QBIO ELIXIR

Pre-Clinical Insights: QBio Elixir Boosts ECM Production by 100%, Cell Proliferation by 2X, and Enhances Cell Migration by 15X

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Recognizing the need for effective post-procedure care following cosmetic treatments, Quintessence Biologics, in collaboration with the Nano Medicine and Tissue Engineering Lab at the University of Texas at Arlington, has conducted a pre-clinical study on its new cosmetic formulation, QBio Elixir. Enriched with growth factors, exosomes, and biomolecules derived from human umbilical cord and amniotic membrane tissues, this formulation is designed to support the skin's natural regenerative processes, reducing downtime and significantly enhancing the aesthetic outcome of cosmetic treatments for long-lasting, visible results.

Addressing the Signs of Aging

The signs of aging are a natural and inevitable part of life; however, advancements in cosmetic treatments have been a boon in fighting and even delaying these signs. Procedures such as CO2 laser resurfacing, microneedling, microderma-brasion, and similar cosmetic treatments have empowered individuals to rejuvenate their skin, leading to a more youthful and radiant complexion. While these treatments are effective, they often require significant recovery time and specialized care to optimize results.

Effective skincare products that support the skin's natural functions are essential in maintaining and enhancing the benefits of these cosmetic procedures. By utilizing innovative skincare solutions with bioactive components, individuals can promote skin health and vitality, potentially contributing to long-lasting results and reduced downtime.

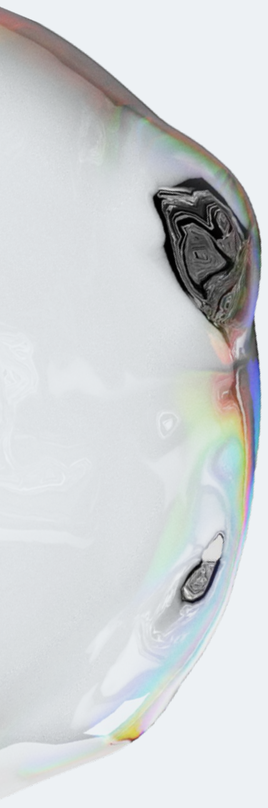
The Need for Effective Post-Procedure Care

Following cosmetic treatments, the skin undergoes a

healing process where proper care is crucial. Specialized post-procedure care can:

- Minimize discomfort and visible signs of treatment
- Support the skin's recovery process
- Enhance and prolong the benefits of cosmetic procedures

QBio Elixir is formulated to assist in this crucial period by enhancing the skin's natural regenerative processes, potentially reducing downtime and improving cosmetic outcomes.



Potential of Umbilical Cord and Amniotic Membrane-Derived Biomolecules

Bioactive molecules derived from human umbilical cord and amniotic membrane tissues have garnered attention for their supportive properties in skincare. These components may:

- Aid in maintaining skin hydration
- Contribute to smoother and more even-looking skin
- Support the skin's natural barrier function
- Assists in skin’s natural abilities to sustain long-term improvements

By incorporating these biomolecules, QBio Elixir aims to provide a cosmetic formulation that complements post-procedure care routines and daily skincare regimens, promoting overall skin health and vitality.

Study Overview

The research focused on human dermal fibroblast (HDF) cell lines to assess the effects of QBio Elixir on:

