nights once a week. So, there were numerous possibilities to meet new people in a very easy way and you really felt a sense of community, especially among students. We also had a WhatsApp group and people would ask if they wanted to go for a beer or to the beach, so you really felt included.

Not only did I meet many people at work however my roommate introduced me to many of his friends which was very nice. We would go to bars, to Salsa once a week and visited castles, such as the Frederiksborg Castle in Hillerod. I thought Copenhagen was a very nice place with a lot to offer. You have small lakes, canals and beaches. When the weather is nice which is not that often you have numerous places where you can swim, for instance Amager beach or Islands brygge. There is a newly built residential area which they call 'little Amsterdam' due to all of the canals and you can go swimming, but you will also find a lot of people on boats, kayaks and paddle boards. Additionally, Copenhagen has many beautiful parks such as Valby Park or Utterslev Mose. They are very well maintained, and you will find great places to barbecue. Furthermore, I would suggest going to Reffen which is one of the largest street food venues in the Nordics and has special events, like salsa or Monday Blues. Another great thing about Copenhagen is the proximity to Sweden, so you can take the train visit Malmo for a day. If you wanted to take a day trip you could also cycle (or take the train) to Charlottenlund. This is a very nice area with a lovely beach. If you cycle a bit further north, you will find the Deer park (Jaegersbord Dyrehave). This is a natural resort with forests, small lakes and wide-open landscapes. It also houses the King's beautiful hunting lodge in the middle of the park. While you are there you can also visit Bakken, which is the worlds oldest amusement park. It is not as impressive as Tivoli, which is in the city centre, however it is free and has a certain charm to it. Tivoli is rather



expensive, but it is very well maintained with beautiful flower arrangements and fun rides. You can buy a ticket just to enter and for an additional cost you can also ride the rollercoasters. They also have various events there, such as live music and at Halloween and Christmas they have beautiful decorations. It is worth a trip. Now the last place I want to suggest is Dragør, a very small, preserved city at the tip of Amager. I would recommend taking the bike as you pass beautiful scenery and can follow the coastline.

Although the city is very nice living there comes at a great cost. Food, drinks, rent and just the basic things are very expensive. I hardly ever went out for dinner and did not go to many bars. However, if you like board games there is a bar/café called Bastard Café with over 3500 games or you have the Meatpacking district (Kødbyen), which has many different bars, restaurants and clubs in one area.

I lived in two different places and paid between 600 and 800 €. As previously said, finding an apartment in the right location, with the right roommates, furnished and at a reasonable price is very hard however not impossible. The first three months I lived in Frederiksberg (very central) in an old apartment with a very small and old bathroom. A very common thing in Copenhagen are very small bathrooms or wet rooms that contain a shower. So basically, when you shower the entire bathroom including the toilet and sink will get wet. My second apartment was in 'little Amsterdam'. It was a new building accommodated with a nice kitchen and bathroom however more expensive.

I started my internship in January 2020, meaning in the middle of my thesis the world had to fight a pandemic. The pandemic did not affect Denmark until about March 2020. However, from one day to another we went into lockdown, so the University and thus the lab was closed. That was a very strange feeling since I was in a foreign country, I did not know many people or even know them that well and the whole reason I was there was for my internship. Many other international students and I were then faced with the decision to either stay in the country and hope it will be over soon or go home and potentially not be able to finish the internship. I decided to stay in Copenhagen, and I was filled with hope that the lockdown would not last long. Oh man was I wrong. The lockdown lasted for two months meaning the lab was closed for almost two months. My colleagues and I stayed in contact via Email and we continued with our weekly lab meetings via zoom. It was difficult to plan anything because nobody knew what was going to happen or for how long. We had to wait for the government to announce that we can go back to work. Finally, after 2 months, it was announced that the University will be opening again. I had a meeting with my supervisor and discussed what I would need to do once I was back in the lab. However, this was not that easy. The University had to follow certain guidelines, only a limited amount of people was allowed to be in the lab at once. Since the lab is an open and shared space used by many different research groups all the employees had to coordinate. Each lab had to fill out an excel sheet to get a time slot in the lab. Not only were these time slots only 4 hours meaning you had to get all your work done in that time and you could not be late, since you had to leave before the following person came but these time slots were also at night. We utilized the entire 24 h of the day and so certain people had to take a night shift. You had to put in your request for time slots about 1.5 weeks earlier, so

you really had to plan ahead. Another problem I was faced with was that my supervisor lived in Sweden and usually he would travel to Copenhagen every day. This was not possible anymore, as border crossing became more difficult. I stayed in contact with him and was able to ask him questions via Email or phone, but it was obviously still difficult since he was not there, and I had only been in the lab two months before the lockdown happened.

To conclude, the research group and the supervision was very good, and I would recommend it to other people. Copenhagen is a very nice city with a lot to offer albeit very expensive and very difficult to find an affordable and decent apartment.



Figure 1: Kayaking in 'little Amsterdam' Copenhagen



Figure 2: Dragør



Figure 2: Tivoli



Figure 4 : Deer park