

Whasanian

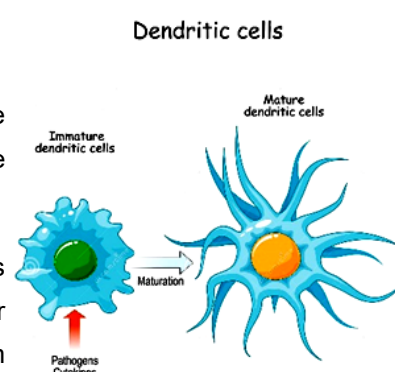
(Cross-curriculum issue)

What makes Ebola so dangerous?

Chan Chun Sheung, Oscar (Graduate of 2020)

How can a virus overwhelm such a complex immune system in our body in such a short period of time? To know about this, we have to learn about the immune system. Our immune system is extremely complex. As the head of the immune system, dendritic cells are crucial to tell the B and T **lymphocytes**¹ that there is an infection in our body.

Unfortunately, the Ebola virus is very smart. It strikes the dendritic cells, preventing them from emitting signals. Once the Ebola virus has entered the cells, it releases its genetic material (RNA) to take over and reprogram them. In a nutshell, it becomes a 'factory' for producing Ebola virus. Meanwhile, the infected dendritic cells will order virgin B and T cells to kill themselves, so the immune system will seriously be disrupted and unable to react. Then, the virus will attack every part of the body, especially the liver.



Ebola Virus

Apparently, our body would not adopt a wait-and-see attitude to let the virus encroach the entire body. The immune system would launch a **cytokine storm**² which is an SOS signal that causes the immune system to launch all its weapons all at once. This hurts the virus but leaves behind tons of damage, especially in the blood vessels, taking away more and more fluid from the blood stream so there is just not enough blood to carry oxygen, seriously dehydrating body cells and causing death.

Nevertheless, currently, the only way to get infected by Ebola is to come into contact with the person or bat that is infected. Otherwise, the most dangerous virus on the planet might turn out to be not very dangerous at all.

¹ Lymphocyte: a form of small leukocyte (white blood cell) with a single round nucleus, occurring especially in the lymphatic system

² Cytokine storm: an overactive immune response occurring in various diseases, characterized by the excessive production of cytokines and resulting in intense localized or generalized inflammation

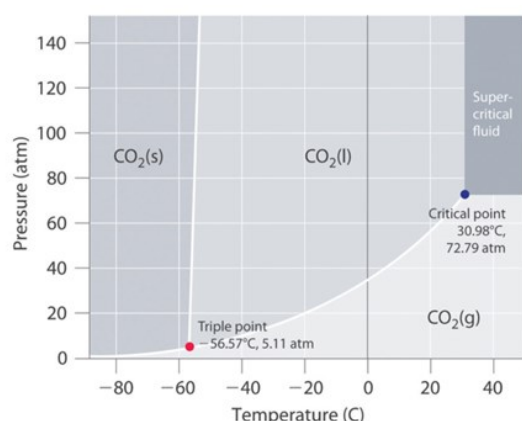


Liquid CO₂

Chen Ka Man, Carmen (4A) & Wong Wing Yin, Mi (4A)

Under normal conditions, carbon dioxide (CO₂) appears in solid form (as in dry ice) or in gaseous form (as in the air). Do you know carbon dioxide can also exist in liquid form?

Carbon dioxide may exist as a solid, a liquid, or a gas under different combinations of pressure and temperature. The atmospheric pressure at sea level is approximately 1 atm. Under this pressure, CO₂ can only exist in solid form or gaseous form. When solid CO₂ is warmed to above -78°C, solid CO₂ simply vaporises (or sublimates). That means the liquid form of CO₂ does not exist at 1 atm. Solid CO₂ will undergo sublimation to form gaseous CO₂ and gaseous CO₂ will undergo deposition to form solid CO₂ at normal temperature and pressure.



