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THINK

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EDITORIAL

HEALTH

In Maltese we say, 'Ghandek is-saħħa, għandek kollox' (In English: If you have good health, you have everything). Most people would agree. And yet as we listened to all the stories that built this issue of **THINK**, we noticed how discordant our behaviour can be to this would-be 'universal truth'.

Diabetes is a major problem in Malta according to the latest national study (pg. 24), yet there is an arguably even bigger issue with the lack of knowledge sufferers have in managing their condition. Mental health issues on the island continue to be flagged, but burnout is still a huge challenge for mental health professionals (pg. 36).

This said, the **THINK** team's realisation was quickly followed by overwhelming gratitude towards the research constantly being conducted. The human body and mind are complex, and researchers are working tirelessly to close the knowledge gaps that exist, from developing potential cancer vaccines (pg. 16) to decoding rare diseases (pg. 13). Others are finding ways to live in harmony with our brethren from all over the world (pg. 26).

Beyond this, we delve into some divisive topics, including Ebola and the attention it needs despite losing its position as scary headline of the moment (pg. 6). We also discuss the rise of veganism, the hate it gets, and the benefits it can provide (pg. 34), as well as the abortion debate taking the country by storm (pg. 10). Some reflection may be needed after reading this issue. You have been warned.

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Are you a student, staff, or researcher at the University of Malta? Would you like to contribute to **THINK** magazine? If interested, please get in touch to discuss your article on think@um.edu.mt or call +356 2340 3451

COVER STORY



HEALTH

Designed and illustrated by Gabriel Izzo, THINK's cover takes us away from the home we focused on in the previous issue. The moon has captured the attention of artists and scientists alike. It inspires us to look beyond ourselves and our world.

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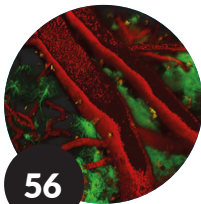


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Our content picks to stimulate your eyes, ears, and mind.

THINK

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June 2019 - ISSUE 28

EDITORIAL

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L-Università ta' Malta

TOOLKIT

A close-up photograph of a mechanical assembly. The central focus is a dark, coiled spring. It is held between two vertical metal rods. Below the spring is a horizontal metal plate. In the background, another similar assembly is visible but out of focus. The lighting is dramatic, highlighting the textures of the metal and the spring.

Redesigned hip joints need a simulator

People are living longer than ever. But a long life has its price. With age come more diseases and health issues, such as hip problems that can limit a person's mobility.

Hip replacement procedures have become common, although implants have a lifespan too. It might happen that a hip replacement you get at 60 needs to be replaced at 75. This is not the ideal scenario.

To minimise these cases, researchers are testing new materials and designs to prolong prostheses' lifespans. These potential solutions need to be tested, but each test costs tens of thousands of euro. Enter, the University of Malta's hip joint simulator.

The hip joint simulator is a machine that replicates the joint movements and loads imposed on the human hip. To do so, the simulator uses three stainless steel frames, each of which can be controlled independently using motors. These motors act as the 'muscles' of the hip, programmed to replicate the walking cycle during testing.

When it comes to simulating load and forces, a mechanism can load the implants with weights of up to 300kg in a fraction of a second. This emulates what happens while walking, when the weight of the body rests on one leg due to the body's shift in the centre of gravity. While running, inertial forces



Donald Dalli

can cause the hip to sometimes take five times a person's body weight.

Finally, to simulate the environment inside the human body, researchers use a specialised solution that mimics the bodily fluids surrounding the hip joint. They even warm the fluid to imitate body temperature.

The hip joint simulator forms part of the MaltaHip project that intends to radically redesign hip implants to give them the longer lifespan patients want and need. Watch this space for more. [T](#)

The MALTAHIP project is funded by the Malta Council for Science and Technology through FUSION: The R&I Technology Development Programme 2016 (R&I-2015-023T).

Spring and load cell system mounted on the hip joint simulator

WITHOUT BORDERS

Author: Dr Raquel Medialdea-Carrera

When was the last time you heard about the Ebola virus? Many of you may recall Ebola dominating headlines in global news throughout 2014 and 2015 when it spread explosively across West Africa, claiming more than 11,300 lives.

For the last few years, Ebola has been my focus, passion, and dreaded nightmare rolled into one. In 2015, I joined a wonderful team of physicians, nurses, and scientists, that were leading the fight against Ebola in Sierra Leone. We worked in Ebola hospitals isolating patients and supporting




Dr Raquel Medialdea-Carrera

survivors of the virus' worst epidemic in history. Then, the World Health Organization (WHO) declared that the outbreak was over in 2016. News stations stopped covering our progress. Discussions about the disease dwindled. But the fight to eradicate Ebola was far from over.

Since August 2018, an Ebola epidemic has spread across the Democratic Republic of Congo (DRC), affecting over 2,000 people and becoming the second largest epidemic ever recorded. Over the last few weeks, I have joined the WHO to support the fight against it in Africa.

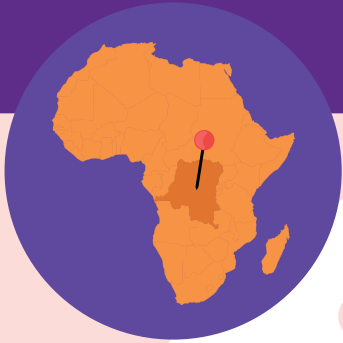
The latest Ebola outbreak in Congo is affecting people who were already suffering from a major humanitarian crisis. People in the DRC are devastated by years of violence and conflict, resulting in the largest displacement emergency in Africa. Four and a half million are currently fleeing their homes. With over 100 different armed groups in the country, the challenge of ending this Ebola outbreak is on a whole new level. But still, there is hope.

Over the last few years, researchers have toiled hard and developed a powerful vaccine against the Ebola virus. This vaccine is still under evaluation, however, the preliminary results show a wonderful efficiency of over 97.5%. Even so, we have to remain aware. Ebola is a cruel, painful death sentence for most people who get infected, and leaves in its wake a trail of broken families, hundreds of orphans, and shattered hospitals. It decimates economies and destroys societies, leading to even more poverty and hardship. This is why we cannot forget about Ebola. 

1

EBOLA IS STILL HERE

Until mid-June 2019, over 1,400 people have died in the Democratic Republic of Congo (DRC) with one in 15 affected being nurses and doctors.



2

EBOLA IS STILL DEADLY

Between 35–90% of those affected die due to a haemorrhagic fever. In the current DRC outbreak, the mortality rate is around 65%.

65%



4 reasons why we should not forget about Ebola



EBOLA IS STILL DANGEROUS

Even when they escape death, Ebola survivors can transmit the disease for many months. It can persist in semen and other fluids, leaving sufferers with a powerful stigma. For several years many suffer from eye diseases, joint pain, or deafness.

3



EBOLA IS STILL A THREAT

Since 1976, there have been 40 documented Ebola epidemics—all starting in Africa. The virus lives naturally in animals such as bats, meaning that epidemics will come again and again—preparation is key for control and eradication.

4

DESIGN

Paintings in motion

Vince Briffa's contribution to the Venice Biennale in 2019 is OUTLAND. An audio-visual piece inspired by The Odyssey, a story intimately linked to the Maltese islands' own folklore, the work unfurls over many layers.


On one level, it explores the lure of safety and the numbness that can bring—exhibited through Ulysses' portrayal, who is caught in a bubble of his own making. 'The plastic room replaces the island from the story, presenting a different interpretation,' explains Briffa. Here, it is Ulysses' own mind and thoughts that keep him trapped.

The character of Calypso is also a reflection of the theme MALETH—port and safe haven. 'She is both a lover and oppressor,' Briffa says. 'Calypso offers a haven for Ulysses during the seven years he spends harboured in her cave. But he is also her prisoner.'

Finally, there is fragmentation and distortion to create new from old. Penelope is Ulysses' waiting wife,

torn between longing for her husband's safe return and an uncertainty she secretly harbours—is that even what she truly wants? Her presence in the work comes through the use of Emmanuel Mifsud's poem Penelopi Tistenna ('Penelope waits'). For Briffa, the Maltese language helps the story 'take on a different life.'

The work's duality is apparent. Images are juxtaposed against one another. One can observe two characters simultaneously, living their own truths and challenging each other. However, the conflict is not structured. 'It's a contemporary art piece, not film. There is no story. It's more of a painting. I am, myself, a painter first,' Briffa notes.

So for those who find a narrative in this piece, know that it is uniquely yours. The question now is: will you share it? 

To watch and read more about OUTLAND
visit www.vincebriffa.com



OUTLAND, video, audio, voice, wood, and water installation, Malta Pavillion, Venice Art Biennale 2019
(photography: David Levene)



Voices for freedom and choice

Dr Alexander Clayman

Abortion is a criminal offense in Malta. This means Maltese women who wish to end their pregnancy have severely limited choices. Those more affluent can pay to terminate their pregnancy abroad. Those who do not have the money can either continue the pregnancy against their will or terminate locally under unsafe conditions, risking both their health and freedom.

Any woman who undertakes an abortion potentially faces three years in jail. Anybody who assists, such as a doctor, could also be sentenced to four years behind bars. This flies in the face of best medical practice which states that safe abortion services should be accessible to women who need them.

A few weeks ago a group of doctors, including myself, came together to set up Doctors for Choice Malta in order to advocate for sexual and reproductive health. This includes comprehensive sex education (NOT abstinence-only education) and access to free contraception (condoms, pills, and intrauterine devices). Increased use of contraception alone results in fewer unwanted pregnancies and subsequent abortions. Putting contraceptives in the hands of comprehensively sex-educated individuals can do even more. This said, abortion still needs to be available to those people who need it.

As a doctor, I feel I have a duty to use my knowledge and skills to better my community's health. Together with Doctors for Choice, we are basing our efforts not on opinions or morality, but on years of medical and sociological research which shows that sex education, contraception, and accessible abortions make a society healthier.

The irony was not lost on me when comments accusing me of being a baby-killing-mad-axe-murderer-who-doesn't-understand-what-a-real-doctor-is started rolling in. Luckily for me, forewarned is forearmed, and the negativity failed to penetrate very deep.

DOCTORS FOR CHOICE MALTA'S FOUR KEY AIMS:

1. To expand and improve sexual and reproductive education
2. To establish universal, free contraception (including barrier methods, oral contraceptive pill, MAP and intrauterine devices)
3. To decriminalise abortion
4. To legalise and provide abortion services locally

What did strike me was the contrast between the way people communicate their derision and their support. Abusive comments come in fast, prominent, and loud. Supportive comments are usually sent in private. At present, it's clearly very easy to be openly anti-choice, but very difficult to be openly pro-choice.

To those afraid to raise their voice and speak the truth, I say: whatever dogma, tradition, or a battalion of angry keyboard lieutenants might tell us, those who advocate for reproductive choice have nothing to be ashamed of. We are on the right side of history. **T**

Read more: Marston, C., & Cleland, J. (2003). Relationships between Contraception and Abortion: A Review of the Evidence. International Family Planning Perspectives, 29(1), 6. <https://doi.org/10.2307/3180995>

Stanger-Hall, K. F., & Hall, D. W. (2011). Abstinence-Only Education and Teen Pregnancy Rates: Why We Need Comprehensive Sex Education in the U.S. PLoS ONE, 6(10), e24658. <https://doi.org/10.1371/journal.pone.0024658>

STUDENTS



Saving the Maltese freshwater crab from extinction

Clayton Sammut

A considerable amount of endemic species inhabit the Maltese Islands. The Maltese freshwater crab (*Qabru* in Maltese) is one of them. In the 50s, the invertebrate was so abundant that freshwater crab soup was a common Maltese delicacy. And up until Malta adopted the Euro, it graced the Maltese five cent coin. The Maltese freshwater crab is unique to our heritage, but it is now threatened with extinction.

Under the supervision of Dr Adriana Vella and the University of Malta's conservation research group, I used various population and biological parameters to analyse the data and produce conservation recommendations.

To estimate the crab population size and density, I used two techniques known as the capture-recapture method and distance sampling in a number of repeated surveys in different sites throughout the dry (August to mid-September) and wet season (October to January). I then measured the crabs to determine their life stage and sex. This revealed more information about the reproductive population size and recruitment at each study site. What we found was that there was an imbalance in the number of female to male breeding adults, which resulted in a small amount of offspring. This means the population cannot sustain itself, putting the species in grave danger.

Beyond health and numbers, we also directed attention to the crabs' natural habitat. We wanted to find out whether hydrological and chemical parameters, such as

water depth and water acidity, are also having an impact. As it happens, the freshwater crab's population density is affected significantly by a water stream's depth, width, velocity, and acidity (pH). We also found that specific sites and seasons also had an impact. Direct water extraction, excessive use of fertilisers, and water stream channelisation are creating severe drought that suffocates the crabs during summer. So much so that adult male crabs were seen preying on their own juvenile crabs.

Looking at the rapid decline of watercourses around the Maltese Islands throughout the years, and the abuse that goes ignored and unchecked, the freshwater crab will not have a future unless we act immediately. There are three things that we can do to undo some damage. We can fund research to determine if a reintroduction programme would work in sites which previously hosted the crab. We can also create new engineered habitats which can host the crab and bolster the population. Finally, the highly diverse habitats that are now hosting the crab can be turned into protected nature reserves. The nature reserves could engage citizens with Maltese organisms. If run as a social enterprise, it could generate funds to support important research. Protecting the animals that call our islands home is our duty as responsible citizens, but it goes beyond that. Protecting them means protecting our surroundings, our home, from a path that severs us from our roots. Protecting them is protecting ourselves. **T**

Enter the swarm

Jean Luc Farrugia



Once upon a time, the term 'robot' conjured up images of futuristic machines from the realm of science fiction. However, we can find the roots of automation much closer to home.

Nature is the great teacher. In the early days, when Artificial Intelligence was driven by symbolic AI (whereby entities in an environment are represented by symbols which are processed by mathematical and logical rules to make decisions on what actions to take), Australian entrepreneur and roboticist Rodney Brooks looked to animals for inspiration. There, he observed highly intelligent behaviours; take lionesses' ability to coordinate and hunt down prey, or elephants' skill in navigating vast lands using their senses. These creatures needed no maps, no mathematical models, and yet left even the best robots in the dust.

This gave rise to a slew of biologically-inspired approaches. Successful applications include domestic robot vacuums and space exploration rovers.

Swarm Robotics is an approach that extends this concept by taking a cue from collaborative behaviours used by animals like ants or bees, all while harnessing the emerging IoT (Internet of Things) trend that allows technology to communicate.

Supervised by Prof. Ing. Simon G. Fabri, I designed a system that enabled a group of robots to intelligently arrange themselves into different patterns while in motion, just like a herd of elephants, a flock of birds, or even a group of dancers!

