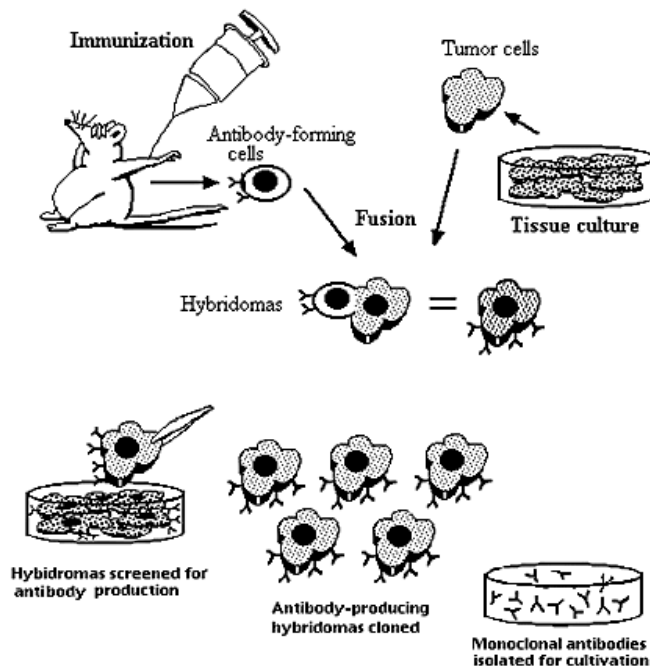


Monoclonal Antibody

Monoclonal Antibodies: Antibodies produced by a single clone and directed against a single antigenic determinant are called monoclonal antibodies. When a clone of lymphocytes or plasma cells undergo selective proliferation as in multiple myeloma, antibodies with a single antigenic specificity accumulate.

Monoclonal Antibody Production: Ingenious method for large scale production of monoclonal antibodies against any desired antigen was described by **Georges J.F. Köhler & César Milstein** in 1975. Shared Noble Prize with **Neils K. Jerne** for Monoclonal Antibody in 1984.

1. Lymphocytes from the spleen of mice immunized with desired antigen, are fused with mouse myeloma cells grown in culture which doesnot form Igs and are deficient in enzyme (Hypoxanthine Phosphoribosyl Transferase-HPRT).
2. The fused cells are placed in basal culture medium (HA medium) containing hypoxanthine, aminopterin & thymidine, which does not permit the growth of the enzyme deficient myeloma cells.



Monoclonal Antibody Production

Normally lymphocyte cannot replicate indefinitely only hybrid cells possessing properties of both the splenic lymphocytes and myeloma cells can grow in culture. These hybridomas are cloned and examined for the production of antibodies.

3. Clones producing antibodies against desired antigen are selected for continuous cultivation. Such hybridomas can be maintained indefinitely in culture and will continue to form monoclonal antibodies.

Clones producing antibodies may also be injected intraperitoneally and monoclonal antibodies can be obtained by harvesting ascitic fluid produced.

Application of Monoclonal Antibodies:

Discovery of hybridoma technology for the production of –unlimited quantities of identical monoclonal antibodies possessing uniform specificity, affinity and other properties created a revolution in immunology by opening up numerous diagnostic, therapeutic and research applications.

1. Mab based immunoassays for monitoring ovulation and detecting pregnancy in cattle. several kits commercial available. i.e., Calf Check, Heifer Check from American Diag. Sales , Westport CT.

2. Mab-based rapid immunodiagnostic assays for early identification of disease outbreaks, to enable isolation of infected animals and reduce spread of disease. Mab based ELISA including dot ELISA, blocking ELISA are being used in the diagnosis of number of animal and poultry viral diseases. A variety of diagnostic kits based on monoclonal antibodies are readily available in the market.

Microscopic examination of Chlamydiosis, rabies by using immuno fluorescence technique/FAT using fluorescence conjugated antibodies i.e., fluorescence conjugated specific monoclonal antibodies.

3. Mabs against specific infectious agents used either directly or passive immunization or indirectly (immune-purification of protective antigens) for active immunization against the infectious disease, in a range of animal species.

4. Mabs used as therapeutic modifiers of specific physiological functions to increase animal production. e.g., increasing frequency of ovulation or as growth promoters.

5. Mabs against immunoglobulins and specific cell surface markers have potential applications in imunoglobulins and for immunotherapy in several disease states and certain types of tumour.
