Asian Journal of Advances in Research

3(1): 400-406, 2020

A STUDY ON NOVEL COVID-19 EPIDEMIC THREAT FOR UNIVERSAL PHYSICAL SITUATION IN 2020

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. Authors DP and BKP designed the study, performed the analysis, wrote the protocol and wrote the first draft of the manuscript. All author managed the analyses of the study and literature searches. All authors read and approved the final manuscript.

Received: 09 August 2020
Accepted: 27 September 2020
Published: 14 October 2020

Original Research Article

ABSTRACT

The human novel COVID-19 was an initial detection in Wuhan, China, Hubei Province on 31 December 2019. The major objective is to seriously study the current situation of the novel COVID-19 in the world. Severe Acute Respiratory Syndrome coronavirus (SARS-CoV) in 2001, Middle East Respiratory Syndrome coronavirus (MERS-CoV) in 2012, and the COVID-19 in 2019 had led to a worsening effect in human life in 185 countries. The COVID-19 is an extremely mutated virus for human beings in 2020. This study reveals the host of the virus, history, characteristics, preventive measure, treatment, effects, and the epidemic situation in the world.

Keywords: Coronavirus; COVID-19; 2019-nCoV; pandemic; public health emergency.

1. INTRODUCTION

Coronaviruses (CoVs) are a large group of viruses and powerful microscopes are required to see them. Corona means crown and infects a wide range of mammals and birds. Gamma Coronaviruses typically communicate a disease to avian species and a few mammalian species, whereas delta coronaviruses communicate a disease to birds and mammals [1]. Animal CoVs are communicating a disease to animals and could be accountable for rigorous effects for economic losses in domestic animals or birds [2-3]. Sometimes regularly cause mild respiratory illness in people.SARS-CoV-2 originated in bats. Special Coronaviruses have jumped species and can be transmitted between people. This is the third

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coronavirus to be done since 2002.SARS CoV emerged in Guangdong, China, in 2002, MERS CoV emerged in the Middle East in 2012 and SARS-CoV-2 emerged in Wuhan, China, in 2019. This virus was very much identical (88%) to two bat-derived SARS-like coronaviruses and more distant from SARS-CoV (79%) and MERS-CoV (50%) [2-3] suggested that the 2019-nCoV might be able to bind to the angiotensin-converting enzyme 2 receptors in humans similar to SARS CoV.

This virus originated from the Rhinolophus bat which is more than 96% homologous with the SARS-CoV-2 virus and 79% homologous with the original SARS CoV [4]. Crown mean corona which is a community health crisis, has founded from the Huanan Seafood Market [5-6], which also traded, in Wuhan State of Hubei Province in China and the focus of global interest due to a pneumonia pandemic of unknown origin [7]. The zoonotic SARS, beta-coronavirus (SARS-CoV) caused the SARS pandemic in 2003 when over 900 people died [8]. Noble COVID-19 is spread through direct contact with oozes and via aerosol droplets.On December 31, 2019, formally announced that the virus caused epidemic pneumonia in several attacks in humans [8,9]. Whereas Middle East Respiratory Syndrome coronavirus (MERS-CoV) [10].

2. NOVEL COVID-19

The diseases caused by SARS-CoV-2 are known as novel COVID-19. The novel coronavirus pneumonia (COVID-19) first detected and confirmed in Wuhan, China was identified on 31 December 2019 and it has expanded globally [11]. Many online websites and applications are developed to detect COVID-19 [12-13].

2.1 Sign and Symptoms of COVID-19

SARS-CoV is the virus that causes the illness we call COVID-19 and not everyone who is infected gets sick. The main sign is objective measurements to characterize illness during a physical exam.

- Temperature
- Breathing faster than usual.

