

BIOSCIENTIST

THE SALFORD BIOMEDICINE SOCIETY MAGAZINE

DEC 2020 | ISSUE 1

CHANGING HEALTH IN A CHANGING WORLD

PHEONIX FROM THE ASHES

Cells damaged by tobacco smoking can reemerge as healthy cells

COWS AND COVID

How might industrial animal agriculture increase the likelihood of pandemics?

CAREER STORIES: SALFORD

We interview Dr Sara Namvar and Aimee Pinnington on the story so far

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WHAT'S IN
STORE FOR THE
SOCIETY



BIOSCIENTIST

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Enter our art competition by 31st Jan 2021 to be in with a chance of winning vouchers up to £100 and a feature in our next issue!

EDITORS' NOTE



The past year has been all about change. In all aspects of our lives, from the way we interact with friends, to evolutions in the realm of biomedicine and healthcare. And so the theme for our first issue was born:

Changing Health in a changing World.

It made sense that the first issue of a publication with an aim to be a resource for Bioscience students to navigate university life and beyond should acknowledge the changes we've all experienced, and how they may impact our future. Themes like climate change, scientific advancement, personal improvement and wellbeing all feature in this magazine, all of which were important to us as editors, and we hope they also hold significance for students and staff alike.

This publication originated as a casual thought in a society meeting one evening. Many a "what if" and countless name

changes later, we are proud to say that this magazine is the result.

Amongst many other things, this magazine stands testament to the plethora of opportunities our Biomed Society provides for students to get involved and push the boundaries of their potential. This issue features details of events, clubs and activities hosted by the society as we approach the new year.

We would like to thank all the wonderful students who contributed in any way to all parts of this magazine, along with Dr Sara Namvar and Aimee Pinnington for their invaluable support throughout every stage in the process of planning and compilation. It wouldn't have been possible without you.

Caitlin Owen, Bruce Veloso and
Nadia Patel
CO-EDITORS



PROGRAMME LEAD STATEMENT

DR CAROLINE TOPHAM

I can't believe it's nearly the end of term already! To say this year has been a rollercoaster is an understatement, and we have all been challenged in ways we never expected. I'd like to use this opportunity to celebrate the achievements of our programme over the past year, and also to make space to recognise the incredibly difficult challenges we have faced.

When lockdown happened in March we were all thrown into a washing machine of uncertainty, and it took a huge amount of dedication for everyone to keep going. For our students, the security and routine of coming to campus and being with your fellow students disappeared in a flash. For our staff, we had to find new ways of teaching overnight. Looking back, I'm incredibly proud of all of us for getting to this point.

There is light at the end of the tunnel now, but we still have a few months to get through before life will be anywhere near normal again, so remember we're here to support you, and dig deep to keep yourself motivated with your studies.

There have been many impacts from the pandemic on the health, lives and employment of ourselves and our loved ones. Please get in touch with your tutor or me if you are struggling with your studies in these circumstances, there are lots of ways we can help. I also want to encourage all of you to take a good break over the winter vacation, at least a few days but ideally a week where you leave your laptop alone and spend time doing things you enjoy.

With the promise of a vaccine we can start to think about the future again, and it is never too soon to start thinking about your career and building your CV. Explore the new BMS Careers Hub community on Blackboard and dare to dream; one day soon you will be walking through the doors on the first day of your graduate job! Having a goal in sight can help to get us through the hard times so, whatever your goal is, spend a few minutes thinking about that moment on your first day. How will it feel? Who will you meet? Where will it lead? We have everything in place to help you to get there, the rest is up to you!



MY JOURNEY TO SALFORD

INSPIRING STORIES EACH ISSUE BY STUDENTS WHO OVERCAME ADVERSITY

BY CHARLES MIDDLETON

My journey to Salford has not been an easy ride. There have been many challenges I have had to overcome, am yet to overcome and still face in everyday life. As we know, life is tough and struggles are a part of daily life. Maybe for some more than others.

So, I am a student on the autistic spectrum. Autism, for me, means that some things can bother me, even the littlest of things, that maybe others do not think about often. It can be hard to socialise, particularly when I do not always pick up on body language and facial expressions. This has been tough during online lectures, but I am gaining confidence with getting opportunities to take part in extracurricular activities, such as the Biomed Society. Societies are a great way of socialising and practicing understanding social cues. Sensory processing can also be a challenge for me, such as with loud noises and food textures.

Because of this, my journey to Salford has been a never-ending mountain of obstacles that I have had to tackle. Kind of like when you first learn to ride a bicycle and you fall off and get back up and try again, but continuously. It can be hard, trying to fit in, trying to succeed, trying to get to your destination.

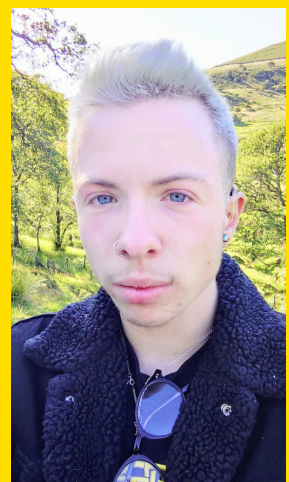
Throughout my school years I found it difficult to make friends and mostly preferred being on my own. I wasn't like everyone else – I didn't use much technology, I didn't do fashion trends, or have an interest in being part of a friendship group. What I did do was have a routine, do extra studying at home and even a paper round job. These things helped me and still do.

What I did do was have a routine, do extra studying at home and even a paper round job. These things helped me and still do.

Being on the autistic spectrum can have some advantages too. For me, I am determined, I pay attention to close details and I am good at identifying patterns. In fact, autistic individuals have great attributes and qualities which can contribute to unique talents, ideas, and innovations. I tend to think outside the box, then outside again, and then further outside; I like to solve a problem when it arises, and I ensure that I am always prepared to. One thing I do enjoy is learning. However, I process things differently to some of my peers and see the world as something perhaps I do not understand, yet information processing is a part of daily life and vital to academia. I did not think I would get into college, or even get onto the course I am doing at Salford.

Throughout this year, I have had even more challenges throughout the pandemic. Not only with becoming a new student at Salford, but socialising. It can become lonely, stressful and tiring at times. Changes that I am not used to or are not part of my pre-planned routines have been a struggle. What helps is discussing these with my lecturers and support staff and doing my best to plan for any changes that will occur further along in the course.

What I am grateful for is how different my experience at Salford has been: I have been supported throughout my time here so far, have made some great friends who are understanding and patient, and most of all, I feel like I am part of a community.



