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Abstract

Microbiological and Quality Control In Stem Cells Manipulation

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Abstract:

Stem cells biology has become apparentas a major area of biomedical research with eventual implementationsindevelopmental biology, diseasemodeling, drug development, tissue engineering, toxicity testing and furtherextra different applications. Implementationof stem cells in regenerative medicine augurs well for improving human health by resorting the cells function and tissues damaged due to injuryor degeneration.

stem cell biology has emerged as an important area of biomedical research with potential applications in developmental biology, disease modeling, tissue engineering, drug development, toxicity testing and others.Use of stem cells in regenerative medicine holds promise for improving human health by restoring the function of cells and tissues damaged due to degeneration and/or injury [1].

Like all other medical innovations, emerging research on stem cells and translational biology not only requires a sound scientific rationale, but also strict adherence to ethical, legal and social issues.stem cell biology has emerged as an important area of biomedical research with poten • alapplica • ons in developmental biology, disease modelling, • ssue engineering, drug development, toxicitytesting and others.Regenerative medicine cell therapy ispotentiallyone of the most presentaspects of the recenttherapeutic methods. Nevertheless, this presents a number of high-rankingbiosafetyissues like the possible microorganisms transmission to the recipients. The most common potential contamination forms in these cell products maybe bacterial (including Mycoplasma), fungal,yeast, andviral [2].

One of cell culturingrequirements is a highly nutrient medium which cause microorganisms and their spores' attraction, consequentlyexposing the cells to different types of microbial contamination ergo, nip uptheirgrowthand alter their characteristics feature in culture medium.Thiscontamination may arise from the laboratory environment (bad cleaning, disinfecting, sterilization and fumigation) and/ or personals(researchers, equipment's operators, and candidates), cell lines received from other labs(external cell lines), bad handling (mixed contamination), and

reagents [3]. Aseptic technique and regular audit with routine microbiological investigations are the key defensetoolsagainst such risks.

The stem cell labs, cryopreservation banks and other research labsaim not only to screen all processed stem cell lines for the incidence of microorganisms, butalso, to identify theirtypes commonly contaminating the cell culture and the sources of contaminating, as well as see their effects on cultured and cryopreserved cells and to assure that no contaminants are introduced in the proceduresofbanking. It is a standard part of current good practice in stem cell banks to carry out routine microbiological controls and restrictions of the stem cell lines and to work in a controlled environment to reduce the probability of contamination transmission in the stem cells final products [4].

This mini review provides an outline of the occurrence frequency,sources,effects, detection monitoring methods, elimination and prevention of cell linesmicrobial contamination.

Conclusion:

Cell lines Microbial contamination is a common problem in stem cells lab, so all isolatedstem cells must be subjected to international and/or local standards for collection, handling, processing, cryopreservation, administration,andapplications. Furthermore, theremustbesubjected to quality control tests in accordance with national accreditation guidelines and standards. The microbial isolates monitoredfromcell linesshould be identified to species level and antimicrobial susceptibility tests must be done. All analysis of collected data should be reviewed by a microbiologist to identify potential sources of contamination,aftermaking serial investigations till reaching the root cause,thenputting the corrective action/s and protective action/s if needed with a process owner and quality manager. This ensures that the risk of pathogens transmission is reducedto be zero and that cell lines are suitable for their intended and proper use.

Future study and scope :

Microbiological risk assessment in cryopreserved cell lines and in bio banking unit

References :

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Biography:

Marwa M. Elmaghrabi is currently a permanent researcher of stem cells and tissue culture labs at Faculty of Medicine Alexandria University, Egypt. Consultant in the field of medical tests under a general registration number (73717) medical science (25403),ISO 9001:2015 lead auditor IRCA Ref.A18108.

She accumulated 10-Years of experience in quality and infection control at health care and research organizations. She had a master degree 2012 Microbiology. She had a Bioanalytical Chemistry Diploma 2006. She participated in a lot of international conferences as a speaker, moderator, and as a member of organizing committee at Canada, USA, and Egypt. She shared twice in international accreditation projects at Egypt as a quality manager and document controller. She contributed to PAN-African and electronic network project as online broadcasting lecturer. She served as member of Arab QOSH of Safety professional's experts.