



# COVID-19 TESTING LABORATORY DESIGN AND BUILD TURNKEY SOLUTION





## ABOUT ESCO ASTER

### Welcome to Esco Aster

Esco Aster focuses on offering vaccine-, bio-, cell- and gene-therapy development manufacturing services using primarily its proprietary Adherent Tide Motion Platform supplemented by single-use suspension and fermentation, downstream bioprocessing, and customized bioengineering equipment for client specific therapeutics.

Within the in vitro/in vivo diagnostic space, we focus on developing mAb-based antigens, single-domain antibodies for radio imaging, RT PCR reagents, RCL diagnostics. We work with collaborators to provide turnkey mobile diagnostic labs: Aster Xpress™.

Within the chem- biopolymer- cosmetic, personal care, cosmeceutical segments, we excel in converting batch processes into continuous flow chemistry, closed aseptic processing within isolators and variety of skin safety/efficacy testing services.

For the COVID-19 pandemic we are working on an end-to-end trace, test, and treat platform from swab booths, to mobile labs, turnkey modular screening and treatment centres with isolation rooms as well as working on diagnostics, therapeutics, and vaccines.

### Esco Molecular Diagnostic Facility Design and Build

Molecular diagnostics involves the detection and measurement of genetic material (DNA/RNA) or other biomarkers specific to a pathogen or associated with certain health condition. One of the most common molecular diagnostic methods is Polymerase chain reaction (PCR), which require specialized equipment and workflows.

Typical PCR workflow involves three steps which are ideally separated by individual rooms:

- Nucleic Acid Extraction: The genetic material is extracted from the source sample.
- PCR Mastermix Preparation: The reagent specific for the extracted genetic material is prepared.
- Amplification: The genetic material is amplified during incubation.

Esco Aster specializes in customized design and construction of molecular diagnostic facilities as per WHO BSL guidelines, CDC, BMBL, and local safety standards for diagnostic testing needs. We have the unique advantage of having our own portfolio of high-quality equipment specifically designed for molecular testing.

We can provide solutions from feasibility assessment and concept design to detailed design-build validation. As a 'one-stop-shop' for your molecular diagnostic facility development, we offer you tailored solutions with convenience and cost control.



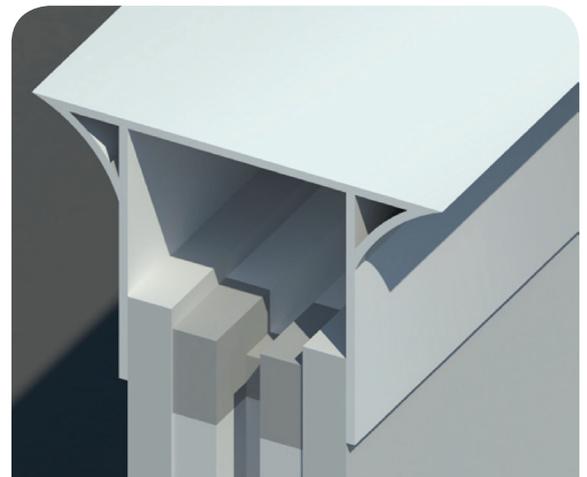


*Esco is able to provide a complete solution from feasibility assessment, conceptual design to detailed design as per WHO and local health agencies' guidelines.*

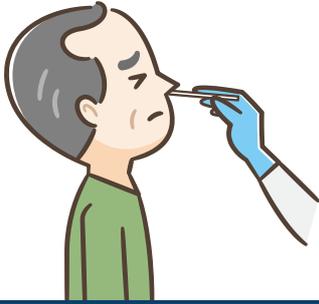
### **Esco Aster Covid -19 laboratory turnkey solution package includes:**

- Laboratory Design
- Existing Lab Renovation/Conversion and Fitting out of GLP Lab
- Equipment, Reagent, Consumables
- Shipments
- Assembly, Optimisation and Staff Training
- Technology Transfer– Laboratory Operation Support
- BSL 2 Laboratory Certification

# Covid-19 Lab Construction Components and Material of Construction



## PCR Workflow



### 1. Sample Collection

Samples are collected from suspected patient through blood, swabs, urine, stool, and other tissue sources.