Pfizer-BioNTech COVID-19 vaccine explained

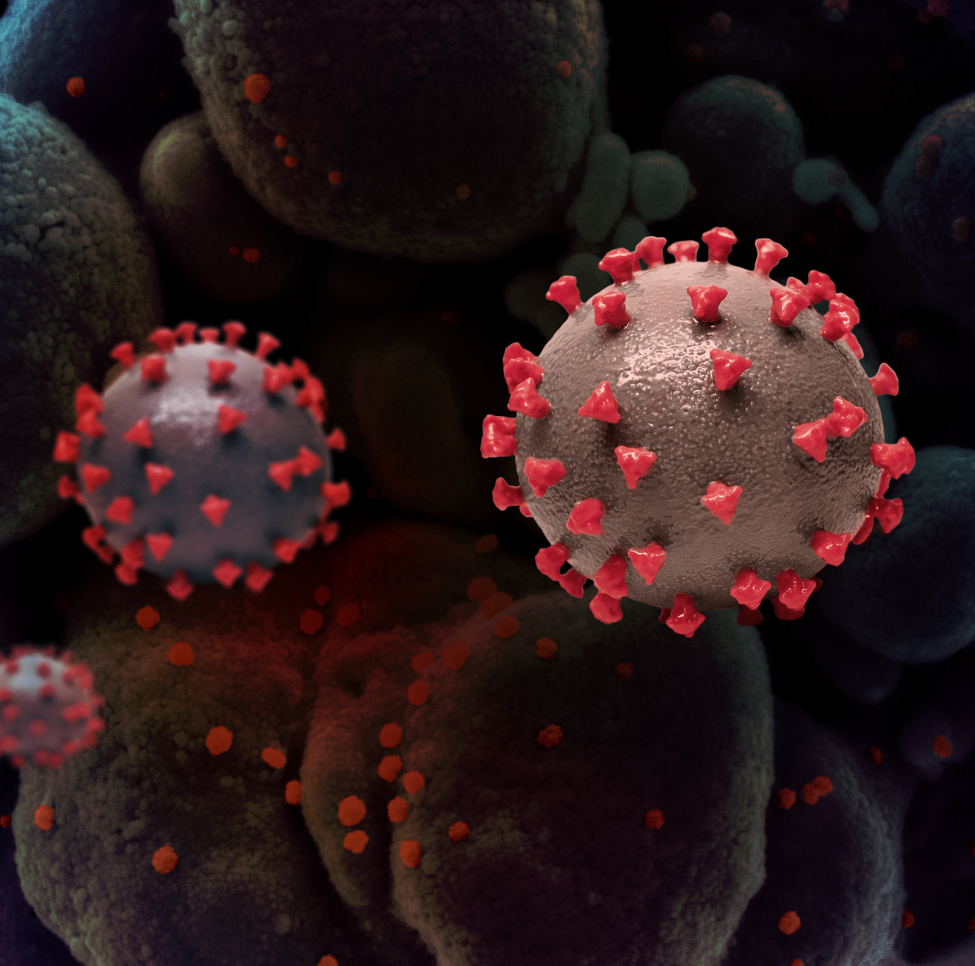
BY NADIA PATEL

With a variety of questions following its approval by regulatory bodies in the UK and US, many are focussed on communicating the precise mechanisms of the Pfizer-BioNTech mRNA vaccine to protect against COVID-19 or SARS-CoV-2. This piece aims to explore the contents of the vaccine and its exact effects upon injection into the muscle of the upper arm.

The vaccine developed by Pfizer-BioNTech is different from other pre-existing vaccines: rather than using weakened or inactivated forms of the pathogen (disease-causing particle), it contains genetic information in the form of **mRNA**. To account for the effects of this, it's important to acknowledge the body's cellular machinery and the effects that the invading virus has:

- All cells contain **DNA**. This is a very compact molecule that contains massive amounts of information encoded into its molecular structure. It contains instructions for your body on pretty much everything, from your eye or hair colour, to the exact details of chemical processes that take place in your digestive system.
- In order to mobilise (read and use) instructions in DNA, the cells convert DNA into **messenger RNA – mRNA** - in a process called **transcription**.
- This requires existing cell machinery called **ribosomes** to read the instructions in the **mRNA** molecules in a process called translation and use them to make proteins which are vital for all day-to-day function.
- The virus takes advantage of the cells' existing processes, hijacking the structures to reproduce its own genetic information (also in the form of mRNA) rather than that of the original, functional cell.
- Viruses hijack healthy cells' existing machinery to produce **their own viral proteins** which then go on to help produce more of the virus. This is what disrupts regular function and causes disease¹.





So what's inside the vaccine?

The vaccine also contains instructions (in the form of **mRNA**) for **proteins**. Mainly one small protein in particular: **spike proteins**. These are often represented by protrusions on the surface of the viral particle, shown in red (left). RNA molecules are very unstable and often 'fall apart', so they are packaged within lipid (fatty) nanoparticles². The vaccine is designed to give the body a 'headstart' to protect against the virus³.

Figure 1, left: Creative rendition of SARS-CoV-2 virus particles. Note: not to scale. Credit: NIAID

The vaccine particles interact with the body's cells, fuse with them and release the spike mRNA into the cells. The cell then uses its own ribosomes to construct the spike proteins which, on their own, are relatively harmless. (Figure 2, below) **The inserted mRNA** is eventually destroyed by the cell, **leaving no permanent trace**.

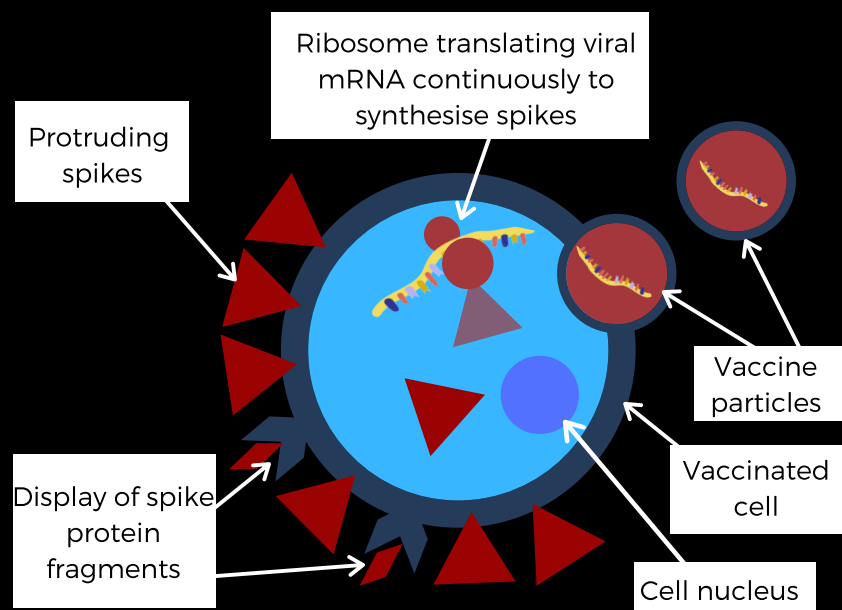
What's the effect of having SARS-Cov-2 spike proteins in the body's cells?

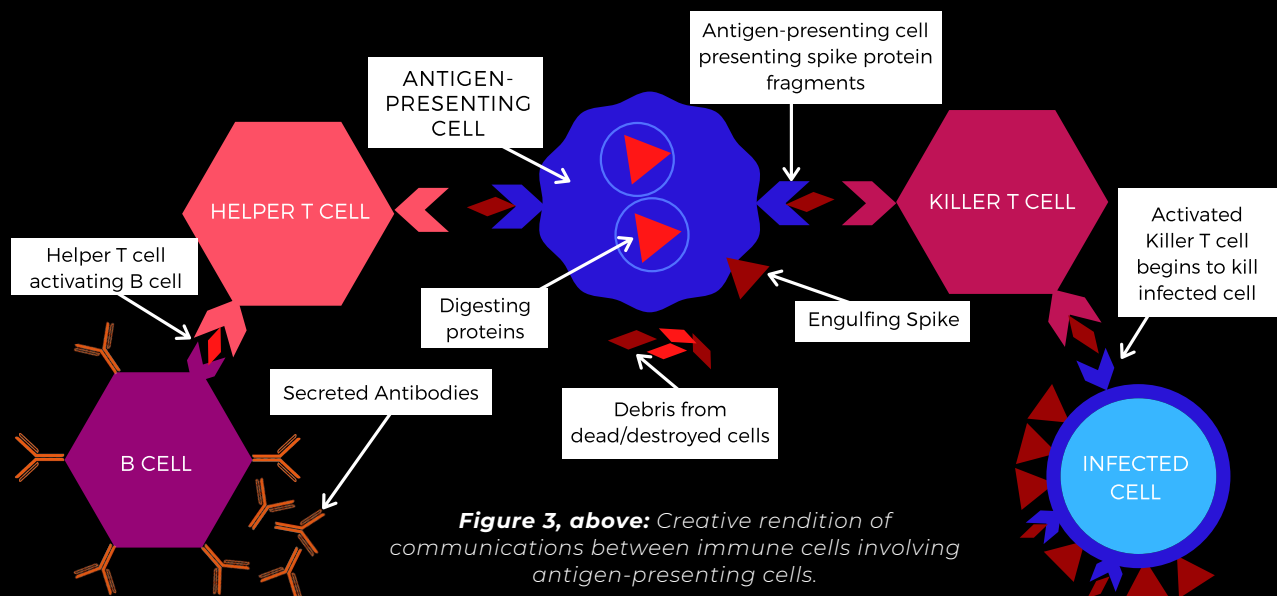
Once they are constructed, spike proteins (and fragments of spike proteins) migrate to the surface of the cell and stick out tips. This is recognised by the body, specifically the body's immune system, and generates an immune response⁴.