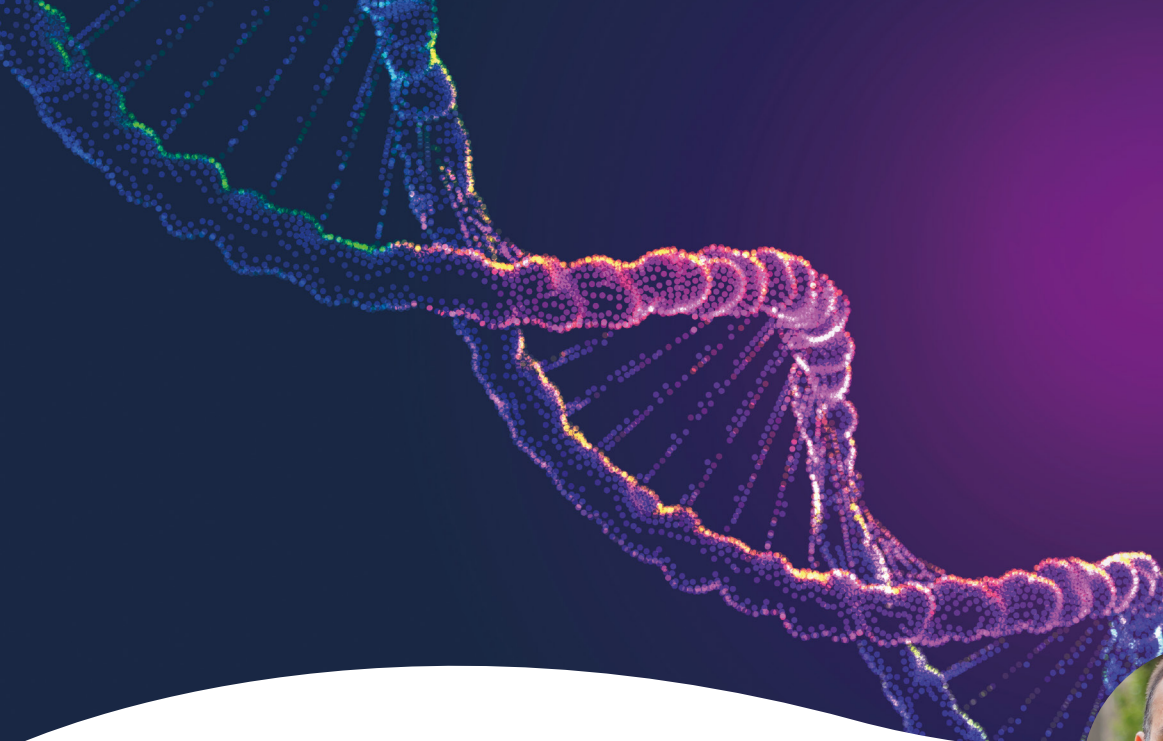
I built and tested my system using real robots, which had to transport a box to target destinations chosen by the user. Unlike previous work, the algorithms I developed are not restricted by formation shape. My robots can change shape on the fly, allowing them to adapt to the task at hand. The system is quite simple and easy to use.

The group consisted of three robots designed using inexpensive off-the-shelf components. Simulations confirmed that it could be used for

larger groups. The robots could push, grasp, and cage objects to move them from point A to B. To cage an object the robots move around it to bind it, then move together to push it around. Caging proved to be the strongest method, delivering the object even when a robot became immobilised, though grasping delivered more accurate results.

Collective transportation can have a great impact on the world's economy. From the construction and manufacturing industries, to container terminal operations, robots can replace humans to protect them from the dangerous scenarios many workers face on a daily basis. **T**

This research project was carried out as part of the M.Sc. in Engineering (Electrical) programme at the Faculty of Engineering. A paper entitled "Swarm Robotics for Object Transportation" was published at the UKACCControl 2018 conference, available on IEEE Xplore digital library.



Living with a rare disease

Clayton John Axiak

Picture yourself waking up one morning with a severe, relentless itch that no clinician or diagnostic tool can understand. Your life would be thrown off kilter. Quality of life would suffer financially, psychologically, and socially as you try to look for a glimmer of light at the end of the tunnel. This is what life is like for most people living with a rare disease.

Often barraged with terms like 'unknown' or 'undiagnosed', matters can get even more challenging when the condition becomes more elusive or develops life-threatening consequences. And all of this is exacerbated by inequities in treatment and high costs of the few existing drugs that are available.

By EU standards, a rare disease is one that affects fewer than one in 2,000 individuals. And these 'less common' ailments are difficult to raise monies for to research, leaving large gaps in scientific and medical literature. One such disease is the poorly understood Idiopathic Hypogonadotropic Hypogonadism (IHH).

Characterised by the absence of puberty and infertility, IHH can be compounded by potentially severe characteristics such as congenital heart disease, osteoporosis at a young age, and early onset of Alzheimer's disease. Its cause is usually a genetic anomaly, but a single genetic change can affect two people very differently. This gives rise to an unparalleled complexity that makes the cause harder to decipher. Symptoms are not clear-cut and sometimes mask the actual underlying cause, bringing about misdiagnosis and delayed

treatment. Timely diagnosis is crucial for successful treatment that enables the patient to achieve puberty and induce fertility. But this is not always possible.

Under the guidance of Dr Rosienne Farrugia, I am currently analysing and expanding upon a preliminary assessment of IHH in Malta using high-throughput sequencing (HTS) technology (conducted by Adrian Plevin). With HTS, we can read a person's entire DNA sequence and attempt to identify differences in the DNA code which lead to such diseases. What the team has found is that some genetic variants typical of IHH are more common in the Maltese population when compared to mainland Europe and African populations. This is likely due to the reduced genetic variation of our population, shaped by successive events of population reduction and expansion throughout our history.

By mapping the genetic cause of diseases prevalent on our islands, we can help medical consultants to employ specific screening tests that are tailored for local patients suffering from IHH. Such advancements in genomic technology and personalised medicine can make a huge impact on people's lives. And not only to those suffering from IHH; researching one disease, however rare it may be, can shed light on mechanisms that prove useful in treating many others, ensuring that when it comes to health, no one is left behind. **T**

This research project is being carried out as part of a Ph.D. program in Applied Biomedical Sciences at the Faculty of Health Sciences.





HEALTH

Good HEALTH is vital for everyone. Which is why Malta provides healthcare that is free at the point of use. Last year, government invested €500 million into the services most, if not all, of us rely on. Yet health systems, like our own

health, are complex and multifaceted, and research investment remains low. In this FOCUS, we dive deep into some of Malta's most prevalent problems and scratch the surface on the solutions being explored by the best and brightest at the University of Malta.



Putting patients first

There's more to cancer treatment than chemo and radiation.

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I <3 potato

The trials and tribulations of adopting a plant-based diet in Malta.

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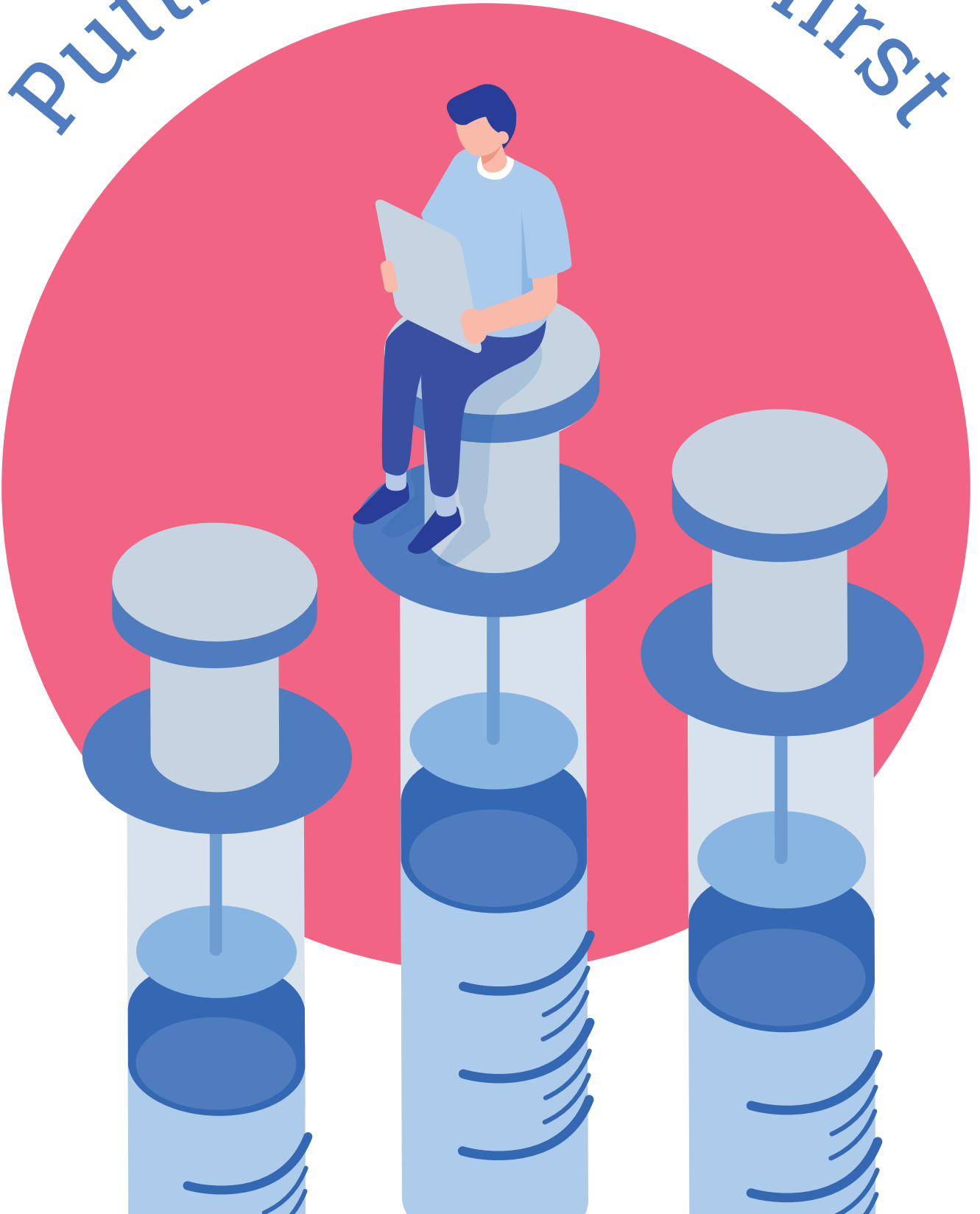
Burnout

Over 40% of our mental health professionals are emotionally exhausted.

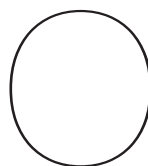
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Putting patients first



Most cancer treatments involve complex surgeries, toxic drugs, or taxing radiation, but there are other answers to this devastating disease. **Prof. Pierre Schembri-Wismayer** is developing a vaccine that works by harnessing our body's own immune response and directing it towards the threat, fighting the disease as an inside job. Words by **Gail Sant**.

 Our bodies produce billions of cells every day. With such industrial production rates, it's entirely likely that a mistake or two are made along the way. Cancer cells are those mistakes—faulty mutants.

Humans are also equipped with mechanisms that allow them to recognise cancer cells and get rid of them, but there can be trouble when distinguishing 'bad' from 'good'. Part and parcel of cancer is that it compromises the immune system to 'escape' our 'guards'. This precious time during which the body fails to recognise the mutants is the golden opportunity for cancer cells to multiply and thrive. And as the cancer grows, so do the problems that come with it.

Despite the varied types of cancers in existence, treatment usually entails surgery and chemotherapy. But the risks and side-effects that come with them are heart-wrenching.

But what if a vaccine can stop cancer in its tracks? Prof. Pierre Schembri-Wismayer and his team are working on a type of immunotherapy that enables the body to recognise the invading cancer sooner, directing the attack as a result.

HOW IT WORKS

Vaccines work by triggering an immune response in the body. These cancer vaccines developed by Schembri-Wismayer work the same way. He collects a piece of the cancerous tumour and denatures (a process not unlike cooking or boiling) it in formalin, which modifies its shape, making it easier for the body to recognise as a

foreign body. The body can then remove it.


Our bodies have a naturally low tolerance when it comes to foreign entities, so when a vaccine injects the cooked tumour, the body recognises it and ambushes both the injected and the original cancer present in the patient, 'engendering a stronger immune response'.

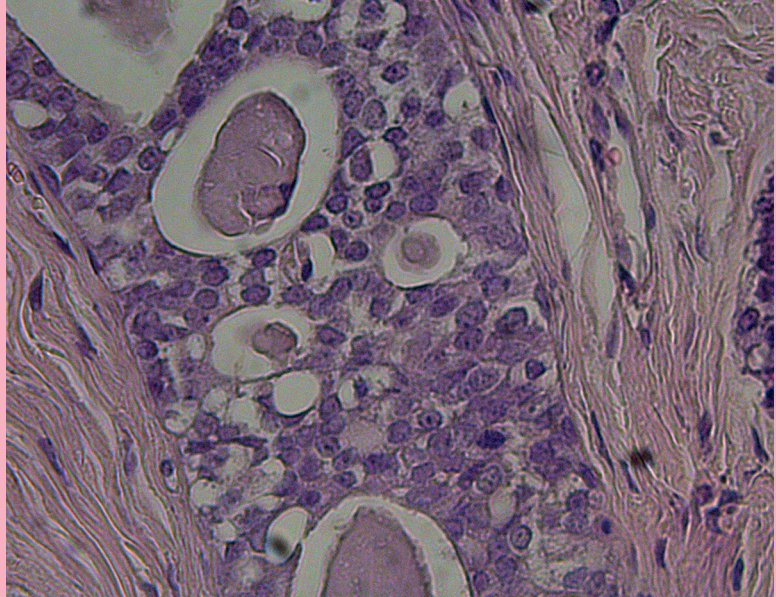
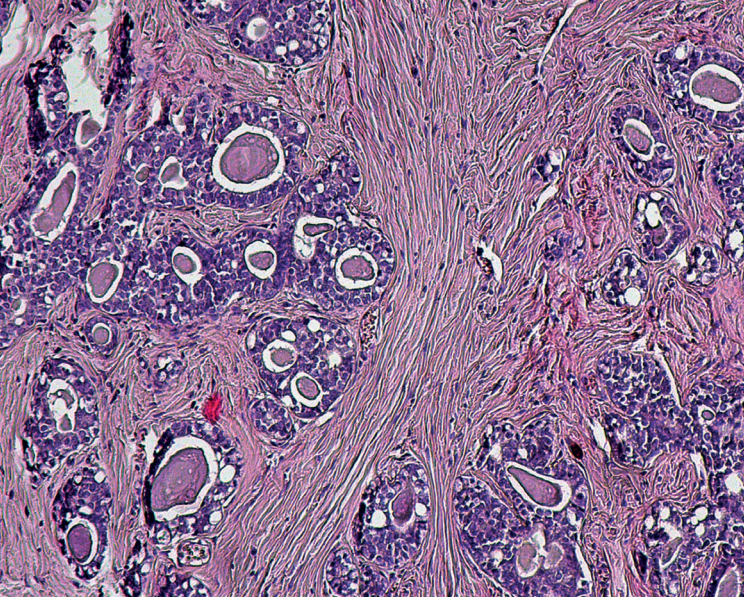
Inspired by a Japanese research paper, yet baffled by its lack of recognition, Schembri-Wismayer modified the method outlined there and created his own version of the vaccine to accommodate his first patients: a pair of pet rats.

THE FOUNDING PETS

Schembri-Wismayer had the perfect opportunity to test the potential cancer treatment when a student's pet rats fell ill. Their owner mistakenly overfed the rats to such an extent that they became obese. 'The rats became square-shaped,' Schembri-Wismayer notes. With the increase in body fat, their oestrogen rose too—a female sex hormone that increases the risk of breast cancer. As a result, both rats developed the disease, and even showed metastasis in both underarms, which also happens in humans. Obesity is linked to cancer in many animals.

Within days, Schembri-Wismayer took samples from the rats and produced a tailor-made vaccine for each rat. Two weeks after their treatment, the rats' owner informed him that they were in a lot of pain. 'But tumours don't hurt,' Schembri-Wismayer explains.

An operation on the rats revealed that the tumours had broken down (were full of dead cells). This confirmed that the rats' pain was actually 



Above:
Pre-treatment, the rat's breast cancer had already metastasised and spread (Right image shown at high power)

stemming from the inflammation caused by the vaccine itself. Physical anguish aside, this was a good sign, an indication that the body was fighting back. In the end, the tumours burst, necrosed, and died. The rats beat the cancer, and thus a new research project found its beginnings.

HURDLES AHEAD

Having had such promising results, and with ethical approval from the local Animal Welfare Council as a therapeutic option, Schembri-Wismayer turned his attention to a group of animals which would benefit a lot from such vaccines—people's pets.

'In many cases, once a dog or a cat gets cancer, there's not much you can do if it spreads,' says Schembri-Wismayer. His vaccines can offer new hope to pet owners when cancer strikes and the only option is to put them down. And so it has.

With consent from owners and vets, Schembri-Wismayer offered the therapy to cats and dogs of different breeds. The types of cancer varied, as were their progressions, and so the results were just as jumbled. The treatment was successful for some, but not all. Considering this treatment is still in its early days, an element of trial-and-error puts some animals

at a disadvantage, particularly those who are very ill when the disease is in its last stages. It should also be mentioned that this research project was held back by challenging communication difficulties between everyone involved. 'Different priorities made the process more difficult than it had to be,' Schembri-Wismayer notes. The ideal scenario would see him and the veterinarian working hand-in-hand to follow up on the animals and their response to the treatment using blood tests and ultrasound.

