



The CHUST Committee



Travel Story 2023

Name:

William Ferreira Andrén

Year and line of study at KTH:

Last year bachelor, starting Medical Biotechnology

Which university did you visit? (Name, city, state):

Stanford University, Stanford, California

Time Frame: 10 weeks, June 19th – August 25th

Visa Category: J-1 Student Intern

Insurance Coverage: Europeiska ERV, Reseförsäkring Student

Scholarship Details:

7500 SEK from CHUST, 10000 from Sverige's Ingenjörer, CSN for 10 weeks (15 credit project course)

Project Overview:

My work was quite individual as both my Professor and PhD supervisor were travelling a lot during summer. I had two main projects, one with microneedles and the other a collaboration I initiated between Niclas Roxhed, from KTH, and with my lab at Stanford. Where I explored the use of microparticles used for transdermal drug delivery.

In both projects, I had to do some level of data handling in the sense of plotting in MATLAB and similar. Nothing too complicated.

Microneedles

This project ran for the whole 10 weeks, I was the only one working on the project and it consisted of indenting human skin samples with 3D-printed microneedles printed by members of the DeSimone lab at Stanford. I tried the needles and then discussed with the DeSimone lab and made iterations of the needles. The goal was to find the displacement for penetration and the force for penetration with a specific needle tip area. In the future, this data will be used to validate a Finite Element physics Model (FEM), that would be able to predict the damages in human skin from microneedles and the differences in damages between various designs.

Microparticles

This project was fully initiated by me, I brought the technology from Niclas Roxhed's lab at KTH and presented it to my professor at Stanford. He was immediately interested, and they will continue collaborating after I left. The microparticles are a novel way of doing transdermal drug delivery, they penetrate the top layer of human skin, Stratum Corneum (SC), and increase the bioavailability of a cream by damaging this barrier.

The main part of my work here consisted of measuring the drying stress of the SC. Isolated from human skin, the SC was placed on a small glass substrate and then the stresses that appeared in the SC sample could be measured. Then, I would apply the microparticles and compare the data that with not using them together with various creams.

Learning & Development:

I learned how to plan my own experiments set up collaborations and how to deal with data. I also had to present at group meetings about 5 times, so I got to practice doing PP. and presentations as well. Main take-away is the hands-on experience of doing research and the iterative process of redoing experiments and tweaking your protocol to ensure that good data is produced.

The project was at some points demanding but I felt comfortable with the goals most of the time.

I was entrusted with lots of responsibility due to my supervisors travelling and because I brought novel tech.

Life on Campus:

Campus life was great! Many students arrived for the summer quarter at Stanford to do courses (~300 undergrad or grads) and I met many people on campus doing their PhD or their master thesis in various labs.

Most days included me going to lab ~9am and wrapping up ~5-7pm, then I went to the dining halls and had dinner with various friends I met at the campus! There were possibilities for nightlife as well, but mostly in San Francisco – which is 1 h away with car and no train at night. Palo Alto has a very limited nightlife and most restaurants/bars close before 12.

I lived off-campus for 1400\$ per month for a single room with my own bathroom, this was on the cheaper side and living on campus would cost about 2-400\$ more. Finding housing is best done via SUpost.com, so get a verified Stanford email ASAP and post that you are looking for a place there, then people will for sure write to you. I came as undergraduate which makes me uneligible for most housing, (graduate housing is almost all of the housing options outside a Stanford program for summer). However, by emailing to the accommodation responsible ones, I talked them into accepting me for graduate by explaining that I am in a 5-year program with both grad and undergrad – so that might be a pro tip.

I lived in the Neighborhood College Terrace and was happy about it! It is just outside campus and I had a small patio which I shared with my house mates (3 other). I cooked food very few times as I most times at the Dining halls and had HUEL for lunch. Dining hall was 12\$ for dinner which for Palo Alto/Stanford was the cheapest thing. Pro tip is that people brought Tupperware and filled them with lunch for the day after – so 12\$ for lunch and dinner. Also, get a bike from SUpost.com as soon as possible, a bike is very useful.

Also! Watch out for housing scams on Facebook marketplace, I ran into way too many scams and people just straight out making up addresses and copying posts. So be careful, SUpost.com is much better.

Application & Stay Insights:

Watch out for the Stanford Cardinal health insurance, if you do not waive it, they charge you ~1800\$ for it. I waived mine as soon as I got access to the "Axess" platform – about 10 days before leaving. Officially that was too late but it was still okay.

One note is that I was there as undergrad, if you visit as a graduate, there is a charge of ~1200\$ per month. For undergraduate there is one fee of 500\$.

What documentation was required by the university? Additionally, what papers were essential for your visa approval at the embassy?

I needed the DS-2019 together with internship description, also had to prove sufficient funds (around 3500\$ if I remember correctly) to Stanford. At the embassy it was super simple, just two questions, where are you going and are you getting paid.

Expense	Monthly cost (in USD)	Notes/Comments
Rent/housing (incl. utilities)	1400\$	
Food	600\$	Includes all the eating out
Transport costs	200\$ bike	1 time
Health Insurance	300\$	Total
Other travel	1500\$	For other trips I made during the summer