Figure 2, below: Creative rendition of interactions between vaccine particles and vaccinated cell. Shows how cellular machinery is used to synthesise spike proteins.

How does the immune system react once recognising the foreign protein fragments following vaccination?

Once the cell is recognised as foreign and infected, it is destroyed by the immune system, releasing its contents into its surroundings. The released spike proteins and their fragments are then collected by and displayed on the surface of an immune cell called an antigen-presenting cell. This can have several effects (Figure 3):

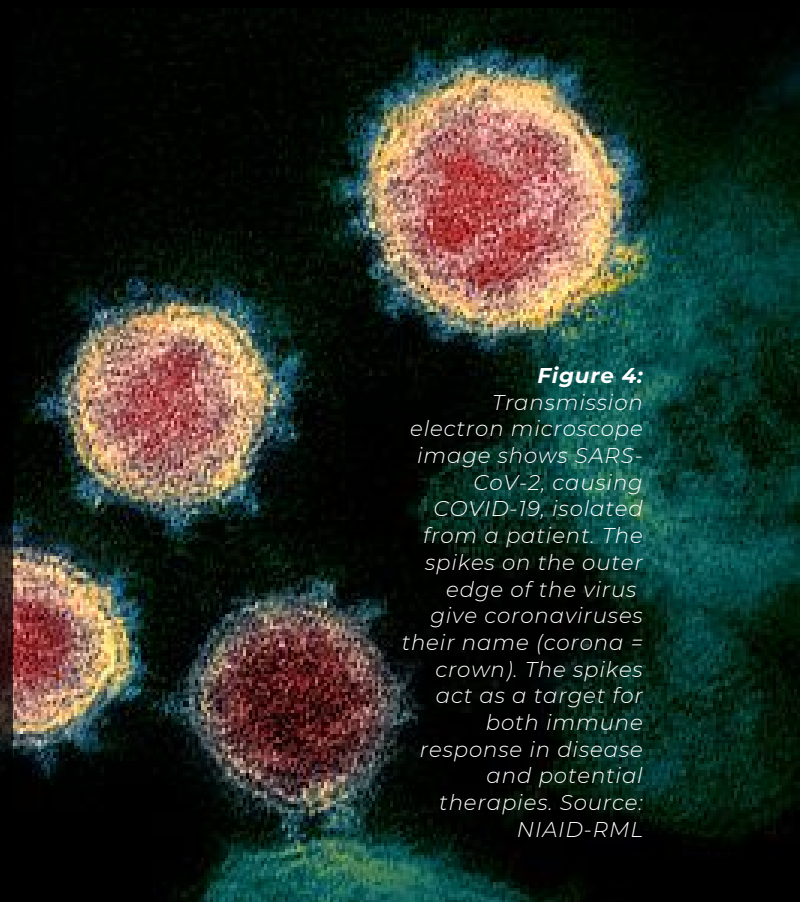




The antigen-presenting cell activates a type of immune cell called the **helper T-cell**. **Helper T-cells** detect the fragments of proteins presented by the **antigen-presenting cell** and communicate with the rest of the body's immune system to help fight the infection.

Antigen-presenting cells also activate a type of immune cell called **killer T-cells**. These then seek out and destroy infected cells displaying spike protein fragments on their surfaces.

Immune cells called **B-cells** then synthesise and secrete **antibodies**. These are protein molecules that the body produces in response to disease and uses to fight infections. **Antibodies produced in response to the vaccine also have the ability to help fight SARS-CoV-2**; they latch onto SARS-CoV-2 spike proteins, flagging them to the rest of the immune system to be destroyed. They also prevent further infection of other healthy cells by blocking the spikes from attaching to them (*Figure 4*).



The Pfizer-BioNTech vaccine requires two injections, given 21 days apart. It's possible that in the months after vaccination, the number of **antibodies** and **killer T-cells** in the body will decrease, as researchers still aren't sure exactly how long protection will last. However, the instructions to construct the disease-fighting antibodies are stored in the body's bespoke 'disease database' managed by immune cells called **memory B-cells** and **memory T-cells**¹.

The production of antibodies in response to vaccination gives the body's immune system a much-needed 'headstart' in fighting a potential SARS-CoV-2 infection. This means that the body can **recognise and fight the virus** by producing **antibodies much more quickly** than if the vaccine was not given. On 18th November 2020, Pfizer and BioNTech reported that primary efficacy analysis of the BNT162b2 vaccine demonstrates 95% effectiveness against COVID-19 beginning 28 days after the first dose⁵.

Whilst the exact logistics of its use within healthcare systems are still being determined, it is certain that the use of an effective and safe vaccine will prove invaluable in the first stage of global recovery from the pandemic.

Is animal agriculture increasing the risk of disease and pandemics?

BY CAITLIN OWEN

Zoonoses are diseases transmitted between humans and vertebrates. These are relatively rare but potentially devastating events. About 60% of human infections are estimated to have originated from animals⁶, and this phenomenon is becoming more frequent⁷. 75% of new and emerging diseases are zoonotic⁸, and most pandemics are caused by zoonoses⁹.

Zoonotic diseases can emerge when a genetic change happens which allows pathogens to jump from animals to humans. Some pathogens, such as coronaviruses, may even swap genetic material with each other, allowing them to transfer advantageous mutations and the ability to infect animals and humans¹⁰. This is thought to have occurred for the H1N1 virus, causing the Spanish Flu pandemic in 1918, when a human influenza virus and a bird influenza virus exchanged genetic material in a pig¹¹.

Animal agriculture may be increasing the risk of new zoonoses forming.



Tens of billions of animals are killed every year for human consumption¹². How does this industry meet our excessive demand for animal products and profits? How do its practices impact on global disease spread?

SARS-CoV-2
(source: CDC)

Disease becomes more likely when large numbers of genetically similar animals of the same species are kept extremely close together¹⁰. Even “free-range” hens may be kept with ~13 birds per square metre in the UK¹³. In the US, they simply have to be outside¹⁴. Livestock are prevented from moving around to prevent wasting of energy that could be spent on growth. Animals have also been selectively bred with genes that make them better products, causing much of livestock to be genetically similar in favour of bigger chicken breasts, or increased milk production¹⁰. Low genetic diversity in any population increases its overall susceptibility to certain diseases¹⁵, and when animals are kept close together¹⁶, especially in poor welfare conditions where they cannot escape the waste of other animals¹⁷, or are frequently injured, an ideal breeding ground is presented for pathogens to spread and mutate quickly.