### 2. Nucleic Acid Extraction

The genetic material is extracted from the collected samples either by manual or automated method using DNA/RNA extraction kits



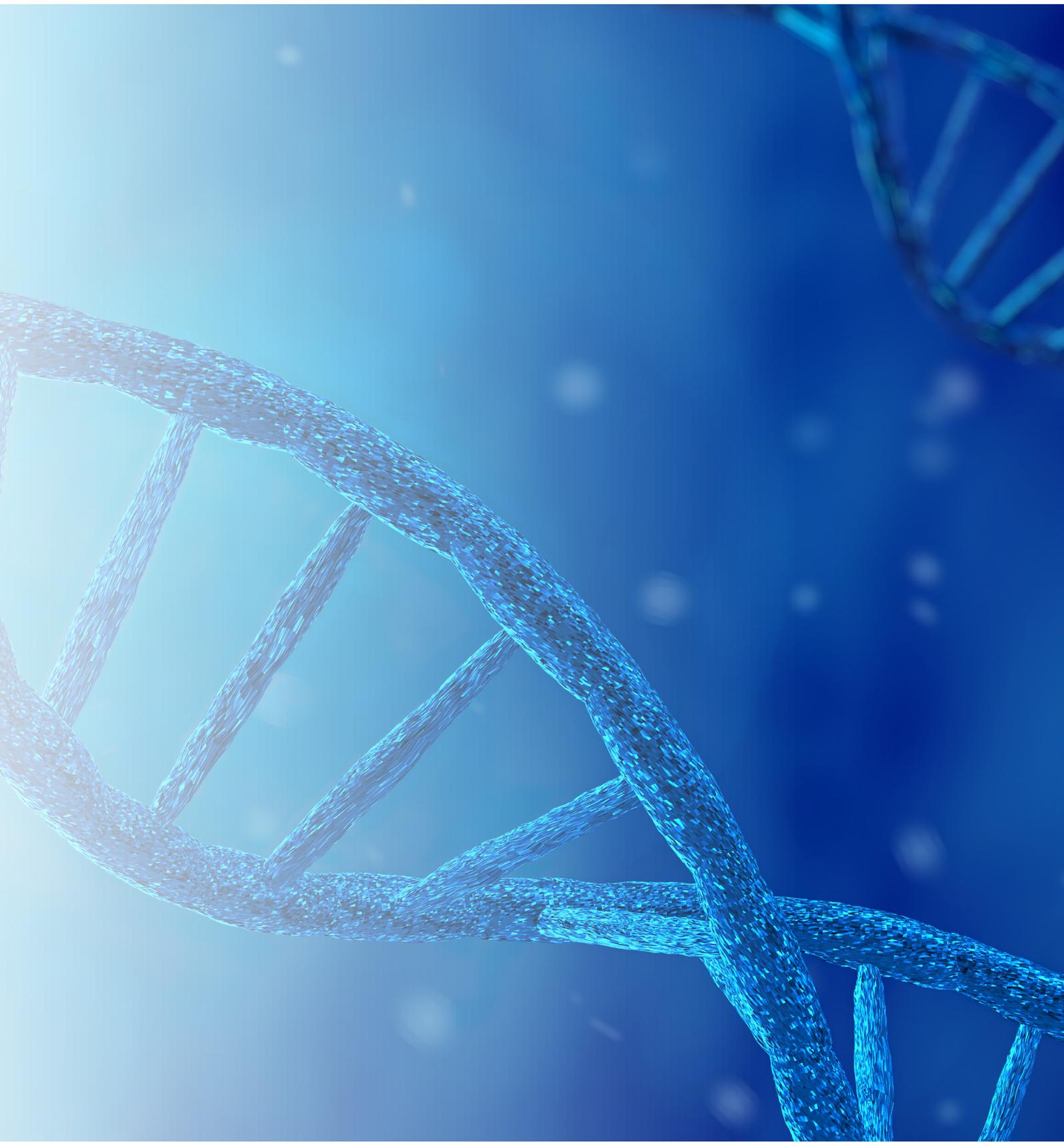
### 3. PCR mastermix preparation

PCR reagents specific for the target are prepared in one mastermix to be distributed to individual PCR tubes or wells in PCR plates. Extracted samples are then added to each tube/well.



