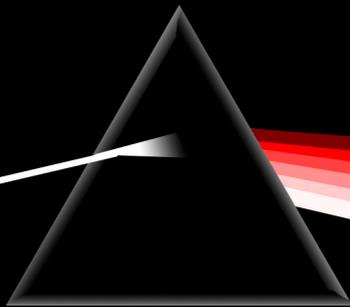


∞mRNA



YEAR 8 // ISSUE 2 // MARCH 2023

ATTRACTIVENESS // COLOUR BLINDNESS // CHATGPT // PINK UNDERSTANDING
PHOBIAS // CHINA'S CHIP PREDICAMENT // INSECT CATWALK // MEAL PREP



CONTENT

- 3 Editorial
- 4 From the Board
- 5 One Sheet to Restore Civilisation
- 6 Understanding Phobias
- 8 Neuromorphic Computing
- 11 How to be Colour-Blind-Friendly?
- 12 Student-Friendly Meal Prep
- 14 Insect Catwalk
- 16 Hooke Pictures
- 18 ChatGPT
- 20 Is Pink a Real Colour?
- 22 Public Displays of Affection
- 23 Hedgehog's Dilemma
- 24 Quirks Explained
- 26 Career Prospects for Nanobiologist
- 27 China's Chip Predicament
- 28 Palliative Care for the Elderly
- 30 What Makes People Attractive, Historically Speaking
- 31 Hooke Agenda

EDITORS

Editor-in-Chief: Calin Alecu

Editor: Avin Nayeri

Commissioner of Acquisition: Laren Kıryağdı

Commissioner of Acquisition: Carlo Geertse

Captain InDesign: Kelly van Strien

Captain InDesign: Leó Szücs

QQ: Josephine Sonneveld

QQ: Mijke Dijken

S.V.N.B. Hooke

mrna-hooke@tudelft.nl

Van der Maasweg 9

Room C0.010

2629HZ Delft

015 2781639

If you do not want to receive the mRNA, please send us an e-mail. Third years and up: opt in via the QR code on the last page to receive it if you have not done so yet.

COLOPHON

The mRNA is the official magazine of the study association for Nanobiology, S.V.N.B. Hooke. Printed versions will be sent to and distributed among the members. The committee strives to enforce copyright laws of the texts and images used. If you believe to have the rights to any media we used, we ask you to contact us. We reserve the right to shorten, alter or reject submitted documents and we thank all people involved for their contributions.

March 2023

Year 8, Issue 2.

Print run: 325.

A PDF version will be published on the mRNA page of Hooke's website: <https://svnbhooke.nl/index.php/mrna/>

EDITORIAL

CALIN ALECU

Dear readers,

Welcome to this academic year's second edition of the mRNA! I hope that you are well and that you've found your footing in the courses you are taking. To our first years: you've made it this far, keep going. I have faith in you, and so should you. I recommend keeping your curiosity well-fed, your scepticism vigilant, and your mind sharp; Asimov once declared that the "most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka!' but 'that's funny...'", and I cannot help but agree. Stay curious and you will learn things you otherwise would not have; you never know what seemingly useless fact or skill can make a difference where you never expected. Best learn everything to be safe.



With winter's end and the sun's return, hopefully these coming months bring with them happier mornings and more optimistic days. Who knows, string enough cheerful days together and you might even catch yourself enjoying 0830 classes; I haven't heard of anyone who does, but I suppose it's possible. In tribute to sunnier mornings, the theme for this mRNA edition is "Shades of Red". Inside, you will find pieces on love, loneliness, and the colour itself, or at least shades of it. If that's not to your liking, you can explore how to best restart civilisation after the apocalypse or how to best prepare hearty meals on a student budget (at least until basisbeurs comes back, after which you might afford not being so skir anymore). Lastly, more practically-focused students might like to read about future career options, so they can better lament what could've been if only ChatGPT launched after their retirement.

As usual, I hope this new edition of the mRNA finds you well. For some of our members, this edition will be their last; they have poured their hearts into it and worked hard to make this a worthy sendoff, but that is ultimately left up to you to decide. Hopefully, you enjoy it, and our future members are left with a solid benchmark to measure up against.

Relish the coming months; with the days growing longer again, I suggest ditching the blanket, going for a cycle, and enjoying the wind in your hair again.

At your service,

Calin Alecu
Editor-in-Chief of mRNA 6.5

FROM THE BOARD

JOSEPHINE SONNEVELD

Dear members,

We are already in the second semester so it is time for the second edition of the mRNA! I hope you all got some rest this holiday or had great fun during Wnt or Diffucie. The next holiday will be the summer holiday, but that is still quite a bit away.



During the summer is when the IntroN and OWee will take place. Recently we got the news that the OWee will be a week earlier this year. Therefore, IntroN will also be a weekend earlier, so put a reminder in your calendars for August 11th until the 13th!

Soon the IntroN committee will be gevraagd, and they will spend the next few months organising the first year weekend. You can also be involved by becoming a mentor or joining IntroN as a supervisor. It will be the way to welcome new Nanobiology first years. The OWee and IntroN being so early also brings some challenges. It will be even harder for international students to join the introduction period this early. Do you have any ideas on how to properly welcome these students? Let us know! There is an idea box in the hub, or you can always come by or send an email. We would love to have your input to figure out a good solution!

However, before it is time for summer holiday there are many other fun things ahead: we will have kinecie, our memberweekend, at the end of May as well as the multiple day excursion by Cohecie.

Soon we might have our first club, Schiet 'm in de Hooke! Currently they are organising a team to run the Batavieren race, the largest relay run in the world! In total, a team of 25 students will run 175 kilometres. There are various distances you can choose to run, so if you are up for a challenge, sign up and join!

I have spoken,

Josephine Sonneveld

President of S.V.N.B. Hooke 2022-2023

ONE SHEET TO RESTORE CIVILISATION

WHAT IF?

Can you imagine a world whose destruction could be imminent and in the hands of totally stable people? Well I certainly cannot, but let us explore an alternate reality, where you or I got the opportunity to create humanity's "black box". We only have one sheet of paper to help future survivors rebuild society, so what should be on it?

Now normally I would respond with the lyrics to the Smash Mouth hit "All Star". But since future descendants rely on my help, I will take this a bit more seriously.

First of all, if I know of resources such as bunkers with technology, knowledge repositories, or seed banks, the coordinates of those would be vital to create a head start. I am fairly certain that these doomsday shelters do exist in at least developed countries, although the locations of these sites are not in the public domain. However, I find it extremely likely that once they become relevant the locations would be released. Not the shelters, because they would be occupied by the bourgeoisie, but the memory banks with art, books or any other type of heritage.

Secondly, I would include pictures of edible plants. The first survivors surfacing could face a short destiny if the food source of choice is not optimal. Hopefully mutations won't change the flora to such a level that the vegetation would be unrecognisable by that time.

Thirdly, I would include a rough map of the planet showcasing the prior locations. With a little luck and time and enough exploration, the survivors can deduce where these locations are, and where they could or should expand further.

Lastly, and this is merely a personal preference, I would include a thought-provoking short poem. This would hopefully lead them to realise culture

Hope

and art as backbones of human tenacity and meaning. Off the top of my head I would choose 'The Road Not Taken' by Robert Frost. I do not want to explain this choice, if you read the poem I think it will speak for itself.

Well, if you survived this article this long, I sincerely hope you find this writing obsolete. If not, ask yourself: what do I think humanity represents, what is worth saving? Maybe that will change the value of things in your life, and who does not like that?

Source (background): Alpha Stock

UNDERSTANDING PHOBIAS

THE UNDERLYING SCIENCE

Before delving into the underlying science of phobias, it is important to consider what a phobia actually is beyond the ambiguities we read or hear. A phobia is not to simply dislike certain objects or situations, it is rather an extreme, irrational, and lasting fear of or aversion to an activity or object. Usually appearing between the ages of 15 and 20 in men and women alike, such substantial fear often proves as an impediment to daily life, as the individual constantly attempts to avoid the source of this fear.