Table 1. Types of COVID-19

Virus	Reservoir	Host
SARS-CoV	Cattle, Birds, Bats, Rodents	Human
HCoV-HKU1	Mice	Human
MERS-CoV	Bats, Civets, Camels	Human
SARS-CoV-2	Wild animal, Bats	Human

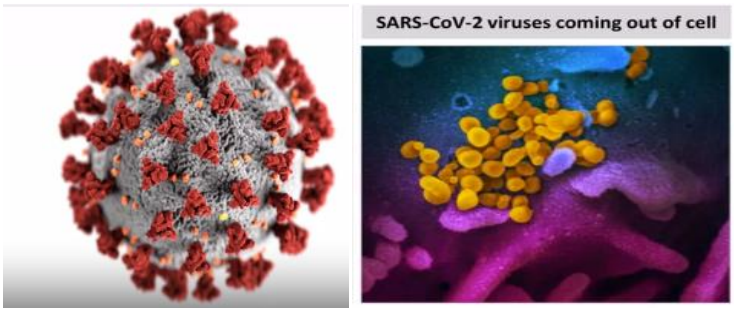

Fig. 1a. Coronaviruses (CoVs) and b. viruses coming out of the cell [Image Credit: US centers For Disease Control and Prevention(CDC)/ Alissa Eckert MS: Dan Higgins, MAMS& Photo Credit: US National Institute of Allegory and infection Diseases, Rocky Mountains Laboratories (NIAID-RML)]

Table 2. List of Coronaviruses

Name	Invented Name	Discovery Place
2002-nCoV	SARS-CoV	Foshan, China
2005-nCoV	HCoV-HKU1	Hong Kong, China
2012-nCoV	MERS-CoV	Jeddah, Saudi Arabia
2019-nCoV	SARS-CoV-2	Wuhan, China

2.1.1 Main symptoms

The main symptoms are what the infected say about how they feel. The greater part of patients was affected with fever, fever with cough, and shortness of breath (98%, 83%, 72%) [14].

- Fatigue
- Nausea
- Loss of Taste or smell
- Muscle ache

Apart from signs and symptoms fever is both signs and symptoms. Sign and symptoms can vary widely as below

- Some people have no symptoms and are known as asymptomatic.
- Some people have mild diseases.
- Some people have a more serious disease that can lead to death as well.

2.1.2 Common signs and symptoms

1. Fever (Temperature >100.4 F).
2. Tiredness
3. Chills
4. Muscle Pain
5. Cough
6. Loss of Taste or Smell
7. Headache
8. Sore Throat.

There are two types of symptoms one is specific and the other is non-specific. In Nonspecific many symptoms such as fever, cough, and myalgia (know as muscle pain) and they are common in COVID-19 And other respiratory diseases while in specific symptoms like one third affected persons report a recent loss of the ability to taste or smell and this is very uncommon in other infections. Some signs and symptoms mean that the disease is becoming more severe and also known as progressing. The most common signs of progressive infections are increased and more servers fevers and increased difficulty breathing.

2.1.3 Emergency warning sign or symptoms

Patients should immediately seek care if they have an emergency warning sign or symptoms such as

1. Blue lips or Face which could mean they are not getting enough oxygen.
2. Increased Rate of breathing.
3. Shortness of Breath
4. Chest pain when breathing
5. Waking during sleep with shortness of breath.
6. New confusion or difficulty waking up.

2.2 History of the Novel COVID-19

SARS-CoV seems to be an animal zoonotic virus that first infected humans in the Guangdong province of China in 2002. HCoV-HKU1 was first identified in January 2005, from a hospitalized old man with severe respiratory syndrome in Hong Kong, China. Whereas Middle East Respiratory Syndrome coronavirus (MERS-CoV) [15]. The majority of patients were affected with fever, fever with cough, and shortness of breath, (98%, 83%, 72%) [16]. The virus was subsequently reported as a cause of pneumonia in additional cases from Saudi Arabia, [10,17] Qatar, [18] Jordan, [19,20] the United Kingdom, [21,22] Germany, [23]iFrance, [24] Tunisia, [25] the United Arab Emirates, [26] and Italy, [27,28] observed that the novel coronaviruses, like influenza viruses, affected in various animal species in natural ways.

