

THE LAB CYCLE



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SCIENCE SPEAKS

The Cold Chain Solution for COVID-19 Vaccine

Millions of vaccine doses are administered each year to prevent the spread of infectious diseases and through vaccine usage, numerous diseases have been eliminated. In the current condition of the Coronavirus Disease (COVID-19) outbreak, many are hoping that the large-scale production and distribution of the vaccine could be the most effective and long-lasting solution in controlling this pandemic. *Continue at page 2.*

IN THE BLUELIGHT

Esco in Action: COVID-19 Projects and Installations

In the past few months, the COVID-19 pandemic has taken the world by storm. Many laboratories were initially unequipped with the right equipment needed for the sudden surge of samples to be tested. Esco is proud to be of service to various healthcare and scientific institutions by providing world-leading and internationally certified products. *Continue at page 4.*



UP AND ABOUT

Esco Provides Safety from the Comforts of Your Home

Esco Lifesciences Group stays true to its vision—to invent, discover, and commercialize enabling technologies to help make human lives healthier and safer. With this in mind, we continue to provide forward-thinking innovations, essential not only amid crisis but also in our daily bustle to improve the quality of living. *Continue at page 6.*



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The Cold Chain Solution for COVID-19 Vaccine

Millions of vaccine doses are administered each year to prevent the spread of infectious diseases and through vaccine usage, numerous diseases have been eliminated. In the current condition of the Coronavirus Disease (COVID-19) outbreak, many are hoping that the large-scale production and distribution of the vaccine could be the most effective and long-lasting solution in controlling this pandemic. Generally, vaccine development takes a long process before it can be approved and released in the market. Scientists have implied that developing the COVID-19 vaccine is expected to take years to resolve. Since the identification of SARS-CoV-2 was done within three months of transmission, thorough studies about its biological characteristics are afoot to augment its data which will help to facilitate the vaccine development. COVID-19 cases are still rapidly rising and may exist with human beings for years. Thus, vaccine development is essential to control the spread of the virus. The only way to ensure that the vaccine is both safe

and effective is by going through the appropriate drug development and regulatory channels. (See figure 1).

As of 12 November 2020, 48 candidate vaccines are in clinical evaluation and 164 candidate vaccines are in preclinical evaluation. (see list for reference: <https://www.who.int/publications/m/item/draft-landscape-of-covid-19-candidate-vaccines>).

Once the vaccine is approved and made available to the public, it must be produced in sufficient quantities to serve a large portion of the world's population. Continuous safety surveillance and testing should be done to ensure that the vaccine is efficient and maintained its quality.

Developing an effective vaccine is the first step. Then comes the complications regarding transport and delivery. Due to the vaccines' temperature sensitivity, shipment and distribution confront a challenging issue.

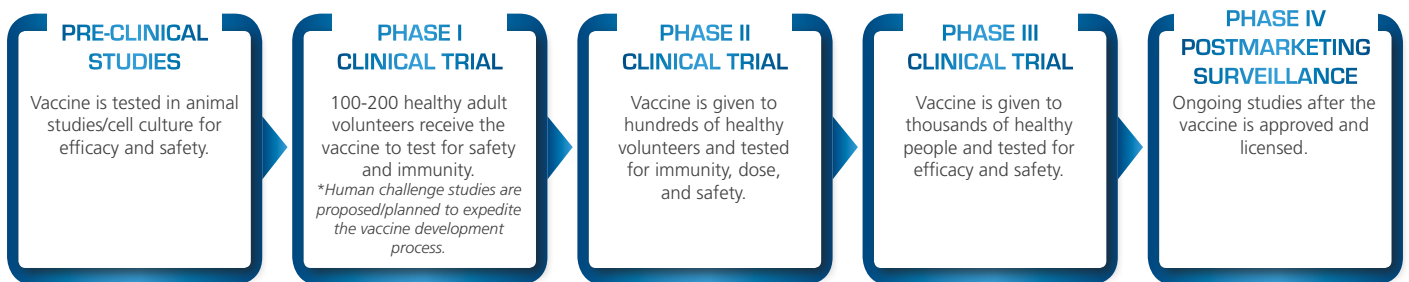


Figure 1. Stages of COVID-19 Vaccine Development. Source: World Health Organization

Pfizer developed a new vaccine based on a novel technology that uses synthetic mRNA that gives the immune system genetic instructions to identify the virus. The vaccine was found to be 90% effective but needs to be stored at -70°C to -80°C since it is made with genetic materials that may degrade once thawed. This complex requirement of the vaccine became the stumbling block particularly in rural areas and underprivileged countries where resources are tight.