That said, the potential of the treatment isn't limited to individual successes. Each pet-patient contributed to a better understanding of the treatment, especially when owners were immensely helpful and allowed the veterinary surgeon to provide the team with a piece of the tumour after treatment (even if the pet was put down). With that in mind, the prospects of this type of immunotherapy are promising to say the least.

MOVING ONTO HUMAN TRIALS

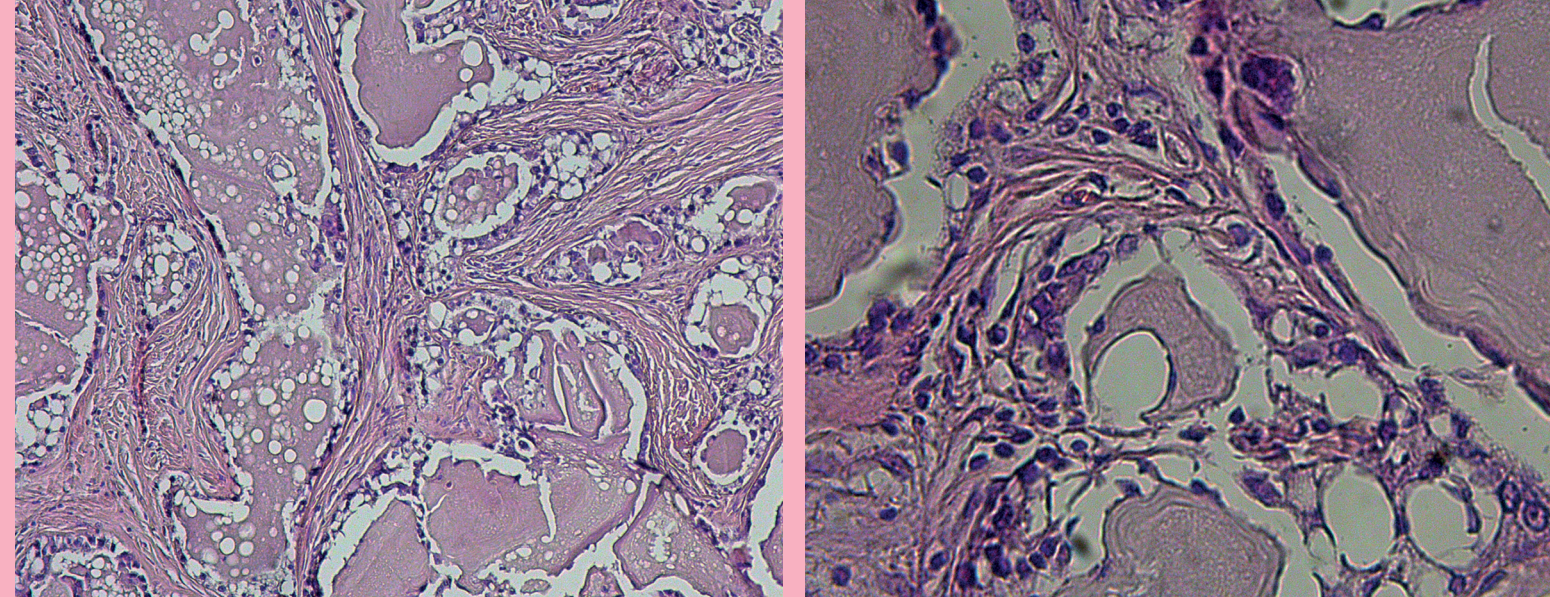
While the vaccine's promising results might be a step in the right direction, the cure for cancer doesn't seem to be in the near future. The ongoing animal treatments are providing



Prof. Pierre Schembri-Wismayer

useful information, but the move to human trials is gruelling. Testing out new therapies comes with storey-high hurdles, including financial ones, that need to be overcome.

The reality is that this kind of therapy would work best as a first response (or after debulking surgery). Because the more widespread the cancer, the bigger the immune response the vaccines create. And 'if a reaction is strong enough, it might be enough to kill the patient,' Schembri-Wismayer explains. But medicine works with a set of rules and best practices. Doctors are obliged to try what's known to work first before moving onto lesser-known experimental



Above:
Post-treatment, the tumours are clearly broken apart and destroyed. (Right image shown at high power)

drugs. This fact is a challenge. Despite the hurdle, Schembri-Wismayer is certain that people would eventually volunteer to be involved in clinical trials, as happened with HIV/AIDS treatments. 'Unfortunately in end-stage cancer you have no other options.'

Vaccines for human use need to be produced in Good Medical Practice (GMP) facilities, cites Schembri-Wismayer. However, there are no such facilities locally. After a long search, he has finally found an industry partner that has agreed to create the vaccines in Belgium, against a price, as long as he sets up the clinical trials. This little victory comes with its own set of problems. In this case, the new limiting factor is mainly funding. Clinical trials typically cost millions.

THE POLITICS OF CANCER

Logistics aside, the hunt for a cure faces problems even more complex than what already seems immensely problematic. Schembri-Wismayer explained that there's a major systematic flaw. 'Many cancer researchers are not doctors. Their career depends on peer-reviewed publications and not finding a cure.' This means that as long as their findings are statistically significant or are 'good enough' to be published in a high-end scientific journal, their job

is done. Granted, no research finding can be seen as wasted knowledge. Each can be seen as a small step forward. However, Schembri-Wismayer believes that the millions of funds designated to cancer research should have more rapid deliverables that directly benefit the patients, not just academic careers. Unfortunately, the cancer research community is a circular one, where scientists review other scientists mainly based on publications to get further funding.

'I am not trying to publish in Nature [the world's top academic publication], I'm trying to cure cancer,' says Schembri-Wismayer as he confesses that he feels guilty about not letting his students publish papers. But this is a necessary evil in the journey towards therapies. 'Once a method is published, no company will touch it because it's in the public domain.' The method would have no monetary value since anyone could copy it. Needless to say, no pharmaceutical company will industrialise a drug that doesn't guarantee profit.

Speaking of profit, Schembri Wismayer expressed that the financial aspect of this study is one of his greatest motivations. 'Most of these drugs cost the Earth', he said, adding that 'when each shot costs €30,000 and the success rates are low, very

few National Health Care systems are going to provide it.' Take Yervoy, a drug commonly used to treat melanoma; one dose can cost up to €4,000. Survival rates after treatment are low. And there are no 'money-back-guarantees' if the outcome is less than satisfactory. As a result, studies have shown that a quarter of cancer patients in the US choose not to take such prescriptions because of such high prices. Money shouldn't be the limiting factor in the fight for survival. Schembri-Wismayer believes in cancer treatment that's affordable for everyone.

FIGHTING THE GOOD FIGHT

Even in the face of all these odds, Schembri-Wismayer persists. A cancer patient isn't just a number; a cancer patient is also a mother, a brother, or a friend. And knowing this is enough to help him and thousands of other cancer researchers to continue pushing through.

One in two people in the UK will be diagnosed with cancer during their lives. It is a harsh reality, but humankind will eventually find a cure just as it has with other previously deadly diseases such as influenza or measles. This vaccine is in its early stages but with the proper support, it may contribute to an affordable, life-saving cure. **T**

I am online





*We're always warned about what personal details we share on social media. But what does the language people use on platforms like Facebook and Twitter tell us about their wellbeing? Words by **Dr Olga Bogolyubova**.*

Today being an Internet user means being a social media user. The two have become synonymous.

According to the Global Web Index report, there are now over three billion people worldwide using at least one social networking site. The average Internet user has eight social media accounts and is active on at least three platforms. In our contemporary world, most of us spend a significant chunk of our lives online.

This is a modern reality: we access information online, purchase goods and services online, search for jobs online, follow professional interests online, schedule events online, invest in relationships online (some of them purely virtual), and then spend the remaining idle time browsing through our news feeds.

Humans are social creatures, and like other big apes we care about hierarchies and group status. This is reflected in our behaviour on social media, where we actively engage in impression management. We select aspects of our lives to present online in the hopes that they will bring us more benefits, while editing out other parts


that could cause negative consequences.

We want to look happy, popular, rich, and successful, or if that doesn't work, at least try to come across as dramatic or alluring. But in a world where the line between reality and the digital world continues to blur, can we really separate our real-life characteristics from our online persona? Can we effectively hide aspects of our offline identity when online? Are we as good at concealing our true selves as we think we are?

GOING DEEP

A few years back, Dr Michal Kosinski and his team set out to find answers to the above questions. They sought to determine if it would be possible to predict individual characteristics (such as age, gender, sexual orientation, and so on) and personality traits from Facebook Likes.

Over 58,000 people volunteered to take part in the study and provided their Facebook Likes, demographic data, and answers to a set of psychometric measures.

Ethnic origin and gender were predicted from Likes with the highest level of accuracy (95% and 93%, respectively). Prediction of religion, 



political preferences, and sexual orientation was also good, with 75% to 85% accuracy. However, predicting personality traits turned out to be somewhat more difficult.

In psychology, personality traits are described as characteristic patterns of thoughts, feelings, and behaviours and, by definition, these are latent variables, meaning that they are not directly observable but derived from answers to a set of questions. Even so, Kosinski's research team did manage to demonstrate significant connections between the study participants' personality traits and their Facebook Likes, with the trait of Openness showing the best predictive potential.

The study has attracted a lot of attention. Other researchers have since been attempting to predict individual characteristics from various features of social media profiles. At first glance, some of the findings may look strange or even absurd. For instance, in one of the studies aimed at predicting personality traits from profile pictures, it was found that extroverted people are less likely to have profile pictures with nostrils showing. Sounds ridiculous... but it actually makes sense if you think about it. By definition, extroverted individuals are more likely to be mindful of other people's perceptions of them, more likely to see themselves from another's point of view. As a result, they'll post better selfies and profile pictures when compared to introverts, who are more likely to upload casual



Dr Olga Bogolyubova

snapshots as profile pictures.

This observation shows that we are unable to control the little details of our behavior. There are so many minute variables involved that it is impossible for us to keep track of them all. A lot of non-vital and therefore 'unnecessary' information slips through, yet it reveals a lot about us. This is also found in language. While we usually have no trouble controlling what we say, it is much harder to control how we speak. The topics of our conversations with friends and strangers are firmly under our control, but our use of pronouns and articles in everyday conversations is not. The style of our language is invisible to us.

HONING IN ON THE INVISIBLE

James Pennebaker, Professor of Psychology at the University of Texas, USA, was among the first behavioural scientists to propose

computational approaches for the study of these invisible, functional components of language.

Pennebaker's research demonstrated that it is these 'stealth' elements that connect deeply with our psychological makeup and state of mind. His ideas provided a starting point for a lot of current social media-based research. After all, our online presence is still largely text-based and rooted in language, and it is only natural that a lot of social media research is based on linguistic analysis.

Many studies are exploring predictors of how online language is being used. For instance, in a recent Facebook-based study, conducted in collaboration with my colleagues from St. Petersburg State University, Russia, we explored connections between subjective wellbeing (i.e. level of satisfaction with one's life and positive emotionality) and language used in wall posts. We were able to show that



individuals with lower levels of subjective wellbeing are more likely to use 'should statements' in their language. In psychotherapy there is a long-standing tradition to regard 'should statements' as a type of irrational thinking associated with distress and mental health problems. It is interesting that we were able to demonstrate the relevance of these classic, pre-Internet theories to the contemporary world.

Identifying markers of mental health problems in online language is another important strand of research. Anxiety and mood disorders are the most common mental health conditions, responsible for a significant burden worldwide. They are also treatable, so early identification is vitally important, and social media may provide a platform for screening, psychoeducation, and connection to treatment (including affordable digital

interventions). Research can change these citizens' lives.

Social media-based research on mental health disorders has consistently found an increased use of first person pronouns (I, me) by people with depression. The finding reflects the painful self-centeredness of the mind in mental illness. Some other findings include observations on language use in post traumatic stress disorder, seasonal affective disorder, and obsessive compulsive disorder, as well as on identification of suicide risk.

Social media can be risky, but is it the monster we are seeing splattered all over mainstream media? Research can help build systems that bring mental health interventions to low resource regions, and it can aid in identification of suicide risk and risk of violence. Ultimately, it can promote healthy living and save lives. **T**

Public health priority: Type 2 diabetes mellitus

What is Malta doing to address this very prevalent problem? **Dr Sarah Cuschieri** writes about a project called SAHTEK.

In Malta, diabetes has been a health concern since 1886. In 1981, the World Health Organization performed the first national diabetes study in Malta and reported that the total prevalence of type 2 diabetes mellitus (T2DM) is 7.7% (5.9% previously known diabetics and 1.8% newly diagnosed diabetics).

Since then, we have seen that percentage increase through self-reported questionnaire studies such as 2008's Maltese European Health Interview Survey, which reported a T2DM prevalence of 8.3% in the population aged between 20 and 79. In 2010, it rose again to 10.1%, according to the Maltese European Health Examination Survey. And while this information is definitely useful, it cannot help researchers and doctors investigate what elements contribute to the diabetes epidemic in Malta.

The economic boom over the last four decades has permanently changed the Maltese Islands. With it came a change in lifestyle habits, like car use and diet, and an influx of different cultural and ethnic populations settling on the islands, which meant that it was time to update our understanding of T2DM in Malta; its prevalence, determinants, and risk factors.

I undertook the project "SAHTEK – The University of Malta Health and Wellbeing study" to find out more about T2DM in Malta. SAHTEK was a cross-sectional study that will effectively act like a snapshot in time. The study population included a randomised sample of adults that had been living in Malta for at least six months and held a permanent Maltese identification card, irrelevant of their country of origin.

HOW IS YOUR HEALTH?

The survey took place between November 2014 and November 2015, and involved 4,000 people (18 to 70 years of age) who were statistically chosen from the national registry. We set up examination hubs in each town where the participants came in to complete socio-demographic questionnaires. While participants were there, we also took several measurements, including blood pressure, weight, height, and waist circumference. Finally, we took blood samples to check for their glucose levels during fasting periods, genetic analysis, and lipid profile (cholesterol and fats in the blood).

In the end, 47.15% of the invited adults actually attended the health survey. From these, we found that the prevalence of type 2 diabetes was 10.39%, with males being more

affected than females. From the total T2DM group, 6.31% were known diabetics, while the remaining 4.08% were newly diagnosed with T2DM during the study. The numbers mean that over the past couple of decades there has been a rise in the diabetes rate in adults. Higher levels of T2DM mean that related diseases, such as obesity and heart problems, will also be more common.

In fact, study participants were often overweight (35.66%) or obese (34.11%). The weight increase is very relevant because it puts pressure on the body's organs, including the pancreas, which has a direct link to T2DM development.



Dr Sarah Cuschieri



SAHHTEK was performed as part of Dr Sarah Cuschieri's Ph.D. studies with the expert guidance of Prof. Julian Mamo (Epidemiology), Prof. Josanne Vassallo (Diabetology), Prof. Neville Calleja (Medical statistics), and Prof. Alex Felice (Genetics), Dr Nikolai Pace (Genetics), and Dr Christopher Barbara (Pathology). The project was funded by the University of Malta (through the Medical School and the Research Innovation and Development Trust) and the Alfred Mizzi Foundation, and supported by the Parliamentary Secretariat for Health.

Top row: Ayrton Borg Axisa, Bernard Schembri, Ryan Camilleri
 Middle row: Bader A. Ali, Russell Bonnici, Andrew Chilton
 Bottom row: Angeline Sapiano, Sarah Cuschieri, Fatemah Abdullah

An increase in weight increases waist size, and this too comes with its own set of problems called the metabolic syndrome—increased blood pressure being one of many. A third of survey participants reported a high blood pressure (30.12%), again with a male majority.

Tobacco smoking was also prevalent at 24.3% (male majority). Smoking is linked to T2DM development, increased blood pressure, and stroke.

WHAT ARE THE IMPLICATIONS?

