

Wound-Care-2020: Cellular rejuvenation using electromagnetic resonance: Corage- Kyung Chun An- The Cellpia Aesthetic Surgery Clinic, South Korea

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Aging leads to changes on an organismal but also cellular level. However, the exact mechanisms of cellular aging in mammals remain poorly understood and the identity and functional role of aging factors, some of which have previously been defined in model organisms such as *Saccharomyces cerevisiae*, remain elusive. Remarkably, during cellular reprogramming most if not all aging hallmarks are erased, offering a novel entry point to study aging and rejuvenation on a cellular level. On the other hand, direct reprogramming of old cells into cells of a different fate preserves many aging signs. Therefore, investigating the process of reprogramming and comparing it to direct reprogramming may yield novel insights about the clearing of aging factors, which is the basis of rejuvenation. Here, we discuss how reprogramming might lead to rejuvenation of a cell, an organ, or even the whole organism. In the past two decades, a lot of developments were seen in the field of skin rejuvenation. Most of the methods for skin rejuvenation were dealing with heat. Radio frequency, ultrasound, LASERs, etc., all these deal with heat. We could designate them as 'controlled burn' without any blisters. The consequences were having dry and sensitive skin. PRP and Stem cell therapies, however, produce different effects. They have made the skin cells to proliferate and induce good skin textures. But, this method could be uncomfortable for the patient because injecting these materials produce a lot of pain. Here comes a new concept of skin rejuvenation: Corage. It is a device which can stimulate and activate the growth factors and other factors cascade by delivering an electromagnetic resonant wave to cells and extracellular substance. They have found out that these wavelength have various effects on quantum at a molecular level. Thus, this technology is named as QMR (Quantum Molecular Resonance). The simultaneous radiation of 16 frequencies creates new wavelengths. These composite wavelengths create new nature available for resonance with all frequencies within the scope of 4~64MHz. These waves does not produce a lot of heat. This is the main difference between general RF devices which use single wavelength. Resonance, made by this machine, is caused in the molecular units forming a cell. Cell metabolism is activated like its own movement, which leads to cell generation and proliferation. The electromagnetic field (EMF) has a great impact on our body. It has been successfully used in physiotherapy for the treatment of bone disorders and osteoarthritis, as well as for cartilage regeneration or pain reduction. Recently, EMFs have also been applied in in vitro experiments on cell/stem cell cultures. Stem cells reside in almost all tissues within the human body, where

they exhibit various potential. These cells are of great importance because they control homeostasis, regeneration, and healing. Nevertheless, stem cells when become cancer stem cells, may influence the pathological condition.

We expect vasodilation, muscle fiber contraction, increase lymphatic activity, etc. upon using this machine. Studies have shown that epidermis and dermis regenerate by reproduction of collagen and elastic fibers. The thickness of dermis increase by 0.2~0.3mm after 6 sets of treatments. Facial tissues tighten, thus wrinkles are significantly reduced. The skin is moist after the treatments, and it lasts for several weeks. Adult stem cells are very important within our body because they are responsible for homeostasis, regeneration, aging, and so forth. Stem cells may respond differently to external stimulation such as the EMF/PEMF depending on cell type, cell density, differentiation stage, and type of medium, as well as the characteristics of the EMF. So far we have few data on the influence of the EMF on stem cell biology. More studies are therefore required because stem cells are responsible for multiple processes within the human body, both desired (e.g., wound healing, regeneration) and undesired (e.g., pathological growth, carcinogenesis).

The parameters of EMFs (frequency, magnetic flux density) and times of exposure used by different research groups are quite diverse with no clear rationale for why particular parameters are chosen. The texture of the skin improves a lot. Acne, atopic dermatitis, ichthyosis have shown a lot of improvement. Acne scars are significantly alleviated with the use of roller of Corage. Recent advancement of treatment using this machine is the use of needles, both short (3-5cm) and long (10-15cm) needles. This method of treatment lifts up SMAS and instant lifting is achieved and it lasts for about a year after 6 treatments protocol. Strong evidence exists that reprogramming induces cellular rejuvenation. This is not only of great promise for therapeutic approaches but also renders important insights for basic understanding of aging. Instead of only investigating changes that occur with aging, potential aging factors can be studied in the process of reprogramming. Studying the dynamics underlying aging factor clearance might additionally render hints to distinguish between causal aging factors and secondary signs of cellular aging. Even though many aging factors were postulated to contribute to aging, demonstrating a causal role remains difficult. Unfortunately, the best-characterized aging factor in yeast, extrachromosomal DNA circles, is the least studied in mammalian systems. This might be partially due to the difficulty to investigate them on a cellular level, the complexity of their appearance and

sequences, and the laboriousness to obtain and study aged cells. Nevertheless, many aging factors that were studied in yeast were confirmed in higher organisms including mice and humans. The new era of skin and facial rejuvenation has arose. Most effective and powerful with minimal invasiveness and pain is key of rejuvenation.