Phobias are not confined to a single cause, but can have multiple roots of causation. For example, past incidents or traumas, such as being trapped in a confined space, can give rise to a fear, which overtime can develop into a phobia. Factors from an individual's childhood environment could be responsible as well. Moreover, the presence of anxious and worried parents or guardians can influence how an individual copes with anxiety later in life, which if not managed could underline a phobia. In addition to that, the individual could be subject to developing the same phobias as their parents or guardians. Long-term stress can contribute to feelings of anxiety and depression, potentially leading to phobia formation as a side effect. Embarrassing experiences can often lead to an aversion of that experience, which over time can develop into a phobia if not controlled. Finally, genetic factors can leave individuals to be more susceptible to obtaining phobias than others.

Having discussed this, you might be curious about the types of phobias people have. Therefore, here are five of the most common phobias:

1. Glossophobia: the fear of speaking in front of an audience, also known as performance anxiety.
2. Acrophobia: the fear of heights.
3. Aviophobia: the fear of flying.
4. Dentophobia: the fear of the dentist or dental procedures.
5. Hemophobia: the fear of blood or injury.

More interestingly, here are five of the least common phobias people possess:

1. Omphalophobia: the fear of belly buttons.
2. Hippopotomonstrosesquippedaliophobia: the fear of long words (which is rather ironic).
3. Lachanophobia: the fear of vegetables.
4. Eisoptrophobia: the fear of mirrors.
5. Chaetophobia: the fear of hair.

Major brain activity alterations have been associated as an underlying cause of phobias, as detected by functional imaging techniques. For example, shown by an MRI, individuals who suffer from phobias display increased activity of the amygdala when exposed to phobia-inducing stimuli. The amygdala, a pair of small almond-shaped regions deep in the brain, is the integrative centre for regulating emotions. The right amygdala is more active in response to negative emotions, like those associated with phobias, while the left amygdala is more associated with pleasant emotional reactions. One study displayed that the higher the activation of the right amygdala, the greater the sense of distress induced by the phobia trigger. It was also shown that the stria terminalis, the anterior cingulate cortex, and the insula were hyperactive in individuals with high exposure to phobia-inducing situations.

So what goes wrong and causes the brain to cause phobic reactions in an individual? Studies have shown that brain lesions and damage to the amygdala are factors. Other brain areas related to phobic reactions are the hypothalamus, hippocampus, and brain stem. Damage to those areas due to an accident or medical cause can trigger specific phobias of different kinds.

While PTSD is always caused by a traumatic event, specific phobias can result from either a traumatic event or not, in which case it is a non-experiential specific phobia. Non-experiential or non-associative specific phobia is caused and activated by stimuli that arouse fear without previous direct or associative learning. For example, genetic, familial, environmental, or developmental factors play an important role in the development of this type of specific phobia. Sensitisation is a form of non-associative learning expressed by exaggerated emotional reactions to specific stimuli; for example, nyctophobia is characterised by sensitised fear during exposure to darkness or during anticipation to darkness exposure. Moreover, it is suggested to be supported by dysfunction in the "learning-independent" fear circuits that include the amygdala and drive defensive behaviour without prior learning. Sensitisation-associated increased amygdala activity is an important amygdala mechanism contributing to fear sensitisation in non-experiential phobia, which is directly supported by corresponding animal studies. For example, predator stress can induce long-lasting enhancement of the right amygdala afferent and efferent neural transmission, which potentially conciliates behavioural effects.

Innate fear of stimuli such as darkness, heights, and animals gradually diminishes with time, with repeated, non-traumatic exposure to the feared object or situation, a phenomenon known as

habituation. Therefore, another principal cause of phobias is the lack of habituation. It is speculated to serve as the functional purpose of protecting the brain from flooding with sensory information.

Despite the ongoing research into the causes of phobias, which still remain relatively unclear, there are many treatment options available to reduce the symptoms of phobias. Cognitive behavioural therapy is a type of counselling that aids problems by altering the ways in which individuals think and behave. A method often used in this type of therapy is desensitisation or exposure therapy, in which the individual undergoes gradual exposure to fear. Moreover, antidepressants are often prescribed to help reduce anxiety. For example, selective serotonin reuptake inhibitors are the most prescribed for social phobia. Finally, tranquillisers and beta blockers can also be used.

In conclusion, although this is not a large field of research, I believe Nanobiologists and other scientists alike should consider pursuing this research path in the future, as we still do not fully grasp the science behind phobias, and there are still many individuals out there who remain in fear of the most ordinary things.

Sources:

- García R. Neurobiology of fear and specific phobias. *Learn Mem.* 2017;24(9):462-471. Published 2017 Aug 16.
- Treatment- Phobias. NHS.uk. <https://www.nhs.uk/mental-health/conditions/phobias/treatment/#:~:text=Talking%20treatments>
- Wodele A. Phobias: Causes, types, treatment, symptoms & more. Healthline. <https://www.healthline.com/health/phobia-simple-specific#takeaway> Published March 23, 2019.
- Sareeta Behera BS(H. Phobia and its brain chemistry. *Mental Health.* <https://www.online-therapy.com/blog/phobia-brain-chemistry/>
- Heidi Moawad MD. Phobias and brain activity. *Neurology live.* <https://www.neurologylive.com/view/phobias-and-brain-activity> Published November 14, 2020.
- What causes phobias? *Mind.* <https://www.mind.org.uk/information-support/types-of-mental-health-problems/phobias/causes-of-phobias/>.

NEUROMORPHIC COMPUTING – EXPLORING SILICON SYNAPSES

INTERVIEWS

As the branches of scientific understanding and technological progress grow, one often finds connections, stems which seem to converge, suggesting more promising things can be unlocked if only all their shared synchronicities could be figured out. Neuromorphic computing seems to lie at one such intersection; neuroscience, artificial intelligence, and computer architecture goals all seem to point towards neuromorphic computing as a potential breakthrough technology that could lead to interesting advancements in their disciplines.

Put simply, neuromorphic computing refers to the design of computers, processors, or architectures inspired by or intending to imitate the human brain. To a computational neuroscientist, this could mean a much better platform to simulate and study brain function; an AI engineer would hope for better accelerators to their existing tools, or a discovery that brings them closer to “true” generalised AI; a computer engineer takes one look at the power draw of a brain, its compute power, its density, and salivates thinking of the efficiency of it all. For all, the hope is that the benefits of a computer could be married to the benefits of a brain to form a happy union greater than the sum of its parts.

Most current research falls under those three main categories. To learn more, I spoke to two researchers who approach neuromorphic computing in different ways: Professor Steve Furber, head of the SpiNNaker project in Manchester, and Dr Christos Strydis, head of the Neurocomputing Lab at EMC.

Source: University of Manchester



Professor Steve Furber has decades of experience in computing. Back in the 80s, he worked on a project at Acorn Computers, where he was one of the main designers of the ARM

architecture; yes, that ARM architecture, the one in everyone's phone, likely now the most produced processor architecture in the world. He brought his experience with ARM to the SpiNNaker project, a massively-parallel asynchronous high-performance compute platform aiming to simulate the human brain. Consisting of over a million ARM cores networked together, it can theoretically simulate ~256 million neurons, each with ~1000 synapses.

“What made you get into neuromorphic computing?”

“I got into neuromorphic computing because I worked for over twenty years in mainstream computing and I've seen processors improve in performance by a very large factor, a thousand or so, yet they still struggle to do things that humans find very easy. I realised that science still does not have anything approaching a satisfactory explanation of how the brain works, so I then began to think, well, what can I do as a computer engineer to contribute to our understanding of the brain? That led me in the general direction of neuromorphic computing, which is basically building computers that are optimised for brain modelling applications to try and answer questions about the brain.”

“What stands out about SpiNNaker?”