2.3 Evolution of Structure of Coronavirus

The coronavirus is known for its ejection of spike proteins when it enters into the host. No other virus shows this response inside the host. The spike proteins combine with the host molecules to produce hybrid spikes. These spikes are analyzed in laboratories to know the intensity of the virus inside the body. Drug delivery via liposomes proved to be a promising treatment for affected patients. However, there are a few limits of using liposomes like it degrades when kept in suspension for a very long time. Thus the researchers and clinicians are still thinking to use liposomal drug delivery. However, if the intermolecular distance between the liposomal molecules and the drug molecules, then the liposome's lifespan can be increased. We did a software application which proves the same.

2.4 Experiment

The software is split into two parts. In the first part, Priorly prepared TEM samples were collected from the NCBI bank in the form of pixels. In order to reduce the memory occupied by the software, this pixel is converted from image to binary (identical form). This will be analyzed by blob detection and the locations inside the liposomes where the drug can be effectively conjugated will be analyzed and marked. The other properties of liposomes were visualized with the help of a histogram analysis.

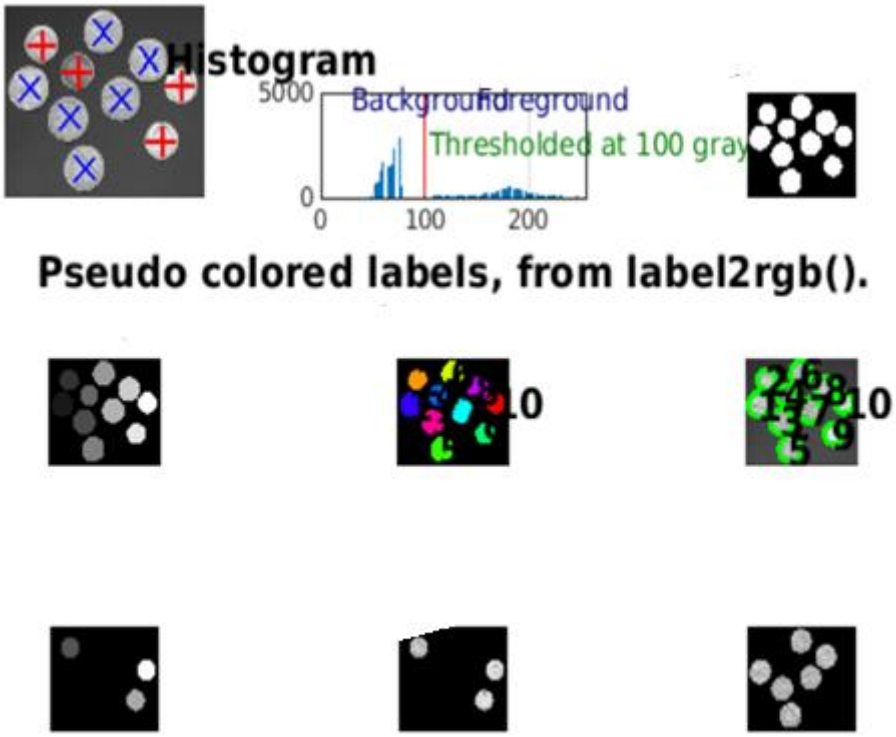

Fig. 2. Histogram showing dead cells and liv cells

The red marks indicate the dead cells and the blue marks indicate the live cells

In the second part of the analysis, the intermolecular distance is increased and the annotation plots for various types of liposomes were analysed and proved to be 50 times more accurate than the original conjugated one. The significance of this work is that there are more than 3000 trials conducted by the software and everytime no matter what the number of errors occur, the accuracy is always maintained to 50 percentage

Though there are technologies that can perfectly capture and process the amplified signal, there is still a lag in visualizing it. Some data can be lost or missed during visualization. Hence, data collection tools like CPP (Computer presentation package) are important in visualizing. Our group also discussed the various tools available to check the failures and load bearing capacity of a Bio mechanical application which includes solid works and FEM.