One way that the industry compensates for this is through mixing antibiotics into animal feed and water supplies, leading to overuse¹⁸. Antibiotics are antimicrobial agents produced naturally by bacteria to reduce the competition presented by other bacteria and it is natural for bacteria to develop resistance through genetic changes for this reason¹⁰. However, our use of antibiotics in modern medicine presents the need to prevent this from happening too often. We are now accustomed to the various campaigns to reduce antibiotic abuse in human healthcare, yet animal agriculture accounted for a third of UK antibiotic use in 2016¹⁹. Fortunately, many measures are now being taken to reduce the overuse of antibiotics in animals, but while global demand for animal products continues to rise¹⁰, the demand for antibiotics will too.

Domesticated animals now account for 60% of the land vertebrate biomass of the planet, while wild animals only make up 4%²⁰. Humans are the other 36%. This loss of biodiversity is thought to increase the risk of new zoonoses in a few ways, though this concept is not yet fully understood¹⁰. One such example is in the spread of zoonotic viruses by mosquitos and ticks – where native vertebrate diversity is high, they feed from a greater variety of hosts, of which only a few are good reservoirs for the virus, leading to fewer infections²¹.

Paradoxically, the increasing demand for land for resource-intensive livestock is in turn increasing wild animal-human interface, which also increases the risk of zoonoses jumping species to humans¹⁰. Our growing demand for land and resources forces us to further encroach on wild habitats. Cattle in particular require vast amounts of land and crops, which is driving deforestation in places like the Amazon²². While habitats decline, wild animals are forced closer to human and livestock populations. This increases contact between livestock, wild animals, and humans.

Many zoonoses are already found in animal agriculture as foodborne diseases, such as *salmonella* and *campylobacter*¹⁷. Animals are a major source of foodborne pathogens, even in plants after contamination with animal waste¹⁰. Animal-sourced foods formed 35% of the global foodborne disease burden in 2010²², and agricultural intensification has been linked to increased risk of foodborne pathogens¹⁶.

So is animal agriculture increasing the risk of disease and pandemics?

The World Health Organization seems to think so¹⁰. In their 2020 report, 'preventing the next pandemic', increasing human demand for animal protein was listed as the first of 7 drivers of pandemics and as a contributing factor to other drivers listed, such as unsustainable agricultural intensification and climate change.

As we are now well aware, diseases do not respect borders and pandemics are worldwide. If we hope to prevent them in future, it will take global change in practices, and when both farming livestock and interacting with wild animals appears to increase the risk of disease, it seems ever-more likely that this will have to involve reducing our consumption of animal products.



The number of outbreaks caused by zoonoses (blue) is rising, including relative to outbreaks limited to humans (yellow)

The total area under the line (blue and yellow combined) represents the total number of outbreaks of disease; The blue area shows the proportion of outbreaks that were caused by zoonoses as opposed to pathogens limited to humans (yellow).

Phoenix from the ashes: Lung tissue damaged by tobacco smoking may be able to regenerate

BY BRUCE VELOSO

What if lung tissue could regenerate after smoking damage and become healthy again – like a phoenix rising from the ashes?

Surprising new research published by Nature suggests that this may be the case. It has been found that cells which escape damage have the ability to repair smoking-related damage inflicted on other cells in the lungs – but only if you stop smoking.

Hundreds of carcinogens are present in tobacco, which cause changes in DNA sequences of cells, resulting in the formation of cancerous cells over time. For years, it was thought that damage in the lungs caused by smoking was irreversible, and life-long with an unspoken rule which stated that lung cancer was soon to chase after and find ex-smokers. New research suggests that this may not necessarily be true. The results of quitting tobacco cause lungs to self-repair, noted in people who smoked at least a pack of cigarettes continuously for more than 30 years.

It was also observed that the lungs of past smokers were comparable to people who had never smoked before, because the healthy cells that were able to avoid tobacco-related mutations could replace the damaged cells. It was noted that the majority of cells taken from a smoker's airway had suffered mutations, with cells displaying up to 10,000 genetic alterations. But to the researchers' surprise, a few cells managed to avoid damage to their DNA. How exactly, is as yet unknown. Nonetheless, after an individual stops smoking tobacco, those are the cells that repair the lungs by replacing the damaged cells.

"MAGICAL"

- Dr Campbell, of the Wellcome Sanger Institute, involved in the research

NHS Stop Smoking Services are free, local services providing a range of techniques to help you stop smoking. You can gain access to a stop smoking adviser via a GP referral or by contacting an adviser directly. To contact a stop smoking service in England, please call the free smoke-free national helpline: 0300 123 1044

Need a reason to quit smoking?

After you quit, your heart rate drops. In less than 12 hours, carbon monoxide level in your blood drops to normal. In 2-12 weeks, your circulation and lung function improve. Within 1-9 months Coughing and shortness of breath decrease. After only 5-15 years, your stroke risk is reduced to that of a non-smoker, lung cancer death rate is about half of a smoker and risk of heart disease is that of a non-smoker. The longer you stay away from tobacco the more your health can improve – quitting can be challenging but it is possible.

CAREER ADVICE

Each issue Prathyusha Viswanathan brings you advice from Salford Careers staff to help springboard your career.

BY PRATHYUSHA VISWANATHAN WITH ANNA-MARIE GRAYSON



The achievement of completing a university degree is especially felt when you secure a good job. Even a small opportunity, especially as an undergraduate, can be considered valuable, as work experience will boost your career. Initially, career planning can make you feel daunted, but just as building the foundation is crucial for constructing a building, taking the essential correct steps at university plays an incredibly significant role in your journey to a career. You will be able to feel yourself developing and progressing with each of these steps you take. To start, our university's experienced career enterprise leader, Anna-Marie Grayson, has detailed some of the important steps students should aim to take at each level of their study. Question? Email SEE-Placements-Industry@salford.ac.uk

YEAR 1

- (A) Learn to develop a good rapport with your tutors or lecturers, their wide career network can help and guide you well.
- (B) Join societies related to your field – this will allow you to interact with other students and volunteering here will develop team work and leadership skills.
- (C) Draft a substantive C.V. and cover letter which can be updated when required.

YEAR 2

- (A) Consider joining a placement to gain work experience – apply with placement providers who would be essential to your programme of study and research the placement providers you are applying for.
- (B) Make sure to attend the career fairs and workshops conducted on campus.
- (C) Create and keep updating your LinkedIn profile.

YEAR 3

- (A) Ensure you have a PLANNER for the year.
- (B) Focus on applying for graduate/postgraduate schemes applicable to your course and make sure you note deadlines.
- (C) Update your CV.
- (D) Apply for Postgrad or PhD courses in good time, if you don't wish to interrupt your studies.
- (E) Ensure you are balancing your University workload with applications.

“Apart from these useful tips, I must definitely stress that our university not only conducts career fairs and workshops on campus, but also provides students with exceptional support and guidance in approaching their career goals. A C.V is the tool to start your career search, a document which must be perfectly presented to employers. Our careers and employability team ensures students have an impressive C.V if you consult with them. Students can also book mock interviews with our career team experts via the platform Advantage, to help prepare them to exhibit a confident, professional attitude and overcome fear to ace any interview. It is highly advisable students take the utmost advantage of such accessible support services set up for them. Remaining focused and vigilant always whilst pursuing your goals counts the most! I hope all of you ensure to adopt the right steps in your career search and wish you all the best to attain success in your desired career!”

OPPORTUNITY HUB

HIGHLIGHTING OPPORTUNITIES AND ACCELERATING YOUR JOB SEARCH

BY PRATHYUSHA VISWANATHAN

Use these resources to find opportunities for work experience or work after you graduate. You may also find it useful to contact relevant people in your network and keep an eye on LinkedIn and social media for any, such as for job adverts. Don't be afraid to get in contact with opportunity providers like hospitals about how they specifically advertise opportunities and what they might have available.