“SpiNNaker looks very much like a standard high-performance computer, except it has small processors and high-performance computers have big fat processors. The major innovation is the way the processors communicate. SpiNNaker has an innovative communication fabric that allows a spike generated by a neuron that’s modelled on one processor to be distributed to thousands of other processors in biological real time, which means in a small fraction of a millisecond. It’s really the communications infrastructure on SpiNNaker that is different from either a high-performance computer or a GPU-based engine. With GPUs, it’s quite difficult to construct the communication, particularly if it’s a multiple GPU system. Getting the spikes around the network is quite hard, whereas in SpiNNaker, that’s the focus of the architecture, the focus is the scalability in the way the processors communicate. Standard high-performance computer communication is generally point-to-point, so a processor sends a message containing quite a lot of data to another processor. On SpiNNaker, a processor sends a message with a very small amount of data to thousands of other processors at once.”

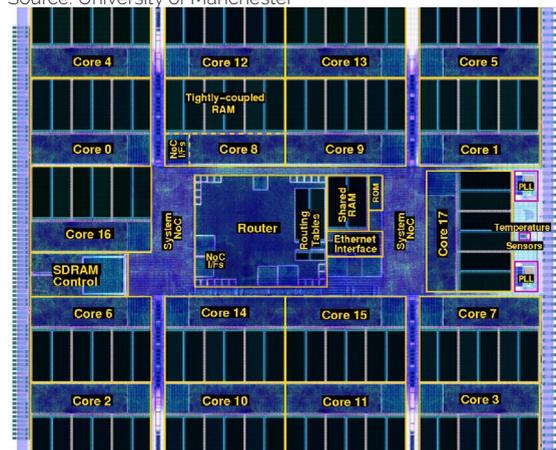
“I’ve seen headlines about SpiNNaker simulating a mouse brain in real time. What exactly does this mean?”

“Well, SpiNNaker has the potential, we think, to simulate a complete mouse brain. The mouse brain is around a hundred million neurons. It’s very similar to the human brain, but a thousand times smaller. The SpiNNaker machine with a million cores is nowhere near capable of supporting a whole human brain model, but it could support a whole mouse brain model, we think. We haven’t done that. We simply believe that with the current scale of the machine, that’s something we could do if a suitable model were available, which it isn’t.”

“What progress could you see being made in the next decade?”

“I think, realistically, in a ten, twenty year time scale, you are going to see whole brain models on the scale of mice or rats. Even insect brains will be interesting. I mean, the drosophila has a hundred thousand neurons in its brain. That would be worth modelling if we had all the data to build such a model, and I think that data is emerging at an increasing rate and the models will grow and get bigger. Ultimately, what these models can be used for is for testing hypotheses of brain function, the kind of hypotheses that come out of the theoretical neuroscience community. When theories begin to emerge that describe what the function of the cortex is, then I think the whole of AI will take another leap forward, because it’s clear, cortical function transcends what we can do with artificial neural nets at the moment quite significantly. And so I expect to see those kinds of leaps take place, when things come together in the future, and that kind of leap is probably on a ten year time scale. Longer term than that, there are sort of more detailed brain models that will allow us to test the effects of drugs on brain diseases and will reopen the whole issue of searching for effective drug treatments for brain diseases.”

Source: University of Manchester



A labeled die-shot of the SpiNNaker chip

Source: Erasmus MC

After talking to Professor Furber, I reached out to Dr Christos Strydis for his thoughts. He is the head of the Neurocomputing Lab (NCL) at the EMC and - together with the lab co-head, Dr Mario Negrello



- they have supervised several NB students on their BEPs and MEPs. We spoke about some more quirky approaches to neuromorphic computing, the work being done at the NCL, and the opportunities it makes available to students.

“[it’s] very efficient, supported by a massive community, and very good at doing matrix / vector operations.”

One unorthodox tool he highlighted that may have useful applications in neuromorphic computing is TensorFlow; think of it as doing neuromorphic computing backwards. Built as a language for deploying artificial neural networks on GPUs or other accelerators, it’s “very efficient, supported by a massive community, and very good at doing matrix / vector operations.” Brain simulation involves a lot of these operations, which can get very messy; AI researchers have been headbutting walls for years trying to accelerate these workloads, so why not borrow their tools? TensorFlow has also reached enough users for chip designers like Intel, Graphcore, Google, and Nvidia to pay attention and natively support TensorFlow operations; “what if we could abuse TensorFlow to do very efficient computations? You have a very mature tool mapping onto very mature silicon, you might as well.” There are no

free lunches, but with some luck, this one might at least be discounted.

Dr Strydis also elaborated on some of the interesting projects at the NCL: “we’re doing brain simulation. Mario’s doing functional brain dynamics. We’re also fiddling with medical neural implants, next generation implantable devices, basically.” The research into neural implants in particular could have promising future applications; if everything lines up, future brain implants could potentially be capable of brain rescue. Damaged parts of the brain, whether from accidents or neuro-degenerative diseases, might one day be repaired or even replaced by neuromorphic chips that recreate damaged brain function. This is partly why there’s focus on neuromorphic computing done in biological time; “in that condition, real time input-output response of that chip is important”. The NCL has also done some interesting work with functional ultrasound, imaging the brain: “generated images are much better than MRI in some sense, but of course, MRI is forty years more mature, so this is just the beginning.”

Lastly, I asked about BEPs / MEPs at the NCL; if you found this interesting, if you’re good with coding, and if you have experience with bio data analytics / bioinformatics, you are probably the kind of person suited to their needs. You can find out more at <https://neurocomputinglab.com/> if you’re interested.

HOW TO MAKE YOUR FIGURES COLOUR-BLIND-FRIENDLY

SHADES OF RED

About 8.5 percent of the Western population has some form of colour blindness. People with dichromacy, the most common form of colour blindness, cannot distinguish red and green from each other, for example. Colour-blind people can experience certain challenges in academic research that non-colour-blind people do not experience. They can have problems with reading certain figures, like heat maps, microscopic fluorescence images or graphs using different colours. This can then result in an increased difficulty in understanding and interpreting the data. However, this struggle is completely unnecessary, as it is entirely possible to create figures that are also easy to interpret by colour-blind people. So here are some tips and tricks you can use to ensure that everyone can understand your figures.

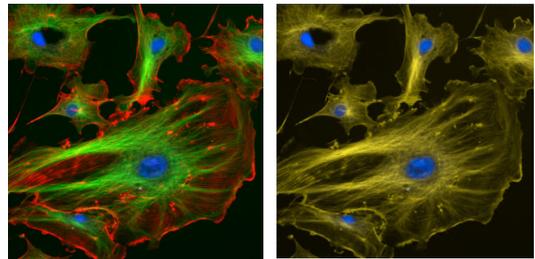
STOP using red and green together in figures. These colours are incredibly difficult to distinguish for people with dichromacy. This advice counts for all types of images: fluorescence images, heat maps, graphs, anything!

Preferably, if you can, don't use colours at all, but use textures to define different sample groups in your graphs, like dots, squares, stripes, etc.

You can also use contrast differences. Anyone can see differences in contrast. You can also use gradients in brightness to map colours.

Use greyscales instead of different colours. These are readable for everyone. As an added bonus, people can then still understand your figure if they print it!

Always check your figures with a colour-blind filter. You can do this for example in the developer tools in Chrome, but also in Adobe Photoshop through View > Proof Setup > Color Blindness.



Normal vision (left) vs simulated dichromacy (right)

If you really need to use colour combinations, use combinations that colour-blind people can also distinguish such as cyan/red and yellow/blue. A lot of tools also exist online that can help you choose colours that are colour-blind-friendly, such as ColorBrewer, Gregor Aisch's chroma tool, and Coblis.

Use perceptually uniform colourmaps. These maps are implemented in libraries such as matplotlib. They still work when printed in greyscales, are readable for colour-blind people and prevent bias due to its uniformity.



Example of the perceptually uniform map "magma".

To make the scientific community a little more inclusive, we should ensure that all scientific figures are understandable and readable to everyone. It is therefore important to take into account colour-blind people when you create your figures. It takes little effort to keep them colour-blind-friendly!

