

Students Committee
CSnD Master's Programme

Cancer, Stem cells & Developmental biology

Newsletter February 2016

INTRODUCTION

Dear fellow CS&D students,

This is the first newsletter of 2016! We decided to change the format of the newsletter and extend its content with some additional articles. With this letter we want to keep you up to date about our previous and ongoing activities. In February, several new students started our Master program. We would like to welcome those students and hope to see them at our activities!

In addition to the activities we have organized, including the seminars and the fantastic Sinterklaas/ Christmas evening, we are very busy with organising the annual CS&D retreat! Together with all CS&D students we will be visiting a great research city (which will be revealed later) to get an idea of what kind of research is being carried out there. Besides several seminars, lab visits and fun activities, all students will give a poster presentation about their own research project to their fellow students. The date of the annual retreat is set on Wednesday 8th of June until Friday 10th of June. Make sure to save these days in your agenda! Also, all students will have to hand in an abstract about the research project or thesis they are working on. More detailed information will be provided soon.

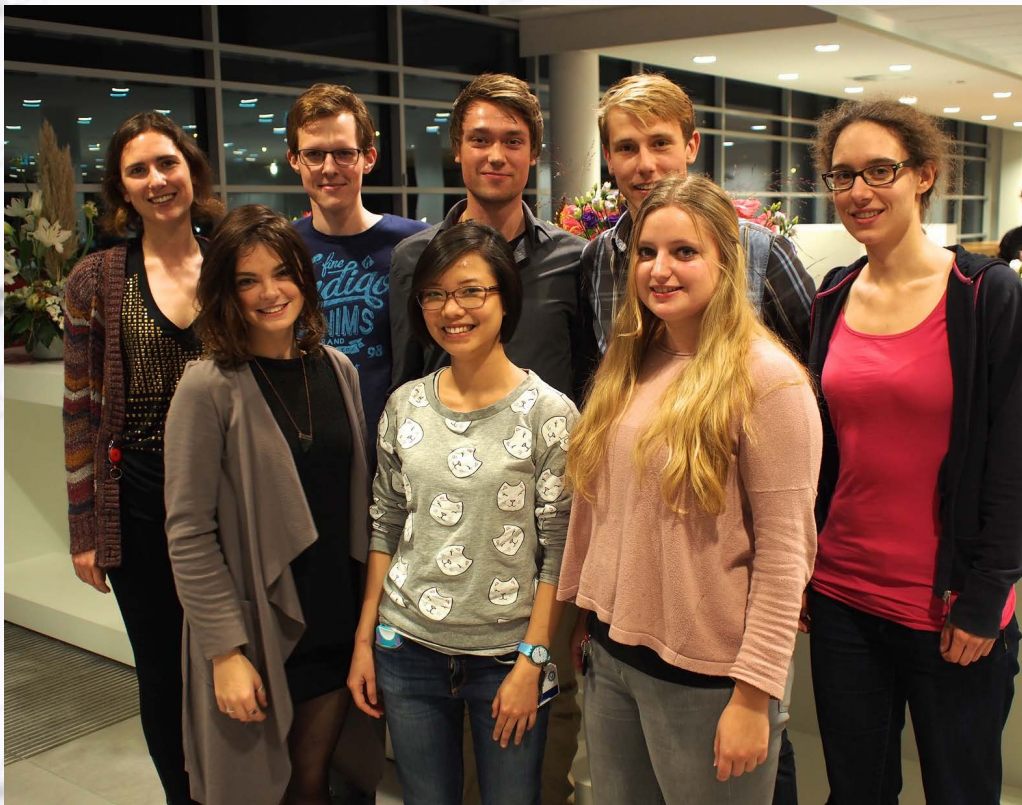
If you have any suggestions for an activity or question about the retreat, please contact us. You can contact us personally or reach us via e-mail, stucomcsd@gmail.com. To be informed about activities or to stay in touch with your fellow students and CS&D alumni, please join the LinkedIn and Facebook page:

<https://www.linkedin.com/groups?home=&gid=8190467>

<https://www.facebook.com/groups/658827320829393/>

We hope you will enjoy reading this new format of the newsletter!

Best,
The StuCom



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STUCOM SEMINAR

CSnD Seminar 11th of November 2015

Speaker: Marvin Tanenbaum

Topic: Dynamics and molecular mechanisms underlying gene expression control

Marvin Tanenbaum recently started his own research group at the Hubrecht Institute where he aims the study how gene expression is controlled within live cells. He is fascinated by the apparent contradiction that cells are extremely close packed and messy, while at the same time being tightly regulated.

