

Renowned Immunologist and Inventor Explains Topical Use of Growth Factors

By Ahmed Al-Qahtani, Ph.D.

Environmental factors, specifically ultraviolet (UV) radiation, causes extrinsic aging. This, combined with intrinsic aging, affects tissue function and structure due to the production of damaging reactive oxygen species known as free radicals. Free radical damage, such as reduced procollagen production and increased collagen degradation in the extracellular matrix (ECM), yields fine lines, wrinkles, discoloration, dark circles, eyelid bags and sagging of the facial and periorbital areas. As increasing evidence reveals the shared fundamental molecular basis between chronological aging and damage-induced aging, exciting new developments for anti-aging therapies have emerged. One research breakthrough to combat and reverse the underlying causes of aging is the use of topical products employing growth factor technology.

Growth factors (GFs) are specialized and fragile proteins that act as chemical messengers between the dermal and epidermal layers of the integumentary system. Found naturally in body cells such as fibroblasts, they are responsible for the synthesis of collagen and the ECM. Cytokines, which are closely related to GFs, are associated with the immune system and play a role in the modulation of inflammation for wound healing and skin regeneration. Both, GFs and cytokines, are involved in cell differentiation, angiogenesis, production and distribution of collagen and elastin, and the regulation of essential cellular activities. They support healthy skin structure and function by promoting cell growth, organizing the ECM, and promoting cell recovery. AQ Recovery, Active and Eye Serum from AQ Skin Solutions (Irvine, Calif.), are cosmeceutical topical serums containing GFs, skin conditioning agents

and antioxidants that have been proven to reverse signs of aging, stimulate the repair of photodamaged skin and improve the appearance of fine lines, wrinkles and spots by utilizing the skin's own renewal mechanisms.

The AQ Skin Solutions product line is specifically formulated at the correct combination and balance of the various GFs that play a crucial role in the remodeling and strengthening of damaged dermal tissue. Since aging results in decreased levels of necessary GFs, reversal of the signs of aging requires supplementation of those GFs involved in skin repair and an appropriate medium for adequate delivery and absorption. Unlike collagen and elastin, GFs and cytokines can penetrate the skin and do not comprise cytoskeletal proteins. These molecules penetrate the skin predominantly along vertical pathways, such as through the pores of a hair follicle, sweat glands, or micro lesions of the interfollicular stratum corneum.

Each of the AQ serums are formulated utilizing the screened, immortalized cell lines protected by U.S. Patent 8,518,819. These physician-dispensed serums target a specific part of the body – facial skin (AQ Active and Eye Serum), hair follicles (AQ Advanced Hair Complex and AQ Lash), and even

Table 1: List of growth factors, cytokines and other proteins identified in AQ Recovery, Active, and Eye Serum and their functions in the skin

TGF-βs (β1, β2, β3)	Stimulates collagen production
	Stimulates fibroblast collagenesis
	Stimulates glycosaminoglycan production
	Increases fibronectin synthesis
	Inhibits matrix degradation
	Facilitates cell chemotaxis
PDGF	Controls fibroblast activation of collagen synthesis
	Stimulates fibroblast collagenesis and glycosaminoglycan production
	Stimulates angiogenesis
	Stimulates wound contraction
GM-CSF	Facilitates cell chemotaxis
	Improves leukocyte function
	Activates neutrophils, eosinophils, and monocytes/macrophages
Interleukins (ILs)	Stimulates proliferation and differentiation of haematopoietic cell lines
	Regulate cell homeostasis
IL-3, IL-6	Enhance neutrophil functions
IL-7, IL-8	Function as anti-inflammatory agents and stimulate wound healing

the vaginal cell walls (AQ Vaginal Rejuvenation System). AQ Growth Factor Induced Therapy (AQ GFIT) combines these benefits with treatment modalities, such as microneedling and laser skin resurfacing, to trigger the body's healing response, and boost the natural repair process through the immediate application of AQ's pure and concentrated serums. The resulting benefits are suitable for most Fitzpatrick skin types and textures.



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Dr. Al-Qahtani is a National Institute of Health (NHI) scientist and is accredited with numerous scientific publications as well as his patented GF technology (U.S. Pat. 8,518,879). He is a long-standing member of the *American Association of Immunologists* and is an assistant professor with the faculty of medicine at the United Arab Emirates University (Al-Ain, United Arab Emirates).