### 4. Amplification

The PCR mixture is then incubated in a thermal cycler for amplification of the genetic material. Conventional PCR requires additional electrophoresis step for detection. Results are then analyzed for generation of test reports.



## EQUIPMENT FOR YOUR MOLECULAR DIAGNOSTIC TESTING NEEDS

### Sample Collection

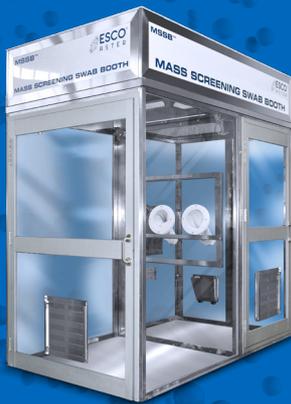
#### Infectious Disease Diagnostic Sampling Booth (IDDSB™)

This booth controls risk exposure to harmful aerosols/airborne diseases by providing containment using airflow. The booth provides both operator/patient and environmental protection.



#### Mass Screening Swab Booth (MSSB™)

This booth is designed for mass swabbing of potential disease carriers. It provides both healthcare professional and patient protection.



#### Streamline Swab Booth (SSB™)

This booth is designed for the safe and efficient testing of suspected and symptomatic patients.





## Nucleic Acid Extraction

### Airstream® Class II Biosafety Cabinet

The Airstream® Class II Biosafety Cabinet is designed to handle pathogenic biological samples. This cabinet has an inflow for operator protection, an ULPA-filtered downflow which creates an ISO Class 3 work surface and prevents cross-contamination for sample protection and an ULPA-filtered exhaust for environment protection.



### Provocell™ Microplate Shaker

The Microplate Shaker/Incubator is designed for accurate incubation and mixing applications. This is applicable for viral inactivation, heating of samples to release genetic material, and other extraction procedures.



### Versati™ TCV Tabletop Centrifuge

This centrifuge features versatility and easy handling with its functions. It is perfect and robust for repetitive short centrifugations involve in manual DNA/RNA extraction protocols. Its aerosol-tight rotor helps prevent bioaerosol generation.



### Swift™ Extract Automated Nucleic Acid Extraction System

Automated extraction systems are helpful to decrease burden in laboratory personnel. This extraction system is designed for high extraction efficiency and can process 32 samples at a time





## PCR mastermix preparation

### Airstream® PCR Cabinet

PCR cabinets provide DNA and RNA contaminant-free environment through HEPA filtration and UV decontamination system. The cabinet provides clean airflow to keep PCR mastermixes clean and free from potential nucleic acid contaminants.



## Amplification

### Swift™ ProGene Real Time PCR Thermal Cycler

This thermal cycler feature wide applications, ranging from presence/absence experiments, quantification, Single Nucleotide Polymorphisms analysis, and High resolution melt analysis. It can process 96 samples at a time, high heating/cooling rates, and equipped with on-board PC.



## Decontamination

### VitaClave™ Laboratory autoclave

Diagnostic testing facilities generate biological wastes required to be treated before handled as regular waste. This autoclave is designed for automated decontamination to deactivate microorganisms.



## Storage

### HP Refrigerators

Esco HP refrigerators are recommended for short-term storage of collected samples and most extraction kits. These ensure that biological products are protected through accurate and uniform control.

### HP Freezers

Esco HP refrigerators are recommended for longer-term storage of collected samples and most PCR kits. These freezers provide product protection with long-term reliability and exceptional quality especially for sensitive PCR reagents and samples.

### Lexicon® II Ultra-Low Temp. Freezer

RNA extracts and samples are best stored at lower than  $-70^{\circ}\text{C}$  specially in cases with delayed or batch testing. This ULT freezer features top notch protection to ensure the stability of samples and extracts for reliable results.





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