Visualization is one of the most intuitive ways to understand how individual proteins can still navigate their way through this murky soup and participate in complicated intracellular events. However, many microscopic techniques fall woefully short of being able to visualize single molecules, let alone follow them. The most important reason why this is so difficult is because a protein that is labelled by one fluorescent tag is hard to detect against a background of autofluorescence and a haze of fluorescent tags outside the plane of focus.

Tanenbaum's approach to solving this inconvenience seems simple: if one fluorophore is not enough to see a protein, why don't we attach multiple to it? Yet, this is more easily said than done. Attach a few GFP tags to one protein and it will quickly become too bulky to perform its original task. Tanenbaum's solution to this problem is a system called "SunTag". In this system, a string of epitopes is attached to the protein of interest as a peptide tail. This tail in itself is non-invasive and does not hinder the protein while forming a platform for up to 24 antibodies that carry a fluorescent tag. In this way, a single protein can shine bright enough to be detectable and can be followed for a period of time within the cell. However, in his paper, Tanenbaum shows how this system can be used in very different ways as well (Tanenbaum et al., 2014). For example, the epitope peptide can be attached to a nuclease deficient CRISPR/Cas9 protein to target transcription factors to a particular gene.

Using these techniques, Tanenbaum aims to study the dynamics and molecular mechanisms underlying gene expression control.

Tanenbaum, M. E., Gilbert, L. A., Qi, L. S., Weissman, J. S., & Vale, R. D. (2014). A protein-tagging system for signal amplification in gene expression and fluorescence imaging. *Cell*, 159(3), 635-646.

MY PROJECT - A LOVE STORY

There you were, sitting at home behind your laptop. While it was already quite some time ago, you clearly remembered the last time you were in this same situation. It started out exactly the same way: desperately looking from research group to research group, comparing profiles, pictures and interests, lonely and looking for a sign that you have found your perfect match. Finally you had the courage to send that email to the group that you had been stalking for some time now. After obsessively refreshing your inbox for a couple of days, it finally arrived: the reply you had been waiting for. You immediately opened the email and could not believe your eyes; he really wanted to go on a date with you?!

While you read everything you could, the first meeting still feels like a blind date. You got to know your soon-to-be love bit by bit and while you couldn't comprehend at that first day how big of a part of your life he would soon become, the first impression was enough to make you enthusiastic. The first few weeks were nicely awkward. You both still needed to get to know each other better, unable to find the right thing to say immediately. Most of the time you had to go on double dates together with your supervisor in order to prevent awkward silences and hold-ups. But week by week your connection grew until you couldn't think of anything else and you had to make an effort to schedule some alone time as well to do essential things, such as eating. Yes, he, your research project, was always by your side. You spent so many hours together and even in your dreams he was there.

Then you recall that special moment. It was late, only you two were left in the lab and there it happened. He asked you to marry him, just as the PCR was done. How romantic! One week later you are married. The honeymoon period was in one word: amazing. You knew each other so well, you did everything together without any stress or worries. You completely forgot about your other friends, but who cares, it was just you and your project.

Although a familiar saying already warned you (all good things come to an end), you didn't really believe that when you got married. However, as time passed, something in the back of your mind started to interfere with your present relationship. While you tried to ignore it for a while, you started to see an expiration date on your life together. Your project, on the other hand, became more and more pushy, demanding an ever bigger share of your life. "How about just trying this experiment? It's only one experiment right, what can happen? Let's just run away together!" No, at some point you had to make the decision. This had to stop now. That was the start of a terrible divorce, including an excessive amount of paperwork and arrangements for what you had built up together.

Completely done with the whole situation you decided to take some time off. However, you can't help it, you still sometimes think back of the time you spent together. So one afternoon you decide to drop by to say hi. When you arrive you cannot believe your eyes. It has only been a couple of weeks, but there he is cuddling up to some upshot, first-year master student. While you are not nearly ready for a new relationship like that one, he already found someone new. Ah, it is probably just a rebound, no big deal right... right..? Well okay, time to get over it.

If you now think back you still wouldn't have wanted to miss out on that relationship for the world. All the nice experiences together have shown you what you are really looking for in a relationship and may help you to find someone even better for you. And as you still made sure you didn't end it on a bad note, you even now get a nice letter from him from time to time. A letter helping you to take your next step. Let's get back out there, plenty of fish in the sea, right?

BY DENNIS NAHON

INTERVIEW JOP KIND

“Molecular biologist Dr. Jop Kind (1978) joined the Van Steensel lab as a postdoc after a highly successful PhD at the EMBL. Since October 2014 he is Junior Group Leader at the Hubrecht Institute. He made visible how 6 feet of DNA is dispersed in a cell nucleus of 10 micrometres. The location of the DNA (whether at the edge – or lamina – of the nucleus or not) is related to gene activity. Kind discovered that in cells that seem to be identical, the spatial localisation of the DNA is not the same. Only 15% of the DNA is always touching the lamina.

