

Microbiological Quality Control in Cell Therapy Products for Ocular Surface Disease Applications

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Summary: Ocular surface diseases (OSD) comprises a heterogeneous group of diseases, which have in common the presence of at least one of the following pathophysiological characteristics: change in the composition of the tear film, eyelid changes, destruction of limbal stem cells, inflammatory process, and changes in corneal innervation. Placental tissues, including the Amniotic Membrane (AM), have been used for at least 100 years showing good results in terms of epithelialization with antifibrotic, anti-inflammatory, antiangiogenic and antimicrobial properties, as well as limbus-derived stromal stem cells (CTL), and are also a therapeutic option already proven by studies in the treatment of ophthalmological diseases. However, the availability of these tissues in a standardized and controlled manner to serve as starting material for preclinical and clinical studies is still a challenge. However, it is essential and mandatory to implement microbiological quality control process from the collection, processing and storage. For this, sterility tests was performed in petri dishes containing specific culture medium (agar) that favors the growth of Gram-positive, Gram-negative bacteria and fungi, through the sewage seeding technique. Also, to analyze the purity of the samples, endotoxin analysis using absorbance microplate reader and mycoplasma by RT-PCR reaction were tested. Environmental monitoring assay, the points sampled with agar plates (TSA, SDA and RODAC), were specific for: surfaces and the air of the biological safety cabin. When there is bacterial growth, the international unit of measurement (colony-forming unit - CFU) was applied to estimate the number of viable CFU-Fs of bacteria and fungi. As for the quality and purity of the cellular bioproducts, endotoxin analyses was expressed by a standard curve between the values of absorbance X concentration and the results of the RT-qPCR was also expressed in a graph for the analysis of the melting peak between 80°C and 81°C (being positive) and in the absence of the peak (being negative). The results of the environmental monitoring was classified as positive (when there is bacterial or fungal growth on the plate) and negative (in the absence of contamination). In practical and regulatory terms of such processes, the implementation of microbiological quality control processes is crucial and mandatory. The urgency of Brazil in the health area, specifically in ophthalmology, to be able to offer drugs derived from

advanced therapies with quality that makes them capable of being registered and marketed at costs compatible with the practices of the Unified Health System, is the great motivation of our group.

References

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