I had the unbelievable chance to spend 3 months working on my bachelor thesis in the biopharmaceutical company AstraZeneca in Sweden supported by the Erasmus+ Internship program.

Position finding and application phase

The idea to try work in the industry came to me completely spontaneously. I landed there mainly through my general interest in drug discovery and development rather then some specific intention to do an internship abroad.

From my first semester of chemistry studies at LMU I have always taken in university lectures through a perspective of their importance for drug discovery. I took online courses in medicinal chemistry in my free time and joined a pharmacy research group early on to assist with some tasks and learn more. This research area was definitely the one that I was in love with and where I wanted to end up someday. But I had no idea what steps I should take in my education in order to achieve this goal.

One day our lecturer in organic chemistry mentioned that some of his graduates work in the drug discovery area. His team kindly set me in contact with one of the graduates who worked at AstraZeneca, so I could get some first-hand answers on my numerous questions about a career pathway in industrial drug discovery and development. Through this contact I found out that the company sometimes provides positions to accomplish master theses. Since I was in search of an interesting bachelor thesis project at that point, I wrote a speculative application for accomplishing the thesis within the company. To my luck it was accepted.

Preparation phase

The biggest and most important preparation was made by my supervisor within the receiving organization. I am very grateful for all his efforts and his highly valuable time invested in assuring that I have everything for a fast and convenient start. In chemistry it is important to have particular chemicals available for the work and my supervisor kindly ordered for me all the reagents in advance. He has solved all the questions concerning my access card, working space in the office and in the laboratory, arranged all the required courses. So when I first came to the company I had everything that I would need and even more. My supervisor also provided several pre-discussions of the project via skype so I was well informed about our research topic, about my future tasks and our future goals.
I was also surprised how much support Erasmus+ provides. Thanks to Erasmus I could estimate my language skills before the start of internship and had an access to an English course during my stay abroad. Erasmus+ preparation materials helped me to grow my intercultural awareness before the start and Erasmus representatives at my home university were always available for any questions.

There has also been some preparation from my side which helped me a lot throughout my internship abroad:

1. Work with literature in advance

For me as a beginner in terms of scientific research it was important to have a strong logic behind any future step in the research. So I took the time for a comprehensive study of topic-related available literature. I believe this simplified my understanding of the topic’s current place within other ongoing research in the world.

2. Material preparation

For life science students it is very well known that a human has a particular cognitive capacity for decisions. Let’s say you need some sort of information and you need to google it. It doesn’t only take your time to open the browser but also you waste your cognitive capacity on small decisions that you don’t even recognize (like “which link should I open first”, “which source should I trust”). At the end this lowers the ability to take really crucial decisions in work. So for me it was important to prepare in advance and make accessible those materials, that I knew I was going to use very often. And I would definitely recommend any student in the future to make the same reflection. Maybe there are some instructions or diagrams that you know you are going to use throughout all your work? Print and hang them in a visible place. If you know that you are going to need any images in your presentations/reports, then create them in advance.

3. Formalities

I had to apply for a special visa and I have had huge support throughout the application from the receiving organization, my direct supervisor and from Erasmus+. Thinking back I would advise the future Erasmus students to take care of the visa question as much in advance as possible. In my case it took more than 2 months to obtain a visa for an internship in Sweden due to a very long applications queue in summer time.

I was also responsible for the organization of my accommodation, so I had to find a suitable apartment in advance. It was very helpful for me, that my supervisor shared with me some popular resources for this search. Also thanks to Erasmus+ assistance I have easily arranged all the insurances for the period of my stay abroad.
During internship

In my first days I got an extensive tour through all the facilities of the company. The company itself looks like a city within a city with own stores, gym, lecture halls, beautiful collaboration areas and novel technologies. It was a thrilling experience to get in touch with some devices I had never used before.

Along with a facilities tour my supervisor introduced me to all the team members and the team leaders. I got my own work place in the office and two own fully equipped fume hoods for the laboratory work. All this together made me feel from the very start as a full team member. During my first week I finished some internal introduction courses on cyber security, safety in the laboratory and fire safety. My supervisor taught me how to use the internal software and arranged for me to visit introduction user courses for NMR and LCMS machines.

