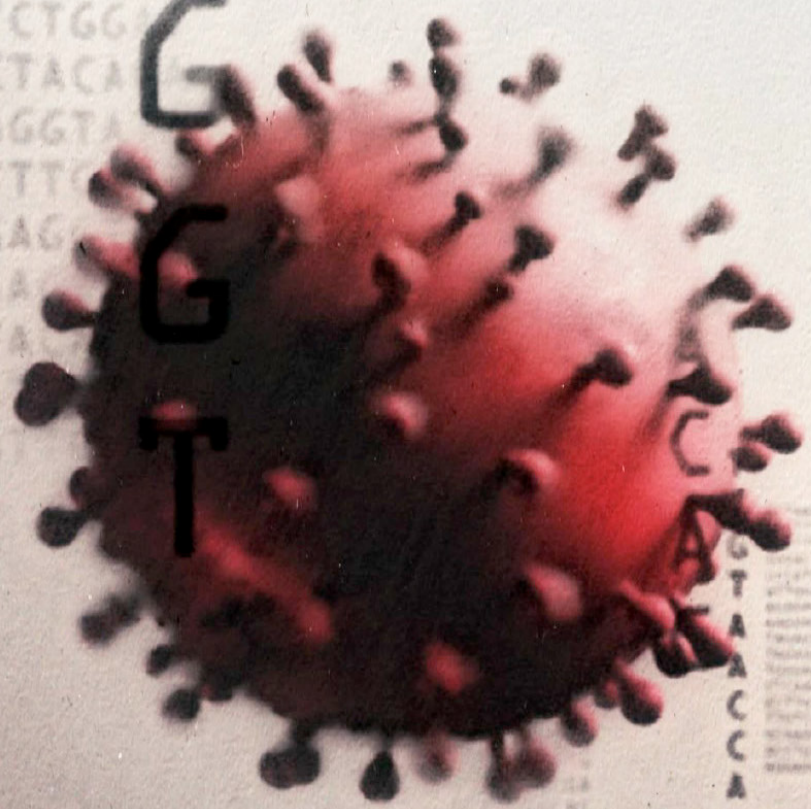


TATTCTGG
AATCTACA
ACTAGGTA
GAATTT
AGAGAG
TAAAA
TATTA
GTAA
CACAT

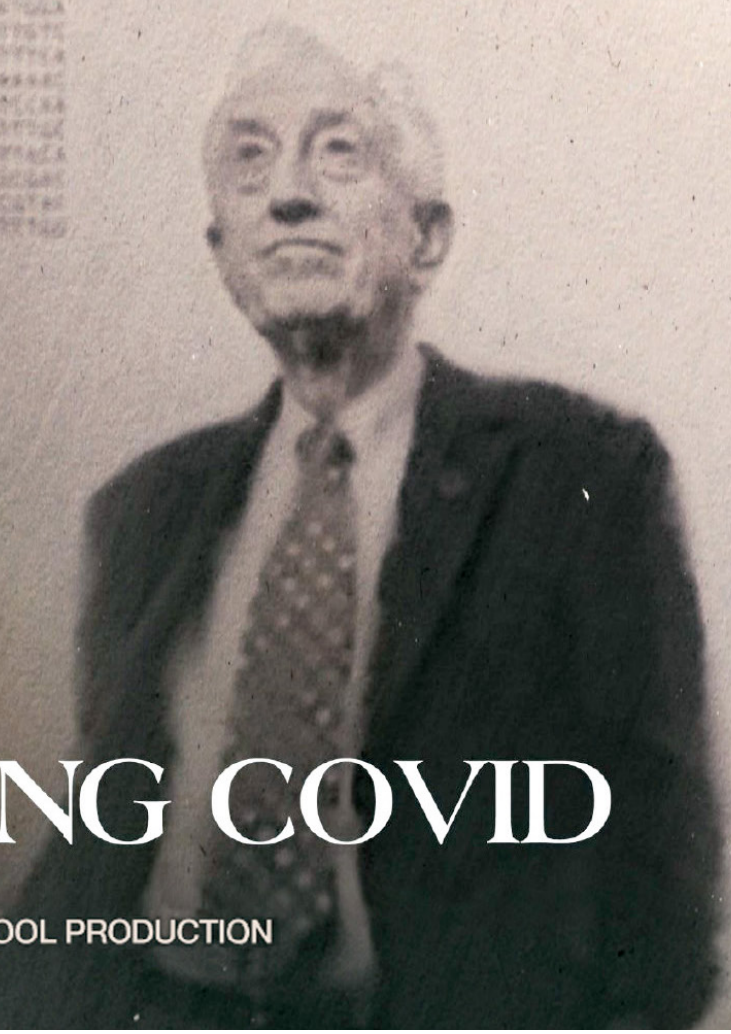
G
G
T



C
A
A
C
A
A

ITAA
CAGTAA
CAACTGTAA
TCACTTAT
KACACACTTA
GATCTAAA
GAAACTCTT
GTACCATGC
CACTTGCTA

ATTTAGCTTT
CTTCAAGTGT
TACTGAAAG
TAAATAAGAA
GAGCTTGTG
CAAGCTTTA
ATGAGAAAC
KACACTTA
CTCACTTGC
CTATTAA
ATTGAGGAG
GTTAGCTTA



CRACKING COVID

A GENEPOOL PRODUCTION



AUSTRALIAN TEACHERS OF MEDIA

Writer Roger Stitson

<https://theeducationshop.com.au>

<https://metromagazine.com.au>

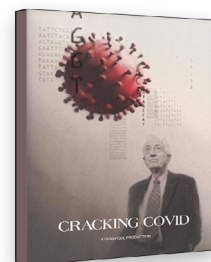
© ATOM 2021 ISBN: 978-1-76061-428-7

STUDY GUIDE



Synopsis

Cracking Covid is a real-time journey through Australia's unique pandemic experience. As teams of scientists race to unlock the secrets of the virus, researchers work to build a vaccine from scratch, and three patients confront very different symptoms of a terrifying new disease. Professor Peter Doherty – who won a Nobel Prize for his discoveries about the human immune system – joins Emmy Award-winning filmmaker Sonya Pemberton, providing warm and witty expert insight. We discover how, in uncertain times, we often have little choice but to improvise. *Cracking Covid* is a surprisingly intimate story of Australia's race against the virus – as it happened, in the moment.