The survey results are a major public health concern. An unhealthier population means higher demands on Malta's healthcare services. In 2016 diabetes cost Malta an estimated €29 million, while obesity cost an estimated €24 million. The increased disease rate identified means that Malta's bills are set to rise.

Men seem to have a worse health profile than women. Older males with a high body mass index (BMI) were more likely to suffer from high blood pressure. The majority had normal levels of glucose but abnormal lipid profiles, so even though the sugar levels were normal, they were still at risk when it came to acquiring diseases such as heart problems. Those diagnosed with a metabolic syndrome were five-fold more likely to also have T2DM. There is no denying—the gender gap is a concern.

The survey shows that more public health research is in dire demand. Malta's underlying problem appears to be the increasing overweight-obesity problem. A number of initiatives have already been put in place by the Health Promotion and Disease Prevention Directorate as well as the establishment of "Dar Kenn Għal Saħhitek", but there is more to be done.

Gender sensitive action is needed. Government, private entities, communities, and NGOs all need to work together to change the harmful lifestyle choices that have become the norm today. Sedentary lifestyles need to change and high intakes of fat, sugar, and salt

need to decrease to alleviate Malta's weight and diabetes problem. A diabetes screening programme also needs to be introduced to help citizens help themselves.

Early diagnosis of this disease will benefit all of Malta's health and wellbeing and safeguard its health services. What more could we hope for? **T**

Read more:

Cuschieri, S., Vassallo, J., Calleja, N., Pace, N., & Mamo, J. (2016). Diabetes, pre-diabetes and their risk factors in Malta: A study profile of national cross-sectional prevalence study. *Global Health, Epidemiology and Genomics*, 1. <https://doi.org/10.1017/ghg.2016.18>

Cuschieri, S., Vassallo, J., Calleja, N., et al. (2016). The diabetes health economic crisis—the size of the crisis in a European island state following a cross-sectional study. *Arch Public Health*; 74: 52.

Cuschieri, S., Vassallo, J., Calleja, N., et al. (2016). Prevalence of obesity in Malta. *Obes Sci Pract* 2016; 2: 466–470.

WHAT IS DIABETES?

Type 1: An autoimmune disease where antibodies start to attack the pancreas from a young age, leading to insulin deficiency. These individuals require daily injections of insulin.

Type 2: An acquired disease where the pancreas does not produce enough insulin to compensate for the glucose levels within the body. A number of conditions such as obesity can lead to the development of such a disease. Initially lifestyle changes can control the disease but as the disease progresses individuals would require medication with a possibility of insulin injections at a later stage.

Moving to Malta



*Our childhood years are meant to help us develop our sense of identity, belonging, culture, and home. But what happens to those for whom childhood is dominated by moving to a new country with a new language, culture, and social norms? Prof. Carmel Cefai speaks to **Becky Catrin Jones**.*

It's a small world these days. Developments in technology and transport mean it's much easier to pack your bags and head off for a fresh start in a foreign land. For many, the destination is Malta. As a beautiful island in the Mediterranean Sea with a booming economy, it is no surprise that it's drawing the attention of bright sparks and aspiring families from Europe and beyond. In fact, Malta currently boasts the fastest growing EU population.

Of course, it's not always through choice that you might find yourself leaving your homeland behind. Humanitarian crises and ongoing wars in North and sub-Saharan Africa and the Middle East have seen thousands set sail under the most treacherous conditions in search of safety. For this population, Malta is often the first port of call between the dangers of home and the promise of hope in Europe.

It seems strange to group these populations together, given the stark differences in the journeys that bring them to Malta and the life they seek here. But together, this influx of people has contributed to a sudden rise in interculturalism, where people from

different backgrounds interact and influence one another. This is a reality all parties are having to adapt to.


Even in a fairytale scenario, childhood is challenging. Growing up when you're far from home, look different to everyone around you, and don't speak their language, makes the challenge reach a whole other level. Children's wellbeing is an increasingly important and emotive topic to study in Malta, which is a signatory to the United Nations Convention on the Rights of the Child. A team of researchers from the Centre for Resilience and Socio-Emotional Health (University of Malta), set out to explore the situation. They questioned: How do you settle into a new home and identity when you are still trying to figure out who you are and where you are from?

FINDING THE VOICES

Children are often a silent group. When analysing the wellbeing or effect of migration on a population, they are usually spoken for by adults. For this study, however, Prof. Carmel Cefai and his team wanted the child's voice as well. The scope of the study was ambitious; every single contactable,

non-Maltese child living in Malta was invited to take part and share their experiences. But this was a challenge.

'Identifying and obtaining access to foreign children from age zero to 18 was not easy... Some schools suffered from research fatigue and did not wish to participate; whilst translation of instruments and data and use of interpreters drained the limited budget we had for this project.' Maltese children were contacted and invited to participate too. After all, they are as affected as anyone else when around one in ten of their schoolmates are not Maltese.

The study focused on four main areas; social interaction and inclusion, education, subjective wellbeing and resilience, and physical health and access to services. They covered the experiences of children up to 18 years of age, from various schools, who were either settled into their own family houses or still in open shetlers following a difficult journey to Malta. They also aimed for a balance in migrants' nationalities; European, North American, African, Middle Eastern, or East Asian; as the experiences of each population are understandably 



different. Cefai and his team found that the experiences of migrant children in their everyday life are quite positive. In some areas, even more positive than those of Maltese children, with only 8% reporting difficulties in their psychological wellbeing compared to 10% in the native population. Overall, they found that migrant children feel safe, listened to, and cared for by the adults in their communities. Despite the language barriers, most feel like they have a support network, and enough friends though more often than not those friends are other foreign children, not Maltese. They are able to keep up at school, and generally do as well as their Maltese peers, with teachers reporting high levels of engagement.

ADAPTING TO A NEW WORLD

All is not rosy. Bullying in schools is quite common, though less frequent than that reported by native Maltese children. One in five migrant children also do not feel they have enough friends.

Younger children seem to be more included and engaged than secondary school ones, and in general females fared better in the study than male

classmates. That said, age and gender weren't the main influencers when it came to predicting how well the children engaged at school and in their communities. 'The study suggests that there are different layers of reality, with the big picture hiding the socio-economic, psychological, and social difficulties encountered by a substantial minority,' remarks Cefai.

Unsurprisingly, those who speak Maltese feel more engaged than those who don't, and those who aren't confident in English are in an even worse position. However, the factor producing the biggest differences between the overall wellbeing, health, and education of the children is their country of origin. 'The health, wellbeing, and relative comfort enjoyed by many children of European economic migrants contrast sharply with the poverty, poor accommodation, psychological difficulties, learning difficulties, and experiences of discrimination of many children from Africa and the Middle East', says Cefai. Western Europeans and American children scored highly over all criteria, whereas African and Middle Eastern children are far more

likely to be lonely or suffering from social or economic difficulties.

They are more likely to be less proficient in English, which leads to difficulties in making friends with children from other cultures and which also contributes to problems in their education. Although they are generally nourished by their spiritual and religious communities, in all other areas these children report social and emotional difficulties and are also more likely to report facing prejudice and discrimination. Healthcare proved problematic; many parents and children worry that they are subjected to discrimination whilst using services, or do not have enough information to use them in the first place.

A LAND OF OPPORTUNITY

Despite the additional challenges that these particular migrant children face, the overriding feeling is one of acceptance and hope. Even children in open centres view Malta as a land of opportunity, even when some are in suboptimal housing and lack basic necessities. What children in open centres do not perceive is Malta as their home. Better living



Prof. Carmel Cefai

Growing up when you're far from home, look different to everyone around you, and don't speak their language, makes the challenge reach a whole other level.

conditions in the community, more cultural sensitivity, and openness to interculturalism may help to reduce the feeling of 'us' and 'them'.

So what do Maltese children think? Again, the overall conclusions show that children are open, tolerant, and welcoming of this dramatic and quick rise in multiculturalism that has happened. However, on closer inspection, it seems that there is still a way to go before we can truly call ourselves an open and accepting society.

Relatively few Maltese children have many foreign friends, preferring to spend time with native peers. This hesitation is stronger in children who aren't from a mixed community, whereas children in independent schools and more exposed to foreign children seem more at ease with the idea that the future might be even more multinational and intercultural. As many as one in three Maltese children also report feeling unsafe in culturally diverse communities, and worry about potential negative consequences of these changes in the future. There also appears to be particular prejudice against children

from Africa and the Middle East in contrast to children from Europe, the US, Canada, and Australia.

What has become clear is that both foreign and native children could do with some reassurance. So what do Cefai and his team suggest we can work on to help everyone embrace this new culturally diverse reality?


A UNITED FUTURE

'[We need] to address the needs of marginalised and vulnerable children, particularly those coming from Africa and the Middle East', says Cefai. There's also a lot both populations could learn from each other; caring for their environment, sharing cultures, or even adopting healthier lifestyles. By encouraging more open and judgement-free spaces to play, learn, and share, we'll take away the 'us' and 'them' ideology from a young age and replace it with one of acceptance, curiosity, and openness to new ideas. This will help prevent the dangerous spiral of segregation and ghettoisation, seen all over Europe.

Cefai suggests a space for more positive role models for those migrant children thrown into a

foreign culture that doesn't seem to have space for them. Having teachers, healthcare workers, or even political representatives who have similar backgrounds will foster this inclusive nature, showing that everyone has a voice when it comes to working together to make this country a home for all.

There's work to be done with Maltese children. 'Whilst it is encouraging that the majority hold positive attitudes towards interculturalism, it is worrying that as they grow older children's attitudes tend to become less positive,' says Cefai. 'It's our responsibility to ensure that educators, community leaders, and parents of Maltese children are part of a national initiative to embrace interculturalism.'

Although overall a positive study, Cefai and team have shown we still have a way to go until every child in Malta feels safe, happy, and at home. And in this ever-changing and diverse environment, Malta has real potential to be an example to its neighbours on how a successful multicultural society can work on every level. These children are our future. 



Art for the mind

How can we use art to address mental health stigma? **Dr Alexei Sammut** writes about the art book *Living with Mental Illness* and the accompanying exhibition, which are his contributions to strengthen the discourse on mental health in Malta.


Declining mental health is a global burden. Anxiety, depression, and substance abuse are on the increase.

Current estimates from the World Health Organization report that one in every four of us will experience some form of mental health challenge during their lifetime. By 2020, these figures are expected to double. And while support services do exist, their accessibility can be difficult.

There is no one explanation for this. The issue is complex and multifaceted. A lack of information on such services is a major contributing factor, however stigma continues to be the main reason people refrain from seeking support and advice. Just a decade ago, discussing depression, eating disorders, self-harm, and suicide in Maltese public

fora was unimaginable. And while things have improved—social media provides plenty of evidence—we cannot become complacent.

As part of my PhD, I looked into the attitudes of Maltese nurses and midwives towards mental illness. As people working in caring professions within medical settings, they are on the front lines of community health, seeing people from all walks of life, day in day out.

What I found was that while local nurses and midwives hold a positive attitude towards individuals with a mental illness, continued education, public engagement, and mental health literacy promotion are imperative. Nurses and midwives who followed specific mental health nursing training held the highest positive attitudinal scores. This finding highlights the important correlation between 





education and mental health literacy to the attitudes towards those with a mental health condition. Without adequate mental health literacy, stigmatising attitudes will prevail, and people will not receive the care they need.

With this knowledge in hand, I wanted to raise awareness around mental health. To do this, I combined my goal with my love for art, collaborating with local artist Anthony Calleja to explore the lived experiences of living with mental illness.

Calleja produced 18 works of art, all of them depicting mental illness based on first hand accounts from people living with the diseases. The idea was to increase awareness and generate discussion without the need for text. Visual art allows for nuanced personal interpretation, empowering the individual to reflect and absorb the messages within the art they are viewing. People use metaphors to relate to their life situations, especially when things become difficult to explain. Like metaphors, art can be used to express things that cannot be stated in words. Art can be a therapeutic medium that helps people reach out. But this was not all we planned to do with the initiative.

Calleja's pieces were collocated into a book titled *Living with Mental Illness*. The publication was launched at an exhibition of the original works. On the night, I conducted a study through questionnaires investigating people's own interpretations of the works and the emotions they conveyed.

Although data analysis is still at a preliminary stage, findings seem to agree with the national survey on health literacy carried out in 2014 by the Maltese National Statistics Office on behalf of the Office of the Commissioner of Mental Health. In 2014, research showed that 42.5% of the Maltese population have a problematic level of health literacy. This further highlights the importance of education and health promotion campaigns.

We've all heard someone around us say that mental health is as important as physical health, and we need to act on that adage. We cannot shy away from giving it the attention it deserves. Now is the time to speak out and collaborate as a collective. We need to listen closely to those among us who are struggling, especially to those who use our community's mental health services. Only they can help us revamp and address the challenges that lie ahead. **T**



I ♥ POTATO

The trials and tribulations of adopting a plant-based diet in Malta

*Plant-based diets are going mainstream all over the world. **Cassi Camilleri** sheds light on the local vegan movement and how reducing our meat consumption can benefit us all.*





Some label the rise of plant-based living as evidence of 'trend culture'. And they're not all wrong. Traditional media bombards us with countless headlines on the topic's pros and cons. Hard-hitting advocacy films like *Cowspiracy* and *Forks over Knives* expose the horrors of the meat industry. Social media influencers share their experiences with the diet, turning it into lifestyle content. And now the market is following suit with vegan and veggie lines and options popping up everywhere.

In 2016, an Ipsos MORI survey for the Vegan Society identified that 3.25% of adults in the UK never eat meat in any form as part of their diet, equating to roughly 540,000 people. Vegan January—commonly known as Veganuary—is growing in popularity. This year, a record-breaking 250,310 people from 190 countries registered for the month-long vegan pledge. And Malta is no exception.

While the official number of people following a plant-based or vegan diet are unavailable, interest is clear. Facebook pages Vegan Malta and Vegan Malta Eats have a combined following of over 16,500 people.

The reasons behind people's decision to take up veganism are various, however three main motivators keep being cited: health benefits, ethics, and environmental

concerns. For vegan business woman Rebecca Camilleri the process was natural and gradual. 'There was no real intention behind it for me. But after a couple of months of following this diet, I noticed that my energy levels were better than before, and this encouraged me to learn more on how I needed to eat in order to nourish my body with the right nutrients to sustain my active lifestyle.'

Researcher and nutritionist Prof. Suzanne Piscopo (Department of Health, Physical Education, and Consumer Studies, University of Malta) confirms that 'moving towards a primarily plant-based diet is recommended by organisations such as the World Health Organization and the World Cancer Research Fund, for health and climate change reasons.'

Oxford academic Dr Marco Springmann has attempted to model what a vegan planet would look like, and the results are staggering. According to his calculations, should the world's population switch to a vegan diet by the year 2050, the global economy would save \$1.1 trillion in healthcare costs. We would also save \$0.5 trillion in environmental costs, all while slashing greenhouse gas emissions by two-thirds.

Despite all this, veganism has earned itself quite a few enemies along the way. The vitriol thrown back and forth across both camps is shocking. Relatively recently, UK



A NUTRITIONIST'S TIPS FOR STARTER VEGANS

1. Variety is the name of the game. You need to hit all the veggies and fruits to target the nutrients you need: carbohydrates, fibre, vitamins, minerals, and phytonutrients.
2. Essential amino acids are essential. They are the building blocks of our body and the enzymes which keep it running. Get these from a variety of plant sources: cereals, beans, peas, lentils, nuts, and seeds.
3. Calcium is key. The usual suspects still apply. Oat, nut, and soya milks as well as fortified soya-based yoghurts; also turn to dark green and leafy vegetables like spinach and kale.
4. Pair iron with Vitamin C. When having high-iron foods like pulses and dark green vegetables, add Vitamin C-rich items in the same meal to boost the body's iron absorption. Chickpeas, lentils, and beans work great beside green or other sweet peppers, peas, or tomatoes. Have strawberries, citrus, or kiwi as dessert.
5. Vitamin B12. The troublesome one found only in meat or meat extracts. Try finding fortified foods such as breakfast cereals, soya milks, soya/veggie burgers, and vegetable margarines—or, pop a supplement.