Kind has developed two new techniques to identify the genes at the edge of the nucleus. First he gave them a ‘stamp’ by permanently adding a methyl group. Then he perfected this technique so he was able to localise the stamps in a single cell instead of needing at least 100.000 of them. The same technique can be used for identifying other interesting spots in the DNA, for example badly repaired DNA damage that might lead to cancer.”

From the Hubrecht website

In the past month, Jop Kind has won two prestigious sciences prizes: The first one is the Antoni van Leeuwenhoek Prize, which is awarded by the Netherlands Cancer Institute (NKI) to one of its (former) promising young researchers in order to promote his/her career. In addition, Jop won EMBL’s John Kendrew Young Scientist Award, which is open to all pre- and postdocs 2-7 years after leaving the EMBL. This award is meant to recognize excellence in science and support scientist in the early stages of their career.

Q1: First of all, congratulations, Jop! It is a remarkable and impressive accomplishment to be awarded two of these prestigious prizes in such a short time span. Did you expect to be nominated for these prizes?

A1: For the John Kendrew award you can apply yourself, but you can also be nominated by others. In my case, the award committee asked me to send in my application, so I knew they were at least interested in my work. For the ALW award you are nominated by the group heads. Apparently my boss was nice enough to nominate me; I had no idea, the prize came as a complete surprise.

Q2: What do these awards entail exactly, i.e. do you get a certificate or some other kind of prize? And how are they meant to stimulate your career?

A2: The ALW prize is 6000 euros to be spent on science and a very official looking certificate in a golden frame. The JK award involves a cash prize of 5000 euros and a golden medal. Best of all is that my portrait will be placed on the wall at a prominent spot next to the auditorium. I find it a hilarious thought that all these big shots have to pass by my portrait on their way to the lecture hall. Above all, to receive these prizes is very honourable and hopefully will help to secure funding for the research in our group.

Q3: Can you shortly describe the projects that you worked on at the EMBL and NKI that eventually won you these prizes? And what was your motivation to work on these projects?

A3: Both prizes were awarded for my work as a postdoctoral fellow in the lab of Bas van Steensel. I developed two complementary methods to study the 3-dimensional genome organization in single cells. The spatial positioning of genomic regions is an important contributor to the regulation of nuclear processes. When I started my postdoc in 2008 the state of the art genomics techniques required large populations of cells and hence only provided ensemble average insights in nuclear processes. To obtain genome-wide single-cell insight in nuclear architecture I developed a microscopy based method to illuminate and track the genome that associates with the transcriptional non-permissive nuclear periphery in living cells and a complementary technique to identify these genomic regions by genomics. These techniques provided us with novel and very surprising insights and will pave the way for future single-cell studies in various research field.

Q4: What was the hardest obstacle to overcome in doing this research?

A4: The most difficult part of the research was to keep faith in a successful outcome and to stay motivated to push the project further.

Q5: Both I and the readers of this newsletter are currently master students, most of us busy working on our internships and trying to figure out what the next steps in our career will be. Can you tell us why you decided to pursue an academic career?

A5: For me I think there was not really any other option. To come up with wild hypothesis, develop crazy techniques and have the possibility to enter the lab in the morning and start working on these questions is a privilege that I truly enjoy.

Q6: Do you have any advice for those master students that are considering going into academics themselves?

A6: My advice is related to Q4. Stay focused, always keep the goal of your project in mind and keep pushing for a good outcome, even when everything seems against you. Failure is part of the job and is essential en route towards great scientific discoveries.

STUCOM SINTERKLAAS EVENT

On the 5th of December Sinterklaas brought presents to all children in the Netherlands, and it is reported that he also visited the CSND students¹. However, the old man and his much debated friend Black Pete were already gone, and had been replaced with another old man, Santa Claus. As both of the men are fairly similar, Santa Claus was not too unwilling to buy some presents for the hard-working students.

In the Hubrecht canteen lots of presents were dropped off by him (imagine all the hard work of buying and wrapping all these presents done by Santa Claus!). After the traditional StuCom-pizza and drinks the presents had to be divided over all the students. For this, an evil-Sinterklaas-game was played, where people can go home with nothing, or more than they can carry :D

In this game, everyone was grabbing, unwrapping and stealing as many presents as possible before the time ran out. But then suddenly our lovely CSND student and rockstar StuCom member, Joep, called for the end of the game! Boo Joep!

