

1. INDIA reports 3277 fresh cases in 24 hrs. 128 died in the last 24 hrs.
2. NDMA issues guidelines for restarting manufacturing industries after the lockdown period.
3. Of the 669 cases reported in Chennai yesterday, 509 are from Chennai.
4. Indian and Chinese troops face off in Ladakh and Sikkim. Several soldiers were injured in the separate incidents that took place in Eastern Ladakh and Naku La Pass. In Eastern Ladakh the incident took place in Pangong Tso Lake whose major portion is under China and the boundary has not been demarcated. This is not the first time that such scuffles have broken between the Asian Giants.
5. TN has been made part of a “Solidarity Trial” to find the treatment options for COVID 19. The Study has four treatment arms, Remdesivir, Hydroxychloroquine, Lopinavir with Ritonavir (anti-retrovirals) and Lopinavir with Ritonavir and Interferon Beta 1a.
6. Landless labourers turn up for work in Cauvery delta under MGNREGS despite virus threat.
7. Kerala High Court okay's the easing of lockdown restrictions by the State Government.
8. Todas - Traditional tribal artisans from the Nilgiris.
9. India develops indigenous ELISA test for CORONA.



What Is ELISA?

ELISA is a basic enzyme linked immunosorbent assay (also shortened as EIA: Enzyme Immunoassay) that is carried out to detect and measure antibodies in the blood.

Antibodies are blood proteins produced in response to a specific antigen. It helps to examine the presence of antibodies in certain infectious disorders.

ELISA is a distinguished analysis compared to other antibody-assays as it yields quantitative results and separation of non-specific and specific interactions that take place through serial binding to solid surfaces, which is normally a polystyrene multiwell plate.

Types Of ELISA

ELISA tests can be classified into three types depending upon the principle of the structure of binding between antigen and antibodies, namely:

Indirect ELISA – Antigen is coated to the microtiter well

Sandwich ELISA – Antibody is coated on the microtiter well

Competitive ELISA – Microtiter well which is antigen-coated is filled with antigen-antibody mixture.

Indirect ELISA

Indirect ELISA detects the presence of antibody in a sample.

The antigen is adhered to the wells of the microtitre plate.

A sample containing the primary antibody is added to the wells which react with the coated antigen.

The free primary antibodies are washed away and the antigen-antibody complex is detected by adding a secondary antibody conjugated with an enzyme that can bind with the primary antibody.

Any free secondary antibody is washed away. A specific substrate for the enzyme is added which hydrolyzes to release a coloured product.

The absorbance is measured by spectrophotometry.

Sandwich ELISA

Sandwich ELISA helps to detect the presence of antigen in a sample.

The antibody is coated on the microtitre well.

An antigen containing sample is added to the well that reacts with the antibody present in the well.

The well is washed and an enzyme-linked antibody specific for some other epitope on the antigen is added to react with it.

The well is washed again to remove the free secondary antibodies and the substrate is added to the plate where it reacts with the enzyme to form coloured products.

Competitive ELISA

Competitive ELISA helps to detect the concentration of antigen in a sample.

The antibody is incubated in a solution with an antigen-containing sample.

The antigen-antibody complex is added to the microtitre wells coated with antigen.

The well is then washed to remove any unbound antibodies.

The enzyme-conjugated secondary antibody specific for the isotype of primary antibody is added to determine the amount of primary antibody present in the well.

The concentration is then determined by spectrophotometry.

Principle of ELISA

ELISA works on the principle that specific antibodies bind the target antigen and detect the presence and quantity of antigens binding. In order to increase the sensitivity and precision of the assay, the plate must be coated with antibodies with high affinity. ELISA can provide a useful measurement of antigen-antibody concentration.

ELISA Procedure

ELISA is one of the easiest blood tests that can be carried out. It is rapid, quick and requires a blood sample of the patient. The entire procedure of ELISA is mentioned below.

An antibody is attached to a polystyrene plate which is a solid surface and is attracted or has an affinity towards bacteria, other antibodies and hormones.

A microtiter coated with antigen is filled with this antigen-antibody mixture after which unbound antibody is checked for and washed to remove.

A second antibody specific to primary antibody is added which is usually a linked enzyme.

Unbound enzyme-linked antibodies are removed by washing the plate.

Finally, the substrate is added. The substrate is converted by the enzyme present, giving out a fluorescent signal.

HCG protein which indicates pregnancy is detected by ELISA. A combination of blood or urine sample and purified HCG linked to an enzyme is added to the system. If HCG is absent in the test sample, then only the linked enzyme binds to the solid surface.

The more the substance of interest is present, the more reaction takes place and less of linked enzyme binds to the solid surface. These reactions are indicated usually with a change in the colour of the solution.

Diseases That Can Be Diagnosed Using ELISA

ELISA can be used to detect some of these conditions:

Ebola

Pernicious anaemia

AIDS

Rotavirus

Lyme disease

Syphilis

Toxoplasmosis

Zika virus

Carcinoma of the epithelial

Advantages Of ELISA

Following are some of the advantages of ELISA technique:

Results fetched from ELISA gives an accurate diagnosis of a particular disease since two antibodies are used.

Can be carried out for complex samples as antigen is not required to get purified to detect.

It is highly responsive since direct and indirect analysis methods can be carried out

It is a rapid test, yields results quickly

Possible detection for ELISA ranges from the quantitative, semi-quantitative, standard curve, qualitative, calibration curve models etc.

Easier to perform and uncomplicated process as compared to other assays which require the presence of radioactive materials.

Applications of ELISA

The applications of ELISA are discussed below:

The presence of antibodies and antigens in a sample can be evaluated.

It is used in the food industry to detect potential food allergens.

To determine the concentration of serum antibody in a virus test.

During disease outbreaks to track the spread of diseases.

The Centre has advised the Assam state government to go for culling of pigs affected by the African Swine Fever (ASF).

Key Points

It has been advised to divide the affected areas into zones and go for culling accordingly.
The disease was first reported in November-December , 2019 from the areas of China bordering Arunachal Pradesh.A few organised piggeries in Assam have been affected and the possible carrier could be humans.However, there is no confirmation on humans being the carrier of the virus.Earlier in April, there were reported deaths of pigs due to the Classical Swine Fever (CSF).ASF and CSF are different from Swine Flu (H1N1) and do not affect humans.CSF can be prevented by proper vaccination but there is no vaccination for ASF. Culling of the affected pigs is the only option.

African Swine Fever

It is a highly contagious and fatal animal disease that infects and leads to an acute form of hemorrhagic fever in domestic and wild pigs.

It was first detected in Africa in the 1920s.

The mortality is close to 100% and since the fever has no cure, the only way to stop its spread is by culling the animals.

ASF is not a threat to human beings since it only spreads from animals to other animals.

ASF is a disease listed in the World Organisation for Animal Health (OIE) Terrestrial Animal Health Code and thus, reported to the OIE.

World Organisation for Animal Health

OIE is an intergovernmental organisation responsible for improving animal health worldwide.

In 2018, it had a total of 182 Member Countries. India is one of the member countries.

OIE standards are recognised by the World Trade Organization as reference international sanitary rules.

It is headquartered in Paris, France.

