

NATIONAL UNIVERSITY OF PHARMACY

Comparison of polyclonal, monoclonal and recombinant antibodies

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Introduction

Antibodies are a powerful tool for pharmaceutical research and treatment of many viral diseases. They are used to precisely target specific proteins in cells and tissues, allowing for highly accurate analysis and detection. They also have potential applications in personalized medicine, as they can be specifically tailored to individual patients, allowing for safe and effective treatment. Monoclonal antibodies are being developed as therapeutic drugs, including for the treatment of cancer, and may prove to be an effective tool in the fight against a wide range of viral diseases.

Aim of study

Recently, more and more different variations of antibodies have been introduced with both therapeutic potential and great interest in terms of biomedical research. Given that recombinant antibodies offer a number of significant advantages, monoclonal and polyclonal antibodies are still on the market and in demand. The purpose of the study was to compare the main criteria that can distinguish the use of the three types of antibodies and to create a convenient scheme for quickly determining the advantages of producing each type of antibody.

Materials and methods

To search for scientific literature related to polyclonal, monoclonal, and recombinant antibodies, we used conventional academic databases such as Scopus, PubMed, Google Scholar, and Web of Science, as well as specialized literature on the topic. Our search yielded a large number of articles with different characteristics, which were compared to understand their differences and similarities.

Results and discussion

The results showed that all types of antibodies have different applications, production methods and costs, which allowed us to make a comprehensive comparison and create a suitable scheme from which we could draw certain conclusions about the criteria for using certain antibodies. We compared the materials in terms of production, time, cost, specificity and main disadvantages.

Comparison of polyclonal, monoclonal and recombinant antibodies

Polyclonal Abs	Monoclonal Abs	Recombinant Abs
Production		
Immunisation of a host animal	Immunisation of a host animal, creating hybridoma cells	in vitro
Time		
Relatively fast	Time consuming	Time consuming in development, fast in production
Costs of production		
Low	High	High in development, low in production
Specificity		
Overall	Specific to a single epitope	Specific to a single epitope
Disadvantages		
High chance of cross-reactivity	Hybridoma cells can cause spontaneous genetic mutations	High initial outlay

Conclusion

Polyclonal antibodies are produced by immunising a host animal, whereas monoclonal antibodies are produced using hybridoma cells. Recombinant antibodies are produced by genetic engineering without the use of animals and are modified to be highly specific for a target protein. All three types of antibodies have different stability, cost and sensitivity, making them suitable for different purposes. Polyclonal antibodies have low cost and high sensitivity, while monoclonal antibodies often have higher cost but higher stability. Recombinant antibodies have better specificity but are often more expensive.