# *Let's Make It All Simple!*


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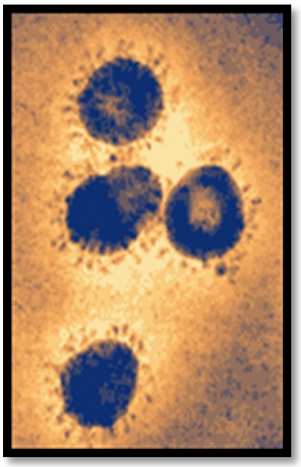
## The particle of Mayhem

The thing that has been dominating our mind for the last couple of weeks is the now infamous Corona-virus. The fancier name scientists use to call this virus is SARS CoV 2 (essentially saying it is a virus similar to SARS causing virus from the family coronaviri-dae; maybe think of SARS virus and SARS CoV 2 as cousins of each other). Generally referred to as a novel Coronavirus; is essentially just a particle. The reason we don't call it a cell but rather a particle is because of an unresolved dispute in the scientific community. But more on that later! So this particle is basically a structure of different proteins inside of which lies the genetic mate-rial of the virus. This arrangement is kind of ana-logues to the skull and the brain. The genetic material inside is the one that makes most important deci-sions for this particle like the brain.



**The SARS- CoV 2 virus looks similar to the top view of a crown (CDC.com)**

However unlike skull; the protein covering is not just protective but also important in decid-ing the fate of this virus. The protein coating has spikes all over its surface which are also proteins literally named spike pro-teins. These spike proteins on the surface of the virus under electron microscope look like a crown. The Spanish word for crown became the name of this virus family: Corona (the suffix - viridiae is just to tell us that it is a virus family).

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# Spike Proteins

The reason these spike proteins are the reason the viruses of this family get this now popular name could be due to their essential role in causing an infection.

Imagine these spikes as a missing piece of a particular puzzle; looking for the rest of the incomplete puzzle. These spikes when come in contact with particular surface proteins on host cells of virus it's like the puzzle gets completed. If this process of finding correct surface proteins on host cell occurs then only the virus can enter that cell and start its life.

***"Imagine these spikes as a missing piece of a particular puzzle; looking for the rest of the incomplete puzzle."***

# Viruses

**What are viruses?**

Viruses are many times considered as particles made up of proteins rather than as living beings. For over a century, scientific community has been changing its mind about viruses and how to classify them. Initially they were thought of as poisons, then as some chemical entity. Now we think of them as something that falls in the region between living and non-living worlds.

***"Viruses, on their own cannot produce new viruses ."***

**How are viruses different from other living beings?**

All of living beings are classified into 5 Kingdoms based on their similarities and differences. They include one kingdom for each of the following: bacteria, all single celled organisms, all fungi, plants and all of animals.

All of these living beings are capable many activities that make them "living". One of the main activity that all living beings perform is reproduction. Viruses, on their own cannot produce new viruses. And thus we cannot really classify them as living beings.

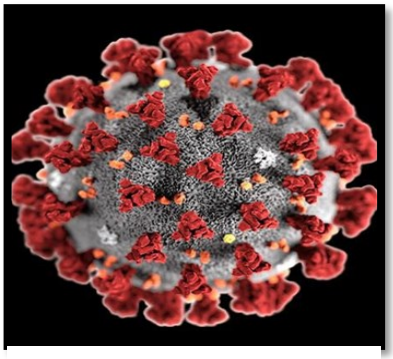
***"It is difficult to call them either living or non-living."***

However when these viruses enter their target organisms, they can reproduce. So they cannot be called non-living too.

Similarly all living beings have the ability to perform cellular activities collectively termed as metabolism. Viruses don't have the machinery required to do any cellular activities on their own but again once inside a target organism they use its machinery to perform all their activities. Hence it is difficult to call them either living or non-living.

**What is this Corona virus?**

To start with Corona is a family of viruses which includes multiple viruses. A family is a term (along with many different terms like used in biology used to classify similar beings in a category. A way of dividing viruses into such category is based on their structure, do they have DNA/RNA and other questions like these.



Public Health Image Library, CDC (ID: 23311)

# Novel Corona Virus

**What does novel Coronavirus mean?**

A novel Corona virus means a virus which is new and has not been encountered before by anyone in any part of the world. Best way to explain this is let's say we know all members of our family and even our extended family. One day imagine a long lost uncle who we have not even heard of comes knocking on our door. He looks like us, knows most of our family history, we can even plot him on our family tree. Only the problem is, he is new and we know nothing about him. He has come from some faraway land and we don't know anything about him except for a fact that he belongs to our family. To some extent scientific community is facing similar troubles. We know to which family he belongs to. But there is still a lot of information about this particular virus we don't know of despite knowing things about its family. So scientists know the notorious cousins of this virus who were involved in SARS pandemic and MERS outbreak. We now even know that this virus very closely resembles the SARS virus. So now this novel Corona virus has got a new and more significant name: SARS-CoV 2; hence the cousins.

**What does this virus do in our body?**

To put it simply, this virus infects our respiratory system, making it difficult to breath in severe conditions. Hence we need ventilators in severe cases to assist patients as breathing becomes laborated . It causes infected individual to develop a dry cough, sometimes a fever and tiredness.

People develop other symptoms too depending on the severity and other factors. Based on observations we know people who are of old age, have pre-existing health problems like hypertension, diabetes, have kidney diseases and are undergoing dialysis, severe obesity, heart conditions, lung conditions like asthma are the high risk individuals for this infection. However it can affect person of any age and of normal health too.

**What is the treatment for COVID-19?**

COVID-19 is a viral infection. And as of now we don't have any proven treatment against this virus. Patients have tested positive for COVID-19 are treated for and as per their symptoms. They are given medications to relieve pain, aches, fever and also medications which will prevent them from getting other infections. They are given external support for breathing in severe cases. Things which make us feel better in Flu are also recommended to these patients like resting, staying hydrated, eating proper food, etc.

However no exclusive treatment is found yet to cure the infection caused by SARS-CoV2.

**So how do anyone gets free from a viral infection?**

We get free from a viral infection when our own body, our own immune system fights against the virus infecting us. So technically we are our best hope to win this battle.

However there are few drugs which antiviral. They function in different ways like not allowing the virus to attach to its target cells, to not allow virus to reproduce even when inside a cell, etc.

However we don't have an antiviral drug which will act against this particular virus yet.

So now we come to the end of the first blog of this series. Now we come to you! Let us know what are the terms, words, phrases in biology that you hear in news, around you and wish to know more about it then we are here for you! Let us know what you want and we get the information to you! Hope you liked the first blog of this series.

Great resources to learn more about The Corona virus and the COVID-19 pandemic:

Center for Disease Control, USA:
https://www.cdc.gov/

World Health Organization:
https://www.who.int/

**Coming up next:**

**"Terms and conditions of COVID-19 situation."**

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