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Abstract

Embryonic stem cells for the manufacturing of Biologicals

Primary cells (eg. chicken embryos, human fibroblasts) and established continuous cell lines (eg. MDCK, VERO, CHO) have been used since decades for the industrial production of vaccines and therapeutic proteins. However, such manufacturing systems are often limited by various drawbacks such as the need of large quantities of specific-pathogen free materials (eg. chicken embryos), limited life span (primary cells), genetic instability and tumorogenicity (continuous cell lines), low cell densities and poor productivities. Embryonic stem cells hold exceptional biological properties that could theoretically be exploited for the derivation of new generations of cell substrates that fulfil modern industrial and regulatory requirements.
ES cells have been isolated from chicken and ducks and were used to progressively derive EBx® cells using proprietary procedures. Such cells maintain most of the desirable features of ES cells (ie. High expression of telomerase and stem cells surface markers, long-term genetic stability, indefinite cell proliferation…) but display new industrial- and regulatory-friendly characteristics (ie. proliferation in stirred-tank bioreactors at high cell densities as suspension cells, growth in serum-free media, maintenance of diploidy, absence of in vivo tumorogenicity, high susceptibility to various human and animal viruses, efficient genetic engineering and heterologous protein production…). EBx® cells constitute a unique alternative for the manufacturing of vaccines currently produced in eggs, but also for the production of therapeutic proteins, in particular monoclonal antibodies, with enhanced ADCC (antibody-directed cell cytotoxivity) activity. EBx® cells have already been licensed to over 22 Biotech and Pharma companies worldwide.

Biography

Majid Mehtali is since 2003 the Chief Scientific Officer and General Manager of Vivalis. He is a graduate of the European School of biotechnology in Strasbourg and received his PhD at the University of Strasbourg, France. He started his career in 1984 at Rhone- Merieux (currently MERIAL) in Lyon. He then joined Transgene SA (France) as Head of the Virology-Immunology Department (1988-1993) and Head of Gene Therapy Research (1993-1999). From 1999 to 2001, Dr Mehtali worked for the Dutch biotechnology company CRUCELL as Vice-President Research. From 2001 to 2003, Dr. Mehtali has been Chief Scientific Officer and General Manager at DELTAGEN-EUROPE, the European subsidiary of DELTAGEN Inc., a US-based functional genomic and drug discovery company.