



# Café Scientifique Newsletter

Half term 5: 06/07/22

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## Biomedicine

### INSIDE

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#### Articles

Written by the L6th on  
things they find  
particularly interesting in  
biomedicine

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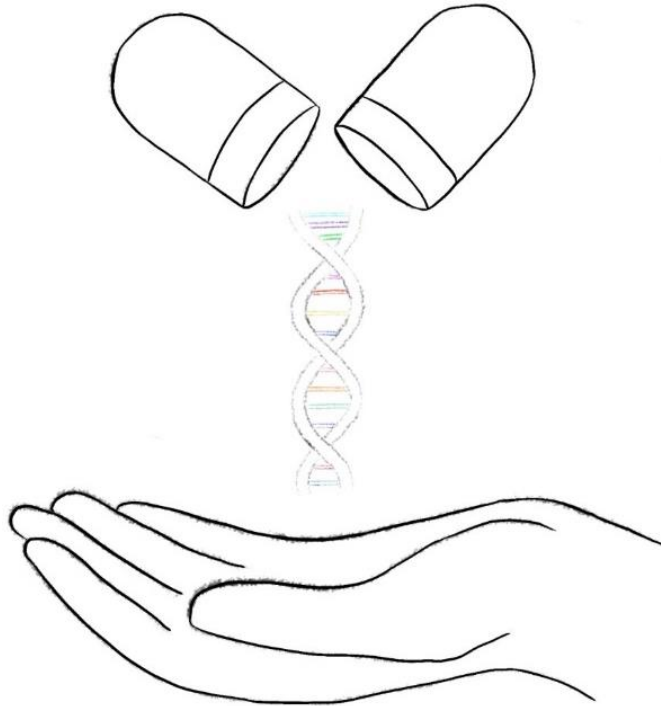
#### Reviews

Reviews of documentaries,  
podcasts and books

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#### Games

A final wordsearch for the  
year



### Welcome to the final café scientifique newsletter of the year!

For any aspiring medics or biochemists - this ones for you... hear all about CRISPR, how to learn, immunology and toxicology by reading ahead. I found it particularly fascinating this term as biomedicine is such a broad topic.

Thank you for taking the time to read this year - we hope you enjoy this final edition.

We're proud of all the work you've done this year and hope you are to...

Have a good summer! - Katy & Olivia

# Gene therapy

-By Vidhi

Gene therapy is a medical approach that treats or prevents disease by correcting the underlying genetic problem. Gene therapy techniques allow doctors to treat a disorder by altering a person's genetic makeup instead of using drugs or surgery.

## **Risks:**

Earliest studies show that gene therapy could have risks such as toxicity, inflammation, and cancer. However, researchers have now developed improve techniques to limit these risks: FDA regulates the products linked to gene therapy and supervises the research and NIH (National Institutes of Health) provide guidelines for investigators and institutions (such as universities and hospitals) to follow when conducting clinical trials with gene therapy. The protocol for each trial is then reviewed by NIH Recombinant DNA Advisory Committee to determine if it raises medical, ethical or safety issues and if it raises any concerns then a further meeting is conducted.

## **Advantages:**

The advantage of gene therapy technique is to give someone that is born with a genetic disease or who develops cancer a chance at a normal life. These technologies will bring about a whole new era in medicine, and the answer to many medical problems people thought were incurable are becoming possible.

## **Ethical impacts:**

Germline gene therapy is where genetic changes are made to offspring which can prevent future generations having a hereditary disease. However long-term impacts are not known and may impact development of the foetus in a detrimental way. Furthermore, people who would be affected by germline gene therapy are not yet born and so they can't choose whether to have the treatment or not.

## **A consideration of the article "Effective Studying Habits of High-performance Medical Students" (Abdulrahman et al, 2021) and the editorial letter by Hayat and Bocus (2021)**

-By Seren

These publications suggest that there are several effective study habits that can lead to increased performance in examinations. The considerations of effective study habits of medical students, from both sources, concluded that there are three key strategies that can be adopted to achieve high-performance grades. These included students abstaining from social media, having strong motivation, and conducting their studying alone.

In addition to these strategies, Hayat and Bocus also suggested a further three effective learning methods. The first being the technique of having multiple sources available when studying. This was found to be greatly beneficial to the student and their performance. The combined use of resources such as textbooks, notes from lectures (lessons) and online sources provided students with a broad base of theoretical material from which they could focus their learning. A second strategy that could be adopted by students engaged the use of critical thinking skills via Problem Based Learning (PBL). PBL can be undertaken in two ways, firstly in the practise of exam questions that require application of knowledge and not just memory recall. Alternatively, this problem-solving strategy can be implemented in lessons during activities that involve group work as it cultivates the development of deep content knowledge along with collaboration, creativity, and communication skills. Finally, Hayat and Bocus also advocated that attending all lessons available to the student is vital, as they are able to take effective course notes that suit the learning style of each individual student.