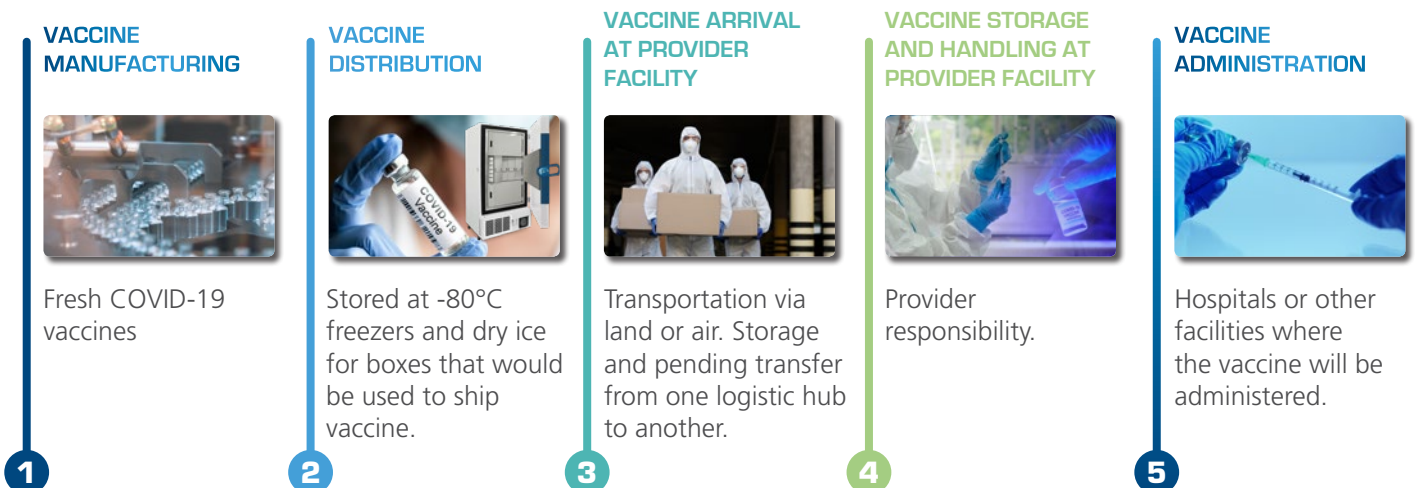


Figure 2. How vaccines are shipped at -80°C. Source: CDC on Vaccine Storage and Handling

The cold chain starts with the cold storage unit at the manufacturing plant. Then it extends to the transport and delivery of the vaccine, proper storage at the provider facility, and ends with the administration of the vaccine to the host. Manufacturers, distributors, public health staff, and health care providers share the responsibility to ensure the vaccine cold chain is maintained from the time vaccines are manufactured until they are administered.

RNA-based vaccines are ideally stored in a -80°C ULT Freezer or a -20°C freezer, while the viral vaccines that contain either inactivated or attenuated viruses require storage temperatures of 2°C to 8°C.

VACCINE NAME		Sputnik V (lyophilized)	Johnson & Johnson	Moderna mRNA-1273	Pfizer & BioNTech BNT162b2
Vaccine Type		Adenoviral vector	Viral vector	mRNA	
Required Storage Temperature and Shelf Life	Short-term	2° to 8°C	2° to 8°C for 3 months	2° to 8°C for 30 days	2°C to 8°C for 5 days
	Long-term			-20°C for 6 months	-70°C for 6 months
Cold Storage Solution	Short-term	Laboratory Refrigerator			
	Long-term		Laboratory Freezer	Ultra-Low Temperature Freezer	

Figure 3. Comparison of Leading COVID-19 Vaccines. Source: Moderna, Pfizer & BioNTech, J&J, Sputnik vaccine

ESCO'S WIDE RANGE OF COLD STORAGE SOLUTIONS:

HP Series Laboratory Refrigerator (HF2-700S)

HP Series Laboratory Freezer (HR1-1500S)

Lexicon® II Ultra-Low Temperature Freezer (UUS-597B)

Always verify that the cold storage equipment operates efficiently and has all the features necessary to protect the integrity of your vaccines. It should be designed to comply with WHO recommendations and other prerequisites for the storage of viral specimens, extracted RNA and cDNA, and other diagnostic outcomes needed for current and future research.

