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The Era of Cell-based Vaccine

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The COVID-19 pandemic has challenged the biotechnology and pharmaceutical industries in designing an efficient and cost-effective vaccine. The production of any vaccine or drug demands standard equipment and efficient methodologies. While cutting-edge research has been conducted over the past year in bringing out the safest vaccines, there still lies a slight hesitation among people when it comes to getting vaccinated. One of the most probable reasons for the same could be the composition of the vaccine. There has been speculation among many people that vaccines comprise egg or egg-derived products. The fact that vaccines were composed of eggs cannot be denied, since eggs have been a constituent of vaccines for influenza, rabies, etc. Such vaccines are referred to as “egg-based vaccines". The production of egg-based vaccines involves the usage of pathogen-free eggs. After the eggs have been incubated with seasonal viruses for 2-3 days, millions of vaccine viruses are harvested from the egg white. As the virus replicates, scientists collect and purify the same. Antigens produced by the vaccine viruses are diluted and packed into syringes or vials. Over the years, usage of eggs for vaccine production has decreased and there has been a shift towards cell culture-based vaccines. Here, the virus is injected into the cells, allowing it to replicate. Cells and viruses are produced on a large scale using stainless steel fermenters. Followed by this, the outer wall of the cells is eliminated and the viruses are harvested, purified and deactivated. The reason for such a shift in vaccine production was to meet the global demand while reducing the production time. The use of cell cultures in vaccine production reduces the extra time that is being spent on egg supply. Cell-based vaccine production also allows the design or formulation of vaccines for multiple strain variations. Most of the current vaccines available in the market have been designed based on cell culture vaccine principles. It needs to be noted that the usage of eggs or egg-derived substances in vaccine production has not been completely discontinued. However, cell-based vaccines have proved to be more cost-effective and have promised high-quality products.

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