CONTENT HYPERLINKS

3 CURRICULUM LINKS

4 TERMINOLOGY

5 ACTIVITIES

5 *Introduction*

6 *Electron microscope*

7 *Australia's contribution in the fight against COVID-19*

9 *Body immune system defences*

9 *Vaccines and vaccination*

12 *Three case studies*

14 *Improvisation*

15 *Issues and ideas for further discussion and debate*

16 *Conclusions*

17 *For the teacher: title animation sequence as scripted*

18 REFERENCES AND FURTHER RESOURCES



Curriculum links

THIS STUDY GUIDE ON *CRACKING COVID* IS MAINLY AIMED AT MIDDLE TO SENIOR SECONDARY SCHOOL LEVELS, WITH RELEVANCE WITHIN THE CLASS ACTIVITIES TO THE AUSTRALIAN CURRICULUM GENERAL CAPABILITIES OF: CRITICAL AND CREATIVE THINKING; ETHICAL UNDERSTANDING.

Cracking Covid can be linked to the following subject areas within the Australian National Curriculum:

- * English/Media
- * Science/Biology
- * Health and Physical Education

Senior Secondary Biology, Unit 4 curriculum content description relevant to *Cracking Covid*:

- * When a pathogen enters a host, it causes physical or chemical and biological changes (for example, the introduction of foreign molecules via the surface of the pathogen, or the production of toxins) in the cells or tissues; these changes stimulate the host immune responses (ACSBL119)
- * All plants and animals have innate (general) immune responses to the presence of pathogens; vertebrates also have adaptive immune responses (ACSBL120)
- * Innate responses in animals target pathogens, through the inflammatory response, which involves the actions of phagocytes, and a myriad of other cell types which secrete messenger molecules called 'cytokines' and defence molecules called 'defensins' and that trigger the complement system (ACSBL121)
- * In vertebrates, adaptive responses to specific antigens involve the development of humoral immunity through the production of specific antibodies by B lymphocytes, and the provision of specific cell-mediated immunity by T lymphocytes; in both cases memory cells are produced that confirm long-term immunity to the specific antigen (ACSBL122)
- * In vertebrates, immunity may be passive (for example, antibodies gained via the placenta or via antibody serum injection) or active (for example, acquired through actions of the immune system as a result of natural exposure to a pathogen or through the use of vaccines) (ACSBL123)
- * Transmission and spread of disease is

facilitated by regional and global movement of organisms (ACSBL124)

- * The spread of a specific disease involves a range of interrelated factors (for example, persistence of the pathogen within hosts; the transmission mechanism; the proportion of the population that are immune or have been immunised, and the mobility of individuals of the affected population); analysis of these factors can enable prediction of the potential for an outbreak, as well as evaluation of strategies to control the spread of disease (ACSBL125)

Year 10 English curriculum content descriptions relevant to *Cracking Covid*:

- * Create literary texts with a sustained 'voice', selecting and adapting appropriate text structures, literary devices, language, auditory and visual structures and features for a specific purpose and intended audience (ACELT1815)

Year 9 Science curriculum content description relevant to *Cracking Covid*:

- * Scientific understanding, including models and theories, is contestable and is refined over time through a process of review by the scientific community (ACSHE157)

Year 9/10 Health and Physical Education curriculum content description relevant to *Cracking Covid*:

- * Critically analyse and apply health information from a range of sources to health decisions and situations (ACPPS095)

Year 8 Science curriculum content description relevant to *Cracking Covid*:

- * Cells are the basic units of life; they have specialised structures and functions (ACSSU149)



Terminology

BEFORE EMBARKING ON THE RANGE OF ISSUES AND TOPICS ARISING FROM YOUR VIEWING OF *CRACKING COVID*, DISCUSS IN CLASS, THEN WRITE DEFINITIONS AND EXPLANATIONS OF THE TERMINOLOGY USED THROUGHOUT THE FILM.

Draw information both from the film and if required from further reading and research. For some terms listed here, you will only need a dictionary as a first source.

- * **Pandemic (also Epidemic and Endemic)**
- * **Epidemiology**
- * **Infection**
- * **Disease**
- * **Virus**
- * **SARS, SARS-Cov-2, and COVID-19**
- * **Long COVID**
- * **ACE2 receptor**
- * **Gene and Genetic Code**
- * **Genome; Genome Sequence**
- * **Immunity/ Immunisation**
- * **Innate**
- * **Innate Immune System**
- * **Macrophage**
- * **Cytokines**
- * **Adaptive Immune System**
- * **T cells**
- * **B cells**
- * **Antibodies**
- * **Toxin**
- * **Memory cells**
- * **Vaccine/ Vaccination**
- * **Herd immunity (note: this term is not mentioned in the film)**
- * **Molecular clamp**
- * **HIV**
- * **Patient Zero**
- * **False positive**
- * **Electron microscope**

Note for teachers: the above exercise could be adapted into clues and answers for wordfinder and crossword puzzles.



MICHAEL ROJALES

Doherty Institute for Infection and Immunity. What is Peter Doherty's role at the Institute? Who is the inaugural (and current) Director of the Doherty Institute? (See "Doherty Institute" in website references.)

- ★ Using poster paper or graphics software, and drawing from the details presented throughout *Cracking Covid*, plan and create a COVID-19 timeline beginning with the first human infection diagnosed in Wuhan, China, through to the end of the documentary, where we are informed about further lockdowns across five Australian capital cities. As time and events will have moved on since then, you may wish to add subsequent items and dates of relevance and importance to your timeline. As preparation you should discuss in class what these additional details might be. In your timeline ensure you include the Global Data

Activities

INTRODUCTION

Carry out the following introductory activities relevant to *Cracking Covid*.

- ★ What is the name of the virus that causes the disease we refer to as COVID-19?
- ★ Professor Peter Doherty is a constant focal point throughout the entire documentary. Why do you think this is so? Carry out background research on his career in the study of infectious diseases, viruses and immunity, including the details of his joint Nobel Prize in Physiology or Medicine in 1996. (If you are not aware of the importance of the prestigious and respected annual Nobel Prize awards in many fields of endeavour, you should acquaint yourself with the Nobel's institutional history and purpose, which extends back to 1901 – see website references.)
 - » What is particularly unusual, and even unique, about Doherty himself winning a Nobel Prize? Explain what was so ground-breaking about the research that led to Doherty's award, and its influence on the way we understand, today, the behaviour of viruses and the means of immunisation against them. Comment also on the wider medical applications of his findings (some of which are mentioned during the film).
- ★ Describe and explain the history, the management and ownership, the purpose of, and the range of research and functions carried out, at the Peter



BORDERS OPEN

- dates and statistics contained in the film.
- ★ Throughout the documentary we see animation film showing a representation of blocks of genetic code, written as "ATCG". We ought to acquaint ourselves with what these letters stand for. (i.e. the names of the chemical bases that make up the DNA or RNA molecules located in the nucleus



PETER AND PENNY DOHERTY



of cells of animals, plants and fungi and encased inside viruses and bacterial cells) –What are the functions of these chemicals within a strand of DNA in the nucleus of each human cell? Create your own labelled illustration showing how they can be visually represented and understood. (See “ATCG” in website references, where you will also find illustrations.)