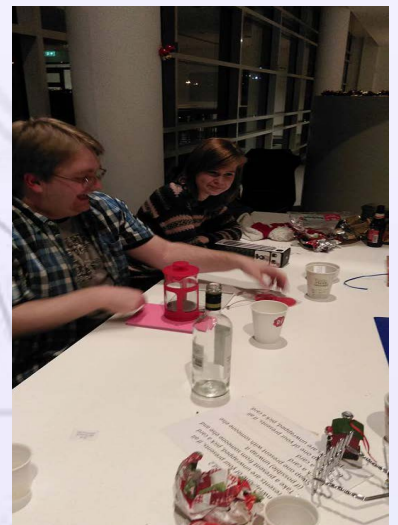
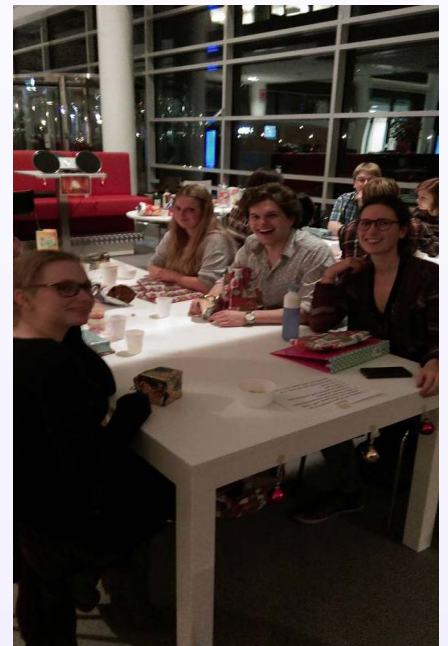
When the dust settled and the smoke cleared, all students were left staring at what they had managed to grab together, their faces either turned content, or troubled. However, in the end, after vigorous fighting over candy, chocolate letters, romantic books and yoga mats, it turned out that CSND students can be nice to each other and everyone went home with a Christmas present, making Sinterklaas and Santa Claus so happy that they will certainly visit the CSND students in 2016 too!

References:

1: Photos of last stucom sinterklaas meeting – December 2014



STUCOM SINTERKLAAS EVENT



STUCOM SINTERKLAAS EVENT



STUCOM SEMINAR

CSnD Seminar 25th of January 2016

Speaker: Matilde Galli

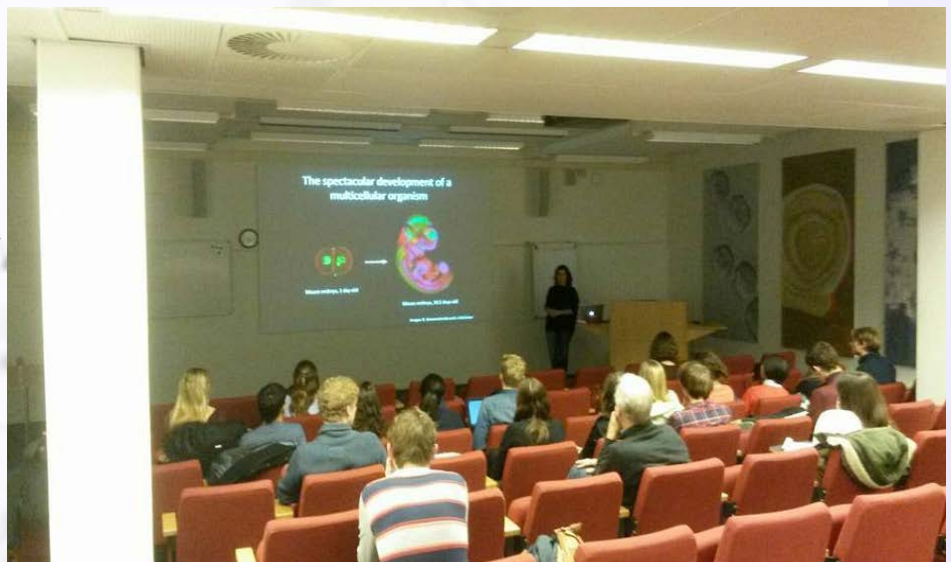
Topic: Developmental control of cell division

Since the beginning of her studies Matilde Galli was amazed by the spectacular development of a multicellular organism. During her PhD she studied positioning of the division plane during asymmetric division. Her fascination for cell division continued. Galli is now working as an independent researcher at the Hubrecht Institute, where she investigates cell cycle control in *C. elegans*.

At the beginning of mitosis, between prometaphase and metaphase, the cell cycle enzyme Cdk1/cyclin B is active, and ensures proper attachment of replicated chromosomes on the mitotic spindle. After metaphase and at the beginning of anaphase Separase becomes active, allowing chromosome separation into two daughter cells. Separase and Cdk1 activities are regulated by the anaphase promoting complex (APC/C). When chromosomes are not properly attached to mitotic spindle, the spindle assembly checkpoint (SAC) prevents precautionary APC/C activation via the mitotic checkpoint complex (MCC). However, checkpoint strengths vary enormously between different cell types. Especially in early stages of development, it has been shown that the mitotic checkpoint is very weak. By analysis of the SAC in *C. elegans* embryos, Galli found that the SAC response becomes stronger after each embryonic division. The hypothesis from these results was that the strength of the checkpoint depends on cell size. The SAC arrest times indeed correlate with cell size. By altering the kinetochore-to cytoplasm ratio, by changing either cell size or ploidy, a stronger checkpoint was induced. This supports a model in which the MCC complex cannot inhibit as much APC/C in a bigger cell compared to a smaller cell.