Prof. Suzanne Piscopo

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2

1. Rebecca Camilleri and her mini-stall at an Artisan Market.

2. Rebecca's all natural range of nut butters and spreads.

3. Raw vegan treats made by Rebecca.

3

4

5

4. Rebecca's newest addition to her nut butter range.

5. Rebecca's golden breakfast topped with her home-made hazelnut butter

supermarket chain Waitrose came under scrutiny after magazine editor William Sitwell responded to plant-based food article ideas from writer Selene Nelson with a dark counter offer—a series on 'killing vegans'. Sitwell was since forced to resign. Nelson posited that the hostility stems from 'a refusal to recognise the suffering of animals. Mocking vegans is easier than listening to them.'

Abigail Higgins from American news and opinion website Vox agrees that guilt plays a role in the hatred aimed towards veganism, but also proposes that the whole movement 'represents a threat to the status quo, and cultural changes make people anxious.' This notion is based on research on intergroup threats and attitudes by US researchers Walter G. Stephan and Cookie White Stephan.

It however remains a reality that some of the loudest voices in veganism

in the past have been militant. Some have invoked hatred and threats towards those that they perceive not to be sufficiently aggressive in promoting the cause. Piscopo calls for a respectful discussion. 'Food is not only about sustenance and pleasure, but has symbolic, emotional, and identity value. Take meat for example. Some associate it with masculinity and virility. Others link it to food security as meat was a food which was scarce during their childhood. Some others equate it with conviviality as meat dishes are often consumed during happy family occasions. What is important is that we do not try to impose our beliefs, thoughts, and lifestyle on anyone.'

The way forward is a 'live and let live' approach, according to Rebecca Galea. When her journey started she had people 'staring strangely at [her] food'. Even her family didn't take her

seriously. 'They were very sceptical as their knowledge on veganism was very limited at the time,' she remembers. Now, seeing the effect the switch has made to Rebecca's life, her positive choices are naturally impacting theirs. 'Everyone is free to make their choice,' she says. Embodying the philosophy of leading by example, Rebecca has even set up her own business making delicious vegan nut butters, spreads, and more, to great success. 'The more vegan options are available [in Malta], the more people will be attracted to learning and accepting the benefits of veganism. This might also lead to them following a vegan lifestyle!'

With that, and sharing valid, up-to-date research-based information, as Piscopo suggests, it seems there is no stopping this 'trend'. And who would want when veganism can lead to a lower carbon footprint and better health for everyone? **T**

BURNOUT

*In airplane safety demonstrations, we are always told to put oxygen masks on ourselves before we help others. If we are not well, how can we help others efficiently? **Dr Patrick Barbara** writes about burnout among Malta's mental health professionals and what we can do to resolve this worldwide issue.*

Mental health professional 'Joe' works in the Maltese hospital's inpatient services.

He feels emotionally drained and at the end of his rope. In the morning, he wakes up dreading his workday. The passion for it has dissipated. Maybe, he thinks, it's time to quit.

Dr Aloisia Camilleri and I explored the concept of burnout in professionals working within our mental health system. The research project itself was born from the notion that to support those who need care, service providers themselves need to have good mental health.

To understand job-related burnout, it is best to see it as a spectrum. People can be happy, satisfied, and fully engaged, or they can be completely disinterested and disengaged. This framing helps us understand that there are differing degrees of burnout, while also highlighting that different definitions of burnout can lead to different results.

In our research, burnout was defined as a process where a

person's psychological resources are gradually depleted as a result of prolonged stress at work. This then manifests in emotional exhaustion, depersonalisation, and loss of personal accomplishment. The person feels worn out, fatigued, detached, and cynical about their job. Ultimately there's a sense of inability to cope, and low morale sets in. This is the ultimate lose-lose situation where both the employee and the patients suffer as the organisation loses efficiency.

For the study, we invited 322 professionals to participate anonymously. The roles they occupied varied and included psychiatry doctors, nurses, occupational therapists, psychologists, psychotherapists, and social workers. In the end, 230 agreed to answer our standardised questionnaires. The results were in line with those of similar studies conducted abroad.

Emotional exhaustion scored highly (40.4% of respondents), as did poor personal accomplishment (30.4%). A fifth (18.3%) experienced high depersonalisation levels, while 13.9% scored high on all three features of burnout.

What causes burnout is complex and difficult to explain. The healthcare environment and the systems operating within it do tend to put healthcare workers at risk. They suffer from time pressures, emotional intensity, role conflict, and difficult relationships between employees and management.

Research suggests that people at risk of experiencing burnout often experience a mismatch between



Dr Patrick Barbara
Photo by Ian Stilon



their personality and abilities and the role they are in. This mismatch is subjective, depending on the individual as much as it is related to any particular job. So while it can mean that a person has chosen a job outside of their natural abilities, it can also mean that there may be a discrepancy in expectations between the person and the



Dr Aloisia Camilleri
Photo by Ian Stilon

organisation. So this is not just an issue of too much work. Other central elements include control, values, community, fairness, and rewards.

To prevent or resolve some of the issues associated with burnout, people need to have a sense of control at work. They need to feel rewarded (not just financially, but also socially) and treated fairly. They need to feel that they are part of a community that communicates in a civil manner and shares the same or at least similar values. Since this job-person mismatch is a subjective experience, a positive outlook towards work also helps avoid burnout. Our research showed that people who have a better 'match' in one factor tend to score better in the other factors as well.

So how can burnout be addressed? Awareness is the first step towards recovery. Education is essential for people to recognise and identify burnout. Practising mindfulness can prove to be an excellent tool for anyone. By becoming more in tune with our own thoughts and emotions, evaluating them in

a non-judgemental way, we can avoid falling down the slippery slope towards an unhealthy mental state.

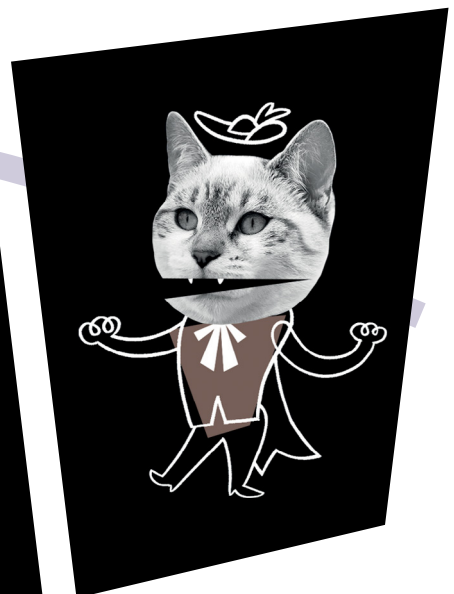
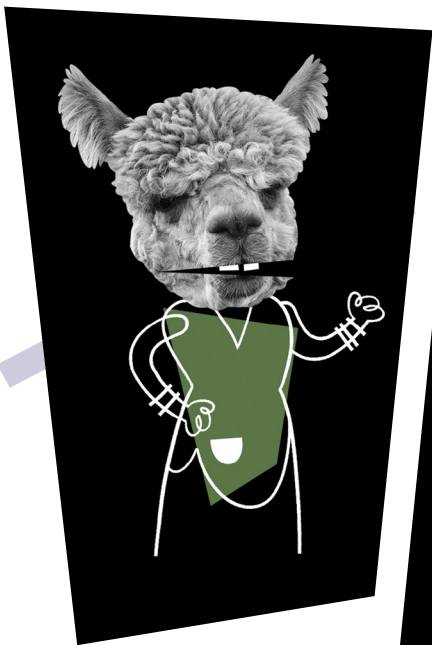
Keeping boundaries and a correct work-life balance is another point. Having time for life outside work and being passionate about other activities is critical. Whether it's exercise, writing, or creating art, cultivating other interests keeps our worlds varied and occupied. It creates a situation where there are other things to focus on when difficult times come.

From an organisational perspective, we need to work harder to recognise that employees are the most important resource at any workplace. They need to be supported and involved in decision making as much as possible.

Burnout is linked to other mental health conditions such as depression and anxiety. Any employee who experiences mental health problems that impinge on one's life must feel that they are not alone and help is available. Most people spend the majority of their day and life at work so we need to make sure that it is experienced as positively as possible. **T**

WE'RE EXPLORING HERE!

Doing and learning in the digital world



Characters from *HERE* videogame



*If you had a rich malleable canvas that could flip rules on their heads and expose truths we take for granted, wouldn't you use it? **Jasper Schellekens** writes about the games delving deep into some of our most challenging philosophical questions.*

The famous Chinese philosopher Confucius once said, 'I hear and I forget. I see and I remember. I do and I understand.' Confucius would have likely been a miserable mystic in modern mainstream education which demands that students sit and listen to teachers. But it's not all bad. Technological advancements have brought us something Confucius could never have dreamed of: digital worlds.

A digital world offers interaction within the boundaries of a created environment. It allows you to do things, even if the 'thing' amounts to little more than pressing a key. Research at the Institute of Digital Games (IDG) focuses on developing a deeper understanding of how these concepts can be used to teach through doing by looking at people interact with gameworlds, studying how games can impact them (Issue 24), and designing games that do exactly that.

DOING IT DIGITAL

Two millennia later, John Dewey, one of the most prominent American scholars of the 20th century, proposed an educational reform that focused on learning through doing and reflection instead of the 'factory model' that was the norm. Dewey's idea was embraced, and has become a pedagogical tool in many classrooms, now known as experiential learning.

Let's not pretend that Confucius was thousands of years ahead of his time—after all, apprenticeships have always been an extremely common form of learning.

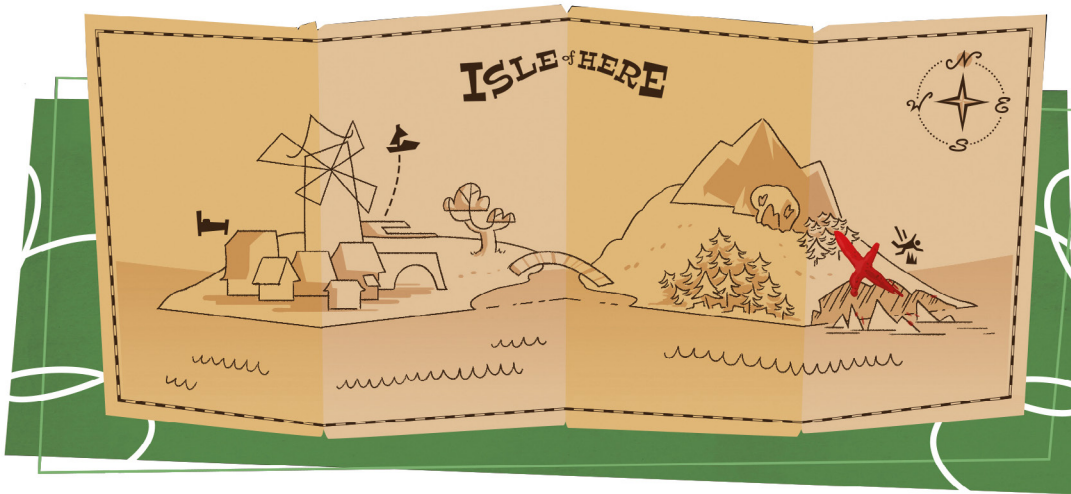
But what if we were to transplant this method of experimentation, trial and error, into a digital world?

It would allow us to do so much! And we're talking about more than figuring out how to plug in to Assassin's Creed's tesseract or getting the hang of swinging through New York City as Spiderman. While these are valuable skills you don't want to ignore, what we're really interested in here are virtual laboratories, space simulations, and interactive thought experiments.

Games make an ideal vehicle for experiential learning precisely because they provide a safe and relatively inexpensive digital world for students to learn from. Think of the value of a flight simulator to train pilots. The IDG applied the same idea to create a virtual chemistry lab for the Envisage Project. They threw in the pedagogical power tools of fun and competition to create what's known as serious games.

Serious games are at the heart of many of the IDG's research projects. eCrisis uses games for social inclusion and teaching empathy. iLearn facilitates the learning process for children with dyslexia and Curio is developing a teaching toolkit to foster curiosity. However, the persuasive power of videogames stretches further than we might think.

In a videogame world, players take intentional actions based on the rules set by the creators. These 'rules' are also referred to as 'game mechanisms'. Through these rules, and experiential learning, players can learn to think in a certain, often conventional, way. ➤





Prof. Stefano Gualeni recording his rap performance for *HERE* videogame

Which brings us to *HERE*.

Prof. Stefano Gualeni is fond of using games to criticise conventions: in *Necessary Evil* a player takes on the role of an NPC (Non Player Character) monster, in *Something Something Soup Something* the definition of soup is questioned, while in *HERE* Gualeni breaks down what 'here' means in a digital world.

WHAT'S HERE?

HERE sees the player explore the philosophical concept of 'indexicality', the idea that meanings depend on the context in which they occur. A fitting example is the extended index finger, which means different things depending on where it is placed and what movement it makes. Point one way or another to indicate direction, place over the lips to request silence, or shake it from side to side to deny or scold.

The game explores the word 'here' in the digital world. It sheds light on how much we take for granted, and how a lot of concepts are not as straightforward as we think.

HERE you play as 'Wessel the Adventurer', a cat of acute perception that is sent on a quest by a wizard to find magic symbols and open an enchanted cave. Playing on the tropes of role-playing games, the expectations of the adventurer are thus framed in a conventional manner, but not everything is as it seems.


By subverting players' expectations of role-playing games, they will have the opportunity to discover what they have been (perhaps unwittingly) taught. They will

be confronted with a puzzle involving the many versions of 'here' that can co-exist in a digital world. Among their prizes is Gualeni himself performing a philosophical rap.

EXPLORABLE EXPLANATIONS

Experiential learning isn't the only way to learn, but video games, with their interactivity and ability to manipulate the gameworld's rules with ease, offer a ripe environment for it. The digital realm adds a very malleable layer of possibility for learning through doing and interacting with philosophical concepts. *HERE* is not alone in this approach.

Words often fall short of the concepts they are trying to convey. How do you explain why people trust each other when there are so many opportunities to betray that trust? Telling people they have cognitive biases is not as effective as showing them acting on those biases.

Explorable Explanations is a collection of games curated by award-winning game developer Nicky Case that dig into these concepts through play. *The Evolution of Trust* is one of them, breaking down the complex psychological and social phenomena contributing to the seemingly simple concept of trust in society. *Adventures in Cognitive Biases* is able to show us how we are biased even when we don't think we are. *HERE* delves into our understanding of language and the world around us, showing us (instead of telling us) that learning doesn't have to be boring. Now go learn something and play *HERE*. 

To try the game yourself visit www.here.gua-le-ni.com

STEM ambassadors thrashing stereotypes

Over the last four decades, STEM industries have risen to great heights. Scientific, technological, engineering, and mathematical minds have been called to rally. And the demand continues. How can you contribute?

Few would dispute that technological and scientific advancements dominate the 21st century. Adverts provide ample proof. From tablets to smartphones, to robot home appliances and driverless cars, our world is changing fast. As a result, we are now living in a global knowledge-based economy where information can be considered as the highest form of currency. This reality comes with both benefits and challenges.

Statistics from 2013's European Company Survey show that 39% of European Union-based firms had difficulty recruiting staff with STEM skills. Malta is no exception. Another report in 2018 showed that people with STEM careers are still in short supply locally, especially in the fields

of healthcare, ICT, engineering, and research. So, while the jobs are available, there aren't enough people taking up STEM careers, and this is holding Malta back.

There are many reasons for this trend. For one, Malta has a low number of tertiary level graduates; the third lowest in the EU. An array of harmful stereotypes can also shoulder some blame. The 'fact' that people in math, science, and technology 'don't have a social life' is unhelpful. The 'nerd' image is still prevalent, especially among the younger generations that are still in primary and secondary school. Then there is the 'maleness' associated with STEM jobs and industries. According to Eurostat statistics, in 2017, from 18 million scientists and engineers in the EU, 59% were men and 41% women.





Still, this is far from the whole picture.