- ★ You may wish to carry out some background research on previous viral pandemics. The most well-known, devastating and world-wide in the modern era was the “Spanish flu” in 1918-1920, immediately after the First World War. (See website, book and film references.)
 - » Research the reasons for, and the effects of, the Spanish flu. What have we (scientists, political leaders and the community in general) learnt from the Spanish flu that we have been able to apply, or put into action for dealing with COVID-19 today? What did they not know which we were perhaps lucky today to know about diseases, pandemics and how to control them? Discuss what we haven’t learnt, or what we have forgotten, or ignored, from the days of the Spanish flu, which we ought to have applied to COVID-19, but didn’t. Have we repeated the same mistakes, errors of judgement and uninformed mass behaviour during our own era of COVID-19, which were demonstrated during the time of the Spanish flu pandemic? Consider, for example, why there are multiple waves of infection – the second wave, the third wave. What causes these, and how can they be prevented?
- ★ View the opening sequence up to and including

For the teacher – the animation sequence and film title as scripted by Sonya Pemberton: See the relevant sequence of the script on page 17; it may help as a guide into class discussion on the media studies aspect of the opening sequence.

▶ jump to Page



the point where the film’s title appears on-screen. Immediately preceding it a screen image of the director-narrator, Sonya Pemberton, seems to be scratched out by pencil markings, which morph to an animated insert of a globe. Taking into account what Pemberton is saying at that moment, plus the accompanying soundtrack music and the visuals, go through this animated section very carefully, frame by frame, shot by shot, noting carefully all the minute changes, and what happens.

- » Discuss what you think the animation scene means. What story does it tell, and encapsulate? What does it tell us about the rest of the film? (Note that more about the opening sequence is in the section of this study guide under the heading, “Improvisation”. The final scenes of the film are examined later in the “Conclusions” section of this study guide.)

ELECTRON MICROSCOPE

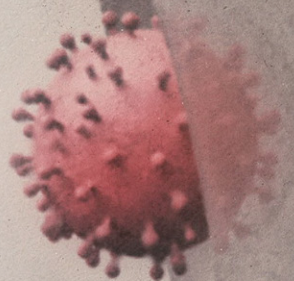
Carry out the following background activities relevant to *Cracking Covid*.

- ★ As we see early in *Cracking Covid*, much of our knowledge of the structure and behaviour of living human tissues and cells in the presence of viral particles is through being able to observe them via extreme high magnification – higher than is possible for an optical or light microscope to render. Professor Sharon Lewin (Director, Doherty Institute), says, “Because viruses are super, super, super small, you can’t see a virus with a standard microscope. You need an electron microscope, to allow you to visualize actual virus.” (See “Electron microscope” in website references.)
 - » Describe what an electron microscope is, comparing and contrasting it to an optical microscope. When was the electron microscope invented, and by whom? What levels of magnification can an electron microscope achieve? How small is the SARS-CoV-2 virus and what is the magnification needed to see it?
- ★ Comment on, and explain whether an electron microscope is able to produce colour images of coloured objects. Besides what we see in *Cracking Covid*, briefly discuss the wider, practical uses of electron microscopes in other spheres of research and endeavour.
- ★ On poster paper illustrate and label the main functioning parts of an electron microscope.





AUSTRALIA'S CONTRIBUTION IN THE FIGHT AGAINST COVID-19



Carry out the following activities.

- ★ Comment on the important role played by Professor Eddie Holmes (virologist, University of Sydney), in acquiring a strand of the Wuhan SARS-CoV-2 virus genetic code. What were the circumstances that allowed him to achieve this feat? What were the immense and profound results and consequences of what he did with the SARS-CoV-2 genetic code once he received it?
 - » View the sequence of the film showing graphically, via an animated map of the world, the immediate importance of Holmes' actions. What does this map tell us symbolically about the work and ethics of science investigators in the search for knowledge and understanding? Consider terms such as collaboration and sharing.
 - » Holmes says that within two days of the genetic code being sent to the USA, two biotech companies – Moderna and Pfizer – had designed vaccines against the virus. Discuss in class how this might have been achieved so quickly, in contrast with the actual rollout of vaccines to the public at large, basically a year later. (We will look more closely at this aspect of vaccine research, development and production later, in the section titled, "Vaccines and vaccination".)
- ★ The first arrival of the SARS-CoV-2 virus into Australia was through an infected man flying into Melbourne from Wuhan, China, in late January 2020. We are told, though, that he was **not**



'Patient Zero'. Explain why. Why can we know that he was not Patient Zero if he was the first person to bring the disease into Australia? What did he and his family do, and achieve, to prevent the possibility of him becoming Patient Zero?

- » Explain the importance of the work done by Dr Julian Druce (virologist, Doherty Institute), in using the samples of SARS-CoV-2 taken from the Chinese arrival from Wuhan. What did Dr Druce and his team do with these samples which appears to have been a world-first outside of China?



ABOVE RIGHT: PROF EDDIE HOLMES AND SONYA PEMBERTON
 ABOVE: MICHAEL ROJALES IS INTUBATED IN ICU

» How is the procedure of growing a live virus carried out? Explain the importance and significance of growing a live virus in a testing laboratory. When is a virus considered to be ‘alive’? What can be learnt and put into practice from it? (See “Growing COVID in the lab” in website references.)

- ★ From the film, another Australian world-first in the race to understand and fight the coronavirus was the first study to compare immune responses in children and adults, led by Dr Shidan Tosif (Paediatrician, Murdoch Children’s Research Institute). Explain the specific events involving one Victorian family (Leila Sawenko, her husband and children), which then led to this study of almost 80 Victorian families taking place. What was the study testing for, and why? What were the findings of the study? Discuss the significance of those findings. (You will need to refer to the “innate immune system”, which we first encountered in our “Terminology” list at the beginning of this study guide. Also see the following section in more detail under the heading, “Body immune system defences”.)
- ★ During 2020 Australia was well on the way to producing its own COVID-19 vaccine, through the development at the University of Queensland, of the “Molecular Clamp” technology, led by virologists Professor Paul Young and Associate Professor Keith Chappell. Describe the way the molecular clamp was intended to work. You may wish to draw and label an illustration to show this visually. Comment first on the relative success, or not, of the initial testing results. What did the findings show so far as the fight inside the human body against the virus was concerned?



» Now discuss and explain what went wrong, and why the entire venture, the production of millions of vaccine vials, was halted and ultimately abandoned. Despite its success, what was “flawed” from the very beginning, about the way the molecular clamp was constructed? Would it have been possible to ignore the data of irrelevant and meaningless “false positives”, and to press on regardless, in testing to see if the vaccine was working? Comment on how the general impression in the media and community attitudes, were seen to interfere with, and prevent, the rollout of a successful vaccine.