In addition to the work on SAC signalling, Galli studies how specific types of cell cycles are regulated in *C. elegans*. During larval L1 stage, intestinal cells undergo an endomitotic division, in which no cytokinesis takes place. Normally mitotic exit and cytokinesis are tightly coupled, but this is not the case during endomitosis. The intestinal divisions are slower compared to other cell types in *C. elegans*. Furthermore, it was shown that during endomitosis the central spindle was lacking. There are two cytokinesis regulators that normally localize to the central spindle in anaphase: the chromosomal passenger complex (CPC), consisting of Aurora B, and the centralspindlin complex, consisting of ZEN-4 and CYK-4. During endomitotic divisions Aurora B is present, so this means that the CPC complex is not absent in intestinal cells. However, during endomitotic divisions ZEN-4 and CYK-4 are absent. This indicates that the centralspindlin complex is absent during endomitosis.

Galli wants to examine this process further in the future. For example, she wants to look at ZEN-4 and CYK-4 expression, and consequences for cytokinesis by forcing ZEN-4 and CYK-4 expression during endomitosis.



STUPICS



February starters

LOBS master market



Information market

INTERNSHIP ABROAD - LUZ ALONSO

Hello fellow students!

My name is Luz Alonso, a second-year CSnD master student currently performing my minor internship at the University of Cambridge (UK). When the time came to make a decision about my next step within my Master's I wasn't sure what the best option would be. In one of the CSnD seminars I met Alfonso Martinez-Arias, a Professor in Developmental Mechanics in Cambridge. After a very stimulating and friendly chat he offered me the opportunity to work with him during 8 months. When I started this Master Programme my main interests were the Cancer and Stem Cell fields. However, after the course on Developmental Genetics I realised how fascinating and intriguing the biology of development could be. For this reason, and in sight of new challenges, I could not but accept Alfonso's offer with a big smile.

I was very lucky and could arrange all the paperwork during July so in September I was flying to... Cambridge! In the beginning everything was a bit tricky, having to move in and out in a period of two weeks! Some issues concerning our lovely first landlord. But after a month almost all things were going smoothly. I met a lot of new people thanks to my housemates – two PhD students and one post-doc – and the list increased once I was happily integrated in the Cambridge society and hanging out with people from all over the world.

