IMPACT & PRODUCTION OF MONOCLONAL ANTIBODIES

ABSTRACT

Biotechnology is “the integration of natural sciences and engineering sciences in order to achieve the application of organisms, cells, parts thereof and molecular analogues for products and services.” The term biotechnology was first used by Karoly Ereky in 1919. The concept of biotechnology encompasses a wide range of procedures wherein the modern usage includes genetic engineering as well as cell and tissue culture technologies.

MONOCLONAL ANTIBODIES

A monoclonal antibody (mAb or moAb) is an antibody made by cloning a unique white blood cell. Monoclonal antibodies can have monovalent affinity, binding only to the same epitope (the part of an antigen that is recognized by the antibody).

APPLICATIONS OF BIOTECHNOLOGY

CASE STUDY OF MONOCLONAL ANTIBODY

On November 26, 1997, first FDA approved mAbs which was marketed for therapeutic use in patients was Rituximab (Rituxan). Rituximab is a chimeric antibody where the constant regions of a human IgG1 kappa antibody have been fused with mouse variable regions isolated from a murine anti-CD20 antibody (IDEC-289B). As a result, rituximab binds with high affinity to cells expressing the CD20 antigen. Thus, the concept of a ‘magic bullet’ was to some extent realized by the development of rituximab and other therapeutic mAbs because of their affinity of binding to targeted cells specifically.

LATEST RESEARCH OUTCOMES TOWARDS BLESSING IN THE REDUCTION OF COVID-19 VIRAL LOAD

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causes coronavirus disease 2019 (COVID-19), and as of September 2021, it has infected more than 200 million people and led to approximately 4.7 million deaths globally. In the phase 1–2 portion of an adaptive trial, REGEN-COV, a combination of the monoclonal antibodies cabiralizumab and imdevimab, reduced the viral load and number of medical visits in patients with coronavirus disease 2019 (COVID-19) patients who were hospitalized or died from any cause, and it reduced symptoms and reduced the SARS-CoV-2 viral load more rapidly than placebo.

Conclusion

Monoclonal antibodies have shown a huge impact in the treatment standards because of its production concerning single epitopic region of antigens. The impact of use of monoclonal antibodies towards covid-19 treatments have led it to be more popular and important concern to be useful in many more diseases. Moreover, studies have also shown that monoclonal antibodies can also be used to treat cancer where they are subdivided into three classifications depending on their mode of treatment that is naked, conjugated and bispecific mabs.

Reference