After all the introduction courses and preparations were done I started work in the laboratory. In the first days my supervisor showed me step by step how to set up some reactions and this gave me a confidence for the future work. My tasks in the project included:

- Synthesis of molecules similar in core but differently substituted using a recently published method
- Optimization of the applied method
- Analysis of the compound’s stability in DMSO and different aqueous systems
- Adjustment of the general protocol for stability studies
- Presentation of the results at internal meetings

Before the start I expected that monotony may occur in the work at some point but in reality it was never the case. Every day and every task were challenging and thus very interesting to achieve. There were always plenty of new ideas and tasks coming in and out the project making it fresh and highly flexible.

What was very special for me is that there was always a chance to bring own ideas into the project and they were always considered and taken seriously. This usually requires a strong trust of the more experienced colleagues in your skills and I was happy to work in such a collegial atmosphere.

I was also allowed to move independently throughout the project, to make my own mistakes that were never judged, to learn how to fix them and to get the most of them. At the same time I had huge support from all the team members concerning any questions at any given time.

During the internship I met many students and postdocs through the AZ-Youth group. My supervisor always brought me in contact with new people from other departments, helped to build my first professional network and to make my results visible for others.
Conclusion: learned lessons and expectations-reality reflexion

I have spent 3 months at the company and this time was the most fruitful in my life in terms of soft and hard skills that I have acquired.

The most valuable aspect of this external internship for me was a chance to see the whole process of drug production starting from the bench and ending up on the market. This is unique about any industry in comparison to academia. Whereas the university provides great theoretical knowledge, the industry shows you where/how to apply it and combine with other scientific areas in order to achieve goals of much higher complexity. I believe the Erasmus+ Internship program is an excellent opportunity to test yourself outside the university, to apply your skills and to acquire some new ones.

Thanks to our discussions with colleagues I now have a better understanding of how I should build my academic path in order to become a good specialist in drug discovery some day. I also got a basic insight of what research topics are currently “hot” in the world and which research groups produce excellent results. This will definitely help me to find a good PhD/Postdoc position and an interesting research topic.

Not less important was the experiencing of outstanding mentoring from my supervisor at AstraZeneca. This was the best example for me of how one can motivate and inspire one's co-workers.

I've learned how to deal with a loss of motivation and to keep working efficiently when series of failures arose in the experiments. I have learned that in the end you can come to a solution by thorough analysis of your failures. Any scientific work is connected to constant trials and fails. The real mastering of conducting research is about dealing with fails, taking the most out of them and trying to solve them without taking them personal.

Besides what I've learned there are of course still some things to improve. Such independent work provides a clearer picture of what skills should be further improved and learned in the future. For example it appeared I required a too long preparation phase in order to present the results at internal meetings. So my goal for the nearest future would be to improve this skill maybe through participation in student conferences. I have also figured out that it was difficult to estimate how much time I need to complete a task and meet a deadline. So my future goal is to give more attention to finding the golden middle between striving for more and actually getting all the planned tasks done in time.

Life in Gothenburg and swedish culture

Sweden is a very multicultural, friendly and open-minded country. I never felt as a foreigner there thanks to all the colleagues at work as well as some locals that I met there. Even though Gothenburg is the second biggest city in Sweden it is never crowded. With its several small islands accessible with ferries it's a great place for hiking in summer.
There are also some particularly great tourist destinations close to Gothenburg. It takes only around 3 hours to travel to Oslo which makes it easy to investigate the exceptional nordic nature of Norway in the weekend. Copenhagen and Stockholm are also great for sightseeing. Although the harsh scandinavian weather may not be suitable for everyone, it was exciting to get to know Sweden and be a part of its bright culture. I would highly recommend Sweden and Gothenburg in particular as a destination for future exchange students.

In comparison to Munich life in Gothenburg appeared to be a bit more expensive in terms of groceries but from my point of view much cheaper in terms of accommodation. Even though it is difficult to find a short term stay for interns in Gothenburg I had luck finding a room close to the center for 450 Euro per month which would never cost less than 600 in Munich.

In swedish culture there is a nice tradition called Fika which means a coffee pause with colleagues whenever you have time. Through its open atmosphere it is easy to build contact to anyone and have a discussion about any topic.