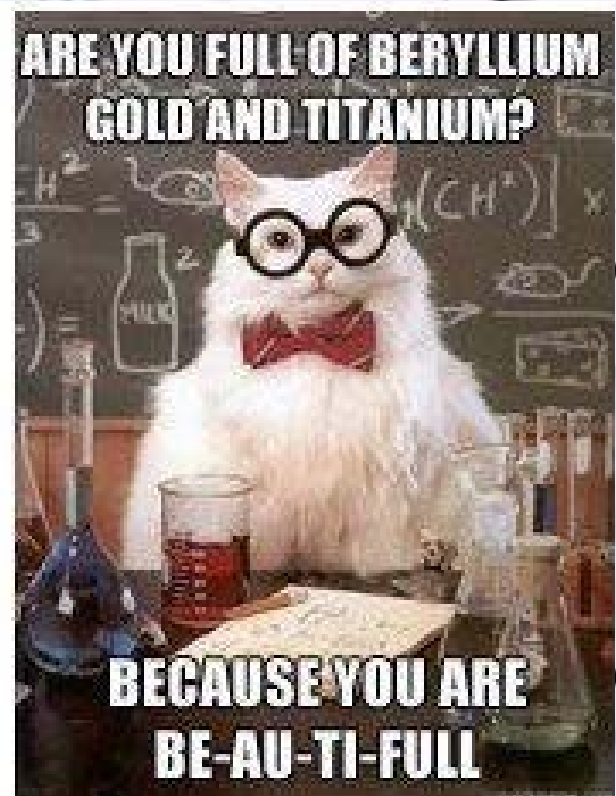
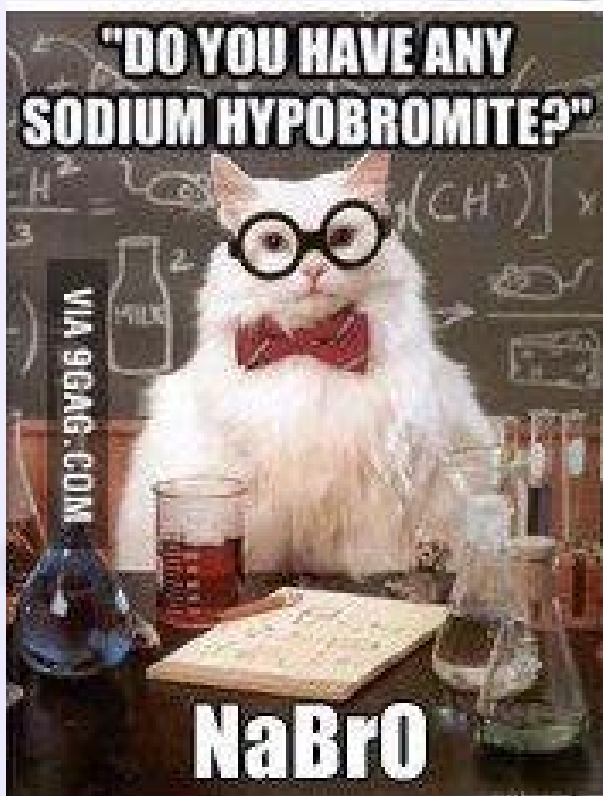
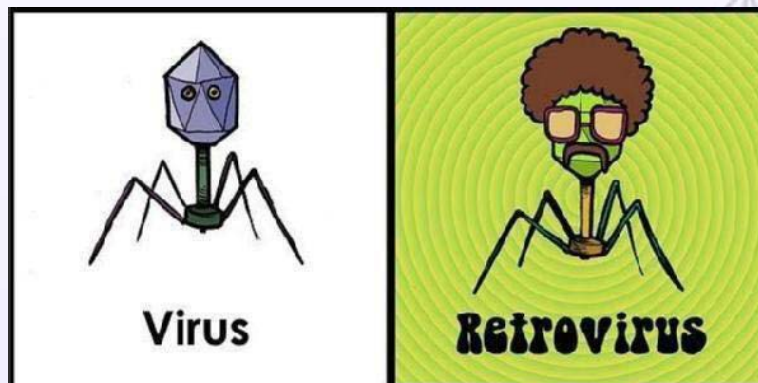
At lab things were not much different. People were very friendly and helpful since I stepped in the first day. Although I had to read and work quite a lot from the first second that has not stopped me from enjoying every single thing this lab experience is offering me. My lab is intensely working on the generation and optimization of an organoid-like cellular system able to mimic some patterns of the mouse embryo during the first stages of development. This system consists of aggregates of mouse embryonic stem cells ("Gastruloids") whose behaviour resembles at many levels the processes occurring within the mouse gastrula, making it a potential and interesting model system. My project aims at deciphering the signalling pathways (Nodal, Wnt, BMP) involved in symmetry breaking, polarization and germ layer specification in these gastruloids. I am very excited with this project and looking forward to getting interesting results which could contribute to a further understanding of this novel system.

Apart from work carried out at the lab bench, science is everywhere in Cambridge! With many Institutes and university departments which synergize in a way that you are permanently in a desire-to-know atmosphere. It is not strange to walk around and run into very well-known scientists (even Nobel prizes!) as well as students in very fancy gowns. Cambridge is a vibrating city with uncountable activities, creating a unique and perfect ambience for the daily life. Furthermore, the city is characterized by the presence of 31 colleges and their ancient buildings which make the walk a melancholic and idyllic experience.

Taken everything together, I could not be happier of having chosen this city and lab to carry out my minor internship. I would recommend them to everyone! It is being a very enriching experience at professional and personal levels and, although I do not know what my following step will be, I am pretty sure the memories built here will always remain with me.



STUCOMICS



STUCCOFFEE

Simon Lévelt Koffie and Thee, Vismarkt 21 A

Article:

'Microenvironment-induced PTEN loss by exosomal microRNA primes brain metastasis outgrowth'

Zhang L, et al., (2015)

So perhaps this isn't the most typical coffee hot-spot that would spring to mind as you trudge around the city with your laptop and umbrella. Certainly this tight space is a more paper-orientated, short-stay visit than a curl-up-in-the-corner with your notes on seminars past like a forgotten cringe-worthy moment that you dread to think about whenever it flashes across that wonderful mind of yours. This is what I like about it though. It's pretty straight-forward as far as cafés go.

The interior is nothing to be inspired by unless gazing at generic pictures of coffee beans and coffee harvest season is something that will stimulate a Eureka! moment. However, the soft lights, the California-dreaming, wish-I-was-at-the-beach-with-my-baby pop-rock music and the opportunity to stare ruthlessly out onto the heavily pedestrianized street that leads to the Domplein snaps you away for a quiet cup and flick through a paragraph or so of one of your papers of interest. That, was a mouthful.