While hope and optimism are much needed in these trying times, cooperation and transparency are important. Go with the equipment that is qualified to support the COVID-19 vaccine race and its challenges in cold chain management, shipment, and deployment.

References:

[1] Begum J, Mir N, et.al. 2020. Challenges and prospects of COVID-19 vaccine development based on the progress made in SARS and MERS vaccine development. <https://onlinelibrary.wiley.com/doi/full/10.1111/tbed.13804>

[2] Dong Y, Wei Y, et.al. 2020. A systematic review of SARS-CoV-2 vaccine candidates. <https://www.nature.com/articles/s41392-020-00352-y>

[3] Nuventra Pharma Sciences. 2020. Developing Vaccines for the Coronavirus Disease (COVID-19). <https://www.nuventra.com/wp-content/uploads/2020/03/Developing-Vaccines-for-the-Coronavirus-Disease-COVID-19-Outbreak.pdf>

[4] World Health Organization. 2020. What we know about COVID-19 vaccine development. <https://www.who.int/publications/m/item/what-we-know-about-covid-19-vaccine-development>

[5] World Health Organization. 2020. Draft landscape of COVID-19 candidate vaccines. <https://www.who.int/publications/m/item/draft-landscape-of-covid-19-candidate-vaccines>

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Esco in Action: COVID-19 Projects and Installations

In the past few months, the COVID-19 pandemic has taken the world by storm. Many laboratories were initially unequipped with the right equipment needed for the sudden surge of samples to be tested. Esco is proud to be of service to various healthcare and scientific institutions by providing world-leading and internationally certified products. Here are some of our remarkable projects and installations:

NORTH AMERICA

Veterans Affairs Palo Alto Health Care System California, USA

Veterans Affairs Palo Alto Health Care System (VAPAHCS) belongs to the top 3 VA hospitals in the US. This teaching hospital provides a full range of patient care, research, and education. VAPAHCS has already tested 913,624 veterans and employees, 73,083 of which were diagnosed with COVID-19. Behind every excellent healthcare service provider are the reliable equipment. VAPAHCS owned 60 units of Esco biosafety cabinet and 46 units of CO₂ incubator.



EUROPE

Ghent University Ghent, Belgium

A so-called “super lab” has been opened on November 2, 2020 at Ghent University—one of the major universities in Belgium. The new COVID-19 testing laboratory is equipped with 3 units of biosafety cabinet capable of processing up to 7,000 tests per day.



Photo courtesy of David Van Hecke

Valduce Hospital Como, Italy

Valduce Hospital is situated in Lombardy, the most affected region in Italy. It was founded in 1853 and was transformed into a modern hospital with state-of-the-art equipment. Esco Airstream® Class II biosafety cabinet was chosen to boost their fight against COVID-19.



ASIA

Kuala Lumpur International Airport

Selangor, Malaysia

Kuala Lumpur International Airport (KLIA) has founded its own COVID-19 testing laboratory in June 2020 to increase the efficiency of health screenings and the capacity to receive passengers. They have partnered with Esco to deliver 7 biosafety cabinets, which were delivered and installed the day after receiving the request.



Marikina City Health Office

Manila, Philippines

Marikina is the first local government unit in the Philippines to build its own molecular diagnostic facility in May 2020. They were able to process up to 400 tests a day with the aid of an Esco biosafety cabinet and 2 units of laboratory refrigerator.



USWAG Iloilo Molecular Laboratory

Iloilo, Philippines

The province of Iloilo established the biggest, non-hospital molecular laboratory in the region. Esco provided innovative solutions from ventilation to equipment with 4 biosafety cabinets, 6 pass boxes, 2 PCR cabinets, 2 refrigerated micro centrifuges, 2 microplate shakers/incubators, 1 ultra-low temperature freezer, and 1 lab refrigerator. USWAG Iloilo Molecular Laboratory will officially operate by the end of 2020.