- ★ The film presents some startling statistical figures on-screen, comparing daily reported cases in the United Kingdom to those at the same time in Australia:

August 5, 2020: Australia – 725; U.K. – 891
January 5, 2021: Australia – 19; U.K. – 61,087

» The first set of figures are relatively similar; the second set of figures are not. Taking into account relative population figures, discuss in class what these figures tell us about how the pandemic has spread in the two national jurisdictions, and the

measures taken, or not taken, to combat it. What are the range of factors that should be taken into consideration in explaining the raw figures? Can it be simply asserted that Australia has “done better” than the U.K. or had Australia paid a substantial cost, in various ways, to achieving these results without the benefit of a vaccine? Discuss the range of costs and problems – both short-term and long-term – that Australia has experienced in its measures to “flatten the curve”.



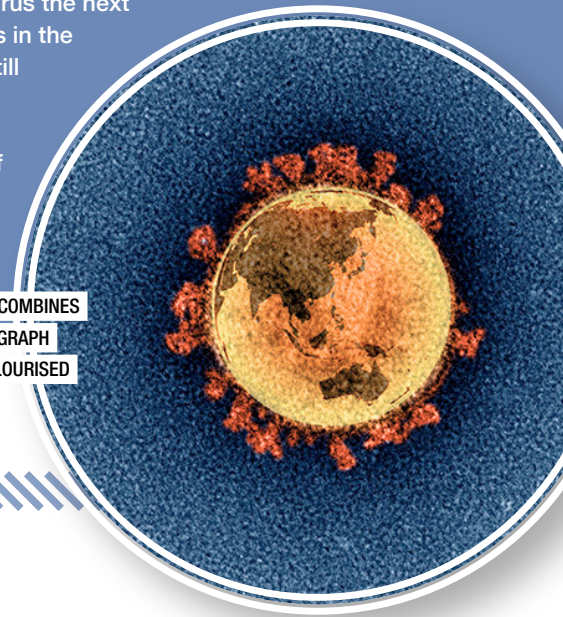
BODY IMMUNE SYSTEM DEFENCES

Carry out the following activities.

* You have already briefly defined the concept of the human body's Innate Immune System, or first line of defence, and the Adaptive Immune System, or second line of defence (see the Terminology list). From the film and other sources, create an illustrated, coloured and labelled poster display of the ways in which the parts of each system function, specifically as related to entry into the body of viruses such as the common flu and SARS-CoV-2 through the mouth and nose. In your display, include the eventual production of memory cells at the completion of the adaptive immune system response. You may need more than one poster to show the entire process of the innate and adaptive responses. Note that an alternative, or a follow-up to

a poster display, might be the planning and creation of an illustrated comic strip narration to explain the various processes and stages as an illustrated story. (See "Innate and Adaptive Immune Systems", and "Memory Cells", in website references.)

* Explain why, if memory cells are created for the purpose of recognising and mounting a defence to a specific virus the next time it appears in the body, it may still be necessary to rely on the introduction of a vaccine.



THIS BEAUTIFUL ARTWORK COMBINES BOTH AN ELECTRON MICROGRAPH OF SARS-COV-2 WITH A COLOURISED GLOBE IN THE CENTRE

VACCINES AND VACCINATION

Carry out the following activities.

* From the previous section, above, you may have created a poster display and/or comic strip of the natural bodily processes of developing immunity against pathogens. How does the introduction of a vaccine into the body affect or alter these processes? Does it even alter those processes at all, or merely enhance them, speeding them up?

Based on your previous poster display, plan and create an illustrated and labelled poster display where the vaccine replaces the virus.

* Comment on the risks of vaccination – adverse reactions and side effects – as opposed to the rewards of vaccination, for the individual, the local community, the nation and the world. In particular,

you may wish to examine the issue of community hesitancy towards the AstraZeneca vaccine, the reasons behind it, the role played by mass media news reports and commentary, and the statements and statistics about it, emanating from the specialist medical epidemiological community.

* The problem with a deadly pandemic is that, as we are informed in the program, "Making a new vaccine usually takes at least ten years". From the program and elsewhere if necessary, describe and explain the various steps, or phases, that are usually taken over years to bring a new vaccine through trials (with humans) to the stage



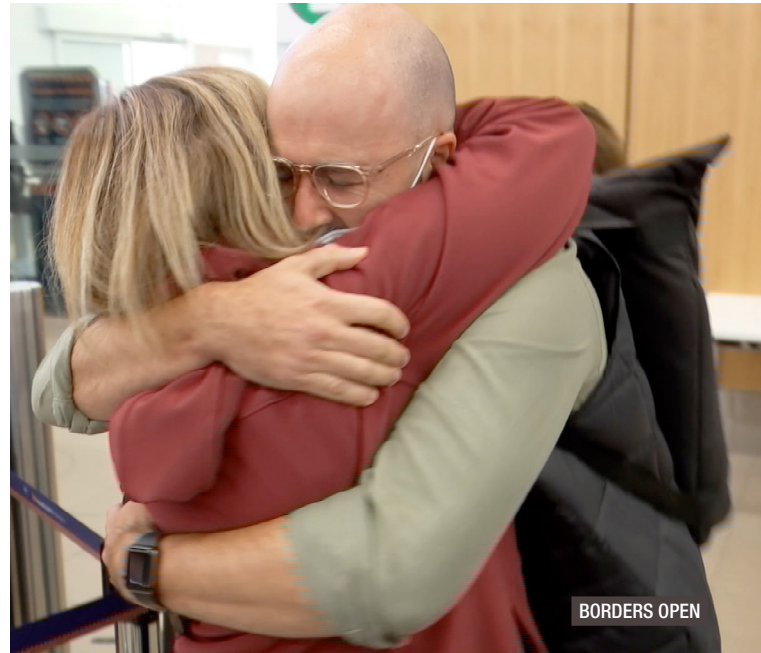
PETER DOHERTY
GETTING VACCINE

where it can be rolled out to the general, national populace, in such a way that it is determined to be clinically safe, has minimal side effects on people's health, and is effective in preventing infection and illness. What is the role, in Australia, played by the Therapeutic Goods Administration (TGA) in assessing, monitoring, controlling and approving new vaccines?

» You may be able to present your findings about the phases of development in the style of a flow chart, either shown on poster paper or using on-screen graphics software. (See "Phases of vaccine development" and "Therapeutic Goods Administration" in website references.)