A mouthful like the one I am now taking of this delicious cappachino which I ordered. Wow. That was a smooth transition, as smooth as the thick layer of bright, white foam sitting on top of a reasonably priced and reasonably sized cup of coffee starting from 2.30e for a medium cup.

So, if you like coffee these guys have got you covered, for the most part of it.

They pride themselves on a decent and diverse Fair Trade selection of beans from places such as Ethiopia and Brasil. Boasting this variety of coffee described as 'Donker & Krachtig', 'Zoet & Mollig' and 'Vol & Rijk' they also have shelves full of the infamous Monin syrups; 'Siropen in diverse smaken: 0.60e, so even if the straight taste of coffee isn't your *cup of tea* they are not the type to judge you for your decaf, half-shot, extra milk and 3 shots of caramel.. 'coffee'.



SOMEONE GIVE THIS GIRL A CUP OF COFFEE!

They also have a range of desserts too such as carrot cake (oh yes!), brownies (please, don't stop!) and walnut cake (YES!) and loads more but here is where this place really takes the biscuit..All desserts and pastries are under 3.00e and I think that's a big deal.



So guys, to wrap up this segment as I wrap my hands around a caramel cappuccino to-go as the idea of Utrecht on a rainy day, California-dreaming with the good-byes of the lovely staff at Simon Lévelt Koffie singing in my ear seems romantic to me I know I will be back. Not only because it was easy to settle down and read up on PTEN expression plasticity in metastatic cells but also because she gave me a loyalty card..and stamped it twice. Simon Lévelt Koffie, you legend.

Till the next issue my lovelies,
is mise le ghrá, S.



Zhang, L, Zhang, S, Yao J, Lowery, F. J., Zhang, Q, Huang, W-C., Li, P, Li, M, Wang, X, Zhang, C, Wang, H, Ellis, K, Cheerathodi, M, McCarty, J. H., Palmieri, D, Saunus, J, Lakhani, S, Huang, S, Sahin A. A., Aldape, K. D., Steeg, P. S., & Yu, D. (2015). Microenvironment-induced PTEN loss by exosomal microRNA primes brain metastasis outgrowth. *Nature*, 527, 100-104, doi:10.1038/nature15376.

INTERNSHIP ABROAD - THIJS WILDSCHUT

Living the American life in Boston

Hey everyone! As one of the very few to be abroad for a longer time at the moment and one of the “oldest and most experienced” people of our Master’s program being a third-years Master’s student at the moment, I’d be super happy to share some experiences and tips with all of you guys that I collected in the past seven months. But where to start.....

Well, let’s start at the start. My first experience was being stuck at US border patrol, which, to put it lightly, isn’t very recommendable. So the first tip, make sure that you don’t get into a global US visa system shutdown, and that you don’t have to go to Brussels to get your visa the day before your flight :) After this small setback, the US has started to amaze me more and more. Everything from the movies is true! This country is the country of big, bigger, biggest, extreme, and.. it’s just like, you know, like totally a-ma-zing! Walking around in Boston downtown makes even an “extremely tall” guy (according to American standards... I would just call it being Dutchee!) feel small. Biking on the big roads among the (big) cars can be quite exciting sometimes, though I still feel 10x less scared to die than when biking on Oudegracht during rush hour.

