ELISA READER

- ELISA stands for enzyme-linked immunosorbent assay.
- It is an evaluation technique for immobilizing an antigen to a solid surface to determine peptide, protein, antibody, or hormone concentrations
- . The procedure uses an automated ELISA microplate reader in combination with a series of microplates—a plate with 96 indentations, or “wells”—that act as tiny test tubes combined in a single molded plastic plate.
- Biochemists frequently test liquid samples to find out if antibodies, antigens, hormones, proteins, or other substances are present in the solution. They do this by conjugating, or attaching, antigens to the antibodies—or blood proteins produced in response to different antigens in the sample. This creates a reaction of some type, often a change in color.
- A microplate reader uses colorimetric, fluorometric, or luminescent reagents that measure the concentration of the compound of interest by developing a signal that can be detected by the reader, similar to a traditional spectrophotometer but able to process 96, 394 or 1536 samples in one read sequence
- The typical microplate contains 8 columns and 12 rows of wells for a total of 96 sample wells. However, some readers contain 384 wells—or more—to maximize reagent testing. The automated ELISA reader features an optical system that showers the samples with light and then reads the light’s intensity and wavelength coming off the sample. This permits the reader to calculate the light absorption rate of each sample and converts the returning light beams into data sets so users can interpret the results clearly.
- Two common examples of the ELISA reader principle are Direct ELISA and Indirect ELISA.
- During direct ELISA testing, immobilization of the antigen takes place directly onto the well of the microplate. The antibody is then added to the solution, and it binds directly to the antigen and prepares it for the addition of an enzyme. Finally, the testing enzyme is added, and this produces a reaction and a visible color change. The advantages include fewer steps, fewer reagents are needed, and there are no reactions with a secondary antibody that could confuse results.

- Indirect ELISA is a two-step process, during which the antigen sample is applied to the well of the microplate. First, a primary antibody is added, and it binds to the sample. Next, a secondary antibody is added that binds with the primary antibody. This method offers high flexibility and signal amplification. However, it may result in cross-reactivity from the secondary antibody that muddies the result.

- Uses of the ELISA Reader :

- ELISA readers have numerous uses. The reactions a reader can detect permit diagnosis of various conditions. These include the following: AIDS, ebola, Lyme disease, rotavirus, cancer, anemia, and rotavirus. During the COVID-19 outbreak, tests helped detect the presence of antibodies in the blood samples. Finally, in the food industry, the reader is used to detect any food allergens present.