In consideration of the suggestions from both publications, it would be worthy to conclude that the adoption of some or all of these strategies leading up to the exams might prove to be beneficial in improving grade outcomes.

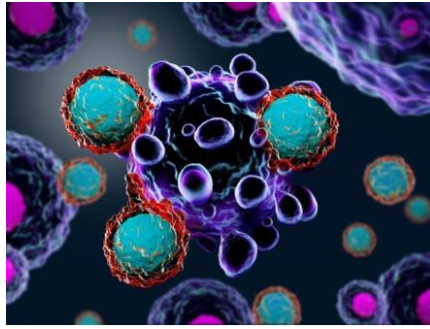
### Immunotherapy: The Battle Within

-By Olivia

This highly captivating documentary has a particular focus on the past, present and future of cancer immunotherapy: a form of cancer treatment focused on utilizing the immune system to help in the prevention, control and elimination of cancer cells. First invented in the 1890s by William B. Coley; within its employment in the Memorial Sloan Kettering Cancer Centre, a high number of patients in the early 20th Century were seen to be cured using this technique, with one of the most recent advancements having been the development of the Immune Checkpoint Inhibitor.

Having been overlooked for many years, this academic film discusses why this form of treatment is now being put at the forefront of research and development by scientists worldwide. Why are we seeing a newly found interest in this treatment option, and what could the future look like for cancer immunotherapy?

Click [here](#) to find out more.



### Take your pills

-By Olivia

Interested in the production of widely prescribed medications? Keen to understand the significance of psychostimulants of those who take them?

This hour-long documentary explores the benefits and disadvantages of the usage of psychostimulants, such as Adderall, which is the main focal point of this film. Interviews are conducted with young adults, specifically those who have been prescribed these medications for the treatment of ADHD (Attention Deficit Hyperactivity Disorder), alongside those responsibilities of the professionals to their patients. The opinions of cognitive neuroscientists, alongside those of teachers and healthcare professionals on this subject allows for a broad range of intriguing viewpoints and insights.

### When Antibiotics Don't Work

-By Olivia



What is the future for the use of antibiotics in medicine? This question is one being asked by many in healthcare and is addressed within this scientific film. From the case of a young girl being put on life support, the presence of drug resistance infections and their threat to those who have them is becoming more evident with time. With the abandonment of the creation of new antibiotics by larger pharmaceutical companies, due to steep scientific hurdles and the expectations to derive increasing profits, presenter David Hoffman shows viewers the efforts of one pharmaceutical company to overcome these drug resistant bacteria.

Click [here](#) to watch the full documentary.

### Science Vs: Science's rotten underbelly

-By Ellen

This episode of the podcast explores the issue of experiments in America in the 1960's to advance both the medical and cosmetic world through tests on prisoners for a small payment. The episode explores the issue through the eyes of a young scientist, Sigmund Weitzman, who found himself doing the experiments as a summer job. These experiments helped advances in medicine such as vaccines for flu and finding medicine for athlete's foot. They were also used to test baby shampoo and deodorant. This episode looks into the moral issues behind developments in science in fascinating and makes the listener consider how much we have benefited from malpractice. The episode also explores the debate around the morality that happened during the 1960s to 1970s and the reactions of doctors, prisoners, and the general public. I thought that the episode was a brief but well-researched overview of the issue and encourages more research into both the topic and the morality of science experiments. Additionally, I thought that the angle that they explored through Sigmund as someone who lived through the experience was a very unique and interesting viewpoint. Overall, it's worth a listen. Click [here](#) to listen.



### The immunology podcast: 'AAI 2022: Epithelial Immunity'

-By Katy

This episode takes place surrounding the immunology 2022 conference. The team discuss how immune systems respond to an attack - the adaptive method where it learns from the situation and the maladaptive method leading to more illness. They discuss trained immunity - non-specific memory - and how immunity of plants have taught immunologists much about this system. We hear about the fascinating series of events that take place when a secondary attack takes place. Click [here](#) to take a listen.



**THE IMMUNOLOGY  
PODCAST**



### Dose makes the poison: The Toxcast

-By Katy

This is a fascinating series of podcast episodes based on toxicology. With episodes ranging from stories in the media explained to plot lines in movies and how accurate the science of murder scenes are. Hosted by a forensic toxicologist, there are often brief but interesting explanations of how certain poisons can be detected in the body, how long they remain in the body and some of the symptoms of ingesting them. Check out the podcast [here](#) to learn about poisonous substances such as carbon monoxide, nicotine, and cyanide.