Employers have reported instances where, despite having enough graduates to fill roles, applicants did not possess the right non-technical skills for the job. This was especially true for abilities such as communication, creative thinking, and conflict resolution. Many were unprepared to work in a team, to learn on the job, and to problem solve creatively. This is a real concern, especially for the country's future. At the rate with which markets are evolving, a decade from now young people will be applying for jobs that do not exist today, and the country needs to prepare students for these roles. And it has to start now.

The Malta Council for Science and Technology (MCST) is trying to do

this through an Erasmus+ project called RAISE. They are launching an Ambassador Programme to empower young students to take up the STEM mantle. STEM Career Cafés are going to be popping up in schools all over Malta, alongside a Career Day at Esplora aimed to inform and inspire. This is where you come in.

They want undergraduates from the University of Malta and MCAST to work with Esplora by sharing your experiences in STEM and telling your stories to encourage those who may be considering a STEM career. STEM Ambassadors will gain important public engagement skills while making research and science careers more accessible.

STEM is crucial in our contemporary world; our economies depend on it. It

has completely changed the way we live and opened up new prospects for a future we never imagined. For those who have already made up their mind to be a part of it, there is now the opportunity to empower others and guide them in finding their own path. 

Note: To become a STEM Ambassador, email programmes@esplora.org.mt or call 2360 2218.

The MCST, the University of Malta, and the Malta College of Arts, Science and Technology have embarked on a national campaign to promote STEM Engagement. Its first activity was a National STEM Engagement Conference.





SMARTAQUA: ACTING FAST ON MARINE CORROSION

*Maintenance is not the sexiest aspect of business, but diligent corrosion monitoring in the oil, gas, and maritime industry could prevent massive environmental accidents. **Inês Pimparel** writes on behalf of AquaBioTech Group.*

The maritime industry is going through massive developments. Traditional oil and gas remain powerful, as does the shipping industry, but there is a big rise in more sustainable businesses such as offshore wind and solar energy farms. Corrosion affects them all equally.

The NACE International Institute estimates that corrosion costs the maritime industry between \$50 and \$80 billion every year. Clearly,

maintenance is an expensive practice, which might lead to neglect, resulting in catastrophic environmental incidents.

A low-cost, eco-friendly, and efficient solution is needed to monitor corrosion and enable earlier repair. The industry currently monitors structures using ultrasonic or magnetic sensors. However, other solutions exist. The University of Aveiro (Portugal), the Norwegian research institute SINTEF, and the

Maltese company AquaBioTech Group are working on SMARTAQUA, an innovative but simple approach that uses a special paint.

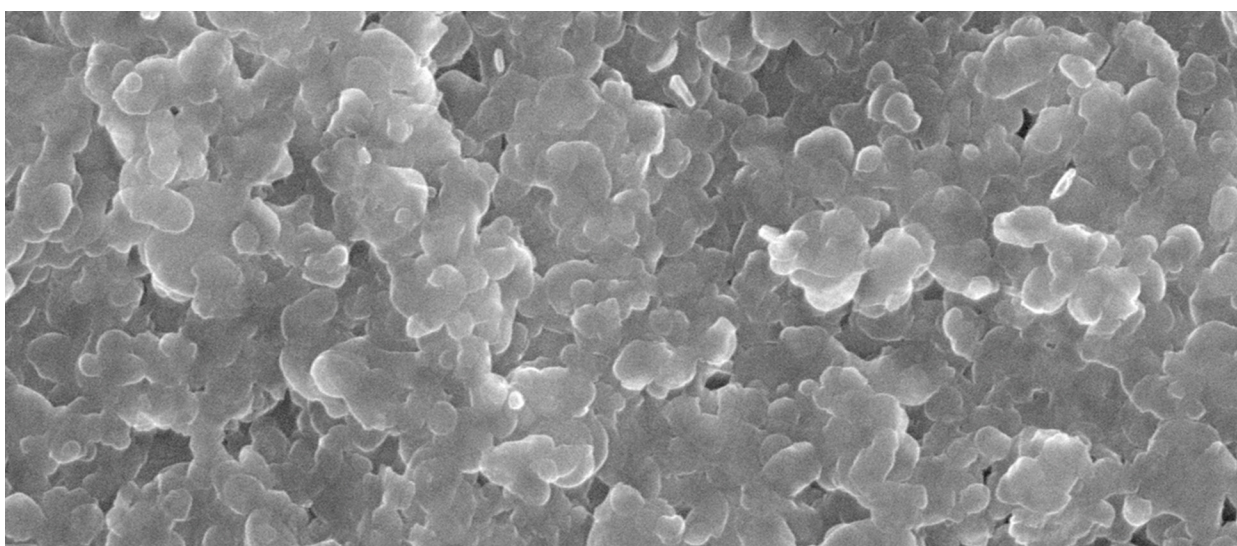
It uses environmentally-friendly nanomaterials to form a functional solid film over surfaces such as the support for a floating fish farm or the base of a wind turbine. Because the nanolayer goes directly onto the structure, it can combine colorimetric with magnetic analysis to detect corrosion as it happens.



Inês Pimparel



Microalgae cultures used for testing




Scanning electron microscope pictures of nanomaterials used in the project

The detection method will be tailor-made to the depth at which the metallic structure is placed to assess the integrity of the structures. Colorimetric detection is a relatively simple, user friendly, and reliable manner of detecting corrosion in splash zones. But in submerged structures, where colorimetric detection is not possible, the use of magnetic measurements would reveal the state of coated substrates.

The approach is not completely novel. The aeronautical sector is already introducing it. The AquaBioTech Group is performing toxicity tests on the nanomaterials using marine organisms such as microalgae and mussels. After this, the team will test the nanolayer's efficacy on metallic structures in their offshore testing site close to St Paul's Islands.

If this technology is proven safe and effective it will revolutionise the field of monitoring activities. It will reduce

transport needs when assembling new offshore structures, indirectly reducing fuel use and greenhouse gas emissions. The commercial and environmental benefits are massive.

The project is highly collaborative. It brings together a small business, a research institute, and a university; testament that success can be achieved through co-creation, inclusivity, and sustainability—and that small advances can lead to a sea of change. 

Note: This project was funded by the Research Council of Norway (through the programme of Petromaks II, project 284002), the Foundation of Science and Technology in Portugal, and the Malta Council for Science and Technology via the MarTERA - ERA-NET Co-fund scheme of H2020 of the European Commission.

IDEA

Science and coffee anyone?

In an age of misinformation, having a grasp on current affairs and research is essential for us to be active, responsible citizens.

Gillianne Saliba writes about the dire need for more dialogue and engagement from citizens and scientists alike.

For many, science is far removed. It's just a subject they had to take at school. Or the star of crazy stories on newspapers, or videos and memes on social media. Opposing views are a dime a dozen. And sometimes it's very hard to discern between them; what's right? what's wrong? 'It's complicated,' they say, 'it's hard', and so most people move on, letting others do all the talking. As a result, science and citizens have had a rocky relationship. But when the issues being discussed relate to health, technology, and our environment, that is, when they affect us directly, we need to be able to engage.

Science Communication (SciComm for short) can offer a solution to this problem.

SciComm can take many forms. Articles, films, museum exhibitions; you name it. In the wake of a scientific knowledge-gap in the community, SciComm has taken root and has been rapidly growing over the last 40 years. Researchers want to share their ideas and get citizens' input, gauge interest, and see what others have to say.

Enter Malta Café Scientifique.

To create a safe space where people can chat about science, Malta Café Sci organises monthly science communication events in Valletta where researchers and professionals discuss



Gillianne Saliba



**Malta Café Scientifique speaker
Johan Zammit and his audience**

topics of interest with attendees. Entrance is completely free and open to all, which attracts a diverse audience.

What makes Malta Café Sci special is how it prioritises the public, putting their learning experience first. The events are tailored to them. Speakers keep their talks short and succinct, taking complex scientific concepts and breaking them down, discussing how the research can impact society. The Q&A session that follows is often far longer than the talk itself, opening up a dialogue within the audience. The elitist mantra of 'it's complicated' is so far gone that talks, and the following question and answer portion of the evening, are put to bed with closing drinks where speakers and audience members can have one-on-one time, discussing the topic of the day.

I have been volunteering as an organiser with Malta Café Scientifique for the last nine months. Through the experience, I have gained marketing and public speaking skills. More importantly, I have had the privilege of a front row seat to pivotal moments in people's lives—the moment when perception shifts.

I've often had audience members come up to me after an event to tell me how the talk changed their ideas. How they are learning to be more receptive but also critical

about what they learn and read online. Some point out how they usually steer clear of such events, with many wrongly thinking they aren't smart enough for them, only to find that they not only understand, but can also participate.

Aside from all this, Malta Café Scientifique is also conducting its own research. Led by Café Sci's project manager Danielle Martine Farrugia, we are evaluating and interviewing different science communicators about their practices. We're also evaluating the initiative to understand its contribution to science communication in Malta.

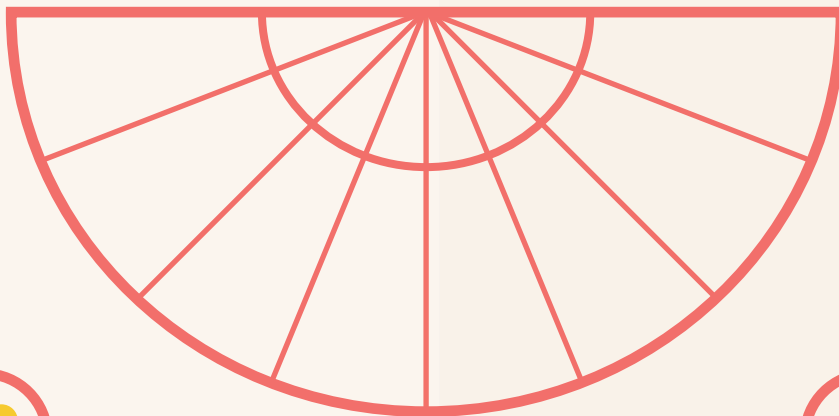
What we can already see is that Malta Café Sci is living, breathing proof of how people can come together when dialogue is open and welcoming. It is empowering local researchers to share their findings with citizens while giving community members the chance to learn and weigh in on work that may have ramifications for them. Where a learning process is no longer from expert to layman, but a continuous sharing of information in both directions. **T**

Note: For more about Malta Café Scientifique's next events, or if you want to get involved, see its Facebook page or Instagram @maltacafesci. Or email us on cafesci@mcs.org.mt.

START UP

Crafting business
from hobbies:

THE HUSKIE STORY



Put a physicist and an engineer together and what do you get? A brewery. Obviously. **Cassi Camilleri** sits down with **Jean Bickle** and **Miguel Camilleri** to talk about entrepreneurship, beer, and how variety really is the spice of life.

As you read this, a warehouse in a Qrendi quarry is bustling, undergoing hefty conversions as it morphs into a dream brewery. Water and electricity supply is solid, the walls have a fresh lap of white and the steel housings are in place. Now, the countdown begins until the tanks are set up. But they're used to it. This waiting business.

The Huskie Craft Beer company was but a twinkle in their eye when Jean Bickle and Miguel Camilleri first met as workmates during a stint in Leeds, which is where they discovered a thriving craft beer scene.

'We were part of a club at the Wharf Chambers,' Bickle remembers. 'It's what we did after work. We played table soccer and tried beers.' Learning about the process, the recipes, and the different flavours that are possible to incorporate in a beer, planted a seed in them both. 'Eventually, when we came back home, we wanted to give brewing a shot ourselves,' Bickle adds. And so they did.

GETTING THE BASICS DOWN

Their first investment was in education. 'We spent quite a bit on books and materials to learn how to brew,' Jean says. They had the ingredients down—water, malt, yeast, and hops. Hops being the flowers of the hop plant which are used as a bittering, flavouring, and stability agent in beer. They understood the role temperature played and gained plenty of experience with identifying flavours through taste tests. Beyond this, however, they also needed to be familiar with how these ingredients interact with one another

and the techniques involved in creating a beer.

They were more careful with their purse strings when building their first set up in early 2017. 'We could have very easily gone online and found these home brewing kits. But you have to spend a lot of money to get those. And this was all coming from our own pockets. So, with Miguel being an engineer, we just bought stainless steel tanks and sheets, shaped them, and welded the parts together. We even built the control panel and electronics ourselves. Everything was done from scratch.'

This is not to say that it was all smooth sailing. 'Sometimes you get ahead of yourself. You start rushing in your eagerness to try out new things. Which is fine. But sometimes you have to take a step back and go back to basics. We keep each other in check,' Jean notes, smiling. 'We both come up with radical ideas on how to approach the task at hand, but you can't do everything at once, otherwise you get careless.'

'You've also got to be adaptable and not follow others' rules to the dot. Malta's ambient conditions and accessible raw materials make brewing harder than in many other countries. With the right technique though, it's definitely possible,' Miguel points out.

CREATIVE THINKING MEETS BUSINESS

Initially, it was all about making beer. 'Our focus was that the quality of the process should be done to a certain standard,' Jean says, but the creative element soon started becoming a priority. 'Now we have shifted to the actual product being top >

quality. You have loads of recipes online if you want to find them, but we wanted to create our own.'

From a business standpoint, finding what makes you unique is an essential part of building a company. What is the value you are bringing to your client base that others are not?

Huskie's approach harkens back to the reason the boys started the company. They loved beers and wanted to continuously try new ones. When they had the brewing process perfected, it was time to start being experimental.

'We started thinking about creating recipes we hadn't seen before, with flavours we hadn't seen anyone use before. We made beers using Maltese strawberries for example, and we also produced a range of beers inspired by the flavours of the traditional qagħaq ta' l-għasel (honeyring).' Of course this isn't as simple as adding some extra water to a cake mix. 'Experimentation brings about its own set of challenges. Some ingredients have their own sugars, so including them in the beer recipe drives the yeast crazy.' And when Jean says crazy, he means it. 'If we don't get everything right, the pressure in the bottle can build up and they literally explode. We've had this happen a few times,' Jean admits. 'We call them molotovs,' Miguel grins.

But even with the added cleaning time, all's well that ends well. This curiosity has given Huskie a very niche service they can provide to clients. 'We can create beers exclusive to our clients. If someone

comes along and tells me I like cinnamon or whatever, we can create something specifically for them.'

Coming up with each new recipe involves another process of trial and error, tinkering, and perfecting. 'When we come up with a new recipe, we usually come up with three different versions and we taste each different beer on the same day. We write down notes, we compare, and if there is some kind of consensus, we move onto that.' Now, Jean and Miguel have a spreadsheet with all the beers they produce, each marked with a rank. So far, over the course of two years, they've already finalised 11 beer recipes and released four to the market!

NO TO MASS MARKETS

The culture behind craft beer is one that is very close to Jean and Miguel's hearts. This is not about making three beers, sticking to them, and selling them en masse. They want to keep the personal touch, the Maltese identity in their product, while pushing boundaries and trying new things. 'So our philosophy is get this beer now because it won't be around in six months. We want to continue creating.'

Of course, this isn't always easy. And Jean is the first to say it. 'It's hard letting go of a good beer,' he admits. 'Even we fall in love with some of the recipes. But you have to come from a place of abundance. We know we can continue to create good beers. And we will.'

Now they're in the growing phase. Setting themselves up to expand their brewing power. With the new brewery they'll soon be able to increase production tenfold. 'Then it's about creating our own events. Entering competitions abroad. We want to put Malta on the map.'

'We've already spent a year working on the new brewery, so we've had a lot of time to think about what we want to do and where we want to go, and this is essential in building a business that is sustainable. You have to do things right and really think about things properly,' Miguel asserts.

This measured attitude has definitely worked in Huskie's favour. Research led to new funding opportunities. 'Miguel found out about [the] TAKEOFF [business incubator] and we met Joe Bartolo. He really motivated us and was of great help in the vital early stages,' Jean says. After a few months Huskie was

We can create beers exclusive to our clients. If someone comes along and tells me I like cinnamon or whatever, we can create something specifically for them.'

Top photo: ALPHA IPA.
The beer which started it all

Bottom photo: 'When you're an engineer, you build your own brewery.' That's Miguel measuring and cutting the drains system.


awarded a TOSFA fund that they used to purchase more equipment, allowing them to try more recipes and scale up production. They followed this up with some EU funding applications. 'We [obtained] funding to purchase more equipment for the brewery,' he notes.