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A well-established platform and excellent guide for student internships or placements, if you want to gain work experience while studying. Also provides some graduate opportunities

UNITEMPS

www.unitemps.com

UNITEMPS

Recruitment service at Salford University House, providing employment services to job seekers across all profiles

Biomedicine Careers Hub launched on Blackboard

BY DR DAVID GREENSMITH

I'm sure that for most of you, to enter a career related to your degree and so realise your ambitions is of the utmost importance. Indeed, it's probably why you chose your particular degree in the first place! In an increasingly competitive employment landscape, choosing a career path that is right for you, then making yourself as employable as possible, has never been as important.

To facilitate this, the Biomedicine leadership team has launched a brand new "Biomedicine Careers Hub" located within the communities section of Blackboard. It's important to stress that the hub does not replace existing dedicated and personal mentorship schemes such as Biomed Soc, the Research Careers Working Group and GEMMS. Rather, it will support and expand those schemes by providing a permanent and centralised repository for resources related to careers and employability

At the top of the hub's landing page, you will see a video (see "Welcome to the Biomedicine Careers Hub") that provides more general information but briefly, you can use the hub in two ways:

(1) To research career options. On the hub, you will see activity spaces for fundamental career groups. We have kept those groups relatively high level (representing a considerable breadth of distinct pathways in some cases) and the list certainly isn't exhaustive. Indeed, if you feel a certain career group isn't represented, let us know. Nonetheless, you can casually browse the hub to get an idea of the sort of careers that are aligned to your degree. If you decide you wish to pursue a given career, the associated space will provide specific information that intends to help with your own endeavours. For example; career-specific job advert sites, CV-enhancing opportunities and application / entry routes.

(2) To make yourself more employable. To facilitate entry into any career, the richer your CV the better; you must stand out from the crowd. To this end, we will also place CV-enhancing opportunities on the hub. If you engage with as many opportunities as you can, your CV will improve consequently. As most opportunities have wide scope (i.e. will support many degree-related careers), they will appear in the "CV-enhancing opportunities (for all careers)" space. If an opportunity is career-specific, you will find it in the related career space. Remember, many opportunities are transient so you should check the hub frequently.

The hub is a highly dynamic resource. It will constantly grow and develop with new content so do access it on a regular basis to see what's new. And remember that while we created this resource to help you research careers, enhance your CV then go for the jobs, all we can do is provide the opportunities. It is up to you to engage with as many of those as you can to make yourself as employable as possible! Enjoy the hub. Your programme team has invested a lot of effort in creating this for you, so we really hope you find it a useful resource. Feel free to send constructive feedback to:

d.j.greensmith@salford.ac.uk



SALFORD LECTURERS DR SARA NAMVAR AND AIMEE PINNINGTON

IN CONVERSATION WITH CAITLIN OWEN

DESCRIBE YOUR JOURNEY FROM COLLEGE STUDENT TO NOW

SARA: "I'm a lecturer in biomedical sciences, but I didn't do a degree in that. I teach cell biology, physiology and anatomy. I come from a research focussed background, only coming into teaching two years ago.

"In college, I always wanted to do medicine. All my family went to university, but not to study medicine. I didn't go to private school, and I've always lived in an inner-city area, so there wasn't that mentor to support medicine applications.

"I didn't get into medicine, but neuroscience had caught my attention as a plan B. I got on to that. It was really hard core; I struggled and failed MANY modules! I resat the vast majority of my exams in first and second year. I think I had a lot of anxiety at the time but didn't realise it, so my sleep was all over the place.

"In the third year, I think I had more of a support network. I really improved and managed to pass my degree in the end with a 2:1 – that was a very steep trajectory!



Dr Sara Namvar photographed by @InzarVideo

"There was a more funding knocking about those days, so I ended up doing my final year project in a lab at the University of Manchester and then asked, 'Can I do a PhD?' It turned out there was one available. It was with AstraZeneca as well. So, then I had a four-year funded studentship with significant industry contribution and extended placement. I had an excellent PhD supervisor who was so understanding – I was inexperienced, but the PhD made me. I spent a significant amount of time at AstraZeneca, and it was very regimented. They would pick me up if I made a mistake. I had to face a lot of red tape and telling off in the first year, but I think it helped me develop resilience – accepting all the tough feedback, crying about it if you need to, but then acting on it.

"I DIDN'T HAVE A CAREER PLAN... I JUST DECIDED TO FOCUS ON WHAT I WAS ENJOYING."

"I enjoyed every moment of my PhD. After that, I just knew I wanted to be a postdoc.

"A postdoc is somebody who is very heavily involved in a research project. You're not a lecturer, you have some very small bits of teaching, but the major responsibility is research. You work on set big projects, spend a lot of time in the lab, and you're busy writing papers. It's like a continuation of the PhD student role, but with more responsibility. I did, about seven or eight years of post-doctoral research at the University of Manchester.

"I considered a couple of times leaving academia because I can see there is this bottleneck in going from your degree to PhD, to actually securing a permanent post. It's an extremely slim chance of making that transition, and to be in a heavy research institution. I looked at a lot of other places to work. But finally, a job came up here at Salford. It went well, and I was offered the job that evening.

"I didn't have a career plan after I didn't get into medicine. I just decided to focus on what I was enjoying."

DESCRIBE YOUR JOURNEY FROM COLLEGE STUDENT TO NOW

AIMEE: "I thought I wanted to do medicine, applied, got in everywhere. I was the first from both of my parents' families to go to university, went to quite a rough, inner-city school, so no sort of support, like Sara talked about. But, because my parents both worked in a hospital, it was very easy for me to get work experience. I got placements everywhere. The GP even lived next door!

"But then the more work experience I did, the more I realised I hated it. My dad came home to me crying in the kitchen trying to get stuff ready for uni-versity. He said, 'Aimee, you don't you don't have to go'.

"I said to him, 'I think I want to be a scientist; I don't think I want to be a doctor'. I like all the theory, and I want to help people. But every time I came off a ward I was in tears, and all I could see trying to get sleep at night was whichever patients were treated that day, and death.

"We spoke to the head of course for Keele University and she said told me to come to her on clearing day. That's what I did, and I got in, at a university only about 30 minutes away from home, to do biomedical science.

"It was one of the best three years of my life, I loved it from start to finish. I did a placement in my second year, but it wasn't a year out like at Salford: I worked through Easter and summer break. Then I graduated with a 1:1. With an IBMS certificate of competence already, I worked as a BMS immediately – but I was in the wrong speciality. I worked in anti-coagulation, a subset of haematology. It's patient facing – a lot of community clinics. Patients can think you're a doctor or nurse.



If you're a man doing clinics, they think you're a doctor, as a woman, they thought I was a nurse. I wanted people to know I was a scientist, and that there are other health-care professionals involved in treatment.

"So I waited for jobs to come up in haematology and transfusion, where I really wanted to work... six months later, I got a BMS post there, and I've been there since!

"I've done the specialist portfolio, and I did a masters in 2018. I did get on to do a funded master's straight after my undergraduate degree, which would have been great. But when I got what I considered my dream job at Stoke, they said, 'We can't give you the time off to go and do this master's, so you choose: do the masters, or work with us.' So, I gave up the masters and went to work with them instead.

"THE MORE I DID, THE MORE I REALISED I HATED IT"

"Later I did my masters at Chester University - I wouldn't recommend this - full time while I was full time on shifts. I did it in a year and it was a bit intense, but it was great. That is what ended up getting me into this job at Salford, because I was asked to go back and do some guest lecturing, and I really enjoyed it. Something I always enjoyed doing in the lab was training people and doing one-to-one sessions. I came home from a guest lecture at Chester and said to my boyfriend, 'That was great. I wish I could do more of that.' He suggested looking online for jobs, and it was the closing date for one at Salford. I can be impulsive, but it works sometimes.