Sources: Color vision deficiency: MedlinePlus Genetics. Ghr.nlm.nih.gov (2020) Tips for designing scientific figures for color blind readers. Sommersault1824, Bailey, J. Color Blindness: Psychological Effects. (2013) and Ander Biguri (2023). Perceptually uniform colormaps, MATLAB Central File Exchange. Ishihara images from Wikimedia Commons

STUDENT FRIENDLY MEAL PREP

RECIPES

Quick, cheap and practical: all you could ask for in a meal as a student. Although most of these recipes don't have a heartfelt backstory about how grandma used to make it for you as a child, they will still keep you satiated for days. So, here are three recipes that surely taste better than just bread and hummus.

Lentil Soup

Although this recipe takes longer to make, most of it is passive work. You can just place the pot on the stove for 45 minutes and forget about it until it is ready. This is a great soup recipe that is not only very healthy but also overwhelmingly delicious. Your tastebuds will thank you after this.

Serves: 4

Ready in: 55 minutes



Ingredients:

Olive oil
1 medium sized onion, chopped
2 carrots, peeled and chopped
1 large potato, chopped
4 garlic cloves, minced
2 tsp cumin
1 tsp curry
1 tsp thyme
1 can of diced tomatoes
1 cup green or brown lentils, rinsed
4 cups vegetable broth
2 cups water
Red pepper flakes, black pepper and salt to taste
2 tbsps lemon juice

Preparation

Bring a large pot to the stove and add enough olive oil to cover the bottom of the pan. On medium heat let your oil sizzle, then add your onions and carrots. Sauté them until the onions turn translucent and carrots have softened. Then add all the listed spices, mix well with the vegetables until the flavours have distributed nicely and your kitchen smells heavenly. Pour the diced tomatoes on top and give a nice stir. Pour in the lentils, broth and the water. Lastly add your chopped potatoes in and bring the soup over to a simmer at medium heat for 35-40 minutes or until the lentils are softened to your liking. Once the soup is ready, you may choose to separate half of the soup and use a blender if you have one until it is completely smooth, then mix this part back into the original soup. In my opinion this gives the soup a silkier, better texture. However, this step is completely optional and the soup tastes just as great without it.



A Colourful Roast

If you are not a fan of pan-frying or having to do active work while cooking, here is a foolproof recipe that requires little to no effort but tastes as tasty as heaven and will help you meet your daily macronutrient needs.

Serves: 3-4

Ready in: 20 minutes

Ingredients:

Pack of sausages
4 potatoes
1 head of broccoli
2 red onions
3 bell peppers
2-3 tbsp olive oil
Spices and herbs to liking

Preparation

Preheat your oven to 200 degrees Celsius. Roughly chop all your vegetables and your sausages. Spread all onto a baking sheet and drizzle olive oil on top. You essentially have a blank canvas when it comes to adding spice, but my preference would be to use salt, black pepper, thyme, oregano, rosemary and cumin. Bake for 18-20 minutes and enjoy! Couple some white rice with it and you are good to go for days.

Chicken Fiesta

Serves: 4

Ready in: 20 minutes

This is a favourite recipe of mine. Very quick to make, very forgiving recipe that is hard to mess up. This is essentially a pan food where you have a lot of creative freedom to play around with flavours, but I'll tell you my favourite way to do it. Best part is, you get to consume a huge volume of vegetables even with just a single serving of this.

Ingredients:

500 grams of minced chicken
2 sticks of leek, chopped
Small tin of sweet corn
One large carrot, grated
Pack of mushrooms, chopped
Half a cabbage, sliced thinly
Walnuts, chopped roughly
Sunflower oil
Spices and herbs to liking

Preparation

Place the pan on the stove at medium heat. Cover the bottom of the pan with oil and once the oil is heated up add your chicken mince. Cover the lid of your pan and let the chicken cook all the way through, you will notice the chicken releasing its juices. Once cooked, just open the lid and dump all of your chopped and grated veggies in along with the corn. This will seem like a lot more than the chicken itself, but the volume will decrease substantially. Give it a good mix, add in salt, black pepper, garlic powder, paprika and cumin or whatever other spice you please. Give everything a good mix and just cover the lid and let heat do the magic. In 20 minutes, everything will be more than halved in volume and all the delicious flavours will be incorporated into one another. Before serving, add in your chopped walnuts for the final touch and enjoy this delicious, nutritious meal.

INSECT CATWALK

STATISTICS

Insects: beautiful creatures or scary monsters? You find them everywhere, even where you don't want to. So small, but so complex. Have you ever looked closely at a garden spider? You like what you saw? I am going to present to you some of the cutest, hottest and most passionate insects. And of course, in a magazine about love, tell you about their love life. Get ready to be mind blown!

As the mRNA committee, we voted for the top 10 insects in three different categories:

Cutest

1. Weevil
2. Jumping spider
3. Rosy maple moth
4. Bumble bee
5. Sarota gyas
6. Cuckoo wasp
7. Hermit crab
8. Papilio Troilus
9. Lady bug
10. Walking bug



Hottest

1. Orchid mantis
2. Dragonfly
3. Damselfly
4. Scorpion
5. Bombardier beetle
6. Luna moth
7. Picasso bug
8. Shallow tail
9. Lady bug
10. Cuckoo wasp

Source: Frupus/Flickr

Most passionate and why:

1. Stick insect

Male stick insects have come up with a smart way to prevent other males from mating with the female: just never stop mating. Mating between stick insects lasts extremely long, with the longest observed mating lasting 79 days.

2. Honey bee:

For a male bee, the mating process is fatal. After they have sex with the queen, their genitalia is ripped from their body, after which the male bees die.

3. Damselfly:

When the male and female are mating, they form a cute heart shape together. However, the male still has to compete with other males; the sperm cells of males stay in the female for a period of time before fertilisation, so the male genitalia is shaped to scrape out the sperm cells of previous males.

4. Praying mantis

This one is more famous, because the female bites off the male's head during mating and continues to have intercourse with the rest of the body.

5. Bed bugs

Male bed bugs have genitalia shaped like a dagger, and during mating, the male climbs on top of the female and proceeds to penetrate the exoskeleton of its mate using its genitals.

6. Ladybugs

Ladybug mating can last up to 9 hours, and the male stays on top of the female during the whole mating session to prevent other males from fertilising their mate.



Source: Wikimedia Commons

7. Drosophila Bifurca

You might have heard about Drosophila during EvoDevo. The Drosophila Bifurca has one enormous sperm cell which can span a total of 5,8 cm, which is 20 times the size of the fly itself.

8. Earwig

This might sound weird, but earwig males have two penises. Both of them are longer than the rest of the earwig's body and because of this length they are very susceptible to breakage. Luckily, even if one breaks, there is always a spare one in the trunk.

9. Bean beetle

The male beetle has spiked genitalia that injures the female during mating. Research has shown that the spikes are evolutionarily beneficial as this results in more offspring being produced.

10. Flies

During mating, the male has to deal with genital torsion, so it has developed a mechanism which can twist its genitalia around between 90 to 180 degrees.

You might not be familiar with all the insects presented. Not a problem. When you feel bored, or just curious, grab your phone and just Google them. You will see some rather beautiful and astonishing insects. Enjoy!

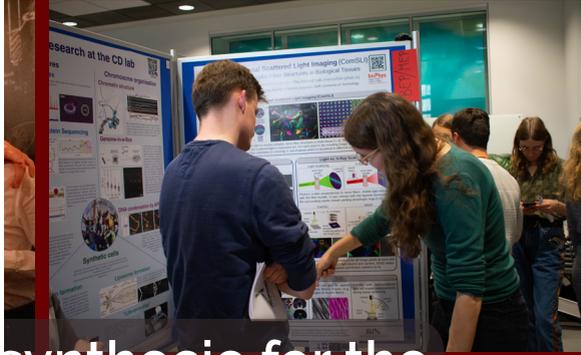
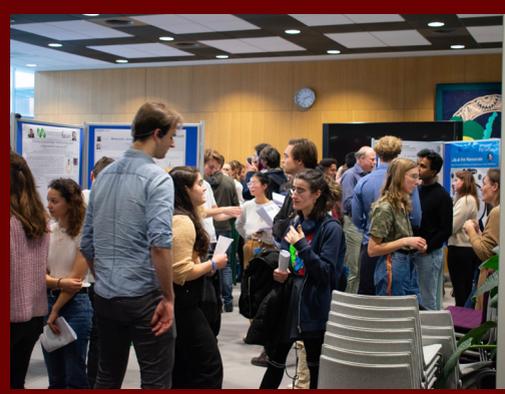
Sources:





Thanks to Fotosyn
lovely pict





synthecie for the pictures!



