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04/13/24

The Impact of Serology on Bioengineering

According to Oxford Language, serology is the study or examination of blood with regards to immune system response to pathogens or external substances. Many serology diagnostics test the amount of antibodies present in one's blood. Antibodies are proteins created by the immune system with the purpose of protecting the body against foreign substances. These substances are often pathogens, causing viruses or infections. There are many benefits in serological advancements to public health and epidemiology, especially in bioengineering. Because the principles of bioengineering surround life sciences and solving problems, it goes hand in hand with serology.

Diagnostic serology examinations can help to determine if one is vaccinated, if a vaccine is effective, signs of autoimmune disease, and more. This improves the quality of bioengineering as it provides a baseline of data for engineers to incorporate into their new tools and innovations. A serology test can not diagnose a disease, but is used to look for specific antibodies that respond to diseases such as lupus, Covid-19, measles and mumps, mononucleosis, and hepatitis. Abnormal serology results do not automatically imply a serious medical condition. There are no risks to these examinations and no special preparations needed before visiting a healthcare professional. During blood sample analysis, blood cells, blood platelets, proteins, hormones, electrolytes, and minerals can be observed. These examinations may be necessary for a regular

physical check up, screenings, when a patient is feeling unwell or receiving treatment, to determine if a patient's medical condition is hereditary, or when a patient has a condition that mutilates genes.

One of the most recent cases of serology impacting bioengineering is during the global pandemic of Covid-19. The viral airborne illness impacted nations with irreversible damage to populations. In California, Stanford and other hospitals in the Bay Area and beyond utilized a molecular test to screen their patients. Before wider availability of an effective vaccine, the test was used to identify donors of immune plasma for critically ill patients, determine the allocation of vaccines for those who lacked immunity against the virus, identifying who can interact with patients, and to determine when a population has been infected to the point where it is safe to discontinue social distancing or quarantine. This test improved the efficiency of healthcare systems and daily lives as it returned order and provided qualifications for those who were able to return to work after infection. Although this serologic test served to be a great advantage to public health, members of the publication identified that the test had little information on reliability and reproducibility. Needless to say, the team was able to take big strides in efforts to reduce the impacts of Covid-19 by combining serology with bioengineering.

Through common practices in healthcare facilities and intricate research innovation projects, serology has proved to improve the quality of bioengineering. Through the examination of blood serum and its containings, scientists and other professionals are able to determine the next steps in order to treat, cure, identify, and develop prevention against many medical conditions.

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