- * Discuss the reasons and the risks, the pros and the cons, in fast-tracking the development and testing of vaccines. From the film, explain how the University of Queensland team were able to fast-track the development of their Molecular Clamp technology vaccine (called the "UQ vaccine") in such a way as to ensure total integrity with the vaccine trial process. We are told their timeline



of development is rearranged from linear (one step and phase after another) to "parallel". What does this mean? What had to be done to achieve "parallel" staging and phasing? How quickly was the team now planning to produce a successful vaccine in comparison to the standard time frame? At what stage of development were they at when the testing was abandoned? In a sense the abandonment of the fast-tracked Molecular Clamp vaccine testing regime could be viewed as a positive rather than a negative. Do you agree? (See "Fast-tracking of COVID vaccines" in website references.)

- * Discuss the purpose and necessity of "booster", or second vaccinations some weeks or months after the initial vaccination. Comment on why it is not advisable or possible to have one large vaccination dose instead of multiple smaller ones. Will annual vaccinations protecting against COVID-19 disease be the norm? (See "Booster vaccinations" and "Articles on vaccinations" in website references. Note that the latter reference is a curriculum link from the Australian Curriculum Years 9/10 Health and Physical Education subject)



- * The more people who are infected by a virus such as SARS-CoV-2, the more likely the virus will alter, or mutate in



one person, and then, itself, will spread to other people, and become a wide-spread variant. From the film (animation sequence of ATCG genetic code, approx. at 59.20 minutes run-time) and also from other sources if required, describe and explain how this can happen. You may wish to illustrate and label your own diagram of this procedure. (See “Variant SARS-CoV-2 strains” in website references.)

» Comment on the problems a mutation and hence a variant strain of SARS-CoV-2 might present for an already-established and effective vaccine. How might these problems be overcome? Carry out some research, for example, on the seasonal influenza outbreaks in Australia, and whether the vaccines created to protect against the virus have the same “recipe” every year.

★ Even after rigorous testing, vaccines designed to save millions of lives may later be demonstrated to cause unwanted side-effects when administered to people. Although most side effects appear to have been minimal, short-lived and harmless, comment on this issue, looking in particular at the history of the rollout of the AstraZeneca COVID-19 vaccine. The AZ vaccine has been shown to prevent severe illness, hospitalisation and death from COVID-19. However it also can cause very rare but serious side effects, called blood clots.

» Explain the risks associated with the AstraZeneca vaccine, and the actual statistical chance of anyone suffering a severe reaction and even death from it? Consider how the balance between the benefits and risks changes, depending on how much disease is circulating in the community.



PETER DOHERTY



MICHAEL AND RACHEL ROJALES

THREE CASE STUDIES

Throughout *Cracking Covid* the filmmakers follow the lives and fortunes of three people who contracted SARS-CoV-2, how each of them responded through illness in different ways to the virus, and what medical researchers and we, as observers, may have learnt and discovered from their range of experiences. Carry out the following activities related to the three participants.



LEILA SAWENKO, TONY MAGUIRE AND THEIR CHILDREN LENNY, BODHI AND MARLEY.

- * First, write a short account of the lives of the three participants, and the different path each of them took on their “journey” through SARS-CoV-2 infection. Where or how did each of them contract the virus? Describe the main differences in the effects of having COVID on each, and their relative rates of recovery.

- MICHAEL ROJALES
- MIRABIA NICHOLSON-MCKELLAR
- LEILA SAWENKO

- * From the film, discuss the explanation as to why Michael’s health deteriorated so quickly and drastically once he became infected with the SARS-CoV-2 virus. Comment on whether he had any known risk factors which may have contributed to his rapid decline. In responding to these questions ensure you refer to the human body’s Innate Immune System and the way it functions. As with your previous explanatory illustrations of the process of acquiring immunity, plan then draw at cellular level what was happening in Michael’s case.

» When it looked like Michael’s condition was reaching critical levels, the medical staff performed a procedure that saved his life. Explain what they did, and why it worked.

- * Comment on what happened to Michael’s wife and mother in-law, and the combined effect this had on his teenage daughter, Megan. Where was she while this trauma was happening? Describe what she had to endure and how this single case was representative of what was happening to families all around the world.



MIRABIA NICHOLSON-MCKELLAR BEEKEEPING



- ★ Let us return to Mirabia. Although she was increasingly becoming ill, explain why it was difficult, if not impossible, for Mirabia to initially be diagnosed as having contracted COVID-19. (Note that when she discusses this on the soundtrack, the filmmakers insert a number of photographs of her. Examine how the mood of the selected photos gradually alters in line with what she is reporting about her declining health.)
- ★ We are told that Mirabia's inability to completely recover is called "Long COVID". Describe the long, repetitive, cyclical nature of her condition. What has she discovered about it that at least gives her an awareness that she is not alone in the world, that she is not the only one caught between quick recovery on one hand, and death on the other? (See "Long COVID" in website references.)
- ★ Mirabia's physician, Dr Joel Hissink, sends her blood samples to be tested at the Doherty Institute. From the film, discuss the findings of those blood tests. What do you think they indicate



MIRABIA

presented as a series of emails, diary entries, phone conversations, recorded messages, or traditional fiction devices.

- ★ Returning to Leila's experiences with COVID-19, we discover that although she and her husband tested positive with mild symptoms, her children, showing no symptoms, all tested negative, via the usual procedure of nasal and mouth swabs. However, later blood tests indicated that the children had been infected. From the film, explain why they were showing no symptoms. What element was protecting the children, giving them immunity to the coronavirus? (Note that more about this research may be found in the section, above, headed "Australia's contribution in the fight against COVID-19".)
- ★ Overall, comment on the inclusion throughout the film, of these three clinical cases in the fight to control, eradicate and understand the coronavirus. Include discussion on the purpose, relevance and importance of personalising or humanising the subject throughout the documentary, in making it relevant to a wide viewing audience. (Since this film was completed Mirabia booked her COVID vaccination and outbreaks have caused fresh lockdowns across Australia).



MIRABIA AND HER MUM

about Mirabia's Long COVID symptoms, and what might now be an appropriate way to tackle the problem, and perhaps break the cycle? In connection with this, read the first listed web references under the "Long COVID" heading for possible causes and clues.

- ★ The narrator's voice-over informs us that Mirabia, when young, had never been vaccinated for any viruses. Discuss whether you think this might be a significant factor to leaving Mirabia more susceptible to infection.
- ★ Drawing from the film and further viewing and reading, plan and write a short fiction story about someone who has Long COVID. You may use any style or approach you see fit: first or third-person narration, genre, present or past tense, use of narrative flashbacks or flash-forwards, settings and character relationships. Your story may be



LENNY, BODHI AND MARLEY

IMPROVISATION

Carry out the following activities relevant to *Cracking Covid*. If necessary, as a preceding background activity, discuss in class the meanings of the words, “improvisation” and “motif”, and offer some examples of each from outside the scope of this film. For example, have you ever been in a situation where you’ve been compelled, with little or no warning, to improvise? How did it work out?