LIFE IN A POST-GPT WORLD

OP-ED

At this point, I expect all of you to have at least tried ChatGPT. If not: what are you doing? Seriously, go try it. As someone who also tried GPT-3 as soon as I could, I'm telling you, ChatGPT is a noticeable leap forward already; for some specific things, it's an absolute gamechanger. When first using it, I spent hours glued to my computer, seeing how deep the rabbit hole went; it felt like years of a future I thought was still on the horizon were compressed and hit me in the face. Based on my experiences, I have some tips and pointers to get the most out of ChatGPT.



Explore

It's fun. Go play with it. Ask it to make limericks making fun of your friends. Feed it copypastas to make it spit out the most unhinged wall of text you've ever seen. Teach it wrong things and gaslight it. The possibilities are vast, so try whatever; not sure how many of you could relate, but it invoked the same feelings I felt when first trying Minecraft over a decade ago. Same principle, just text-based and more tech-y, so play around and get used to it. If you've got techy parents, it could be a good opportunity to reignite the flame of nostalgia; tell them to ask ChatGPT to play a MUD, they'll know what that means.

Tips, Tricks, and Best Practice

All the fun you can have with it aside, I think the majority of its potential lies in more practical applications. It is not a miracle; it cannot do anything and everything you ask of it and expecting it to is unwise. I like to think of it as analogous to a calculator: it doesn't replace doing maths by yourself, but it does obsolete the mundane, autopilot parts of it. Likewise, ChatGPT can't write better than you can (at least I hope not), it won't come up with better ideas than you can, and it won't be funnier than you are. What it is really good at is getting close enough in a fraction of the time. Treat it like your own personal army of monkeys on typewriters: if you take the time to curate its output, it can be great inspiration, quickly giving you ideas to springboard from and implement.

For example, do not ask it to write an essay for you; for starters, you should never trust it, as it will happily say incorrect things with great confidence, and you will easily be caught plagiarising. Seriously, this is an immensely stupid idea, you will be caught, and you will feel like a clown. Instead, give it your essay prompt, ask it to spit out different possible ideas, things it thinks you should include, and keep regenerating responses until it gives you something interesting that you missed out on. Write your essay yourself, fully, but consider feeding it back to ChatGPT; ask it for feedback, ask it for catchy title ideas, ask it to think of counter-arguments to your points, generally use it to improve and support your work instead of expecting it to do your work for you if you want best results.



Source: Freepik

The Elephant in the Room

All of these limitations go out the window when it comes to coding. These monkeys can code. Scary good. Better than me. I was already impressed with its text generation, but its coding ability blew me away. It will require hand holding, but most of the time it'll end up being right eventually. In some cases, it's immediately right, the code runs on the first try, no changes are needed, and you wonder if there'll be any jobs left by the time you graduate. If it isn't, you can just tell it what went wrong, give it the error, and it'll often fix it. You can also do this with your own code if you're out of ideas; it's great at fixing code, so if you're ever stuck waiting for a TA, feeding ChatGPT your code for feedback isn't a bad shout.

Most of my time using ChatGPT has been spent playing with its coding abilities, and I think that this is where ChatGPT will have the biggest impact. It handled pretty much everything I threw at it; "expert" level coding challenges I found online, translating code between languages, old EI assignments, even explaining and adding comments to some old code that I wrote but no longer understood. To poorly thought out programming courses where the focus is more on bodging code together to complete some final project, ChatGPT is probably a deathblow. I think programming courses will adapt to put even more emphasis on fundamentals and understanding; already, courses here at the TU are recognising the value and impact of ChatGPT, introducing students to it and advising them on how to best use it to learn and code. Ultimately, ChatGPT and other AI chatbots / assistants are another tool in the toolbox; a very powerful tool, likely a must-have for future programmers, but not yet reaching the singularity.

We asked ChatGPT to write a poem about mRNA in the style of Shakespeare. This is the result:

*"Oh fair messenger RNA, how thou dost shine,
A wondrous molecule, so divine.
From the nucleus thou dost take thy flight,
To the ribosome where thou dost alight.*

*Thou art the key to life's great chain,
Transcribing the code with such sweet refrain.
Thou art a strand of nucleotides fair,
Guiding us all with such great care.*

*Adenine, Guanine, Cytosine, and Uracil,
Thy bases make the code, so still.
With ribosome as thy trusted steed,
Amino acids join, with all speed.*

*Peptide bonds form, as if by magic,
Proteins are born, without tragic.
Oh messenger RNA, thou art a gem,
In the world of genetics, thy worth is them.*

*Without thy guidance, life would be lost,
Proteins would fail, at such great cost.
So let us praise thee, oh messenger RNA,
For thou dost bring us life, day by day."*

- ChatGPT

IS PINK A REAL COLOUR?

SHADES OF RED

Perhaps you might have heard the statement “pink is not a real colour”. The idea behind this statement is that there is no wavelength in the visible light spectrum that corresponds to pink. What we perceive as the colour pink might actually be a figment of our imagination, but does that mean the colour pink is not real?

Before we dive into that question, let's start with the basics of how we, as humans, perceive colours. Light is sensed in our eyes on our retina, which contains rods and three types of cones. The rods are very sensitive to light and this feature helps us see even in more dimly lit circumstances. The cones, on the other hand, are used for colour perception. The three different cones are sensitive to different wavelengths of light. The degree of stimulation of the different types of cones is interpreted by our brain, and as a result, we can perceive the world in a full spectrum of colours.



Colour defined by its wavelength

There is no wavelength that describes pink. Pink is a combination of red and violet, however, red and violet wavelengths are at opposite ends of the spectrum. A wavelength that would create an “in between” state would therefore be physically impossible. The reason that we are able to observe pink is that violet wavelengths stimulate the “blue” cones, and simultaneously red wavelengths stimulate the “red” cones. This dual stimulation is then perceived by our brain as... pink! We could argue that this colour is not a real colour as it is “made up” by our brain and is not physically present in the spectrum of visible light.

The *unrealness* of colour perception

If we were to define the realness of colours by their wavelengths, aren't then all colours we perceive not real, as there is no way that we can remove the subjective translation of colours in our brain? How accurate is our perception and interpretation of colour compared to reality?

To illustrate this question of the realness of our colour perception, consider this example: imagine you are a bee in search of a delicious flower. Like humans, you are a trichromat (i.e. you have three types of cones), but your cones are sensitive to different wavelengths; your short wavelength cone is sensitive to UV light. The way you would now perceive a flower would be significantly different from humans. So if you would define colour by wavelength, would UV then also be a colour? Or even more dramatically, would any wavelength of light, even those that are far beyond the boundaries of visible light, be considered colours as well, even though as of now there might not exist any organism that uses it to “see”?



Source: Boulif, Menouar. (2019)

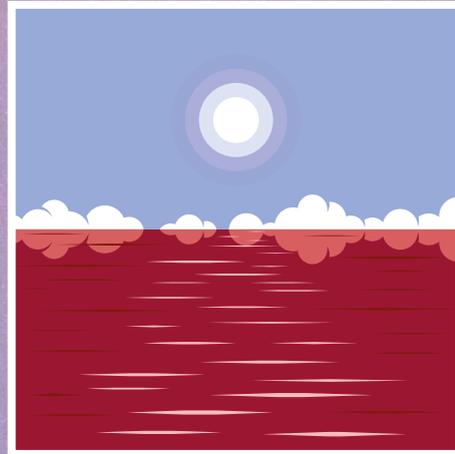
A comparison between human vision (left) and the simulated vision of a bee (right). In the bee's vision, the center of the flower is perceived differently compared to human vision.