- Cell proliferation
- Cell migration
- Collagen production

Key Observations

1. Cell Proliferation

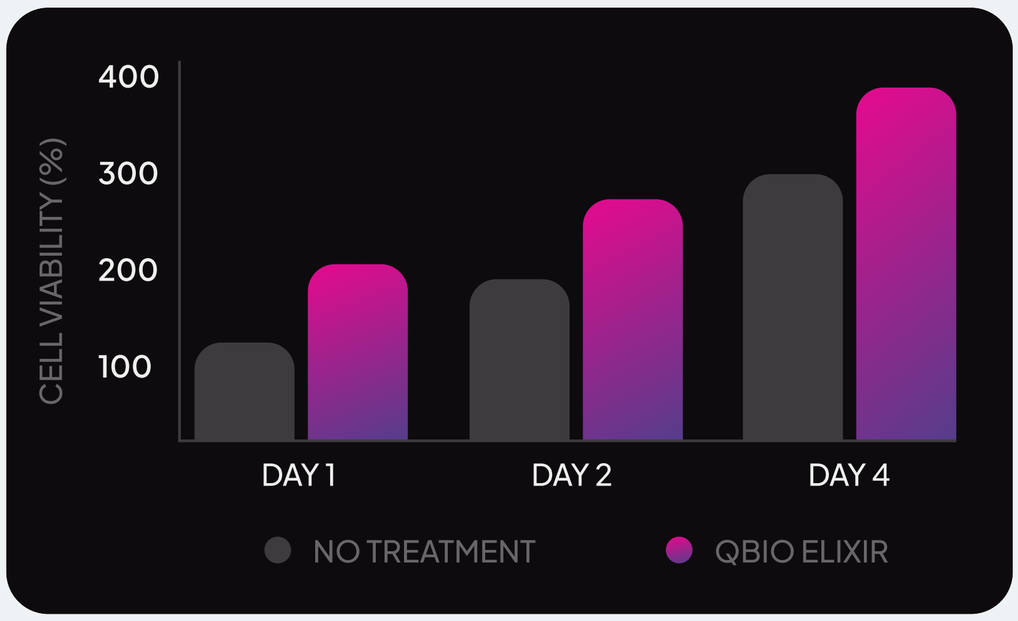


Figure 1. QBio Elixir Treatment Demonstrates 2× Increase in Cell Proliferation Over Time

- Optimal Concentration: A dilution of 1:5 was identified as effective for the study.
- Observations:Treated cells showed increased growth over several days compared to untreated controls.
- Interpretation: The formulation may support cell proliferation in laboratory settings, with treated cells demonstrating up to twice the growth rate of untreated cells.

2. Cell Migration

- Method: A migration assay compared treated HDF cells with untreated controls.
- Observations:
- Treated cells demonstrated enhanced movement in the assay.