COMPOSER
DALE CORNELIUS

- ★ The theme of improvisation is presented in an audio-visual way throughout the film from beginning to end. Discuss the purpose of the various sequences in which musician Dale Cornelius films and records himself in different, on-going sessions playing the piano. Explain the original intention of the improvised music being played and recorded, and why you think the filmmaker, Sonya Pemberton, decided to include it as a central motif of all we see and experience of the COVID-19 pandemic during the film.
- ★ Analyse and comment on the construction of each of the sequences in which Cornelius appears, and the style of music he is playing. Look, for instance at the way the camera is positioned, framed and angled at the subject, and also the specific use of lighting. Listen carefully to way in which audio is presented – the sensation, perhaps of a vast sound vacuum, or an echoing wind, where each note of music played stands out. What do you think Cornelius is attempting to create and express, here, through the combination all of these techniques and elements, in relation to the COVID pandemic?
- ★ Discuss whether these sequences of musical improvisation change or alter as the other “pandemic” contents of the film develop, shift and alter through time, from early 2020 into 2021. Compare in particular the first sequence in which Cornelius appears (the opening scene) to the final sequence in which he improvises (approx. at the 71.30-minute point of program runtime). In what way does the filmmaker mix and incorporate this sound and image into the story of the pandemic, at both points of film? (Note that in both sequences the film dissolves visually to water images, first under it, then above it.)
- ★ Discuss how the concept and the reality of improvisation and of adjustment plays out not only in the work of the scientists portrayed on-screen, but in the lives of people generally (as seen in the film’s three case studies), and in the filmmaking decisions Pemberton has had to incorporate. In responding, take into consideration her own comment, early in the film, that, “I’d no idea that my hometown of Melbourne would head into 111 days of lockdown, or that I’d end up *appearing* in my own film”. What had been her original intentions for the film?



ISSUES AND IDEAS FOR FURTHER DISCUSSION AND DEBATE

Carry out the following activities relevant to *Cracking Covid*.

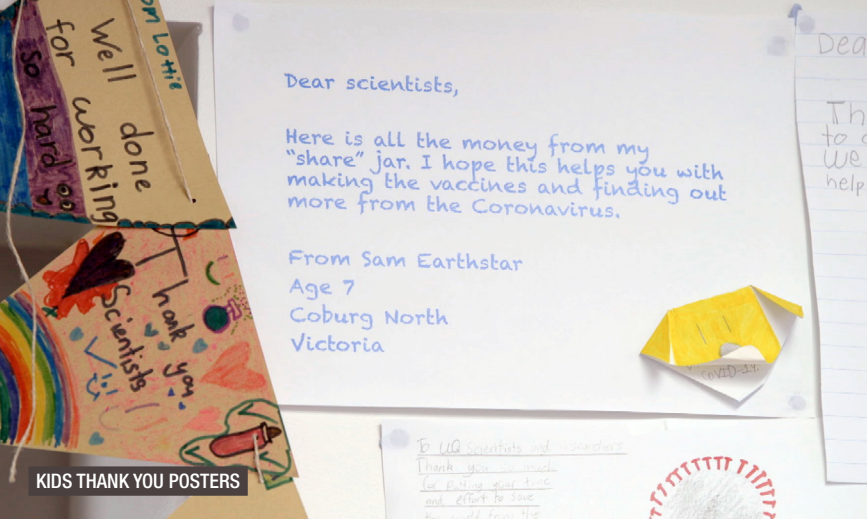
- ★ Overall, how will you remember the COVID-19 pandemic in years to come? Write a letter to yourself about it, to where and who you will be in 20 years' time. You may also imagine who and where you are at some point in the future, writing a letter to your younger self of today. What would you say to your younger self?
- ★ When it comes to ensuring the safety of the community at large at a time of pandemic, public health policy is a priority of all state and federal jurisdictions in Australia. On television, for example, since COVID-19 began to break out across Australia in early 2020, we have seen the faces and heard the words of every state and federal Chief Health Officer, the men and women who advise government leaders on how to respond to the pandemic, and the role the community should play in this. (See "Public health policy" in website references.)
 - » Discuss what you think in general is the public health policy of the states and federal jurisdictions towards the COVID-19 pandemic in Australia, in terms of weighing up levels of, and tolerance towards infection numbers, illness and death, with "herd immunity" (via widespread infection or vaccination), with suppression through community lockdowns and restrictions, with economic impacts through employment loss, with mental health issues, with state, national and international border closures, and vaccination programs, and with methods and means of quarantining. You may wish to compare state to state, states to federal, and Australian in general to other countries.
- ★ Throughout the film we see snippets of mass media reports. View those snippets then comment on their messaging and impact on the viewing audience. For example, is the tone informed and rational, or emotive, perhaps even sensationalised? As an exercise try writing two different news reports on the same news story – it may be about the research into COVID-19 disease itself, or about outbreaks in the community, vaccination, or connected issues such as border closures, lockdowns and protests.

- ★ To what extent does civic duty – the necessity to follow and abide by government mandates to the community during a pandemic emergency – rub up against our assumed individual rights and freedoms in a pluralist democracy such as Australia? In a pandemic should the State use punitive measures such as police fines and arrests, to enforce community restrictions such as lockdowns, curfews, business and sports closures, wearing of masks, quarantining at home or in designated locations, limiting community gatherings (including anti-restriction protests), and border closures?
- ★ Apart from exemptions on medical and health grounds for specific individuals, in a pandemic should vaccination be compulsory? Should those



who prefer not to be vaccinated be allowed, for instance, to travel across state borders, fly in and out of the country, or attend large public gatherings such as sporting events?

- ★ Regardless of budgets, financial constraints and general economic policy, is it the duty of state and federal governments to compensate and look after the welfare, in every possible way, of those who lose their employment or their businesses, their income-producing means, due to a pandemic and the measures taken to combat it?