While we perceive colour differently from other species, maybe we can come to an agreement on which colours are real for human species, by defining real colour based on those we can perceive? However, even within our own species, we do not always perceive the same colours. People with genetic indications of tetrachromacy (four types of cones) are sometimes able to distinguish a larger variety of colour shades than conventional trichromats. Do the tetrachromats determine what our perceptually real colours are, or do trichromats? Or consider red/green colour-blind people, who only have two types of cones. They cannot distinguish between red and green. Does that mean that either red or green is a real colour, or maybe that red is the same colour as green? And then we haven't even considered that the appearance of colours also depends on context. A famous example is of course the white/gold or blue/black dress. Various optical illusions demonstrate that our perception of colour is highly subjective. Therefore, it might even be impossible to universally define the realness of colours using our own perception of colours.

Words to describe colours

Perhaps the naming convention of colours could help us out in defining real colours. If we can name the colour, it is real. In general, we humans agree on categories of similar colours. Shades of red are red, shades of green are green, shades of blue are blue... but sometimes red?! "Wine-dark" or "wine-faced" would describe the seas in Homer's works like the Iliad and the Odyssey. He would never use blue as a descriptive word. More importantly, ancient languages rarely seem to have a word for the colour blue. Similarly, the language Wobé only has three words to describe colours: light, dark and red. There exists a plethora of examples of languages that use less words to

categorise colours. Pink is therefore not always a distinct category. If someone's language does not have a word to describe pink, does that mean it is not a real colour to them?



Were the seas really wine-red? Was wine perhaps blue? Or did language influence the way Homer perceived the world?

It appears that defining the realness of something so subjective to us is open to multiple interpretations. Colour may not be an objective tool to capture the absolute truth of our world, as it is entirely fabricated in our minds. So don't be afraid to pick pink as your favourite colour, whether it's supposedly real or not. It's all in everyone's head anyway.

Sources:

- Jameson, K.A., Winkler, A.D., Herrera, C., & Goldfarb, K. (2015). The Veridicality of Color : A case study of potential human tetrachromacy.
- Jordan, G., Mollon, J.D. (2022). Tetrachromatic Vision. In: Shamey, R. (eds) Encyclopedia of Color Science and Technology. Springer, Berlin, Heidelberg.
- Deutscher, Guy (Aug 4, 2016). Through the Language Glass: Why The World Looks Different In Other Languages. Random House.
- Hempel de Ibarra, N., Vorobyev, M. & Menzel, R. Mechanisms, functions and ecology of colour vision in the honeybee. *J Comp Physiol A* 200, 411–433 (2014).
- Cook, Richard & Kay, Paul & Regier, Terry. (2005). The World Color Survey Database.

PDA; NBD?

SHADES OF RED

According to Wikipedia, physical displays of affection are acts of physical intimacy in view of others. This includes acts like hugging, kissing, and holding hands. These actions are closely intertwined with culture and religion. In this article, I will discuss some of the cultural differences regarding physical displays of affection.

Europe

In Europe, physical displays of affection are generally accepted. It is common for couples on the street to kiss, even among friends, as a greeting. Holding hands and hugging is all over the place too. In some countries it is more common than others, but overall Europe is very open with public displays of affection.

Middle East

All forms of physical displays of affection are not accepted and can even be punished by law. There are several cases where people got punished with severe prison sentences for kissing in public. In many public facilities like schools, boys and girls are even separated.

China

Chinese culture is very strict on public displays of affection. Even though the younger generation is changing slowly, you will never see couples kissing in public. China has a culture of being very closed with their emotions and not showing any sign of affection. Most of the time it is not punished by law, but rather socially not accepted.

Africa

Most of the African countries are very strict in their rules on physical displays of affection. In most countries kissing and hugging on the street is not accepted, but in Mozambique and Namibia it is slightly more relaxed. South Africa is the big exception. They are very open and are more like European cultures regarding displays of affection.

America

For both North and South America, actions like kissing and hugging in public are totally accepted, which makes them highly similar to Europe. This is of course a very generalised statement, since every country has its own specific customs, but it is never as strict as in Africa or the Middle East. In South America, public displays of affection are generally even more accepted when compared to North American or European countries. North America and Europe are a bit more conservative on the topic.

The differences in the acceptance of physical displays of affection is enormous. The clearest difference is of course between Western countries and the Middle East, from lots of acceptance to almost none. And of course, it will change in the future. Over time, I think due to globalisation, the differences will decrease, as is already visible among the youngest generation in China.

Sources:

https://en.wikipedia.org/wiki/Public_display_of_affection#:~:text=In%20most%20of%20the%20Western,as%20engaging%20in%20sexual%20activities.

<https://www.traveltalkmag.com.au/blog/how-pda-is-viewed-around-the-world>

<https://www.babbel.com/en/magazine/public-display-of-affection-laws>

THE HEDGEHOG'S DILEMMA

WHEN LONELINESS HITS

Source: freesvg.org



Being alone is very different from loneliness. One may enjoy being alone, but loneliness poisons the mind. It is more so a parasite rather than a feeling; it eats you up inside, fills you up with darkness and desperation. Nobody sees you, nobody hears you, nobody understands you, but it is always there. Whether you are strolling through a crowded avenue or laying on your bed staring at your ceiling, the dark clouds of loneliness can always be there weighing in on your chest. Loneliness may disguise itself as the brightest laughter on one's face or it may show itself in the tear of an anguished sob of another.

This phenomenon, this loneliness, has captivated the minds of many writers; thousands have devoted chunks of their lives trying to put the indescribable into words. It looks and feels so different from one person to another that we may often mistakenly get too caught up in our own loneliness and think we are the only ones feeling this way.

If you do ever wonder what the loneliness of another person may look like, or you wish to find a piece of yourself in a character of a novel and share the weight on your shoulders with them to soothe your pain, I present to you Jean Paul Sartre, the writer who used his words much better than I could to express the inexpressible, loneliness.

Nausea

Nausea (La Nausée in the original French) is a novel published by French writer and philosopher Jean Paul Sartre in 1938. The story revolves around Roquentin, a young man whose nausea towards the world grows greater every day, and the reader gets to experience his train of thought each preceding day as he comes to the realisation of a bland, empty life where his loneliness grows stronger. It is a tough piece of literature to read, because it is just too real.

"I felt myself in a solitude so frightful that I contemplated suicide. What held me back was the idea that no one, absolutely no one, would be moved by my death, that I would be even more alone in death than in life."

Jean Paul Sartre

background image: pxhere.com



Source: pixexid.com

QUIRKS EXPLAINED

EXPERT OPINION



Tobias, the former henchman of the underworld, again returns to haunt our journalistic inspiration with his varied and interesting commentary on issues we definitely feel the need to discuss with him. This time our aim was to discuss some of the most common or well-known quirks. These are weird traits and behaviours that make us unique, fun and special. These are the things that in the end also make us human, or in other cases devils.

Sneezing while anxious

mRNA: This quirk has a scientific history. While this correlation was shown, the proper causal relation was not found until recently, when biochemical pathways could properly be examined. It turns out anxiety strengthens biochemical pathways that are related to allergic reactions, which is now thought of as a defensive warning mechanism against these antigens. So sneezing in a dusty exam room does not necessarily mean that you have a cold.



Tobias: I've always been suffering from this when I was a child. I always left with only a t-shirt on in the winter, and I would come home so anxious that my mom would find out that I started coughing the day after almost immediately. Hard times.