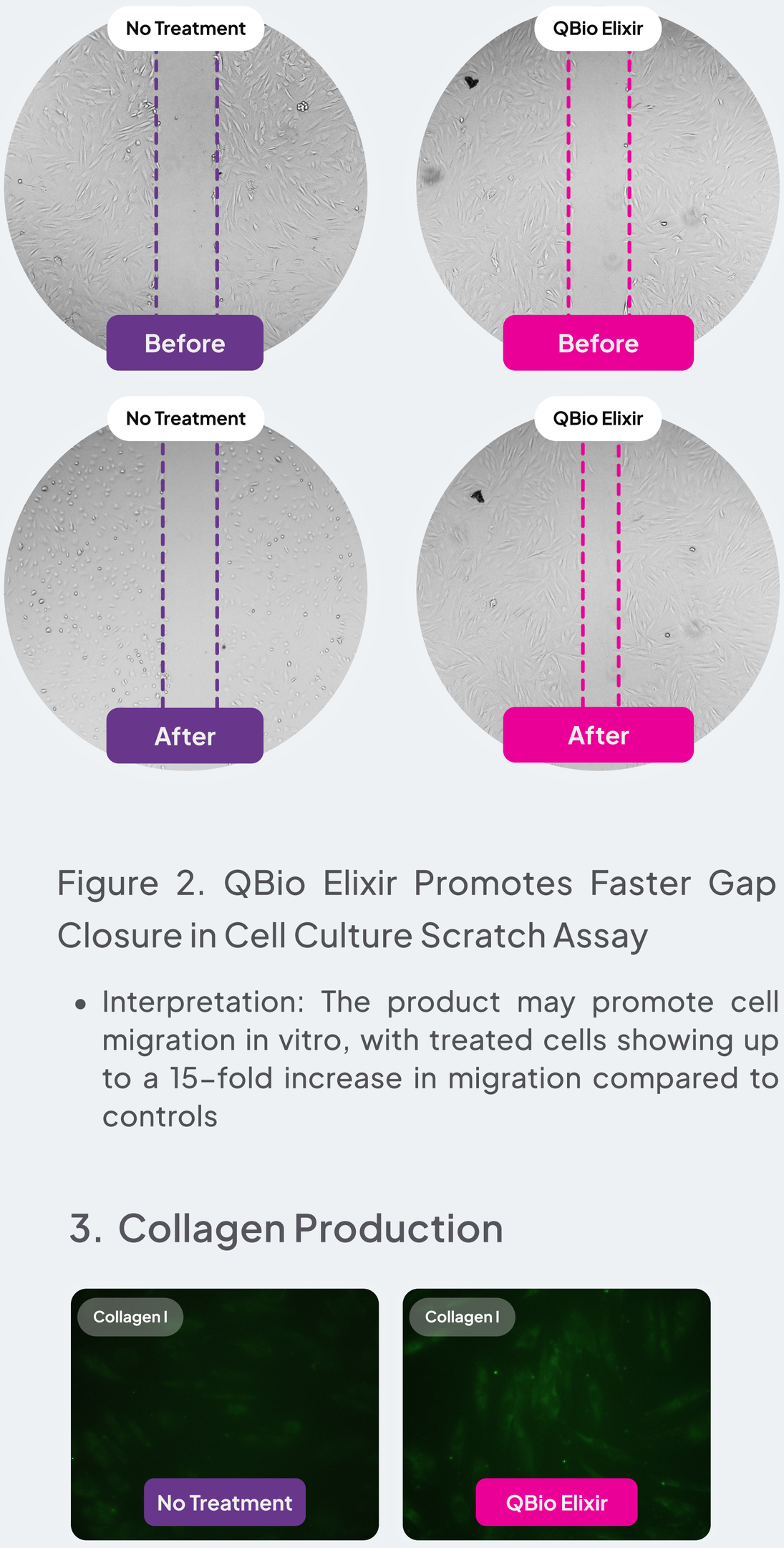


Figure 2. QBio Elixir Promotes Faster Gap Closure in Cell Culture Scratch Assay

- Interpretation: The product may promote cell migration in vitro, with treated cells showing up to a 15-fold increase in migration compared to controls