"A week later I came for the interview. I sweated my way through most of it I was so nervous. I assumed I haven't got it, because I didn't hear anything for two weeks. In the interview, they mentioned how how I was younger and less experienced than other candidates, and didn't live in Manchester.

"But when Lucy Smyth rang me and said, 'Do want to work with us?' That was that!

"Yeah, I felt quite daunted coming to work at the university. I shouldn't have done, because it isn't that kind of environment. But one thing I still think is funny now is that in the online classrooms everyone is Dr. something, and I am just Aimee Pinnington, because I haven't got a PhD, and some students do pick up on it. But I think my advice to students would be to not feel limited by not perceiving your-self to be on the same level as others."

HAVE YOU EVER FELT PRESSURED BY SOCIETY INTO CERTAIN JOBS IF IT WASN'T NECESSARILY WHAT YOU WANTED – BECAUSE THERE'S SPECIFIC JOBS THAT ARE SEEN AS BEING EXTREMELY DESIRABLE?

AP: "I don't think anyone put pressure on me apart from myself, but I think that comes from that societal pressure that you're talking about. Nobody had gone to university and in school I was straight A-stars – without trying. I was just lucky. When I went to college, that changed. I had to try really hard, and then I tried really hard with my degree. My grandparents are from what would could be considered a lower-class background, and they were so ecstatic. I honestly thought, 'Oh, my God they'll be so let down if I don't do this'.

"When we had to apply for work experience in year 10, my teachers said I had to do the medicine ones. They were trying to encourage me, but I wanted somebody to say, 'What do **you** want?'"

"I DON'T REALLY RUN A CLASSICAL CAREER COURSE. BUT IT'S RIGHT FOR ME."

I did go through quite a classic route until I finished my degree. I was 20. When I got my first BMS job, being one of the babies of the year, I haven't even hit 21. Yet I was in what was perceived to be an extreme job, and I did really enjoy it. But then I started splintering off, doing my master's later, and now I do this job split. I don't really run a classical career course. But it's right for me.

"I want to stay working as a scientist. And once you get to the lab management level – you rarely have on a lab coat. Their roles must be really challenging in other ways, but I want to stay working as a scientist."

"But I also love the teaching. I taught all through university as a ballroom and latin dance teacher. I tried to stay doing that, did four nights a week teaching dance while at university, and I just missed it."

"When I was younger, I used to quite regularly be full force, and then I'd have a week, where I literally couldn't get out of bed, and then I wouldn't learn from it. Now that I'm older I'm more self-aware and I avoid the burnout better now."

WHAT SORT OF SHIFTS WERE YOU WORKING BEFORE AIMEE, WHEN YOU WERE PURELY BMS?

AP: "I used to work a 6am-2pm, 9am-5.30pm, 12pm-8pm, 6pm-6am, or 6am-6pm at the weekends. Every day in the week would be different, you could go from a night shift back to an early shift to back to a night shift. It was very random; you didn't do like a block of a week of each. And then in the mix of that you had on-call work as well. So, if I finished a core day, which was 09.00-17.30, I'd come home with a bleep, and I could be phoned any time until six o'clock the next morning to go back in.

IS IT IMPORTANT, THEN, TO TAKE INTO CONSIDERATION NOT JUST WHAT YOU ENJOY BUT ALSO THE ACTUAL WORKING LIFE, THE TASKS, THE HOURS YOU'LL WORK?

AP: "Yeah, definitely. Even when I was there on nights, I still enjoyed my work. And actually, in a way, I enjoyed that more because you work a lot more independently, you run the entire section on your own, so you know where everything is. You don't have to rely on anyone else."

SN: "As a comparison, and in terms of my life as a PhD student, it was very much 09.00-17.00 and then some bedtime reading. So, I'd have a research article – I loved, I still love, reading – so I would gladly read a handful of research articles, through the course of the week as my bedtime reading and at weekends. Then as a as a postdoc, I'd say that that pattern has continued in all my postdoctoral years. And there's travel involved. It's great going to conferences and that sort of thing."

"Now, as an academic, it's highly variable, you'll have a week where it's nine to five, and that's good enough, and you'll have other times where you're working 12 hours a day, and also getting up Sunday morning to do stuff. It comes in massive peaks, and then you have periods where it's actually calm, and it's a nine to five, normal job, and it's okay."

WHAT DO YOU LOVE ABOUT YOUR JOB?

AP: "I enjoy most having a direct impact on patients. That leukaemia that I found yesterday – there's about an hour, where I will be the only person who knows that that patient has leukaemia, and that's a really privileged position. How I deal that will directly affect the patient's chances. If I get that wrong, and they start them on treatment wrong for the patient, then that can be catastrophic, and now that I'm teaching at Salford, I know a lot of the students who I interact with will go away and do the same thing. I think that's a position of privilege and that's the bit that I love the most."

SN: "I enjoy different things at different times. Obviously, there's all the Biomed Soc and GEMMS stuff, I massively enjoy all of that, because you can see the students are enjoying it. I intermittently enjoy research. Nothing can compare to when you get a positive result in the lab, a paper accepted or even a grant! But success in research is infrequent. Grants and papers get rejected and experiments fail."

THAT'S AN INTERESTING INSIGHT. IT SOUNDS A BIT LIKE, WITH RESEARCH, THAT THE HIGHS ARE HIGH, BUT PARTLY BECAUSE THE LOWS ARE LOW.

SN: "That's what it is. When you're a PhD student, and you're a postdoc, it's such a laugh in the lab, because there's loads of students, the radio is on and you're just having a real good time and following protocols that you're good at. Especially because you become quite technically excellent, and all PhDs and postdocs do, but when you become an independent academic, you become quite detached from that first-hand lab experience. You pop your head in and you talk to research students, if you're lucky you train them. And so yeah, you kind of end up losing that kick when you become a lecturer. You don't really get that very often."

SEEMS LIKE YOU TOUCHED ON WHAT YOU WOULD WISH TO BE DIFFERENT THERE. AIMEE, IS THERE ANYTHING YOU WOULD LIKE TO CHANGE?

AP: "Being self-aware to the point where you do not feel like it's a bad thing to say, actually, what I really need is to have a break. I really need to just take this weekend off. I think that comes with a bit more awareness. Maybe as you get older, I'm not sure I would have had the capacity to do that at university."

"It's really interesting. As a teacher, I think a lot of the students are really amazing and do things that I definitely couldn't have done at their age or experience level. Which is strange because like I said, I'm 26, I'm not that much older than the students. But wow, there must have been a big change since I left University in my own development, to spot those things."

"Sometimes, with external pressures, all the pressure we put on ourselves, we don't listen. I think all of us should do more to listen to ourselves. you know what's right for yourself, don't you?"

"NOTHING CAN COMPARE TO WHEN YOU GET A POSITIVE RESULT IN THE LAB... BUT SUCCESS IN RESEARCH IS INFREQUENT"

AP: "I feel more optimistic, to be honest, having done this interview. Doing things like this, it does make you think that 'this is why we do it'."

SN: "A bit of self-reflection."

Want to know more about our academics?

The Biomed Society will be organising live interview sessions with academic staff and other professionals to learn more about their experiences.

Join the society and follow us on social media for updates.

<https://www.salfordstudents.com/groups/biomedical-science-9e9d>

Coffee with Caroline

Programme Lead Dr Caroline Topham has been hosting "Coffee with Caroline" drop in sessions for students to discuss their wellbeing. These sessions will resume in the new year. In this article, Caroline answers some of your queries. Have more? Email c.h.topham@salford.ac.uk

How can I avoid/deal with stress?

