

IMMUNOBIOLOGICALS

KARTHIK R\*, MOHAN N

Department of Oral Medicine and Radiology, Vinayaka Missions Sankarachariyar Dental College, Salem, Tamil Nadu, India.  
Email: drkarthik17@gmail.com

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ABSTRACT

Immunobiologicals are the biologically active agents with immunological actions that are useful for the management of immunologically mediated diseases of infectious or non-infectious origin.

**Keywords:** Immunobiologicals, Epitope, Interferon, Monoclonal antibodies.

INTRODUCTION

Biologicals are molecules that modify the cascade of immunological processes leading to inflammation. Principal immunobiologicals are monoclonal antibodies (Mabs), fusion inhibitors, and interferons (IFNs). Paul Ehrlich first described Mab as “magic bullets” in search of toxins.

An antibody is a protein used by the immune system to identify and neutralize foreign objects such as bacteria and viruses. Each antibody recognizes a specific antigen unique to its target.

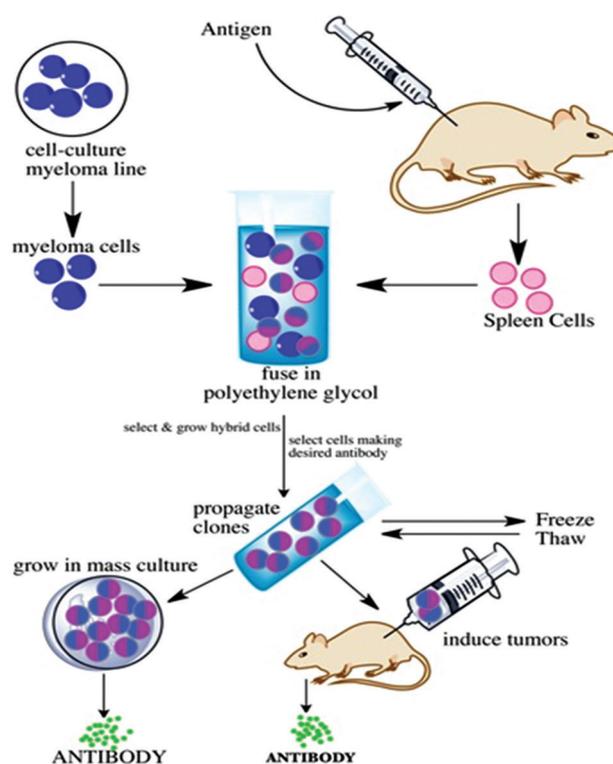
Mabs are antibodies that are identical because they were produced by one type of immune cell, all clones of a single parent cell. Polyclonal antibodies are antibodies that are derived from different cell lines. They differ in amino acid sequence.

The antigen associated with tumor cells are called as the “TUMOR MARKER.” Antibodies produced as a result of specific tumor markers monochonally can be conjugated with drug molecule which, in turn, can be targeted to the specific cells or tumor tissues. Targeting antibodies with drugs involve the following steps: (1) Identification of the new antigen produced by the tumor cells, (2) production of antibody monochonally against the identified new antigen, and (3) formation of drug antibody conjugate or complexes.

These complexes concentrate at the tumor site and deliver the drug. There are several advantages when drugs are delivered as antibody conjugates. The conjugates can specifically reach the target cells without causing any damage to the normal tissue. The drug antibody conjugate could be expected to be the ideal agents for drug targeting in chemotherapy.

Production of Mab

An antigen is injected into a mouse, and after a few weeks, its spleen is removed and plasma cells are extracted. The mouse’s spleen cells are fused with myeloma cells to create hybrid cells called hybridoma cells. Each hybridoma cell indefinitely produces identical antibody, and the hybridoma cells are then screened using an antigen/antibody assay that will reveal which cells produce the desired antibody. The collection of selected hybridoma cells that produce the preferred antibody is rescreened multiple times until a pure line is isolated. These cells are grown in a culture and/or injected into mice to induce tumors. The cells can also be frozen and saved for later use. The hybridoma method for producing Mab is useful because large amounts of specifically tailored identical antibodies can be produced easily [1].



PRODUCTION OF MAB

Mabs are classified according to the decreased order of antigenicity of their components into murine, chimeric, primatized, and humanized.

TYPES OF MAB

1. Murine Mab: Whole antibody is of murine origin produced by hybridoma technology. Major problems with murine Mabs include reduced stimulation of cytotoxicity, formation of complexes after repeated administration, allergic reactions, and anaphylactic shock, for example, Afelimomab.
2. Chimeric Mab: Chimeric antibodies composed of murine variable regions fused onto human constant regions developed by recombinant DNA technology. Antibodies are approximately 65% human origin. This reduces immunogenicity, thus increases serum half-life, for example, Basiliximab and Cetuximab.
3. Humanized Mab: Humanized antibodies are produced by grafting murine hypervariable domains into human antibodies are





