

## **Research Studies Conducted by Blue Horizon International**

### **Umbilical Cord Blood derived Mesenchymal Stem Cells Conditioned Media Research**

#### **Introduction**

Extensive studies are ongoing in the field of conditioned medium application for skin care. Medium where the stem cells are cultured is called conditioned medium (CM). In CM stem cells secrete a plethora of growth factors and cytokines (signaling molecules that control cell activities) which are important for wound healing and also beneficial for skin rejuvenation.

Many research studies are underway for various applications of CM. However, there is not a lot of published research that demonstrate analysis of CM and characterize growth factors and cytokines in the CM. The plethora of commercial product can confuse and mislead subjects due to the lack of evidential research on safety and overall effectiveness.

#### **Conditioned Media Quality Tests**

Immunoassay tests are showing that our CM contains all important anti-inflammatory and regeneration-promoting cytokines.

Skin aging is affected by chronological skin aging and photoaging (UV irradiation). Damage-accumulating theories propose that aging is caused by progressive accumulation of cellular damage. Free radicals are biochemical triggers that manifest skin aging, such as wrinkles, altered pigmentation, and loss of skin tone.

Biochemical triggers that manifest skin aging, such as wrinkles, altered pigmentation, and loss of skin tone include:

- Reactive Oxygen Species (ROS), also known as free radicals.
- Advanced Glycation End-products (AGEs).

Our studies are showing that the CM can effectively scavenge free radicals and increase the survival rate of skin cells under oxidative stress, so that it can improve users undesired skin conditions, e.g. oxidation and aging.

Analysis of anti-aging effects of umbilical cord blood-derived mesenchymal stem cell-conditioned medium on skin keratinocytes showed significant change in the ROS and AGE data with the conditioned medium (Figure 1 and Figure 2).

Figure 1.

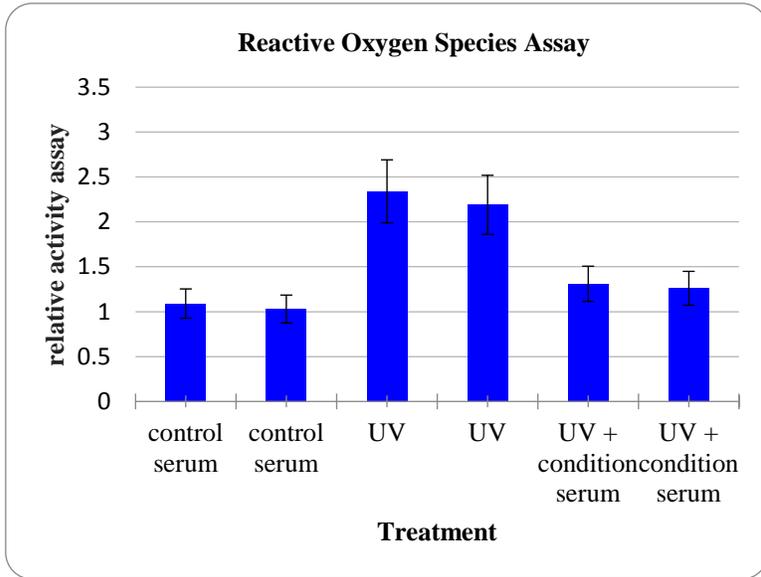
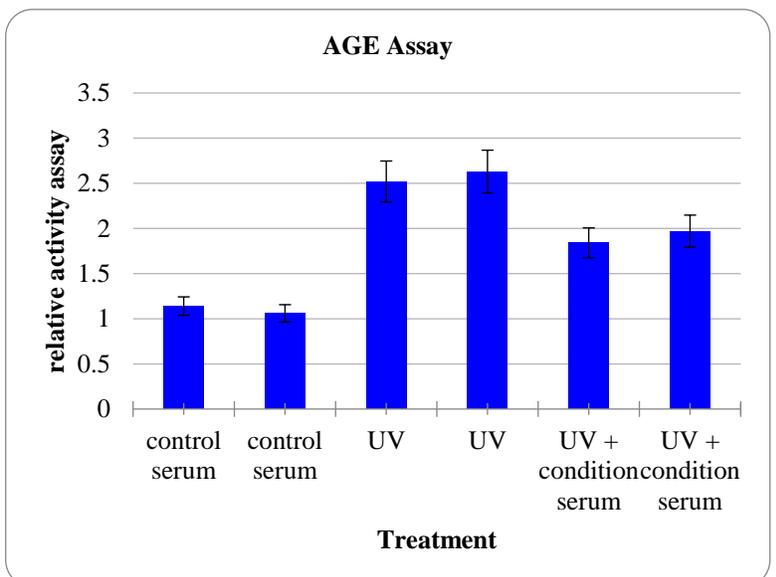
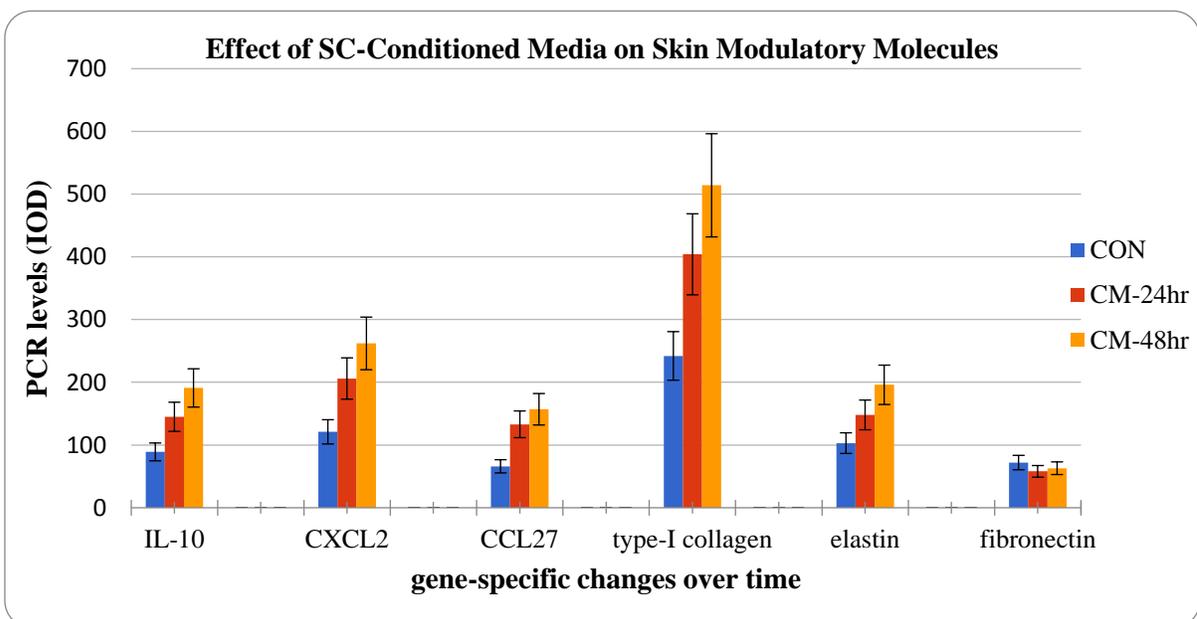