3. Collagen Production

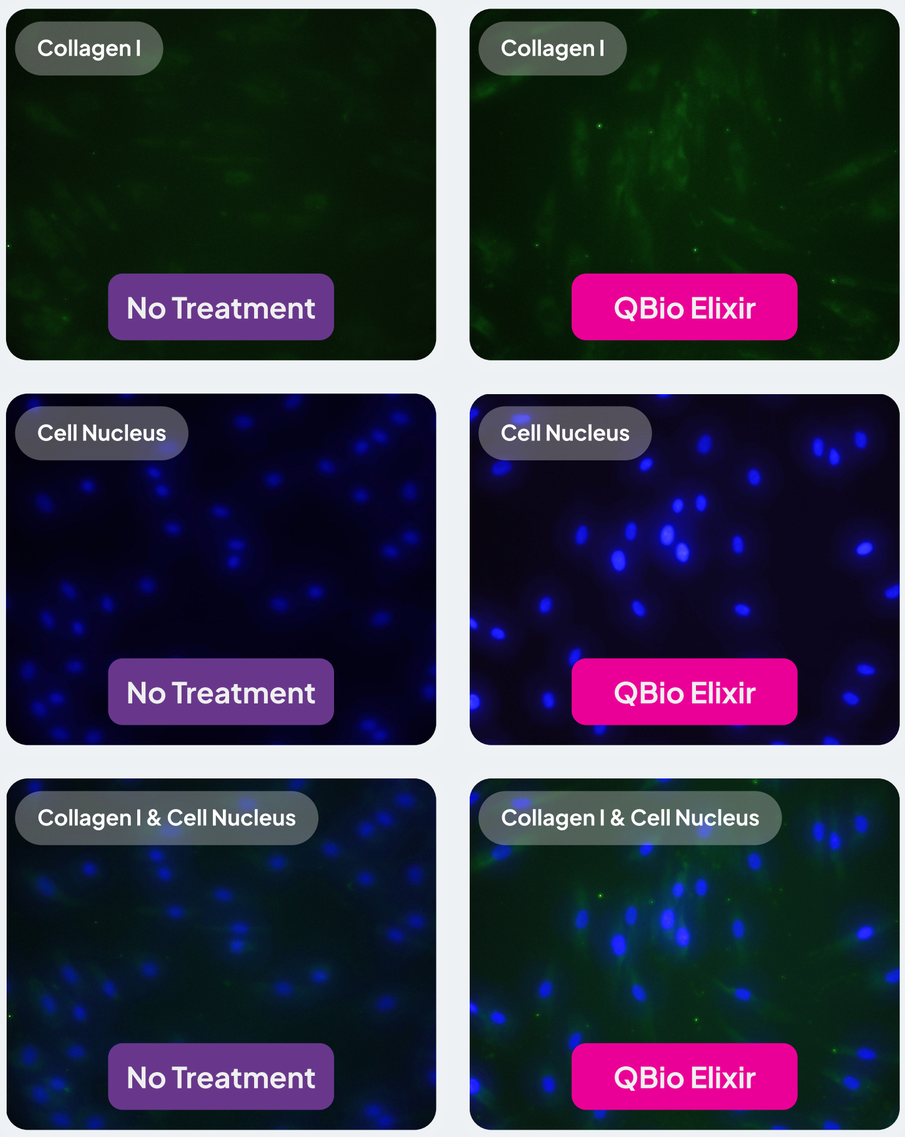


Figure 3. Fluorescent Imaging Demonstrates Enhanced Collagen I Synthesis with QBio Elixir

- Method: Collagen I levels were measured using immunofluorescence techniques.
- Observations: An increase in collagen production was observed in treated cells compared to controls.
- Interpretation: QBio Elixir may support collagen synthesis in laboratory conditions, with treated cells producing up to twice as much collagen as untreated cells.

Implications for Skin Care

The findings from this pre-clinical study suggest that QBio Elixir could be a valuable addition to cosmetic skincare routines, especially in post-procedure care. By supporting cell functions and collagen production in vitro, the formulation may contribute to:

Improved skin appearance and texture

Enhanced recovery following cosmetic treatments

Long-lasting results and reduced downtime

Future Directions

Further research, including clinical evaluations, will be conducted to re-affirm these observations and to understand the potential benefits of QBio Elixir when used as part of a daily skincare regimen or as ongoing post-procedure care.

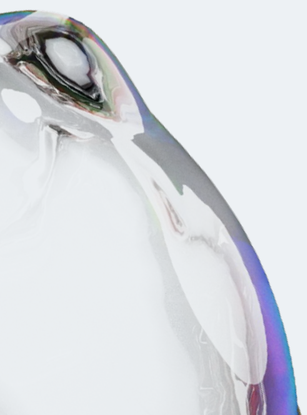
Conclusion

The collaboration between Quintessence Biologics and the University of Texas at Arlington underscores ongoing efforts to advance cosmetic science.

QBio Elixir represents a potential innovation in skincare products aimed at enhancing skin appearance and promoting overall skin health through supportive cosmetic ingredients. By addressing the need for effective post-procedure care and acknowledging that while the signs of aging are inevitable, their appearance can be managed and even delayed, this formulation may offer a new option for those seeking to maintain and enhance the results of their cosmetic treatments.

Disclaimer

The observations and interpretations mentioned are based on pre-clinical laboratory studies. Quintessence Biologics Products are exclusively intended for single-patient topical use in humans to supplement the recipient's skin and assist in its natural regenerative functions. This product is not a drug and is not intended to prevent, treat, or cure any diseases or medical conditions. It is not designed for injection or intravenous delivery. The effects of the product in humans have not been fully established, and individual results may vary. Always consult with a skincare professional or dermatologist before adding new products to your skincare routine. The user must follow the product Application Protocol for its application. It may not be transferred to third parties, resold, modified, or mixed for resale or used to manufacture commercial products for resale without written authorization from Quintessence Biologics.



Materials and Methods

Human Dermal Fibroblast Culture

Adult Human Dermal Fibroblasts (HDFa) (ATCC® PCS-201-012), up to passage 10, were cultured in complete Dulbecco's Modified Eagle's Medium (DMEM) supplemented with 10% fetal bovine serum (FBS) and 1% penicillin/streptomycin. Cells were maintained in a humidified incubator with 95% air and 5% CO_2 at 37°C. The medium was changed every other day until the cells reached confluence. Sub-culturing was performed when the HDFa culture reached 80% confluency. For in vitro studies and assays, a low-serum medium with 1% FBS was used.