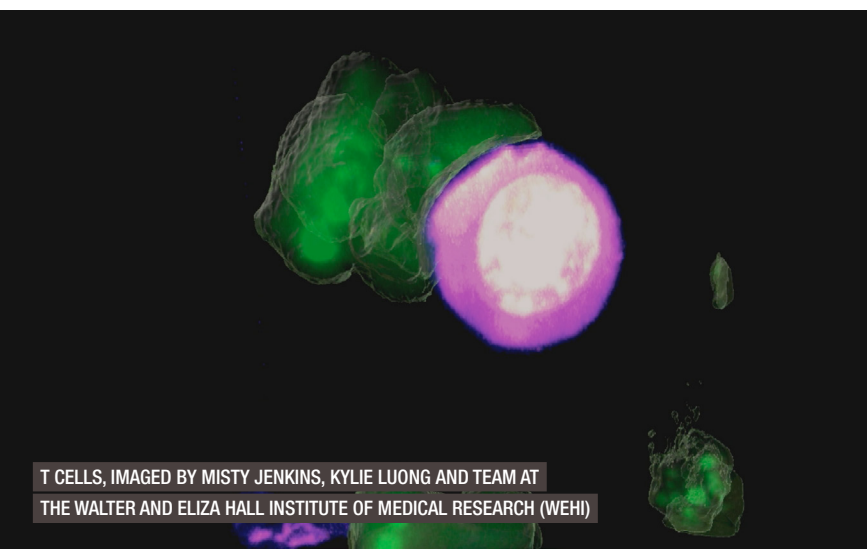
KIDS THANK YOU POSTERS



HOSPITAL WARD ICU



MARLEY SAWENKO

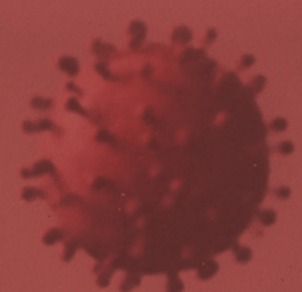


T CELLS, IMAGED BY MISTY JENKINS, KYLIE LUONG AND TEAM AT THE WALTER AND ELIZA HALL INSTITUTE OF MEDICAL RESEARCH (WEHI)

CONCLUSIONS

Carry out the following activities derived from your viewing of *Cracking Covid*.

- * Discuss why the film's producers considered that *Cracking Covid* was a suitable title for the documentary.
 - » If you were asked to give the film an alternative title, what would you call it, and why?
- * Discuss the purpose of the extended concluding scene where Peter Doherty and wife, Penny, are followed by the camera as they leave their home for the location nearby where they are to be vaccinated, then later sit together at a café. Comment on the overall mood, the visual setting and emotional environment, and what it might mean to the audience viewing the film about a pandemic they are presently living through.
 - » Why do you think he says, in this scene, "If you're not going to vaccinate... you're on the side of the virus"? What choices is he offering to us, and why?
- * Comment on the ending of the film. Is it, in fact, an ending in the typical sense of a story's conclusion, or does it offer more than this? For example, could it be considered as a "chapter" or an episode to a greater story?
- * Working in pairs plan and construct a scripted storyboard for a 30-second promotional video about *Cracking Covid*, designed for television screening. In groups you may then wish to produce, record and edit your promo. Consider your use of text captions, sound and film "grabs" of visual content, music, sound effects and dialogue to tie it all together into a cohesive, effective advertising message.
- * Plan and write a review in 250-300 words of *Cracking Covid*, for the general arts review pages of a daily or weekly national newspaper.





FOR THE TEACHER: TITLE ANIMATION SEQUENCE AS SCRIPTED

THE FOLLOWING EXTRACT OF THE SCRIPT RELATES TO AN ACTIVITY IN THE “INTRODUCTION” SECTION OF THIS STUDY GUIDE. IT IS DIRECTOR SONYA PEMBERTON’S DESCRIPTION OF THE FILM’S INTRODUCTORY SEQUENCE IN WHICH AN ANIMATION AND THE SCREEN TITLE IS PRESENTED.



FILMMAKER AND
NARRATOR SONYA
PEMBERTON

Start of script extract:

CUT back to Sonya at computer.

Of course, I'd no idea that my hometown of Melbourne would head into 111 days of lockdown, or that I'd end up *appearing* in my own film. Like everyone, I'm improvising. And trying to make sense of it all.

Sonya at computer becomes a sketchy drawing.

Scene 2 - OPENING TITLE SEQUENCE/ ANIMATION #1 OPENING TITLE

Morphs through to a sketchy animated planet, Australia featured.

Music up – our theme.

Cut to an elegant animation sequence, with hand-drawn elements, impressionistic.

We start wide on the planet, at the population level. A wave of DARKNESS appears, the virus is spreading from China across the entire planet. Then LIGHTNESS then SPREADS, science fighting back.

CARD 1: The AUSTRALIAN BROADCASTING CORPORATION

The globe cleverly transitions, we see a hint of a clock – there is urgency here.

Then it becomes the circle of a Petri dish, a drop of human blood spreads across the surface. This is the human level. The blood of the people infected.

CARD 2: in association with FILM VICTORIA

Full frame blood.

CARD 3: presents

A GENEPOOL PRODUCTION

The blood takes us into live action of immune cells (T cells) engulfing a virus-infected cell. (Misty Jenkins footage) This is the front line, where the battle is won or lost.

CARD 4: CRACKING COVID

We see the T cell destroy the infected cell.

Music is positive – a battle has been won.

Fade to black.

End of script extract.



SONYA PEMBERTON. SONYA STANDS IN FRONT OF MELBOURNE'S MURALS ARTWORK "FRONTLINE WORKERS" IN MELBOURNE (MELBOURNEMURALS.COM.AU)



References and further resources

BOOKS

- Catherine Arnold, *Pandemic 1918: The Story of the Deadliest Influenza in History*, Michael O'Mara Books Ltd, London, U.K., 2018.
- Catherine Carver, *Immune: How Your Body Defends and Protects You*, Bloomsbury Sigma, London, U.K., 2017.
- T. Devasena, *Nanotechnology-COVID-19 Interface*, Springer, Singapore, 2021.
- Larry O. Gostin, *Public Health Law: Power, Duty, Restraint*, University of California Press, Berkeley, 2008.
- Robert C. Horton, *The COVID-19 Catastrophe: What's Gone Wrong and How to Stop it Happening Again*, Polity Press, Cambridge.
- David Isaacs, *Defeating the Ministers of Death: The Compelling History of Vaccination*, HarperCollins Publishers, Sydney, NSW, 2019.
- Jolanda Jetten et al, *Together Apart: The Psychology of COVID-19*, SAGE Publications, London; Thousand Oaks, California, 2020.
- Rae-Ellen W. Kavey, Allison B. Kavey, *Viral Pandemics: From Smallpox to COVID-19*, Taylor and Francis Group, Milton, 2020.
- K.C. Santosh, Amit Joshi (eds.), *COVID-19: Prediction, Decision-Making, and its Impacts*, Springer, Gateway East, Singapore, 2021.