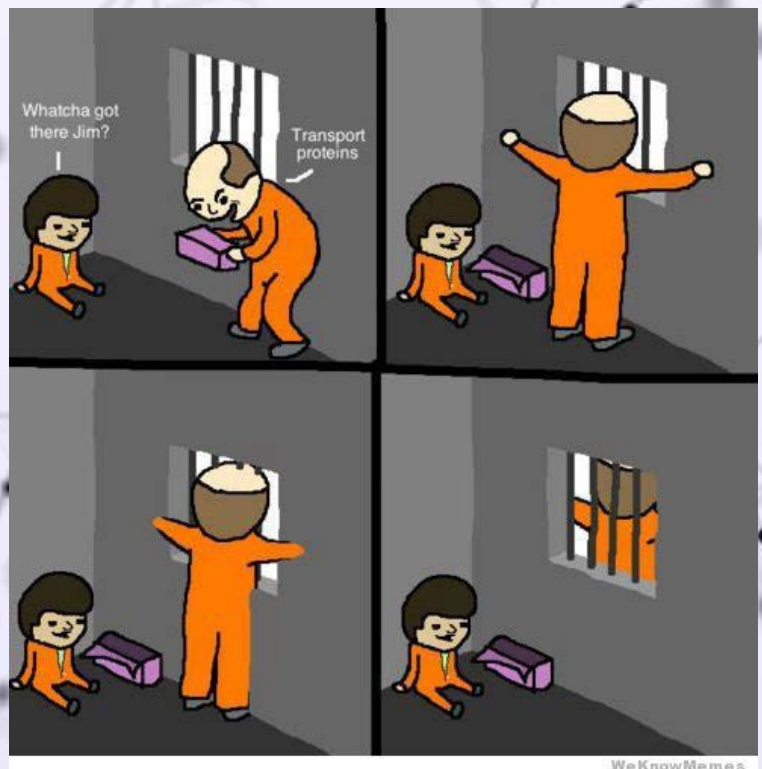
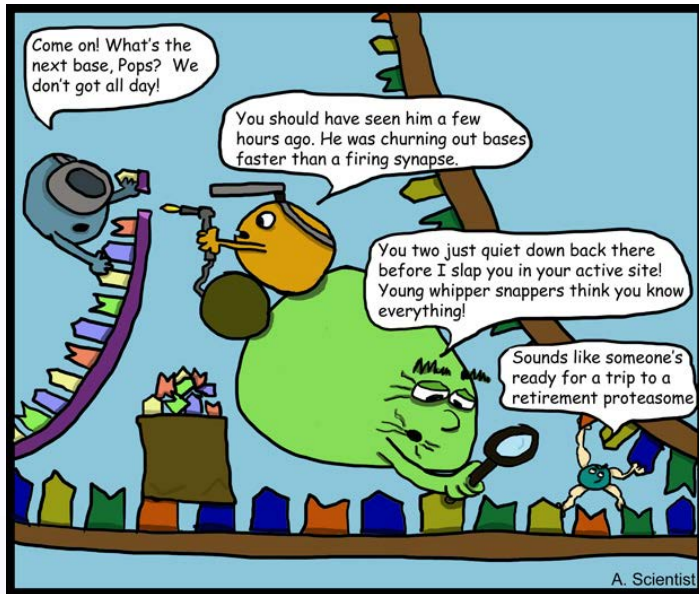
And why did I go to the other side of the world? Well, to perform an 8-month internship in the lab of Angela Koehler at the Koch Institute for Integrative Cancer Research at MIT. My project involves developing and characterizing a potential c-Myc inhibitor. Now that my project is getting close to publication, it’s quite busy, but enjoying the fun and “gezelligheid” in the lab is what makes it super nice: they even have the “vrijdagmiddag-borrel”! It took me a while to get in, but I definitely don’t regret spending the effort. So, if you want to get into a lab but are afraid because you don’t have any connections: be crazy and just give it a try! Don’t be shy to mail whoever you think is that one interesting PI for you, or to send reminders. Or second reminders. Or third. Just go for it!

Now that 2016 has started, not only winter has arrived (snowstorms and temperatures far below zero instead of 35°C every day in summer...) another invasion has started as well: Dutch and Spanish CSnD students are taking over Boston! They aren’t the only ones, because everywhere in Boston you notice it: MIT, Harvard, many other colleges, universities (54 in total!), and institutes attract people from literally all over the world. There is even a substantial Dutch community: I live in a big, 150-year old, wooden house, with nine Dutchies (and a 70ish-year old American lady, to make it even more random). And this is awesome, because we are all young Master’s students, busy with getting the most out of our time here: a house party for 200 people, running and exercising together at 6:30 am, trips to New York, Montreal, National Parks, salsa parties, movie nights, sailing, and a looooooot of parties, are some of the things to do next to our internships. And this is what I think turns an interesting internship, into an unforgettable life-experience. I would recommend everyone going abroad, already because it provides plenty of interesting research opportunities, but don’t forget to always get the most out of it: combine awesome research with awesome activities!

Bye bye from a cold and snowy Boston, see you guys soon! :)
Thijs.



STUCOMICS



ACTIVITIES MEBIOSE & U.B.V.

M.B.V. Mebiose

8th of February: Master introduction

15th of February: Opening of the Dies Natalis

16th of February: Lasergaming

17th of February: Party

18th of February: Massage Workshop

19th of February: Weekly Drinks XL (13:00-20:00)

21th of February: Football Match

22th of February: Dinner

23th of February: Beer Cantus

24th of February: Escape Room

2nd of March: Drinks by the Prom committee

9th of March: Activity by the Mastercommittee

18th of March: Weekly Drinks XL (13:00-20:00)

18th of March: Karaoke night

22th of March: Drinks by the party committee

24th of March: Prom

For other activities and information please visit the website (<http://mebiose.nl/>).

U.B.V.

9th of February: Alternative Master Evening

10th of February: Game evening

11th of February: Cocktail drinks

18th of February: Party

22th of February: Believe it or not tour, Play

26th of February: Drinks

1st of March: Pubquiz

11th of March: Prom

15th of March: Symposium

18th of March: Drinks

24th of March: UBV-Proton Party

For other activities and information please visit the website (<http://ubv.info/>).