At a pressure of over 5.1 atm, CO₂ may exist in liquid form. When CO₂ gas is highly compressed and cooled to a temperature under 31 °C and above -57 °C, it will turn into CO₂ liquid.

The phase diagram of carbon dioxide gives us information that the three physical states of CO₂ (i.e. solid, liquid and gas) can co-exist at a pressure of 5.1 atm and a temperature of -57 °C. Supercritical fluid of CO₂ can also be formed where CO₂ is kept at or above its critical temperature (31 °C) and critical pressure (73 atm). Under such conditions, distinct liquid and gas phases of CO₂ do not exist.

Nowadays, the demand for liquid CO₂ in various industries has grown tremendously. The importance of liquid CO₂ in food industry cannot be understated. The food industry largely relies on liquid CO₂ for refrigeration, preservation, storage and softening. Liquid CO₂ is used as an important cryogenic cooling agent which is used directly as a food preservative that maintains the food at constant temperature. For instance, it is used during the transportation of ice cream because of its high volumetric cooling capacity.

Although we can't usually see liquid CO₂, it's always used in our lives. Amazing!

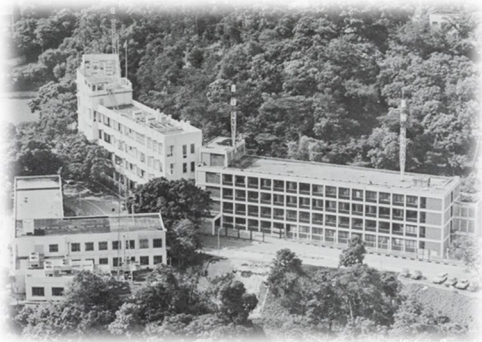
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Moving into The Darkest Time of Hong Kong in History

Wong Cheuk Man, Anson (4A) & Hui Ka Chun, Augustine (4A)

Hong Kong, a colonial city of the British Empire for over 100 years, was an entrepot of the British Empire during the early 20th century. When WWII started, conflicts between The Allies and the Axis increased a lot. As Japan wanted to expand its territory, it wanted to occupy a port for transporting supplies to the Japanese Army in mainland China. Since Hong Kong had an advantageous geographical location, it became a target of Japan. They started to attack Hong Kong on 8 December 1941 until 25 December 1941 as Mark Young, the governor of Hong Kong, surrendered to the Japanese troops at the Peninsula Hotel.



The combined headquarters near Victoria Barracks



Japanese troops marching south after crossing the border

The essential prelude to a good mental health

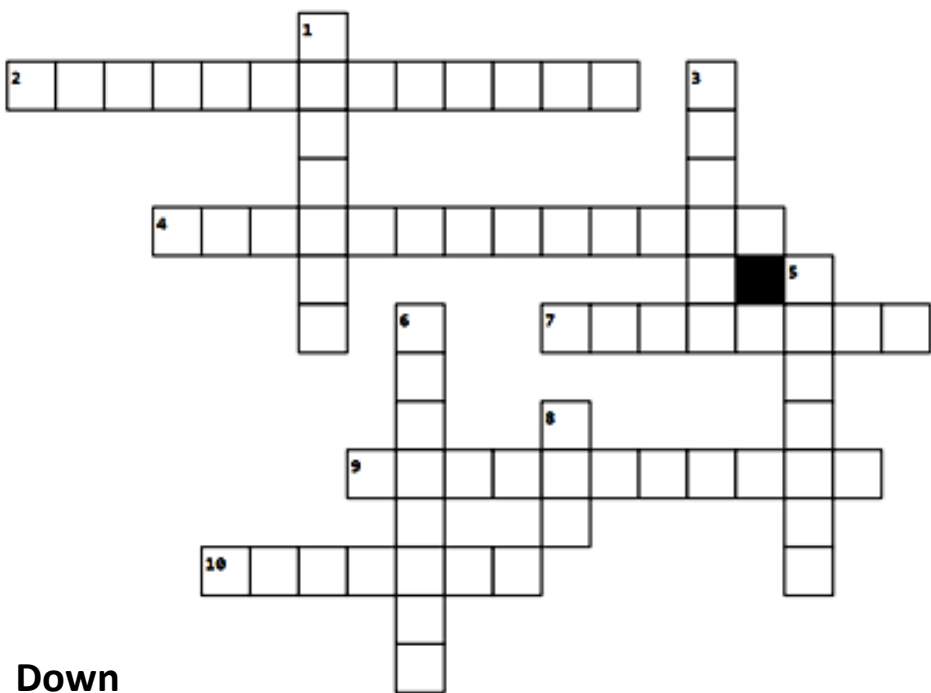
Koo Pak Lam, Logan (5A)

