MONOCLONAL ANTIBODIES - A NEW THERAPEUTIC STRATEGY OF AUTO IMMUNE DISEASE

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Abstract
Monoclonal antibodies are monospecific antibodies which are made from identical immune cells that are all clones of a unique parent cell. Monoclonal antibodies have monovalent affinity, in that they bind to the same epitope. Monoclonal antibodies are currently used for many diagnostic and therapeutic applications. Furthermore, strategies of cell engineering, although still mostly based on trial-and-error experimentation and not in standard protocols, hold great interest to improve cell growth and productivity, as well as product quality in the future.

Introduction

Definition

Monoclonal antibodies are invariably produced from hybridoma clones ; whereas each hybridoma clone is meticulously derived by the actual fusion of a myeloma cell together with an antibody producing lymphocyte, and ultimately the hybridoma clone producing the desired antibody is adequately isolated and subsequently identified. Such a fused cell, which was originally described as hybrid-myeloma was named as HYBRIDOMA. Hybridoma technology for the production of antibodies was introduced by CESAR MILSTEIN and GEORGES KOLHER (1975). The regulation of monoclonal antibodies are different as per the regulatory governing body.

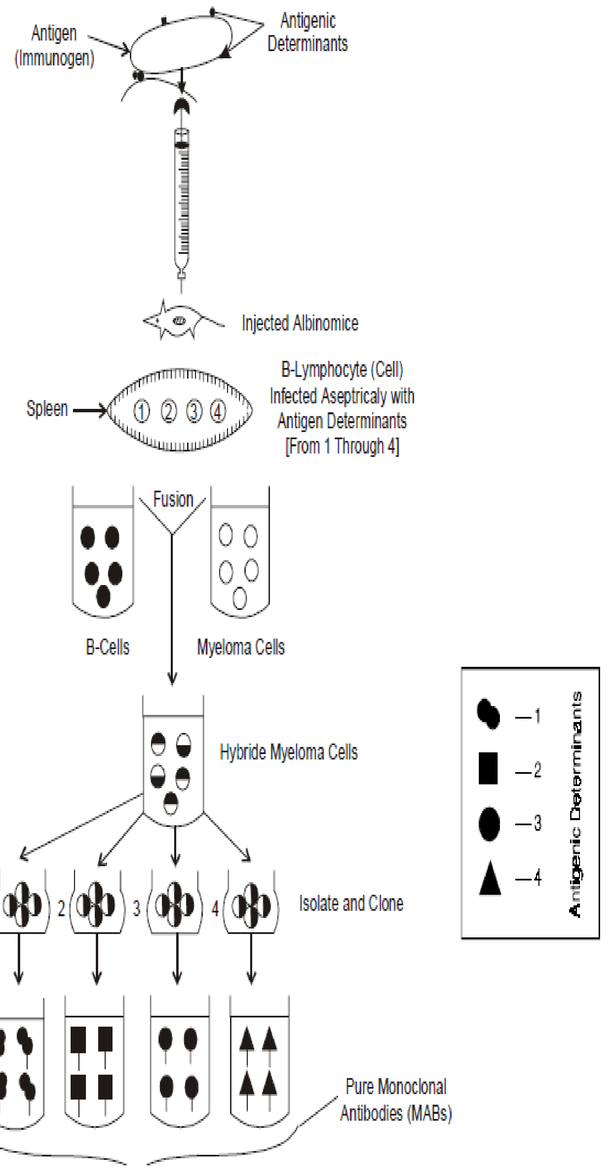
Regulation of Monoclonal Antibody

Country – Regulatory authority	Regulatory Guideline
United States – Centre for Biological Evaluation and Research	21 CFR 200 – 299, 21 CFR 600 – 680. (Federal Register , 1997)
Europe – European Medicine Agency	European Directive, 2001/83/EC
Canada – Health Canada	Guidelines on Antibody Production
India – Department of Biotechnology (CDSCO)	Guidance on Biologics
Japan – Pharmaceuticals and Medicine Device Agency (PMDA)	Guidelines for Biologics (Notification : 266, 0208004, 0912007, 0327025,)
Australia – Therapeutic Drug Administration (TGA)	Guidance on Bilogicals

Techniques used in production of Monoclonal Antibodies

- **MabCure hybridoma technology**
- **Peptide Synthesis for Monoclonal form.**
- **QCM technology**
- **Bioreactor**
- **Crude Sample Analysis Made Eseasy**
- **Kenta's technology**
- **Mouse Ascetic Fluid**
- **Tissue Culture method**

Production of MAbs



Antibody responsible for disease targetting

Antibody	Indication	Company
Orthoclone	Allograft	Orthobiotech
Coresevin M	Anticoagulant	Centocor
Rhu Mab – E25	Allergy	Genetech
Smart anti – CD3	Autoimmune disease	Protein Design Lab
Antegren	Multiple Sclerosis	Elan
Vitaxin	Sarcoma	Medimmune
ABX – 1L8	Psoriasis	Abgenix
Infliximab	Crohn's Disease	Centocor
Ova Rex	Ovarian Cancer	Altarex
BEC2	Lung Cancer	Merck Lga A
Syngis	RSV virus	Medimmune
PRO542	HIV virus	Progeneics
Protoxir	CMV virus	Novartis

Patent Status

Patent number	Name of Company	Innovation
U.S: 5,639,947	Scripps	A transgenic plant comprising: (a) plant cells containing nucleotide sequences encoding immunoglobulin heavy- and light-chain polypeptides that each contain an immunoglobulin leader sequence forming a secretion signal; and (b) immunologically active immunoglobulin molecules encoded by said nucleotide sequences.
U.S: 20040261148	Biolex	A recombinant monoclonal antibody having effector function, wherein said recombinant monoclonal antibody is *produced by expression in duckweed.*
U.S: 5,837,821	City of Hope	A *minibody consisting essentially of the light and heavy* chain variable domains of an antibody fused to, in sequence, the hinge region of an antibody, and amino acid linker and the CH3 domain of an immunoglobulin molecule.
U.S: 6,811,779	Imclone	A method for reducing tumor growth in a mammal in need thereof comprising treating the mammal with an effective amount of a *combination of a onoclonal antibody which specifically binds to an extracellular domain of a VEGF receptor and radiation.*
US: 7,144,990	Genetech	An isolated antibody that specifically binds to the polypeptide

Conclusion

The increasing importance of MAbs in therapeutic applications, occurring in recent years, has led to the rapid development of techniques/ strategies for their large-scale production , but some results have been contradictory, which can be related to the lack of knowledge about cellular mechanisms and specifically their interconnections. If the current know-how is not expanded, success will strongly depend on trial-and-error experiments, and progress in this field will be dependent on new discoveries and their application.

References

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