Jean is quick to mention the help and support from their family and friends. 'We got a lot of help. Really a lot. Miguel's father helped us with the building of the brewery. His uncle did all the electricity. And Connie, Miguel's mum is a star. Miguel did all the planning, plumbing, and the majority of the rest. He's even got the scars to prove it! I painted a wall. It was a real team effort,' Jean laughs.

MAINTAINING BALANCE

For such a new business, Huskie is already growing with leaps and bounds. But hours in the day are limited and questions about priorities and goals are already circling. 'Managing Huskie at its current level already takes up loads of our time, and we've had to sacrifice a lot from our private lives,' Jean says. 'But in doing that, Miguel and I manage to run it whilst still holding full time positions. Where it will take us in the future—well, who knows? We wouldn't mind employing people to take care of logistics and cleaning for example. We're also looking into hiring a driver to take care of distribution for us.'


The love they have for medical physics has in no way diminished. 'Miguel and I both love what we do. Working in healthcare is extremely satisfying and keeps us well in check on life's priorities,' Jean says. 'And that is just as much our passion as brewing beer is. But I believe that if you work hard enough at something, and if you love it enough, you'll find the time for it.'

'Everybody will say you'll enjoy it once you get there. But for us it's more important to enjoy what we're doing while getting there. God forbid Miguel and I weren't friends. We'd kill each other with all the time we spend in the same room. For us, the brewing thing works because it's part of the development of our friendship. We brew, drink, chat, and joke. It's about enjoying the process. Not just tunnel vision towards the end goal. 



LAB TO LIFE





To patent or not to patent?

*As universities and research institutions look to protect the knowledge they develop, **András Havasi** questions time frames, limited resources, and associated risks.*

The last decade has seen the number of patent applications worldwide grow exponentially. Today's innovation- and knowledge-driven economy certainly has a role to play in this.

With over 21,000 European and around 8,000 US patent applications in 2018, the fields of medical technologies and pharmaceuticals—healthcare industries—are leading the pack.

WHY DO WE NEED ALL THESE PATENTS?


A patent grants its owner the right to exclude others from making, using, selling, and importing an invention for a limited time period of 20 years. What this means is market exclusivity should the invention be commercialised within this period. If the product sells, the owner will benefit financially. The moral of the story? A patent is but one early piece of the puzzle in a much longer, more arduous journey towards success.

Following a patent application, an invention usually needs years of development for it to reach its final product stage. And there are many 'ifs' and

'buts' along the way to launching a product in a market; only at this point can a patent finally start delivering the financial benefits of exclusivity.

Product development is a race against time. The longer the development phase, the shorter the effective market exclusivity a product will have, leaving less time to make a return on the development and protection costs. If this remaining time is not long enough, and the overall balance stays in the negative, the invention could turn into a financial failure.

Some industries are more challenging than others. The IT sector is infamous for its blink-and-you-miss-it evolution. The average product life cycle on software has been reduced from three–five years to six–12 months. However, more traditional sectors cannot move that quickly. The health sector is one example. Research, development, and regulatory approval takes much longer, spanning an average of 12–13 years from a drug's inception to it being released on the market, leaving only seven to eight years for commercial exploitation.

So the real value of a patent is the effective length of market exclusivity, factored in with 

the size of the market potential. Can exclusivity in the market give a stronger position and increase profits to make a sufficient return on investment? All this makes patenting risky, irrespective of the technological content—it is a business decision first and foremost.

Companies see the opportunity in this investment and are happy to take the associated risks. But why does a university bother with patents at all and what are its aims in this 'game'?


Universities are hubs of knowledge creation and today's economy sees the value in that. As a result, research institutions intend to use and commercialise their know-how. And patenting is an essential part of that journey.

The ultimate goal and value of a patent remains the same, however, it serves a different purpose for universities. Patents enable them to legally protect their rights to inventions they helped nurture and claim financial compensation if the invention is lucrative. At the same time, patent protection allows the researchers to freely publish their results without jeopardising the commercial exploitation of the invention. It's a win-win situation. Researchers can advance their careers, while the university can

Universities are hubs of knowledge creation and today's economy sees the value in that. As a result, research institutions intend to use and commercialise their know-how.



András Havasi



do its best to exploit the output of their work, bolster its social impact, and eventually reinvest the benefits into its core activity: research.

AT WHAT PRICE?

Patenting may start at a few hundred or thousand euros, but the costs can easily accumulate to tens or even hundreds of thousands over the years. However, this investment carries more risk for universities than for companies.

Risks have two main sources. Firstly, universities' financial capabilities are usually more limited when compared to those of businesses. Secondly, universities are not the direct sellers of the invention's eventual final product. For that, they need to find their commercial counterpart, a company that sees the invention's value and commercial potential.

This partner needs to be someone who is ready to invest in the product's development. This is the technology transfer process, where the invention leaves the university and enters the industry. This is the greatest challenge for university inventions. Again, here the issue of time raises its head. The process of finding suitable commercial partners further shortens the effective period of market exclusivity.

A CASH-STRAPPED UNIVERSITY'S DILEMMA


A unique strategy is clearly needed here. Time and cost are top priorities. All potential inventions deserve a chance, but risks and potential losses need to be minimised. It is the

knowledge transfer office's duty to manage this.

We minimise risks and losses by finding (or trying to find) the sweet spot of time frames with a commercial partner, all while balancing commercial potential and realistic expectations. The answer boils down to: do we have enough time to take this to market and can we justify the cost?

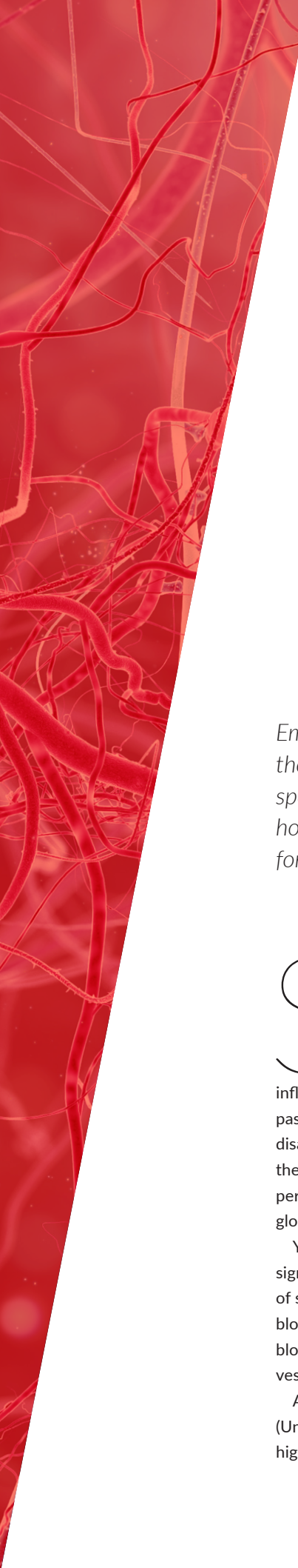
Using cost-optimised patenting strategy, we can postpone the first big jump in the costs to two and a half years. After this point, the costs start increasing significantly. The rule of thumb is that about five years into a patent's lifetime the likelihood of licensing drops to a minimum. So on a practical level, a university invention needs to be commercialised very quickly.

Maintaining a patent beyond these initial years can become unfeasible, because even the most excellent research doesn't justify the high patenting costs if the product is not wanted by industry. And the same applies for all inventions. Even in the health sector, despite product development cycles being longer, if a product isn't picked up patents can be a huge waste of money.

Patenting is a critical tool for research commercialisation. And universities should protect inventions and find the resources to file patent applications. However, the opportunities' limited lifetime cannot be ignored. A university cannot fall into the trap of turning an interesting opportunity into a black hole of slowly expiring hopes. It must be diligent and level-headed, always keeping an ear on the ground for the golden goose that will make it all worth it. 

A healing touch





*Emerging research suggests that mild sensory stimulation like touch can protect the brain if delivered within the first two hours following a stroke. **Laura Bonnici** speaks with experimental stroke specialist **Prof. Mario Valentino** to find out how uncovering the secrets of this ‘touch’ may have life-changing implications for stroke patients worldwide.*

Stroke is universally devastating. Often hitting like a bolt from the blue, it is the world’s third leading cause of death. In Malta, over 10% of the deaths recorded in 2011 were due to stroke. But stroke inflicts suffering not only through a loved one’s passing. As the most common cause of severe disability, stroke can instantly rob a person of their independence and dignity—even their very personality. This impact, individually, socially, and globally, makes stroke research a top priority.

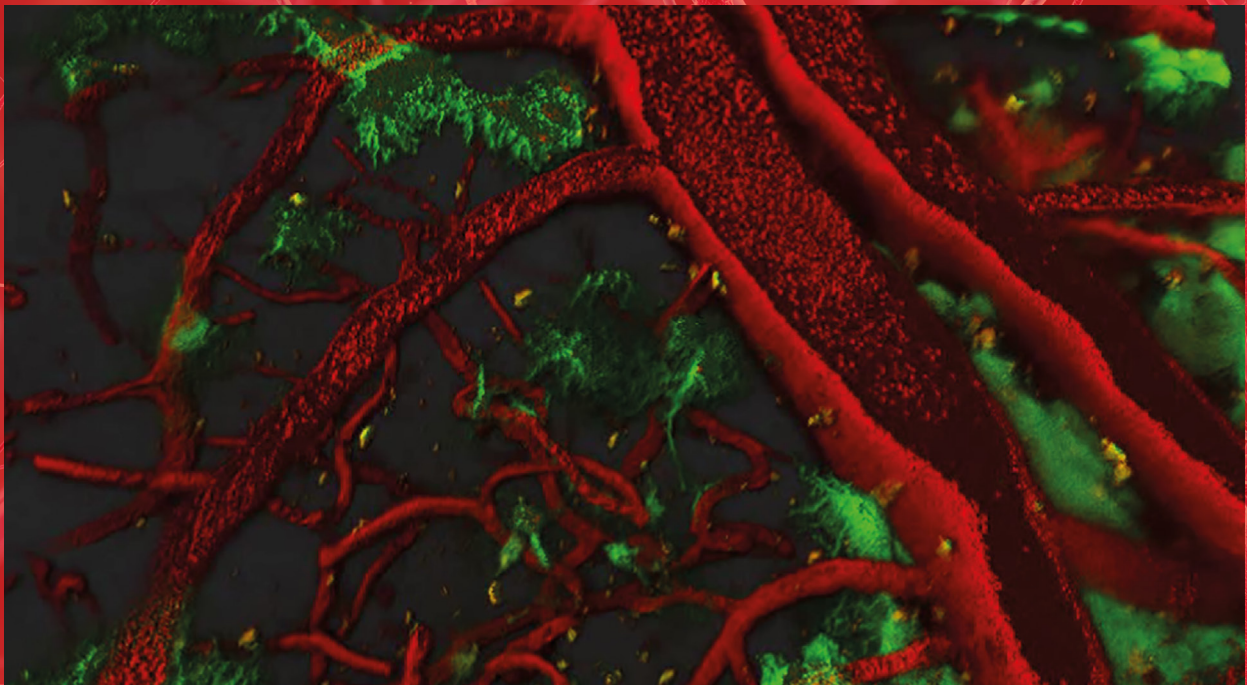
Yet while scientists know the risk factors, signs, symptoms, and causes of both main types of stroke—whether ischemic, in which clots stop blood flow to the brain, or haemorrhagic, where blood leaks into the brain tissue from ruptured vessels—they have yet to find a concrete solution.

A dedicated team at the Faculty of Medicine (University of Malta) hopes to change that. Using highly sophisticated technology and advanced

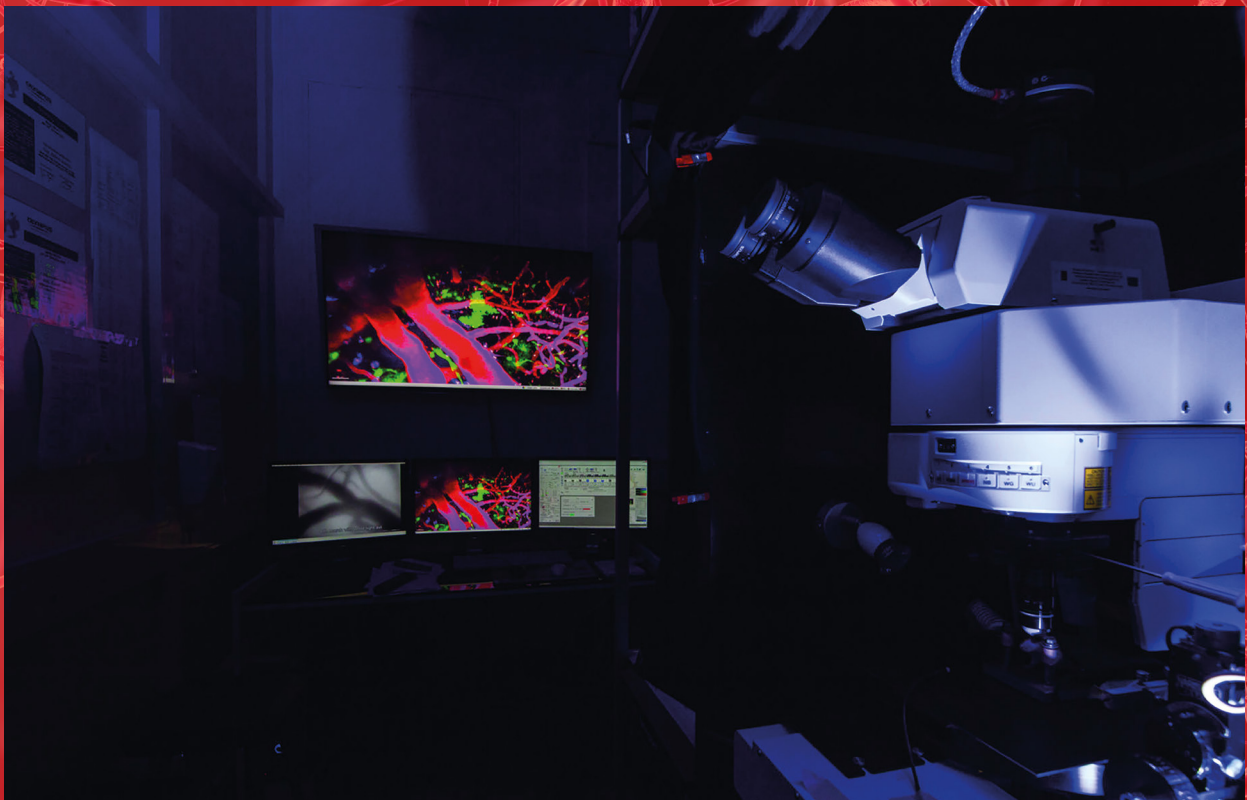
microscopic laser imaging techniques, Dr Jasmine Vella and Dr Christian Zammit, led by Prof. Mario Valentino, can follow what happens in a rodent’s brain as a stroke unfolds in real-time.

‘We use powerful lasers and very sensitive detectors coupled with special lenses, which allow us to capture the very fast events that unravel when a blood clot interrupts the blood supply in the brain,’ explains Valentino. ‘We observe what happens to the neighbouring blood vessels, nerve cells, and support cells, and the limb movements of the rodent throughout.’ Their aim is to find out how sensory stimulation might then help protect the brain.

The idea stems from an accidental discovery in 2010 by members of the Frostig Group at the University of Irvine, USA. The scientists found that when the whiskers of a rodent were stimulated within a critical time window following a stroke, its brain protected itself by permanently ▶



A reconstructed image in 3-D taken from the surface of a mouse brain showing astrocytes in green and blood vessels in red. Astrocytes regulate the vascular tone of blood vessels by sensing the activity of nerve cells. They vasodilate to increase blood flow when brain activity increases. In a stroke, this autoregulatory feature is lost and all cell types are affected. Stalled red cells within the blood vessels indicate the formation of a clot that caused a stroke. The clot was activated by a targeted laser beam.