Encountering countless quizzes and supplementary classes that seem never-ending, would you feel pressurized? Everybody would have experienced times when stress accumulated, so how should we relieve our stress and achieve a better mental health?

One of the tips I find handy at times is to distinguish clearly between work time and leisure time. This is because some people still handle simple stuff during their leisure, which will gradually take up their leisure time and put stress on their shoulders. Hence, drawing a line between working and relaxing ensures a sufficient amount of leisure time, improving mental health.

On top of that, try to talk to your buddies or teachers for help when needed. We should realize the fact that the power of one to conquer challenges is limited. Finding more people to help gathers power and solving problems will become much simpler.

If life is a running track, pressure will be one of the stones on it. It can be a stepping stone, assisting you when you learn to balance the amount of pressure. It can also be a stumbling stone, tripping you off at key moments. Learn to curb your pressure using the above tips, I'm sure it can be one of your life's stepping stones, too!



Down

1. The study of living organisms
3. A need for something to be sold or supplied
5. The money received from customers when goods and services are sold
6. A state or situation in which something needed cannot be obtained in sufficient amounts
8. A part of the circumference of a circle

CROSSWORD CORNER

Across

2. The process by which particular goods and services, or social and cultural influences, gradually become similar in all parts of the world
4. Following the order in which a series of events happened
7. How steep a line is
9. The activity or job of writing computer programs
10. A woman or girl with a voice that can sing the highest notes

THE BATTLE OF HONG KONG

(8 DECEMBER – 25 DECEMBER 1941)

8 DECEMBER 1941

The Japanese army launched an attack in North New Territories, capturing Fanling, Ta Kwu Ling and other places in New Territories in one day.

9 DECEMBER 1941

The Japanese army started the attack on Gin Drinkers Line. After a 2-day battle, Shing Mun Redoubt had fallen and the Gin Drinkers Line was also destroyed. The British Army retreated to Castle Peak road to defend against the attack of the Japanese troops.

12 DECEMBER 1941

The British Army had retreated to Tsim Sha Tsui due to the lack of supplies and poor communication between Battalions. Unfortunately, more and more Japanese troops landed on the Kowloon Peninsula. After the fall of Kwai Chung, Shing Mun Redoubt and Golden Hill, the British Army retreated to Hong Kong Island to prepare for their last battle.

13 DECEMBER 1941

Japan offered terms of surrender but the British Colonial Government rejected it. The Japanese then began a heavy bombardment, causing incalculable damages.

17 DECEMBER 1941

The Japanese was prepared to launch their main assault on Hong Kong Island and later landed successfully in places like North Point and Sai Wan.

19 DECEMBER 1941

The Japanese occupied Wong Nai Chung Gap, where the headquarters of the British Defence of Hong Kong was located. The British Army has tried several times to gain back some of the lands, but their efforts were in vain.

20 DECEMBER 1941

The Japanese had consolidated their control over the centre of Hong Kong Island. Not so long after, the south Hong Kong Island was also occupied, meaning that the entire Hong Kong Island had been occupied.

25 DECEMBER 1941 (BLACK CHRISTMAS)

The British Colonial Government reckoned that further resistance was fruitless and decided to officially surrender. The Japanese occupation of Hong Kong then began and lasted for three years and eight months.

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