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Secretome of Umbilical Cord Mesenchymal Stem Cells: Potential Effects on Melanoma

Pablo Fernandes¹, Andreia Gomes², Pedro Coelho¹

¹Center for Translational Health and Medical Biotechnology Research (TBIO), School of Health (ESS), Polytechnic of Porto, Porto, Portugal

²BebeVida, Ciências para a Vida S.A., Porto, Portugal

Abstract citation ID: szad047.027

Introduction: Melanoma, a tumor resulting from the malignant transformation of melanocytes, is characterized by its aggressive nature and propensity to metastasize. Current treatment options for advanced melanoma are limited and mostly ineffective, highlighting the need for novel therapeutic approaches. Mesenchymal stem cells (MSCs) have increased considerable attention due to their anti-cancer and immunomodulatory properties. In particular, human umbilical cord MSCs (hUCMSCs) have shown promise in various therapeutic applications.

Objectives: The objective of this research was to assess and understand the potential therapeutic effects of conditioned media (CM) derived from hUCMSCs on melanoma cells in vitro.

Methods: hUCMSC, isolated from the umbilical cord of seven healthy neonates by enzymatic digestion followed by direct plastic adherence method, were cultivated and their CM stored for subsequent assays. Then, malignant melanoma B16F10 cells were treated using a final concentration of 100% of

hUCMSC-CM for 24 hours. Afterward, their viability, adhesion, and motility were accessed by MTT, crystal violet, and scratch wound healing assays, respectively.

Results: The MTT assay showed the inhibition of B16F10 cell viability in all treated groups compared to the control group (32%; $p < 0,05$ vs control, $n = 7$). Moreover, crystal violet staining revealed that hUCMSC-CM enhanced the adhesion capacity of melanoma cells by 16% ($p < 0,05$ vs control, $n = 7$). In terms of motility, the hUCMSC-CM reduced migration by 24% ($p < 0,05$ vs control, $n = 7$) after 24 hours.

Discussion: Our results suggest that hUCMSCs may exhibit dual effects on melanoma cells. On one hand, certain factors produced by hUCMSCs have shown potential in reducing the viability and motility of B16F10 melanoma cells, indicating a potential therapeutic benefit. On the other hand, it has also been observed that CM of hUCMSCs can increase the adhesion capacity of melanoma cells.

While hUCMSC-released factors may exhibit beneficial effects on melanoma cells, further research and clinical trials are needed to establish their safety, efficacy, and optimal therapeutic protocols for malignant melanoma.