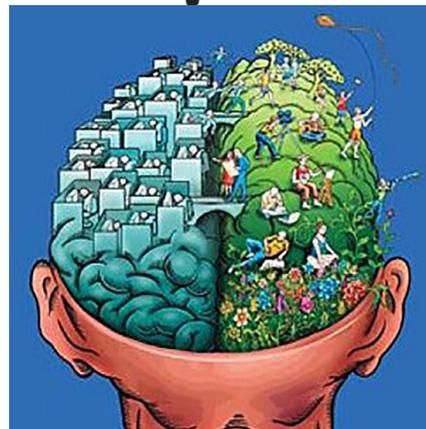


Sleepwalking

mRNA: While the origin of sleepwalking is not well understood, we know it is far more common in children, and children who sleepwalk usually grow out of it by adulthood. When this is not the case it is treated as a sign of mental exhaustion or degeneration. The conditions it was previously linked to are depression, anxiety, Alzheimer's and bipolar disorder.



Tobias: Ok, so hear me out. Do you think we walk while we sleep, or do we sleep while we walk? Now, that is the important question, isn't it! I should win something for this.





Ear wiggling

mRNA: The ability to wiggle your ear was found to be an inherited trait. Since the trait could be passed on from either the mother or the father of the person, it is believed to be a dominant mutation, which occurs in roughly 20 percent of all people. Scientists found no evolutionary benefits to this ability, nor a meaningful correlation with other advantageous traits. It is believed to be a randomly selected mutation, and is not a result of natural selection.



Tobias: Best party trick ever. I had a friend who could do this, and he was always the light of the party. I mean metaphorically. Well, I mean until the time he actually got lit on fire by my boss. That was sad.

Yawning contagion



mRNA: While not specifically a quirk, the contagious nature of yawning has been shown by numerous studies, which in our mind makes it a behavioural quirk. While the origins and the causes of yawning are still debated in the scientific literature, the mirroring of yawning is quite well understood. One of the most fascinating theories in evolutionary biology that explains this phenomenon is related to group conformity.

When animals live in social structures, conformity to the leaders and competitors within that structure is vital towards earning mating rights. This is why conscious and unconscious mirroring behaviour is common in animals, such as us humans. So if anyone asks why you just yawned, you can now answer appropriately.



Tobias: I yawned, you yawned, she yawns, we yawn, you yawn, they yawned. Sorry, I am a bit sleepy, what were we talking about?

CAREER PROSPECTS FOR NANOBIOLOGISTS

FUTURE

If you are still studying Nanobiology or you just recently graduated, it is important for you to consider the different career paths you can take in the future. So, what are your options?

Biomedical Researcher

Pursuing this career option means carrying out a range of laboratory and scientific tests to support the diagnosis and treatment of diseases. Cancer, diabetes, blood disorders, meningitis, hepatitis, and HIV are a few of the many diseases you could research as a biomedical researcher. Throughout most of this career, work done will be largely self-directed. To increase your chances of getting the highest pay and best position, extra studying will be required, which often follows one of two paths: obtaining a medical degree, where you train as a doctor and then transition into research, or directly pursuing a PhD in biomedical sciences, which can take four to six years. In the Netherlands, the average annual salary of a biomedical researcher is 70,000 Euro, given you have at least five years of experience.

Data Analyst

As a data analyst, you can focus on informatics, imaging, biodata, or programming. You would be responsible for analysing data using statistical techniques and implementing and maintaining databases. With many options for employers, you could work in pharmaceutical companies, leisure and hospitality organisations, specialist software development companies, telecommunications companies, and more. This career option suits individuals with high proficiency in maths, statistics, and computer science. An entry level data analyst, with one to three years of experience, can earn an average salary of 56,700 Euro in the Netherlands.

Biophysicist

Examining the chemistry and physics of biological processes is the underlying purpose of this career, where studies on molecular processes are conducted to analyse and interpret data for primarily medicine. The average salary of a biophysicist is 86,000 Euro in the Netherlands with a minimum of three years of experience.

Instrumentalist

An instrumentation scientist designs, maintains, and analyses the performance of various types of instrumentation. The average salary of an instrumentation engineer in the Netherlands is 70,000 Euro, given at least five years of experience.

Molecular Biologist

A molecular biologist studies how molecules interact with one another in living organisms to decipher the various functions of life. With this career path, you could work, for example, as a clinical research assistant in hospitals. The average salary is 56,600 Euro in the Netherlands with a minimum experience of five years.

Sources
<https://80000hours.org/career-reviews/biomedical-research/>
<https://www.tudelft.nl/onderwijs/opleidingen/masters/nanobiology/msc-nanobiology/career-prospects>
<https://worldsalaries.com/average-biomedical-scientist-salary-in-netherlands/>

CHINA'S CHIP PREDICAMENT

OP-ED

As more and more of our world becomes intertwined with electronics, demand for processing has skyrocketed, and nations have begun taking semiconductor supply as a serious matter of national security. You may have noticed headlines talking about a chip war between the U.S. and China, a new cold war heating up, with one Dutch company surprisingly at the centre of it all: ASML.

ASML does not make chips. They make the machines that make chips, and these machines are some of the most complicated single objects ever designed. The reasons why ASML is left as the sole supplier of leading-edge extreme ultraviolet (EUV) equipment all hinge around one simple, unfortunate truth: semiconductor manufacturing, especially the manufacturing of lithography machines, is brutal. Despite twenty years and billions being spent on research around the world, ASML is the only group that managed to produce an EUV lithography machine economically efficient enough to be worth using. As a result, they are a pure monopoly; Taiwan's TSMC, America's Intel, and Korea's Samsung all offer their own leading-edge nodes, but all depend upon ASML's equipment.

One notable exception to the list of foundries using ASML equipment is China's SMIC, and this makes the CCP incredibly insecure. Due to a web of relationships between the U.S. and the Netherlands, U.S. sanctions on China block the sale of Dutch EUV technology to Chinese customers; in one fell swoop, Chinese leading-edge manufacturing capabilities are left gutted.

In the short term, if sanctions continue, the outlook for the CCP is grim; a secure supply of leading-edge chips is vital to their economic and strategic interests, and nobody else but ASML can provide that. From warplanes to warships, chips are key components in their weapons, and they are now forced to lag further behind the capabilities of the U.S. and its allies. Non-military manufacturing also takes a hit; for as long as China misses out on EUV equipment, most manufacturing will be less efficient than it could otherwise be.

With the implementation of these sanctions, the U.S. has successfully secured some of its key strategic interests in the Asia-Pacific region. However, even if sanctions are lifted by the next administration, this was a card that could only really be played once; in proving their willingness to block the sale of ASML equipment, the U.S. has shown China just how vital a domestic supplier of EUV technology is. While China is now forced to lag behind, their efforts to develop or reverse-engineer EUV equipment will take much higher priority, and even if it takes them a decade or more, they will almost inevitably catch up. After all, to quote ASML CEO Peter Wennink, "the laws of Physics in China are the same as here".

Source: Bloomberg News. U.S. sanctions push China to create own chip tech: ASML. Data Center Knowledge | News and analysis for the data center industry. <https://www.datacenterknowledge.com/hardware/us-sanctions-push-china-create-own-chip-tech-asml>. Published January 26, 2023

AS DEATH APPROACHES

PALLIATIVE CARE

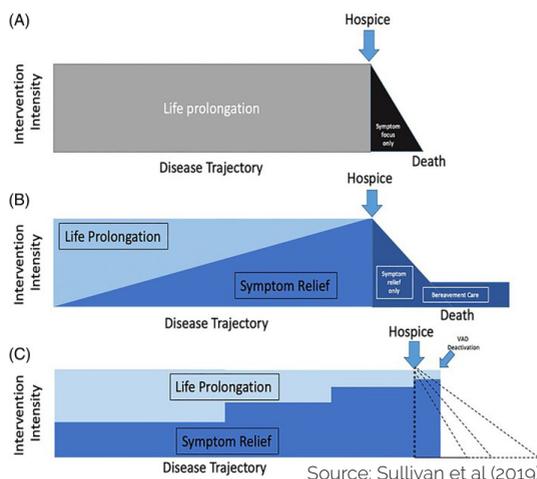
Death is an abstract concept. It is all around but somehow so distant. It feels like it will never wrap its arms around us or our loved ones. However, especially when it comes to the elderly, death is inevitable. The human body can only withstand so many years naturally, yet with the modern technologies we have access to, we may somewhat postpone this ending. Pills, regular hospital visits, heart pacemakers... anything that will give us the opportunity to see our loved ones a tad bit longer. It only makes sense that we do everything in our power to save them. Though, what do the patients themselves think about this?