Proliferation Study

Cells were seeded at a density of 2,000 cells per well in 96-well plates and incubated overnight. The following day, cells were treated with QBio Elixir at various concentrations, diluted from 1× to 1:50×, and maintained for up to four days. Media and fresh QBio Elixir were replenished every two days. Cell growth was assessed using an MTS assay according to the manufacturer's instructions (CellTiter 96® AQueous One Solution Cell Proliferation Assay, Promega, Madison, WI). Untreated cells served as the negative control. Cellular growth was represented as a percentage relative to untreated cells at 24 hours

Wound Healing (Scratch) Assay

Cells were seeded at a density of 20,000 cells per well in a 48-well plate and incubated overnight. Wounds were created using a 200 µL pipette tip. Cells were washed with phosphate-buffered saline (PBS) and incubated with QBio Elixir at an optimized concentration (1:5 dilution)

in low-serum medium for 12 hours at 37°C. Phase-contrast images were taken to measure the initial wound distance at 0 hours and the degree of wound closure at 12 hours. Untreated cells served as the negative control. Cell migration was quantified by calculating the average distance traveled relative to the initial wound distance. For each sample in each replicate, six distances were selected and measured to determine migration.

Extracellular Matrix (ECM) Production

Cells were seeded at a density of 10,000 cells per well on µ-Slide 8-well chambers (80826, ibidi). The next day, cells were treated with QBio Elixir at a 1:5 dilution for two days, then fixed in cold methanol and permeabilized with 0.1% Triton X-100. After washing with PBS for five minutes, three times, cells were blocked at room temperature with 1% bovine serum albumin (BSA) in 0.1% Tween 20 in PBS (TPBS). Cells were then incubated overnight at 4°C with primary antibodies: rabbit anti-human Elastin Polyclonal Antibody (1:200, 15257-1-AP, ProteinTech Group), rabbit anti-human Collagen I Antibody (1:200, PA1-26204, Invitrogen), or rabbit anti-human MMP1 Antibody (1:50, 10371-2-AP, ProteinTech Group), diluted in 1% BSA in TPBS. Following washing, cells were incubated with secondary antibody Goat Anti-Rabbit IgG H&L (FITC) (1:1000, Abcam, ab6717) in 1% BSA in TPBS for one hour at room temperature. Nuclei were counterstained with DAPI for five minutes. Finally, slides were washed, mounted, and imaged using an Echo fluorescent microscope.

References:

1. Chang, L., Fan, WW., Yuan, HL. et al. Role of umbilical cord mesenchymal stromal cells in skin rejuvenation. npj Regen Med 9, 20 (2024). https://doi.org/10.1038/s41536-024-00363-1
2. Fitriani N, Wilar G, Narsa AC, Mohammed AFA, Wathoni N. Application of Amniotic Membrane in Skin Regeneration. Pharmaceutics. 2023 Feb 23;15(3):748. doi: 10.3390/pharmaceutics15030748. PMID: 36986608; PMCID: PMC10053812.
3. Elkhenany H, El-Derby A, Abd Elkodous M, Salah RA, Lotfy A, El-Badri N. Applications of the amniotic membrane in tissue engineering and regeneration: the hundred-year challenge. Stem Cell Res Ther. 2022 Jan 10;13(1):8. doi: 10.1186/s13287-021-02684-0. PMID: 35012669; PMCID: PMC8744057.
4. Vojdani Z, Babaei A, Vasaghi A, Habibagahi M, Talaei-Khozani T. The effect of amniotic membrane extract on umbilical cord blood mesenchymal stem cell expansion: is there any need to save the amniotic membrane besides the umbilical cord blood? Iran J Basic Med Sci. 2016 Jan;19(1):89-96. PMID: 27096069; PMCID: PMC4823621.
5. Hofmann, N., Rennekampff, H.-O., Salz, A. K., & Börgel, M. (2023). Preparation of human amniotic membrane for transplantation in different application areas. Frontiers in Transplantation, 2. https://doi.org/10.3389/frtra.2023.1152068
6. Nejad, A. R., Hamidieh, A. A., Amirkhani, M. A., & Sisakht, M. M. (2021). Update review on five top clinical applications of human amniotic membrane in regenerative medicine. Placenta, 103, 104–119. https://doi.org/10.1016/j.placenta.2020.10.026