The use of two-photon laser-scanning microscopy allows the measurement of blood flow in single vessels concurrent with indicators of cellular activity deep within the rodent brain. Whisker stimulation evokes electrical activity that can be monitored by the use of genetically engineered calcium-sensitive and light-emitting neurons that sense the propagating waves of electrical activity. (Photo by Elisa Von Brockdorff)

bypassing the blocked major artery that commonly causes stroke in humans. The brain's cortical area is capable of extensive blood flow reorganisation when damaged, which can be brought about by sensory stimulation.

The human brain can bypass damage. For example, blind individuals have limited use of their visual cortex, so the auditory and somatosensory cortex expands, giving them heightened sensitivity to hearing and touch. For stroke patients, this means that the brain can compensate for its loss of function by boosting undamaged regions in response to light, touch, or sound stimulation.

'This accidental discovery could be life-changing for stroke patients. The key is to figure out the mechanism involved in how sensory stimulation affects stroke patients, and then establish the best ways to activate that mechanism. Perhaps touching a stroke victim's hands and face could have a similar beneficial effect, and this is what this latest research study hopes to define,' says Valentino.

'The team is now painstakingly correlating the data obtained during this brain imaging with the rodent's movement and trajectory,' he continues. 'Using a motion-tracking device fitted under a sophisticated microscope, we can record the behaviour of the rodent during high-precision tactile stimulation, such as stroking their whiskers, and detect any gain of [brain] function through behavioural and locomotor readouts whilst 'looking' inside the brain in real-time.'

If they can prove that any protection is the direct cause of new blood vessels (or other cells) resulting



Prof. Mario Valentino

from the electrical activity inspired by the sensory stimulation, then the next step would be to explore ways of redirecting these blood vessels to the affected brain area.

The team's track record is encouraging. In collaboration with scientists from the University Peninsula Schools of Medicine and Dentistry, UK, they made another recent breakthrough that was published in *Nature Communications*, identifying a new drug, QNZ-46, that could protect the rodent brain following a stroke.


'That project was about neuroprotective agents – to create a drug that will substantially block or reduce the injury, and so benefit a wider selection of patients,' elaborates Valentino. 'The study identified

'This accidental discovery could be life-changing for stroke patients.'

the source and activity of the neurotransmitter glutamate, which is the cause of the damage produced in stroke. This led to the discovery that QNZ-46 prevents some damage and protects against the toxic effects of the glutamate. This is potentially the first ever non-toxic drug that could prevent cell death during a stroke, and the results from this research could lead to pharmaceutical trials.'

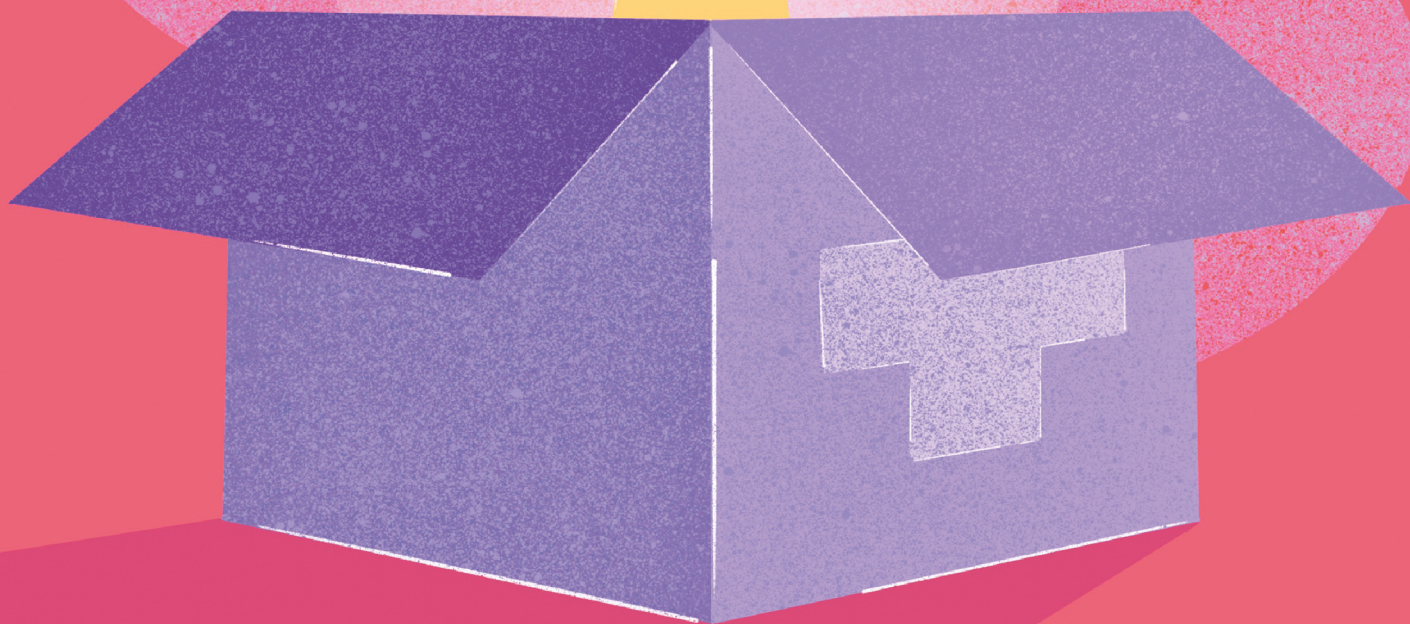
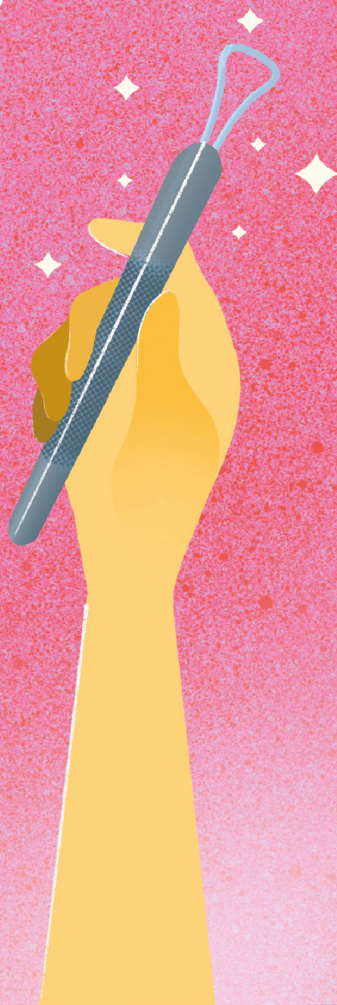
While ongoing research in these projects has been supported through a €150,000 grant from The Alfred Mizzi Foundation through the RIDT, Valentino points out that globally-significant discoveries such as these are in constant need of support.

'The funding of such projects is so important. This money is life-changing for people in such a predicament. Health research changes everything—our lifestyle, our quality of life, our longevity. And yet, government funding for research is still lacking. It's only thanks to private companies and the RIDT, who realise the global potential of our work, that these projects can continue to try to change the lives of people all over the world,' says Valentino.

And while Malta may be a small country with limited resources, the work conducted within its shores is reaching millions globally, proving that when it comes to knowledge, every contribution counts. We must continue striving for more to leave our best mark on the world. 

Help us fund more projects like this, as well as research in all the faculties, by donating to RIDT. Link: researchtrustmalta.eu/support-research/?#donations

Busting out of the box



Aesthetic physician and artistic consultant **Dr Joanna Delia** traces her journey from medical student to successful business owner, telling **Teodor Reljić** that her experience at the University of Malta helped her resist excessive industry specialisation.

Modern life is rigidly compartmentalised. Perhaps this is more true of the West than anywhere else, where the materialist, rationalist models that have aided efficiency and technological advancement also require us to absorb vast amounts of knowledge early on, and specialise later.

Many educational systems reflect this tendency and the Maltese model is no exception. From a very young age, exams come in thick and fast, and cramming to pass them replaces a more holistic education.

Dr Joanna Delia is not a fan of the word 'holistic'—preferring the term 'polyhedral' for reasons that will be explained later—and has enjoyed a career trajectory that has flouted excessive specialisation. A doctor turned aesthetic physician with an interest in the world of contemporary art, Delia's journey is an affront to such restrictive notions.

While she assures me that her own time at the University of Malta (UM) was nothing short of amazing, in recounting the roots of her intellectual curiosity, she is compelled to go even further back.

'Like every excited little girl, my dreams used to alternate and metamorph somewhere between wanting to be a writer like Emily Brontë or Virginia Woolf and a scientist who would make incredible discoveries and change the world like Marie Curie,' Delia recalls. 'I also wanted to be a doctor who would cure people in war-torn countries, yet fantasised about being Alma Mahler or a young Chanel surrounded by philosophers, drenched in fine clothes and surrounded by white rose bouquets...'

Delia recounts this awareness that we're shaped to view these inclinations as contradictory. But for her, the intuitive desire to learn about and closely observe scientific phenomena matched the heights of aesthetic appreciation.

Vella's own student enthusiasm did not come as immediately as all that, however. While she is now secure in her three-pronged role as writer, performer, and translator

(also acknowledging her former role as a lecturer), forging an early path as a student meant first squinting through the fog.

'I just loved learning the science subjects... figuring out protein synthesis and DNA replication literally made me feel giddy, light headed, downright euphoric! I was a real geek,' Delia says with disarming self-deprecation. 'To me, it was just the same as reading an incredible work of literature or staring at a work of contemporary art alone in one of the silent, perfectly lit halls of a museum.'

Given this internal push-pull across various disciplines, Delia confesses that in terms of pursuing the later strands of her formal education, she 'floated into medical school' without feeling the need to strategise things much further. It was only upon graduation that the realities of being slotted into a specialised discipline dawned on her with an ominous pall.

'The day I graduated I felt a suffocating feeling: the thought that I had somehow sealed my fate,' Delia says, though the sense of regret which followed did not linger for much longer.

'Looking at one's future through a tunnel vision perspective based on the imaginary restrictions of one's degree is just that a self-imposed illusion,' Delia observes.

Her University years were active and inspiring, with Delia having happily taken on extra-curricular activities and also quietly rebelled against the notion of boxed-in specialised disciplines.

UNIVERSITY AND BEYOND

'University was amazing! I would repeat those years ten times over,' Delia unapologetically enthuses. Though she does acknowledge that the Medicine course was challenging to begin with—citing the 'competition among students' as an additional factor—she looks back on both her time there, and her association with the UM's Medical School, with immense pride.

'My lecturers were charismatic and experts in their field, which of course garners respect and made us feel ▶



honoured to be part of that system,' Delia says, while also recalling her involvement in additional campus activities.

'I was the chair of the environmental committee at KSU and served two terms as the Officer for the Sub-Committee on Refugees and Peace within MMSA. I loved my time on campus, and encourage all students to participate in campus affairs. We never stopped organising fairs, events, fundraisers, workshops, and outreach programmes with the community...'

Hinting at an essential discomfort with the idea of overbearing specialisation, Delia believes 'the Maltese education system does not proactively encourage sharing knowledge', but also notes that she did find hope, solidarity, and inspiration among her peers, from various faculties.' I socialised with students from the architecture department, and attended their workshop parties. I was invited to history of art lectures and tours. I organised panel discussions to reduce car [use] on campus and lobby for [a] paperless [campus],' Delia says. All these activities contributed to 'a feeling of a hopeful future'.

Adjacent to Delia's academic efforts were her course-related travels abroad, which contributed to expanding her horizons. 'I did internships in Rio De Janeiro and travelled to India and Nepal through the Malta Medical Students' Association (MMSA), both of which were incredible experiences.' During this time, she gained a keener interest in art.

'My sister was studying history of art and eventually read for a Ph.D. in Museology. I followed her as closely as I could; her subjects fascinated me and a lot of her excitement about art rubbed off on me...'

But first, her early medical career needed seeing to. Delia admits that medical students in Malta are somewhat privileged since they enjoy a relatively smooth changeover from academic to professional life. However, the change happens very rapidly.

'Young doctors in Malta have the advantage of an almost flawless transition into a job. This also turns out to be the toughest time in your life, but at least there there is a continuity of support at the start of your

profession,' Delia says, citing the diligence and discipline instilled into her and her peers by their University tutors and lecturers. This rigour was crucial to ensure that those early years went on as smoothly as possible.

Pausing to reflect, Delia feels compelled to add that a culture that leaves more breathing room for exploration and enquiry could only be beneficial for the future of Maltese medicine. 'I wish we had a stronger culture of research and publication in Malta. We need to somehow find time for it as it will not only improve the reputation of the institution but also nurture us as students, alumni, and professionals, and keep us on our toes,' Delia says, adding that these ideas reflect the same culture of hard work that her course promoted, which rewards diligence and depth. 'I believe in constantly keeping astride with knowledge by reading publications and actively pursuing 'continued medical education'. I wish that the institution instilled more of this into its alumni,' Delia muses.

This approach of constant enquiry arguably gave Delia a fount of knowledge and inspiration to draw from when she found herself at a forking road in her medical career.

EXPANDING HORIZONS

'After a few years of working at the general hospital, I was lucky enough to be chosen to pursue some level of surgical training, but by that point I had realised that the life of a surgeon was not for me...'

This was an 'extremely tough decision', with regret once again raising its ugly head. 'However, the 80-hour weeks, and above all the realisation that my professional life would be all about facing and treating ill and dying people, forced me to make a decision to leave the hospital,' Delia says.

This pushed Delia to explore other careers, and she now juggles her love of both medicine and aesthetics in a sustainable way.

'After I stopped working as a hospital doctor, there were too many things I was hungry to explore - one of them was medical aesthetics. I started pursuing training in London and Paris, and essentially spent years of salary training with the best doctors I could find.'

Top: At the Valletta Contemporary pre-opening event
Photo: Oksana Dotsenko

Middle: Joanna's work as an aesthetic physician
Photo: People & Skin


Bottom: With her family at home
Photo: Kristi Palm

After working at a reputable local clinic, Delia finally managed to go at it independently, opening up her own place.

'It was nothing short of a dream come true. I had to search hard within myself and build up entrepreneurial and management skills. I learnt the hard way sometimes, business-wise, but I was also fortunate to find help from my friends who excel in other fields like marketing, photography and architecture, to help me build my brand and clinic,' Delia recalls.

In the end, her resistance to rigid specialisation helped her to open a thriving business called Med-Aesthetic Clinic People & Skin. She couples this work to her position as head of the Advisory Board at the newly-opened Valletta Contemporary, a boutique showcase for local and international contemporary art run by artist and architect Norbert Francis Attard.

Which brings her story back to a 'polyhedral' conception of the world.

'I believe everything in life is polyhedral. I prefer polyhedral to 'holistic'. Every square, or rather, every cube we think we're trapped in, can be pushed out and reconfigured to welcome other disciplines. I don't believe any of us purposely split the two fields, but I believe we don't allocate enough time to explore all the wonders we could discover if we used both their lenses to analyse the world. After all, even Einstein believed that the most important thing in science is creativity...! 



TO-DO LIST

MUSIC



Brikkuni's *Ghadna* is a stark departure from the band's political material which entrances you on many levels.

BOOK



Stephen Fry is our favourite polymath and he's done it all over again with **Mythos**. If you love those tantalising stories of old, but find Greek myth a bit convoluted and confusing, this pick is for you.

YOUTUBE CHANNEL

Videos that will help with your productivity. Whether you're at school, university, or work, **Thomas Frank's** methods, modes, and strategies can help you become the guru you always knew you could be.



PODCAST

Critical Role Dungeons & Dragons with professional voice actors and ALL THE STORIES. And if you want to watch this rather than listen, you can do that too - it's streaming on Twitch.



MOVIE



Pedro Almodóvar described ***The skin I live in*** as 'a horror story without screams or frights'. We describe it as 'high key creepy' and 'painful'.

TV



It is hardly the latest thing on Netflix, but ***The Good Place*** is a surrealist play pen and all round fun time. We would have loved to be a fly on the wall when they pitched this show to producers.

INSTAGRAM



@princesscheeto
She is a Cheeto. She is a cat. And we love her.



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