Stress can be very uncomfortable but is also very important, and the right amount of stress helps us to perform at our best. Professional athletes talk about 'arousal levels' and find ways to achieve optimum 'arousal' in order to give their best performance; if arousal levels are too low they are not focused and energised to perform, too high and they become too stressed and crumble under the pressure.

Stress is a necessary part of life, we as human beings need it to push ourselves to achieve difficult things, but when stress levels become too high they have the opposite effect and can stop us from thinking clearly.

Each of us also have our optimum state where we are most productive, for example I prefer working to a deadline and find the time pressure very helpful to focus my thoughts and motivate me. Other people hate deadlines and find the time pressure stressful and very unhelpful.

So it helps to know yourself so you can manage your workload to meet your strengths. Think about your assessments so far this year, how did you feel about them? Did you prepare far in advance or did you leave it to the last minute? Did that work for you, or did it make you feel anxious? This will help you to avoid making the same mistakes twice.

When stress levels are so high that your usual stress relief techniques (good sleep, relaxing in front of the TV, exercising, praying, meditating, chatting with friends, whatever works for you) stop working and stress is stopping you from working and interacting with people as you normally would, then it's time to get help. If this happens my advice is to reach out to the people around you for support if you can. That might be family or friends, or fellow students or tutors, or it may be professional counsellors and wellbeing advisors (see below). Whoever it is, sharing your anxieties can really help you to find a way forward, and it's never too late to ask for support.



How can I make friends if I can't meet classmates in person?

This is a great question, and some of you may have better ideas than me! We are all learning fast when it comes to our online lives. To start with, I would recommend joining in with programme activities such as participating in your tutorial group discussions, joining in with activities during online teaching, and going to online social events such as those organised by the BiomedSoc. Joining societies is another great way to make friends, we have our own BiomedSoc and there are many other societies hosted by the Students Union for different sports, hobbies, faiths and more. Outside of university, there are many opportunities for volunteering in your community and this can be a great way to get out of the house in a safe way too.

How can I catch up with things if I fall behind?

If you feel you are falling behind, the most important thing to do is to speak to someone at Uni, usually your personal tutor or me as your programme leader, and we also have Del, our Student Progression Administrator (SPA – see below) who is very helpful to talk to if you are struggling.

Catching up with missed lectures is now possible as everything is recorded, and making time to watch these lectures and do any related activities is crucial to getting back on track. Visit each of your module sites on Blackboard and identify any assessments you may have missed. Every student will get another attempt at an assessment automatically, although marks are capped at 40%. If your reasons for falling behind are due to reasons outside of your control then you can use the Personal Mitigating Circumstances (PMC – see below) system which allows you to apply for the opportunity to submit work at a later date without your marks being capped, so please use this if illness or other life circumstances have stopped you from completing assessments.

It's helpful to understand why you have fallen behind, if it's a short term problem (e.g. short illness) then please use the PMC system to take the pressure off your current deadlines. If something in your life has changed permanently that is preventing you from studying as much as you need to, then speak to us at the university and we can advise you on the best way forward.

How can I stay positive and motivated in such challenging times?

As human beings we thrive on variety and social contact and we get a sense of achievement from being out and about in the world. During the pandemic, it has been much harder for many of us to do this, and so staying motivated has been very difficult for lots of people. There is no magical fix for this, but there are three things which have helped me which I will share:

- Keep your eye on the bigger picture – what is your goal, what are you working towards? Keeping the end goal in mind can keep you on track.
- Stay humble – we all know people who have lost their jobs and health as a result of the pandemic, it helps me to remember that we are privileged to still be able to work and study during the pandemic.
- Set daily goals – I'm a big fan of setting small goals and chipping away at work a bit at a time, for example I'll do half an hour on one task and then go and make a coffee. I'll do another hour then reward myself with ten minutes of playing with the dog. If I finish this task by the end of the day then I will have some chocolate/ wine/ takeaway (insert treat of your choice) on Friday! Try the pomodoro technique to help you to focus for short bursts of time: <https://www.themuse.com/advice/the-secrets-to-staying-productive-when-you-have-a-big-project>

HELPFUL LINKS FOR WELLBEING

Our Student Progression Administrator (SPA), Del:
See-Spa@salford.ac.uk

Wellbeing and Counselling at Salford:
<https://www.salford.ac.uk/askus/support/wellbeing-and-counselling>

Information about PMC process: <https://www.salford.ac.uk/askus/admin-essentials/personal-mitigating-circumstances>



CALL FOR ARTICLES

If you would like to contribute to the next issue, we would love to hear from you!

We are always looking for researchers and writers to join the team. Below are some desired pieces:

- short piece on new and interesting **external research** to add to research spotlight section
- Research relevant to **biosciences** currently underway at **Salford**
- Highlighting **upcoming workshops and seminars** useful to students, such as by the Physiological Society, IBMS or Uni of Salford.

If you would like to write about an area of Bioscience you are passionate about, or are a researcher at Salford who would like to write about their work, please get in touch. To place your request, please contact Dr Sara Namvar at **s.namvar@salford.ac.uk** or Aimee Pinnington at **a.pinnington@salford.ac.uk** with your **proposed article title** and a **short pitch** (100 words maximum).

GET INVOLVED

BioArt Club | Biomed Book Club |
Bioscientist Magazine | Graduate Entry
Medicine, Dentistry and Physician
Associate Mentoring at Salford (GEMMS) |
Events and socials

Join the society at
<https://www.salfordstudents.com/groups/biomedical-science-9e9d>



BIOMED BOOK CLUB

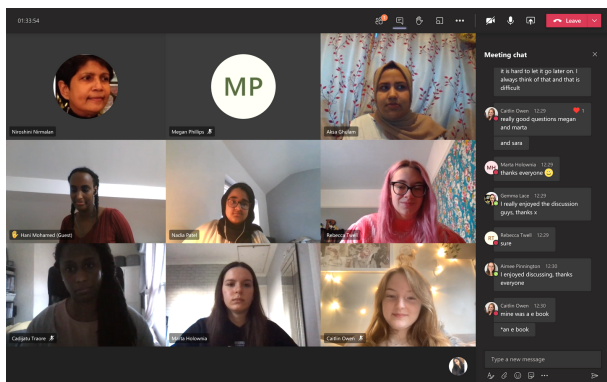
MEGAN PHILLIPS AND MARTA HOLOWINA

The BioMed Society have launched their very own book club, and we'd love you to get involved! We're looking for students of all literary abilities to join us.

Every month you will be tasked with reading a thought-provoking, general interest book to discuss at the next group meeting, where we will explore new ideas, themes, and ways of thinking. Six exciting book titles with varied themes have been selected – these can be found on the club flyer.

We hope that by joining our club, we can create a fun community for everyone to get involved in!

The club is open to members of the Biomed Society. If you haven't already joined the society, you can do this by searching for 'Biomed Society' on the Student Union website, and completing a membership form. Once you're part of the society you will be added to the Microsoft Teams group, where you will be able to access our video meetings and group chat.



Our first meeting

Last month, the book club discussed 'When Breath Becomes Air' by Paul Kalanithi. We talked about the pressures of medicine, whether life begins at conception and what is truly valuable in life and death.

Get ready for some discussion, debate and reflection! **We hope to see you soon!**

Our Next book title is '*Just F***ing do it*', by Noor Hibbert. This book focuses on true personal development using an approach which combines psychological rigour and spiritual power. It will show you how to stop thinking small, make positive changes and live the life you deserve.

Our next group meeting will be held mid-February 2021 via Microsoft Teams.