## Bio-Medicine

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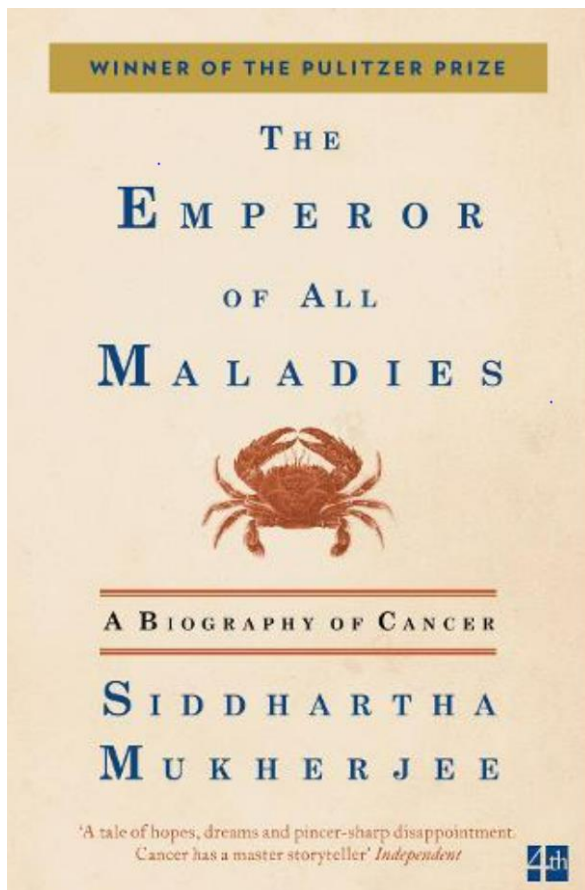
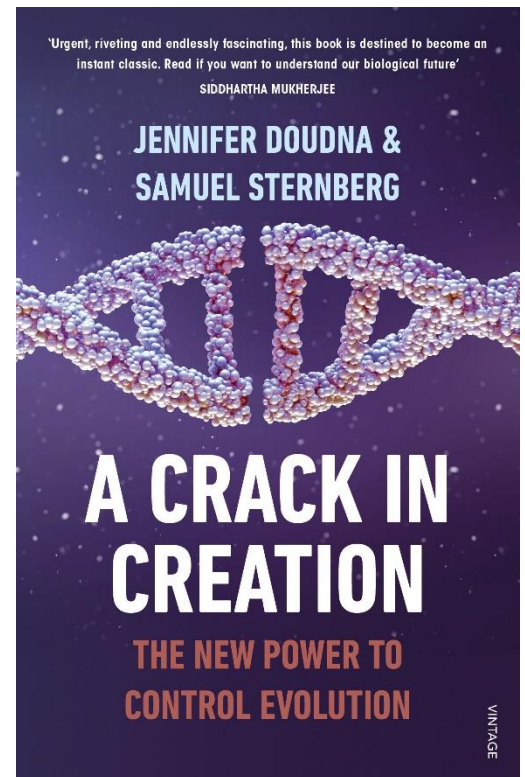
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VEINS  
BONE MARROW  
MUSCLES  
ANATOMY

Play this puzzle online at : <https://thewordsearch.com/puzzle/3660118/>

### **A Crack in Creation: the new power to control evolution – Jennifer Doudna and Samuel Sternberg**

Review by Katy

If you have been following our newsletters this year, you may be familiar with the concept of CRISPR: a wonder-tool for biochemists, which provides the ability to cut and change DNA. A crack in creation discusses first the path that Doudna took through life and how she was introduced to CRISPR, then how the protein works and how they can control it and finally on to the applications of CRISPR and the ethical implications of such a powerful tool. The end of the book looks at the future of the technology and the steps they took when introducing the idea to the science world including the necessity of holding conferences with scientific and non-scientific voices to decide how to deal with the power that is held with CRISPR.



### **The Emperor Of All Maladies - Siddhartha Mukherjee**

Review by Mrs Sims

I read this book 10 years ago, so the fact that I still vividly remember it is a measure of its impact. This isn't an easy read - in places, there is a lot of tragedy and it may not be for everyone. The overall story, though, is of the massive progress we have made in our understanding of cancer as a disease and the leaps and bounds this has allowed us to develop in its treatment. From a historical perspective, I learned a huge amount from this book, and if you are a budding medic, nurse, radiologist, therapist or even vet, this is a fascinating read.