Does the idea of death scare elders as much as it scares young, healthy individuals? Do they even wish to have abnormally elongated lives? Should they have rights to deny such intervention? Research into this concept aims to resolve these issues, and is termed palliative care. This article will discuss and explain proper end-of-life care and its applications.

What is palliative care?

"Palliative" comes from the Greek word "pallium", a cloak-like garment that was worn by the Greeks outside of common work life and was considered a form of protection. Ever since the term palliative care was used for the first time, its definition has been updated by WHO, and is proposed to change once again with regards to the current improvements concerning the matter. According to the most recent definition by WHO, palliative care is "an approach that improves the quality of life of patients and their families facing problems associated with life-threatening illnesses,

through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychological and spiritual."



A) the old definition of palliative care visualised, B) the current model of palliative care visualised. C) the foreseen future of palliative care visualised.

Advantages of palliative care and why most elderly choose this path

A non-patient related advantage of palliative care is the reduction in number of patients admitted to hospitals, thereby reducing the workload of medical staff and a country's medical expenses. Furthermore, it is very likely that the aims of a doctor and an elderly patient do not align. At an old age, patients seem to be more interested in spending their time in their homes and around loved ones where it is safe and peaceful. Indeed, research shows that for patients who were offered a talk about palliative care, the majority chose not to be readmitted to a hospital and chose to sign their do not resuscitate will.

Limitations of palliative care

Although the use of hospice has increased from 10% to 50% of decedents in the last two decades, palliative care itself remains a highly overlooked option around the world. There are also substantial variances between the percentage of patients suffering from different illnesses which make use of palliative care. For example, oncology patients appear to choose the palliative care path more frequently than patients suffering from heart disease. So, if this opportunity seems to help many patients live better lives through their last days, why is it not a widely considered option?

In research where Dutch medical workers were asked to express their views on why palliative care is not yet popularised, there were some common answers:

- Palliative care related consultations take longer, and so do not fit into regular hospital schedules.
- The topic of palliative care usually does not come up until the very late stage for patients with heart disease, so they are incapacitated while dealing with such difficult decisions.
- Most workers feel it is inappropriate to discuss this option during regular check-ups.
- Some healthcare professionals focus so much on their own discipline that they forget to look at the patient as a whole and their personal needs and wants.
- Concerns about taking the patient's hope away if the topic is brought up.

The optimal palliative care system

There are many hard to swallow questions that have to be asked to the patient to get a full overview of what the patient is looking for, such as: what is your understanding of your current situation? What are you hoping for? How would you like to receive your medical information? Do

you consider not renewing your ICD (implantable cardioverter defibrillator)'s battery?

Following these questions both the patient and the loved ones of the patient might be in need of mental support, so medical staff educated on better patient-doctor communication and mental health are vital in making this program functional and coming up with a treatment tailored to each patient.

To destigmatise palliative care from being seen as a certain indicator of approaching death, it may be offered throughout the whole sickness trajectory rather than only when ending is close. Although losing a loved one stings, we must accept the fact that sometimes dying peacefully is a better option than living in pain. To at least ensure less painful end-days, optimising palliative care is significant and the palliative approach has a bright future ahead.

Sources:

- Sullivan MF, Kirkpatrick JN. Palliative cardiovascular care: The right patient at the right time. *Clin Cardiol.* 2020;43(2):205-212.
- Warraich HJ, Meier DE. Serious-Illness Care 2.0 - Meeting the Needs of Patients with Heart Failure. *N Engl J Med.* 2019;380(26):2492-2494.
- Stoevelaar R, Brinkman-Stoppelenburg A, van Bruchem-Visser RL, et al. Implantable cardioverter defibrillators at the end of life: future perspectives on clinical practice. *Neth Heart J.* 2020;28(11):565-570.
- Gelfman LP, Kavalieratos D, Teuteberg WG, Lala A, Goldstein NE. Primary palliative care for heart failure: what is it? How do we implement it?. *Heart Fail Rev.* 2017;22(5):611-620.
- Groenveld HF, Coster JE, van Veldhuisen DJ, Rienstra M, Blaauw Y, Maass AH. Downgrade of cardiac defibrillator devices to pacemakers in elderly heart failure patients: clinical considerations and the importance of shared decision-making. *Neth Heart J.* 2021;29(5):243-252.
- Liu AY, O'Riordan DL, Marks AK, Bischoff KE, Pantilat SZ. A Comparison of Hospitalized Patients With Heart Failure and Cancer Referred to Palliative Care. *JAMA Netw Open.* 2020;3(2):e200020. Published 2020 Feb 5
- Hill L, Prager Geller T, Baruah R, et al. Integration of a palliative approach into heart failure care: a European Society of Cardiology Heart Failure Association position paper. *Eur J Heart Fail.* 2020;22(12):2327-2339

WHAT MAKES PEOPLE ATTRACTIVE, HISTORICALLY SPEAKING

SHADES OF RED

Beauty is subjective: not everybody is attracted to the same characteristics. However, there are some features that are considered attractive in general. Over time, these have changed drastically! Beauty has gone all over the place! Some features that used to be considered attractive are unbelievable nowadays. This article will show some of the weirdest beauty trends in history.

Maya

The Mayan civilisation had a very strict beauty standard, starting at infancy. Elongated heads, crossed eyes, a large and pronounced nose, and pointy teeth were all the rage. A Mayan baby's skull would literally be flattened, and pieces of stone were hung between the eyes. At an older age, the teeth were filed, all to secure beauty. Fun times, but chewing probably sucked.

Victorian Era

For women in the Victorian age, pale skin, red lips and a thin waist were a must. Luckily for them tuberculosis was more common back then. Women tried to get tuberculosis on purpose, just to live up to the beauty standards of the time. One side note: after a while, you would hate your life for getting tuberculosis, even in Victorian times. The men took less drastic measures, but still, ideal men were not muscular at all. The lazier the man, the better.

Lip plates

Among some tribes in Ethiopia, before marriage, the lower lip of a girl is pierced with a piece of wood. The lip grows until it is large enough to hold a large disc. The disc symbolises eligibility for marriage and fertility. Some discs even have a diameter up to 20 cm.

Quite the opposite

Nowadays, skinny is more attractive than fat, but for a long time in history, for example Europe between 1500 and 1900, it was quite the opposite. Being voluminous was a sign of prosperity and good health; paintings of aristocracy from this time period usually show extremely fat people, which could easily participate in the next season of my 700 pound life.

Scary teeth

And last but not least, in Japan, there was a beauty trend called "ohaguro". This meant making your teeth black by drinking a dye of mixed iron filings in tea or vinegar. Beyond beauty, it was believed it prevented tooth decay too. It was very popular from the 10th to the 19th century.

What is considered beautiful has changed so much throughout history, and we are willing to pay extreme prices for beauty. Suffering pain, enduring diseases, so many examples where health was put second. People have done so much for beauty. This article is just the tip of the iceberg.

AGENDA

LinkedIn Workshop YE 20-03
MDE Location Reveal Drinks 21-03
LYSE 25-03

04-04
06-04
18-04
26-04
01-05
05-05 up to 07-05
10-05
27-05 up to 29-05

Karaoke Drinks
Symposium
Study with Nanos
GMA 4
Activity with Formorrow
MDE
LABdance
Kinetic Rally
Weekend

ASConnect 01-06
HOX Family Day 03-06
Studentdoet /
volunteering day 09-06
Formorrow workshop
Choice Overload 14-06
Study with Nanos 26-06
End of the year barbecue 30-06

To be up-to-date with all activities, scan this QR code to receive access to the official Hooke calendar!



For 3rd year and older students, if you want to keep receiving the mRNA, scan the QR code and sign up!