University of
Salford
MANCHESTER

BIOMED SOC BOOK CLUB

2020-2021 LAUNCH

New Literature Every Month

NEXT MONTH'S PICK:
JUST F***ING DO IT

Our next meeting: Mid-February via
Microsoft Teams



@socbiomed

BIOART CLUB

CAITLIN OWEN AND PROFESSOR NIROSHINI NIRMALAN

The Biomed Society will be launching its BioArt Club in the new year!

We have exciting things in store and to kick things off, we are hosting an exciting art competition, BioArt 2020.



Be as creative as you want! Don't be afraid to be out of the box, and remember that this competition is open to all artistic abilities – a good idea executed with care is more important than being skilled with a pencil or paintbrush, so don't be afraid to enter. All media welcome!

Art can be relaxing – good as downtime from study. It can also teach you a lot! If you draw the anatomical structure of the heart a lot, you might find you learn it off by heart too.

If you're stuck for ideas and inspiration, please visit the Biomed Society Pinterest account:
@BiomedSocBioArtClub

To submit, download the Padlet app on your mobile and sign up using your Salford email address. Follow the link or QR code on the next page, click yes to open in the app and upload your art! Ensure that you also email your submission to Professor Nirmalan at N.J.Nirmalan@salford.ac.uk.

THE BIOMED SOCIETY PRESENTS:

BIOART 2020

THEME:

THE HUMAN BODY IN HEALTH AND DISEASE

CLOSING DATE:

31.12.2020

OPEN TO ALL SEE STUDENTS



PRIZES:

1ST PLACE £100

2ND PLACE £50

3RD PLACE £25

IN AMAZON VOUCHERS

FEATURE IN OUR MAGAZINE

BE A PART OF OUR ONLINE

EXHIBITION

BIOART

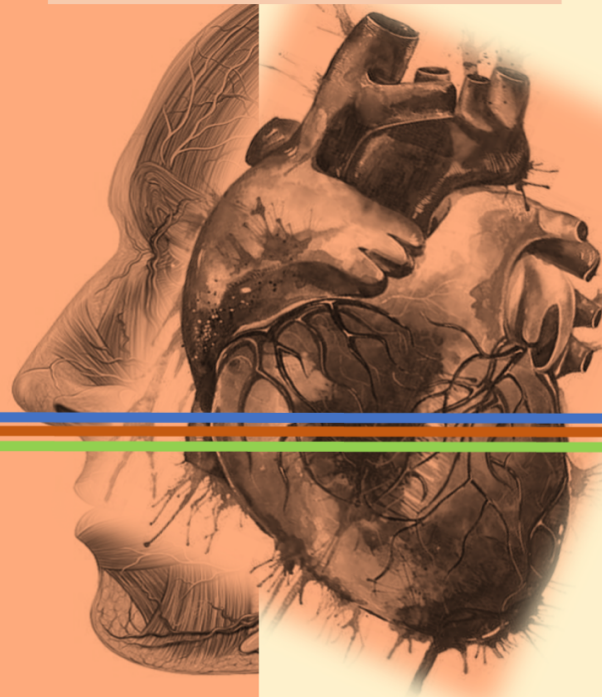
2020



The competition
is open to all
students in
SEE and will
be exhibited
online

Submit your work to Padlet using QR code in Padlet app OR via link: uos.padlet.org/els476_63107/u53q96mmj3owx5pm
AND email to N.J.Nirmalan@salford.ac.uk

Closing date: 31st Jan 2021



Theme:

The human body
in health and
disease

use any media including
drawing, printing, painting,
digital art or sculpture.



The competition
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AND email to N.J.Nirmalan@salford.ac.uk

Win Amazon vouchers for
£100 (1st place)
£50 (2nd place)
£25 (3rd place)
Feature in the society magazine
Be a part of our online exhibition

Biomed Society

Presents:

BIOART

2020



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Closing date: 31st Jan 2021



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BIOBAKES COMPETITION

NADIA PATEL HOSTED BY DR GEMMA LACE-COSTIGAN

The Salford Biomedicine #BioBakes competition has allowed students and staff at Salford to don their aprons and show off their culinary skills by making bioscience themed treats during the lockdown period. Brain biscuits, cellular cookies and cardiac cakes - all bio-themed bakes are being considered for the grand prize, sweet or savoury!

Biomedicine Prize

The best submission from the Biomedicine programmes will receive a hamper of goodies including some bio-themed delights. Their submission will also be entered into the Bake off competition organised by SEE (School of Science Engineering and environment).

The SEE Bake off finale

The programme level winners will be judged by a VIP panel that **includes Makbul Patel** (shown right), a contestant from this year's 'The Great British Bake Off' show, aired on Channel 4.

The Grand Prize

The Grand prize includes a **Bake Off Cookbook signed by this year's contestants**, as well as an array of other treats.

Baking is good for the soul!



Left:

Biomedical Science showcase, submitted by student Aden Hussain Tanveer L4

Below: Red cell cupcakes, submitted by staff member Aimee Pinnington



Above: Makbul Patel, contestant on GBBO 2020, will be a VIP judge

Haven't submitted your entry yet?
There's still time!
Submit images of your Bio-themed treats to Dr Gemma Lace at
g.l.lace@salford.ac.uk
Deadline: 18th December



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MANCHESTER



BIOMEDSOC CHRISTMAS EXTRAVAGANZA!

18/12/20 AT 1PM

CHECK OUT THE ACTION PACKED
PROGRAMME AND MENU!!!

BOOK VIA EVENTBRITE

Hosted on collaborate



Programme (starts at 1pm)



1. Prof Niroshini Nirmalan (10min).
Welcome and reflection on achievement.
 2. Danny Gaskin (Alumni) and Aimee Pinnington (30min).
Biomedical scientists reveal all!
The highs the lows and hilarious tails!
 3. Charles Middleton, Julie Adams and Natalie Goss (30min).
Christmas quiz!
 4. Dr Sara Namvar (20min).
Christmas lucky dip and get your revenge with Mandy!!! Will you get a present in the post?! Which academic will be made to suffer?! Do we have a sylvester stallone amongst us?!
 5. Alejandro Lorent-Pons (20min).
A strange scientific Christmas adventure.
 6. Dr Caroline Topham (15min)
Christmas Crackers (Lets see if her jokes are any good!)
 7. Charles Middleton (20min)
Christmas Origami. Have some A4 paper ready (Coloured if you like!).
 8. Alejandro Lorent-Pons (40min).
Christmas Bingo!!! From story teller to Bingo caller! Warning! There may be singing!!!
 9. Charles Middleton, Julie Adams and Natalie Goss (30min).
Pictionary - Lets put the Blackboard Whiteboard to good use!
 10. Dr David Greensmith
Words of wisdom (I doubt it!) and closing remarks!
- 



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BIOMED SOCIETY

PASSIONFLASH

Podcast Edition



– **Audition Deadline: 18th February 2021** –

Submit a 2 minute TED-style audition video on any topic you are passionate about.

Gain confidence, meet new people and build your CV !

Get in the running for BIG prizes: £250, £150 and £75 Amazon vouchers to be won per year group!



@SOCBIOMED



@SALFORDBIOSOC

School of Science, Engineering and Environment.

SALFORD

BIOMED SOCIETY

PASSIONFLASH

Step 1:



Record a 2 minute TED-style audition on any topic you are passionate about - science or otherwise!

Step 2:



Submit your audition by 18th February 2021. Request OneDrive link via email (s.namvar@salford.ac.uk).

Step 3:



Wait for a week and hope you get through to the finals!

Step 4:



Record a 10 minute TED-style talk which will be played at the finals in March! Panel of judges will select the winners!

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