FILM/TV

- Other films of relevance by director, Sonya Pemberton:
- Jabbed: Love, Fear and Vaccines* (2013)
- Vaccines: Calling the Shots* (2014)
- See website: <<https://genepoolproductions.com>>
- List of 16 films about pandemics, viruses and quarantine (documentary and fiction):
- See website: <<https://www.joincake.com/blog/movies-about-pandemics/>>
- Episode of *Australian Story* series (ABC TV) about the Spanish Flu:
- See website: <<https://www.youtube.com/watch?v=-YmOnJim5wU>>

WEBSITES

- ACTG:
- <<https://medlineplus.gov/genetics/understanding/basics/dna/>>, accessed 21 June, 2021
- <<https://www.genome.gov/genetics-glossary/acgt>>, accessed 21 June, 2021
- Articles on vaccinations:
- <<https://theconversation.com/au/topics/vaccination-33>>, accessed 1 July, 2021.
- Booster vaccinations:
- <<https://theconversation.com/why-do-we-need-booster-shots-and-could-we-mix-and-match-different-covid-vaccines-155951>>, accessed 28 June, 2021
- <<https://www.theatlantic.com/science/archive/2021/06/covid-19-vaccine-booster-shots-probably-inevitable/619272/>>, accessed 28 June, 2021
- Doherty Institute:
- <<https://www.doherty.edu.au/>>, accessed 18 June, 2021
- Electron microscope:
- <https://en.wikipedia.org/wiki/Scanning_electron_microscope>, accessed 28 June, 2021
- <<https://www.youtube.com/watch?v=8TaXtCOZV4o>>, accessed 28 June, 2021
- <https://www.va.gov/DIAGNOSTICEM/What_Is_Electron_Microscopy_and_How_Does_It_Work.asp>, accessed 28 June, 2021
- <<https://www.news-medical.net/life-sciences/History-of-the-Electron-Microscope.aspx>>, accessed 28 June, 2021
- Fast-tracking of COVID vaccines:
- <<https://www.chemistryworld.com/news/what-are-the-risks-of-fast-tracking-a-covid-19-vaccine/4012130.article>>, accessed 23 June, 2021
- <<https://www.mphonline.org/coronavirus-vaccine-progress/>>, accessed 23 June, 2021
- <[https://www.thelancet.com/journals/lanmic/article/PIIS2666-5247\(21\)00034-3/fulltext](https://www.thelancet.com/journals/lanmic/article/PIIS2666-5247(21)00034-3/fulltext)>, accessed 23 June, 2021
- Growing SARS-CoV-2 in the lab:
- <<https://www.scientificamerican.com/article/australian-lab-first-to-grow-new-virus-outside-china/>>, accessed 21 June, 2021
- Innate and Adaptive Immune Systems:
- <<https://www.ncbi.nlm.nih.gov/books/NBK279396/>>, accessed 22 June, 2021
- <https://en.wikipedia.org/wiki/Innate_immune_system>, accessed 22 June, 2021
- <https://en.wikipedia.org/wiki/Adaptive_immune_system>, accessed 22 June, 2021
- <<https://www.youtube.com/watch?v=PzunOgYHeyg>>, accessed 22 June, 2021
- <https://www.youtube.com/watch?v=9_uTdCHp7vl>, accessed 22 June, 2021



Long COVID:

- <<https://newsroom.unsw.edu.au/news/health/long-covid-what-it-and-what-do-we-know-about-it/>>, accessed 25 June, 2021
- <<https://www.youtube.com/watch?v=vkSI87l8eqc>>, accessed 25 June, 2021
- <<https://www.abc.net.au/news/2020-10-01/uk-long-covid-19-survivors-form-group-to-discuss-symptoms/12701112>>, accessed 25 June, 2021

Memory Cells:

- <<https://www.sciencedaily.com/releases/2020/11/201102110039.htm>>, accessed 22 June, 2021
- <<https://theconversation.com/coronavirus-b-cells-and-t-cells-explained-141888>>, accessed 22 June, 2021

Nobel Prize:

- <<https://www.nobelprize.org/>>, accessed 18 June, 2021

Phases of vaccine development:

- <<https://www.who.int/news-room/feature-stories/detail/how-are-vaccines-developed?>>, accessed 23 June, 2021

<<https://www.wellrx.com/news/understanding-the-vaccine-development-process/>>, accessed 23 June, 2021

<<https://www.healthdirect.gov.au/covid-19-vaccination/about-the-covid-19-vaccines>>, accessed 23 June, 2021

Public health policy:

- <<https://onlinelibrary.wiley.com/doi/10.1111/imj.15038>>, accessed 29 June, 2021
- <<https://www.health.gov.au/resources/publications/australian-national-disease-surveillance-plan-for-covid-19>>, accessed 29 June, 2021
- <<https://mspgh.unimelb.edu.au/research/mspgh-covid-19-research-news>>, accessed 29 June, 2021

Spanish flu:

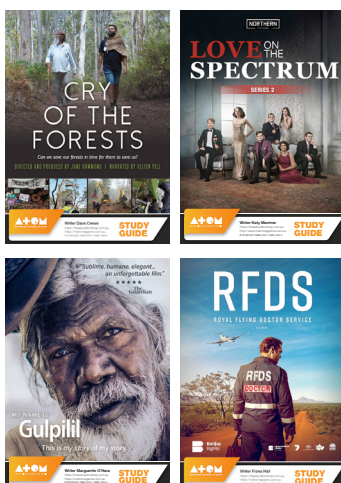
- <https://en.wikipedia.org/wiki/Spanish_flu>, accessed 23 June, 2021
- <<https://www.nma.gov.au/defining-moments/resources/influenza-pandemic>>, accessed 23 June, 2021
- <<https://www.history.com/topics/world-war-i/1918-flu-pandemic>>, accessed 23 June, 2021
- <<https://www.cdc.gov/flu/pandemic-resources/1918-pandemic-h1n1.html>> accessed 23 June 2021

Therapeutic Goods Administration:

- <<https://www.tga.gov.au/>>, accessed 23 June, 2021

Variant SARS-CoV-2 strains:

- <<https://www1.racgp.org.au/newsgp/clinical/what-s-the-difference-between-mutations-variants-a>>, accessed 24 June, 2021
- <<https://www.who.int/news-room/feature-stories/detail/the-effects-of-virus-variants-on-covid-19-vaccines>>, accessed 24 June, 2021 0



ATOM study guide

This study guide was produced by ATOM. © ATOM 2021. ISBN: 978-1-76061-428-7

Terms of use: <<https://theeducationshop.com.au/terms-conditions/>>

Contact: editor@atom.org.au

Study guide design: Pascale van Breugel.

More resources

To download other study guides, plus thousands of articles on Film as Text, Screen Literacy, Multiliteracy and Media Studies, visit <<https://theeducationshop.com.au>>.

Join our invitations list

Join ATOM's email broadcast list for invitations to free screenings, conferences, seminars, etc. Sign up now at <https://metromagazine.com.au/email_list/>.