Figure2.



Moreover, our experiments are showing that conditioned medium stimulates gene expression of anti-inflammatory and regeneration-promoting chemokines and skin-specific molecules: CCL27, CXCL2, Elastin, IL-10 and Type-I collagen (Figure 3).

Figure 3.



## Research Studies Results

- **Safety Study of Alpha Blu Skin Care Line Application for Skin Anti-Aging**

A variety of creams, lotions, extracts, and gels are available that claim to significant effect on anti-aging. Unfortunately, the plethora of commercial product can confuse and mislead subjects due to the lack of evidential research on safety and overall effectiveness.

In the IRB approved research study we evaluate the safety and efficacy of CM-based Alpha Blu Skin Care Line application for skin anti-aging.

Alpha Blu Skin Care line include four products: Moisturizing Skin Serum, Day Cream, Night Cream and Eye Cream. Each product contains 4% umbilical cord blood conditioned medium.

Preliminary follow-up results of 24 participants one month after application of Alpha Blu are showing the following:

### **Safety (results of adverse events questionnaire)**

21 participants (88%) did not develop adverse reactions one month after application of Alpha Blu.

### **Efficacy (results of self-assessment questionnaire)**

Results from participants' self-assessment scales indicate improvement in overall skin appearance and skin feel, fine lines /wrinkles, eye lines /wrinkles and deep wrinkles appearance and uneven skin texture.