Hospital for Tropical Disease

Bangkok, Thailand

Hospital for Tropical Disease is a center for tropical diseases treatment and research. They have selected 8 units of Esco biosafety cabinet to cater to the increasing demand of diagnosing COVID-19 patients.

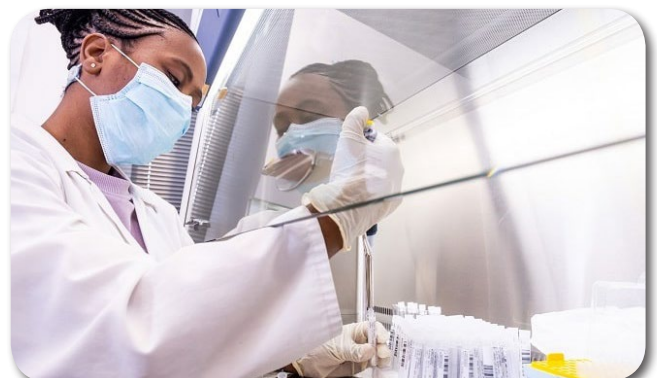


AFRICA

National Health Laboratory Service

Port Elizabeth, South Africa

Volkswagen Group South Africa donated 2 units of Esco biosafety cabinet to the National Health Laboratory Service in Port Elizabeth, South Africa. The equipment were installed in their virology department which was a converted offices to establish a fully functioning molecular lab in only 18 days. This collaboration was made possible with the purpose of fighting COVID-19.



Esco Provides Safety from the Comfort of Your Homes

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Esco proudly launches Airstream® PURE Air Purifier, an intuitive technology for better air quality.

Pollens, volatile organic compounds, dusts, and mold spores that are suspended in the air often cause respiratory problems and allergies. Removal of these pollutants promotes a healthy living environment and reduces health-related concerns.

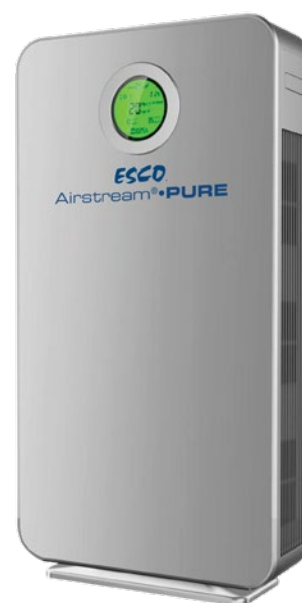
Esco Airstream® PURE Air Purifier provides cleaner air by removing common indoor pollutants through its six-layered filtration system. It delivers rapid air purification and removal of unwanted odors. With its sleek design, it can easily be placed in any part of the house—indeed a healthy addition to your home.

Main Features:

- Color-coded LCD screen to easily identify the room's quality:
 - Green: excellent air quality
 - Blue: light pollution
 - Red: heavy pollution
- Smart mode for automatic wind speed adjustment
- Six-layered filtration for maximum protection
- Dual control system for convenience

Advantages:

- Brushless DC motor for quiet operation and low energy consumption
- Multiple fan system that evenly distributes air for maximum absorption
- HEPA filtration system for efficient removal of particles and dust
- Equipped with carbon filters for removal of unpleasant odor or toxic fumes
- Dual control system for convenience



AP-550

Introducing Esco Automatic Hand Sanitizer Dispenser

Hand sanitization is an effective and important practice in preventing the spread of COVID-19. Esco designed this apparatus to employ a contactless dispensing mechanism for safer hand sanitizing. Esco Automatic Hand Sanitizer Dispenser is ideal for public facilities, offices, laboratories, and even in the comfort of your homes.

Main Features:

- Light indicator
- Refillable container with 1L capacity
- Operates with power adaptor or with 4 pieces of AA (1.5V) batteries
- Has a receiver box and plate to prevent dripping onto the floor during use
- Durable floor stand
- Also available in wall-mounted setup

We are with you in securing safety.

For inquiries, contact your local Esco sales representative!



ASD-S

Slay that Pandemic!