References:

7. Biswas, A., Rajasekaran, R., Saha, B., Dixit, K., Vaidya, P. V., Ojha, A. K., & Dhara, S. (2023). Human placenta/umbilical cord derivatives in regenerative medicine – prospects and challenges. Biomaterials Science, 11(14), 4789–4821. https://doi.org/10.1039/d2bm01977a
8. Aratikatla A, Maffulli N, Rodriguez HC, Gupta M, Potty AG, Gupta A. Allogenic perinatal tissue for musculoskeletal regenerative medicine applications: a systematic review. Biomedicines. 2022;10(12):3173. doi: 10.3390/biomedicines10123173.
9. Cooke M, Tan EK, Mandrycky C, He H, O'Connell J, Tseng SCG. Comparison of cryopreserved amniotic membrane and umbilical cord tissue with dehydrated amniotic membrane/chorion tissue. J Wound Care. 2014;23(10):465–476. doi: 10.12968/jowc.2014.23.10.465
10. Liu J, Sheha H, Fu Y, Liang L, Tseng SC. Update on amniotic membrane transplantation. Expert Rev Ophthalmol. 2010;5(5):645–661. doi: 10.1586/eop.10.63
11. Dua HS, Gomes JA, King AJ, Maharajan VS. The amniotic membrane in ophthalmology. Surv Ophthalmol. 2004;49(1):51–77. doi: 10.1016/j.survophthal.2003.10.004
12. Hanselman AE, Tidwell JE, Santrock RD. Cryopreserved human amniotic membrane injection for plantar fasciitis: a randomized, controlled, double-blind pilot study. Foot Ankle Int. 2015;36(2):151–158. doi: 10.1177/1071100714552824
13. Buck D. Amniotic umbilical cord particulate for discogenic pain. J Osteopath Med. 2019;119(12):814–819. doi: 10.7556/jaoa.2019.138
14. Williams GK. Articular cartilage restoration with adjunctive use of cryopreserved amniotic membrane and umbilical cord particulate. ICRS Summit. 2019;98:5
15. Castellanos R, Tighe S. Injectable amniotic membrane/umbilical cord particulate for knee osteoarthritis: a prospective, single-center pilot study. Pain Med Malden Mass. 2019;20(11):2283–2291. doi: 10.1093/pm/pnz143
16. Bennett DS. Cryopreserved amniotic membrane and umbilical cord particulate for managing pain caused by facet joint syndrome: a case series. Medicine. 2019;98(10):e14745. doi: 10.1097/MD.0000000000014745
17. Ross A, Gambrill V, Main C. Clinical outcomes of amniotic membrane/umbilical cord particulate in spinal disorders: a retrospective study. J Pain Res. 2022;16(15):3971–3979. doi: 10.2147/JPR.S375201
18. Covell DJ, Cohen B, Ellington JK, Jones CP, Davis WH, Anderson RB. The use of cryo-preserved umbilical cord plus amniotic membrane tissues in the resection of tarsal coalition. Foot Ankle Orthop. 2016;1(1):2473011416S0031. doi: 10.1177/2473011416S00311
19. Datta S., Rameshbabu A.P., Bankoti K., Maity P.P., Das D., Pal S., Roy S., Sen R., Dhara S. Oleoyl-Chitosan-Based Nanofiber Mats Impregnated with Amniotic Membrane Derived Stem Cells for Accelerated Full-Thickness Excisional Wound Healing. ACS Biomater. Sci. Eng. 2017;3:1738–1749. doi: 10.1021/acsbiomaterials.7b00189
20. Li J.Y., Ren K.K., Zhang W.J., Xiao L., Wu H.Y., Liu Q.Y., Ding T., Zhang X.C., Nie W.J., Ke Y., et al. Human Amniotic Mesenchymal Stem Cells and Their Paracrine Factors Promote Wound Healing by Inhibiting Heat Stress-Induced Skin Cell Apoptosis and Enhancing Their Proliferation through Activating PI3K/AKT Signaling Pathway. Stem Cell Res. Ther. 2019;10:247. doi: 10.1186/s13287-019-1366-y