### **Overall skin appearance.**

Improvement	No Improvement
88%	12%

Characterization of improvement		
Mild	Moderate	Significant
38%	43%	19%

### **1. Overall skin feel**

Improvement	No Improvement
96%	4%

Characterization of improvement		
Mild	Moderate	Significant
40%	30%	30%

## 2. Fine lines/wrinkles

Improvement	No Improvement
79%	21%

Characterization of improvement		
Mild	Moderate	Significant
26%	53%	21%

## 3. Eye lines/wrinkles

Improvement	No Improvement
79%	21%

Characterization of improvement		
Mild	Moderate	Significant
32%	47%	21%

## 4. Deep wrinkles

Improvement	No Improvement
63%	37%

Characterization of improvement		
Mild	Moderate	Significant
40%	33%	27%

## 5. Uneven skin texture

Improvement	No Improvement
79%	21%

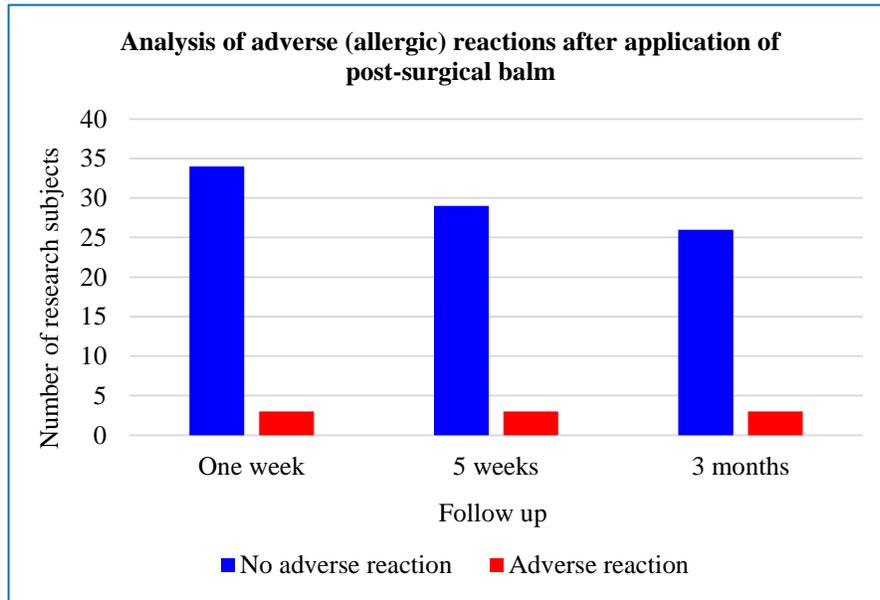
Characterization of improvement		
Mild	Moderate	Significant
36%	32%	32%

- **Safety study of post-surgical balm application for scar reduction**

In the IRB approved research study we evaluate the safety of CM-based surgical balm application for subjects with post-surgical scars and analyze efficacy of surgical balm in reduction of scar appearance on the skin.

Preliminary results of 37 research subjects are showing that post-surgical balm is safe for scars treatment. Significantly high number of subjects did not develop adverse reactions (Figure 4).

Figure 4.



Moreover, subjects are showing improvement of scar appearance on the skin after application of post-surgical balm (Figure 5). Significantly high number of subjects show moderate improvement of scar appearance five weeks and three months after application of post-surgical balm (Figure 6).

Figure 5.

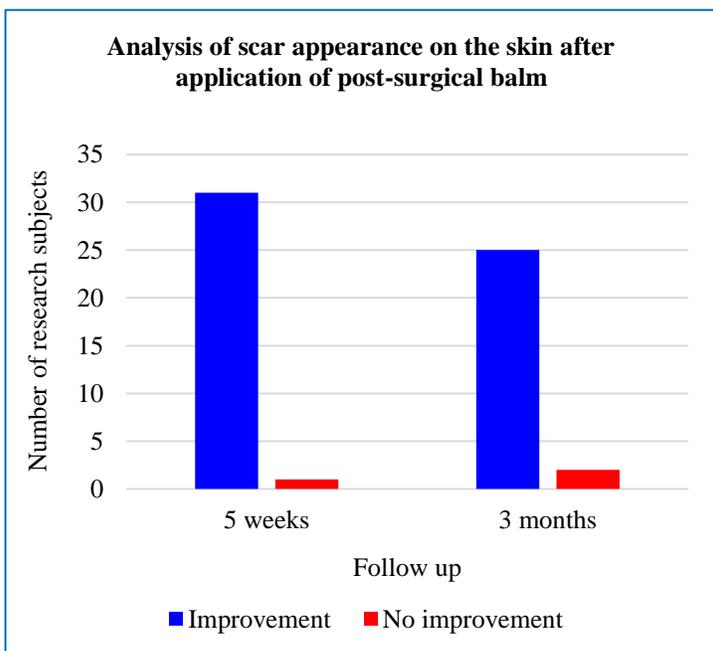


Figure 6.