The unpredictability of health threats is the reason why **biosafety** must be always deemed important. The world has experienced various pandemics in the past. Some of which is the **Bubonic** Plague caused by the bacterium *Yersinia pestis* that devastated Europe in the mid-fourteenth century and **Cholera** caused by *Vibrio cholerae* that seeded seven outbreaks in different timelines. On the other hand, **Influenza** outbreaks caused by various strains of influenza virus have remained ever-present. And now, we face the COVID-19 pandemic. It is contracted via exposure to and inhalation of infected respiratory **aerosol** hence, wearing the right **mask**, frequent washing of hands with soap, use of **disinfectant**, and **quarantine** measures have become essential.

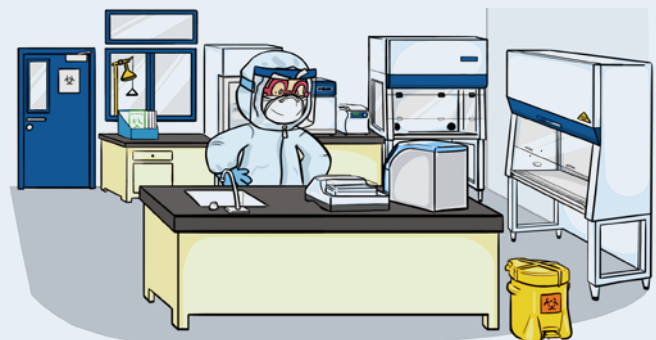
Can you find the highlighted words in the puzzle?



P	A	N	C	A	K	E	T	B	R	E	B
O	H	O	P	J	A	P	N	U	S	A	I
R	R	L	X	O	Z	O	A	B	R	V	O
F	S	O	I	A	N	I	T	O	V	C	S
Q	U	S	K	B	E	O	C	N	I	H	A
V	H	O	A	X	U	Y	E	I	D	O	F
N	F	R	Z	T	L	L	F	C	S	L	E
M	F	E	Y	G	F	K	N	F	V	E	T
Q	U	A	R	A	N	T	I	N	E	R	Y
F	M	I	N	F	I	M	S	J	W	A	U
E	G	Q	H	O	O	G	I	A	A	A	L
R	M	A	S	K	D	F	D	Z	B	F	B

Here is the solution to last issue's SPOT THE DIFFERENCE

1. Door biohazard signage
2. Safety showers and eye washes
3. Biosafety manual
4. Centrifuge
5. Sink
6. Proper personal protective equipment (PPE)
7. Microplate shakers/incubators
8. Automated nucleic acid extraction system
9. BSC biohazard signage
10. BSC control system
11. Biohazard waste container with lid





New Normal Alternatives to Handshaking

A handshake is a ritual act that existed since ancient times. It is known as a gesture of peace and used to indicate friendship, conclude a business transaction, or show religious devotion.

As we are still facing the risk of COVID-19 transmission through physical contact, we are now limiting the use of this practice. In the meantime, here are some safer greeting gestures we can do instead:

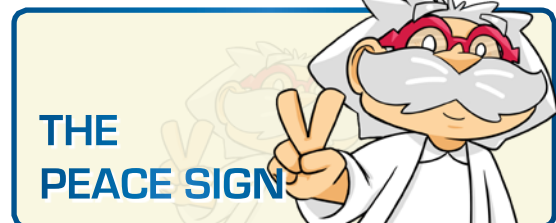
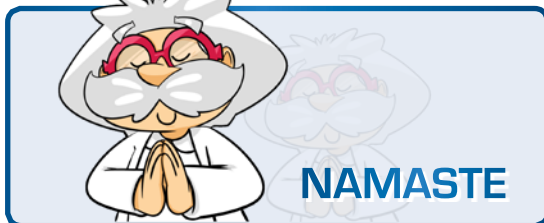


Illustration adapted from World Health Organization.

**TRY IT WITH YOUR FRIENDS!
REMEMBER TO BE DILIGENT AND PUT SAFETY FIRST!**



SCAN HERE TO WATCH VIDEO!

We heard you! These "Alternatives to Handshaking" GIFs can be used in your next Instagram stories. Just search [escolifesciences](#) and do not forget to tag us!