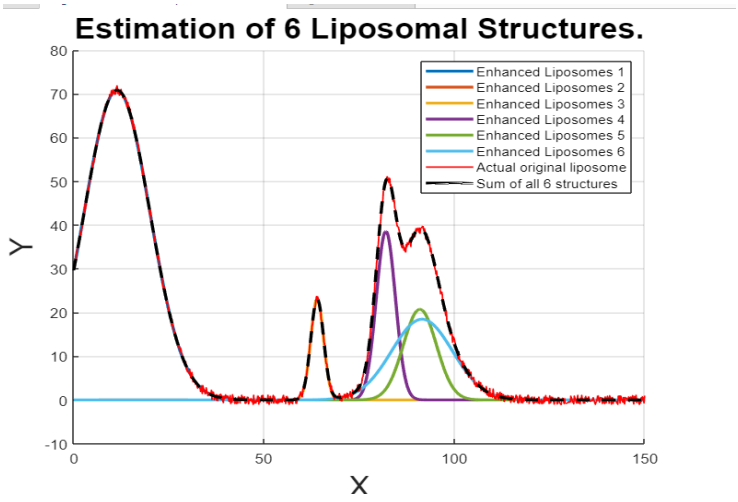

Fig. 3. Estimation of 6 liposomal structures

Accuracy:

Sub class Membership weight –

$S_1, S_2, S_3, \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..S_n$

$$f(x) = m_0 + \sum_{n=0}^{S}\left(S_1 \cos\frac{n\pi x}{L} + S_n \sin\frac{n\pi x}{L}\right)$$

$$= m_0 + \sum_{n=0}^{S}\left(S_1 \cos\frac{n\pi x}{n/2} + S_n \sin\frac{n\pi x}{n/2}\right)$$

$$= m_0 + \sum_{n=0}^{S}\left(S_1 \cos\frac{\frac{S}{2}\pi x}{n/2} + S_n \sin\frac{\frac{S}{2}\pi x}{n/2}\right)$$

$$= m_0 + \sum_{n=0}^{S}\left(S_1 \cos\frac{\frac{S}{2}\pi x}{n/2} + S_n \sin\frac{\frac{S}{2}\pi x}{n/2}\right) * 10 * 0.04$$

$$= n\lambda/2 + \sum_{n=0}^{S}\left(S_1 \cos\frac{\frac{S}{2}\pi x}{n/2} + S_n \sin\frac{\frac{S}{2}\pi x}{n/2}\right) * 10 * 0.04$$

$$= n\lambda/2 + \sum_{n=0}^{S}\left(S_1 \cos\frac{\frac{S}{2}\pi S*0.04}{n/2} + S_n \sin\frac{\frac{S}{2}\pi S*0.04}{n/2}\right) * 10 * 0.04$$

$$= n\lambda/2 + \sum_{n=0}^{S}\left(S_1 \cos\frac{\frac{S}{2}\pi S*0.04}{n/2} + S_n \sin\frac{\frac{S}{2}\pi S*0.04}{n/2}\right) * 10 * 0.04$$

$$= 1 * 34/2 + \sum_{n=0}^{4}\left(4 * \cos\frac{2*\pi*4*0.04}{n/2} + 7 * \sin\frac{\pi*2*4*0.04}{n/2}\right) * 10 * 0.04$$

That's the final to get the total accuracy with is after optimization 74.5%.

Optimization graph:

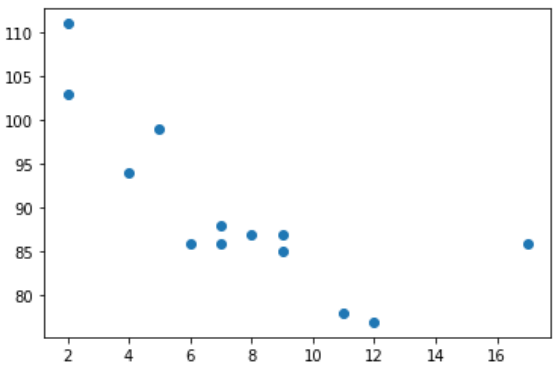

Fig. 4. Optimization graph

3. CONCLUSION

From the above experiment, we have insights of improving liposomal activity by increasing the intermolecular distance between the drug molecule and the liposome. The parameter is that as the suspension rate is decreased, the stability of liposomes increases.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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