



Peptides

REBUILDING THE DERMAL MATRIX WITH THIS NEW IN-DEMAND INGREDIENT IN SKIN CARE PRODUCTS

By Sam Dhatt, CEO, DermaQuest™ Skin Therapy

Peptides are the new in-demand ingredient in skin care products. Chemists are excited about them because they have scientific data that proves they rebuild the dermal matrix. Skin care professionals are excited because they are something new to offer their clients, and their patients are excited because they work. But are they really "new," as in a new discovery? No, peptides have been around since the birth of tissue – way back when.

Scientists have long recognized them as the building blocks of life. They are made up of a string of amino acids held together by tough bonds of nitrogen and carbon. They look like a necklace and are present in all our tissues. One to 100 amino acids are called peptides, 100-200 they are called "polypeptides," over 200 they are the ever popular, long chains called "proteins."

Twenty known amino acids make up peptides; and their unique combinations define the different peptides, polypeptides, and proteins. Their structure is varied and stable, and sets their specific functions. These amino acids can be synthesized in a laboratory when they are successfully broken apart and defined, the difficult part of the equation.

PEPTIDES AND SKIN CARE

The first peptide was mapped in 1975, and around 40 have been determined since then. But replication took some time to accomplish even after each was found. Oxytocin, the substance which is released from the pituitary gland to induce uterine contractions during childbirth, was the first peptide to be synthesized for use

in medicine. Those who have received the "oxytocin drip" to induce labor in childbirth have experienced the use of this peptide. Others have been synthesized since that time; and now, the dam seems to have been broken as peptides are being determined, then synthesized for many uses.

The synthesized peptides for use in topical skin care products were mapped very recently and are quickly changing the world of skin care. Long chain proteins cannot penetrate the

Oxytocin, the substance which is released from the pituitary gland to induce uterine contractions during childbirth, was the first peptide to be synthesized for use in medicine.

epidermis because of their molecular size. But peptides can, due to their short chains. Acting as "messengers," topical peptides can send out signals to tell the receptors on the skin cells

how they are to perform. Each peptide has its own role to play; and formulations of serums, lotions, and creams with peptides as ingredients must be carefully formulated to meet their pre-determined goals. The most important peptides for use in topical products are discussed below.

The first peptide released, with huge fanfare, was Matrixyl, *INCI Name, Glycerin-Water-Butylene Glycol-Carbomer-Polysorbate 20-Palmitoyl Pentapeptide-4. It has five amino acids in a chain and is a synthesized peptide which stimulates the development of the dermal layer of the skin. It is designed to trigger a heal-and-repair response which stimulates the development of collagen I, collagen III, and elastin and collagen IV fibroblasts, as well as fibrectin (FN) and glucosaminoglycans (GAGs), components of the dermis which moisturize and support the dermal matrix.

The next popular peptide introduced was Argireline, *INCI Name, Aqua-Acetyl Hexapeptide-3. It is six amino acid peptides in a chain. It works through the neuro-transmitters to relax facial muscles by keeping the signal protein (catecholamine) from triggering a muscle contraction effectively. In contrast to Botox®, their mechanism is not paralysis; and they allow natural expression and movement while relaxing the repeating contraction of the muscle causing the wrinkle. With the repeated motion effectively diminished and with continual use of the peptide on the area, the skin smoothes and the wrinkle reduces.

Rigin, *INCI Name, Water (and)-Glycerin (and) Steareth-20 (and)

PalmitoylTetrapeptide-7, reduces inflammation, a potential trigger for aging, by suppressing production of interleukins, particularly IL6, the chemical messengers which trigger the body's acute inflammatory response. Rigin has four synthesized amino acids in a chain. As we age, our regulation system for the secretion of

***INCI is an acronym for International Nomenclature of Cosmetic Ingredient**

The INCI name is the accepted name across the world for an ingredient and is now required on labels by the United States Federal Drug Agency. The shorter more familiar name is the brand name, the one which is most known in the market place. With this new requirement, many of the chemical names changed, such as Matrixyl, formerly listed chemically as Palmitoyl Pentapeptide-3 changed to Glycerin-Water-Butylene Glycol-Carbomer-Polysorbate 20-Palmitoyl Pentapeptide-4 on the ingredient list.

IL5 develops defects, and significant levels of IL6 are released even when there is no inflammatory stimulus. This produces high levels of inflammatory proteins in the tissues, a loss of healing potential, and slower tissue regeneration. Rigin mimics the action of DHEA (dehydroepiandrosterone), restoring cytokine equilibrium, and producing more youthful skin. It is usually formulated with other peptides as it creates a beneficial environment for supporting their anti-aging goals by reducing inflammation and thus the

activity of free radicals.

Eyeliss and Regu-age are usually discussed together as they are synergistic, working best when formulated into a product together. Eyeliss, *INCI Name, Water-Glycerin-Hesperidin Methyl Chalcone-Steareth-20-Dipeptide-2-Palmitoyl Tetrapeptide-7, works by decreasing capillary permeability, improving the lymphatic circulation under the eyes, and improving the firmness and elasticity. Dark circles under the eyes disappear in 4-8 weeks, something patients love. Regu-Age, *INCI Name, Oxido Reductases-Soy Peptides-Hydrolyzed Rice Bran Extract, is a soy and rice-based peptide which also reduces the puffiness and dark circles around the eyes.

Melanostatin-5, *INCI Name, Aqua-Dextran-Nonapeptide-1, is a brand new skin lightening biomimetic peptide which works through the antagonism to alpha melanocyte stimulating hormone, meaning, it does not allow the hormone signal to tell the melanocyte to produce melanin, thus preventing and lightening hyperpigmentation. It is being discussed as the answer to reducing hydroquinone-use in patient care and is being formulated into non-hydroquinone lightening products to turn up the speed of lightening and to maintain lightening without the use of that controversial ingredient on a long-term basis.

DO THEY WORK?

Yes, they do; and they have clinicals to prove it. Matrixyl can noticeably increase the skin's thickness and improve its appearance. It is said to develop dermal

components as no other topical ingredient has done before. And has the clinicals to prove it.

Matrixyl is considered a must-use in anti-aging regimen products because of the proven capabilities in developing the dermis. Studies show overall collagen synthesis to 117% and collagen IV synthesis up to 327%. (Collagen IV strengthens the basal membrane of the epidermis, an important aspect of strengthening the overall skin.) It also increases hyaluronic acid synthesis by up to 267%. Studies also support its use between Botox injections as it can stimulate the development of the dermal components of the relaxed wrinkles, lessening their depth over time.

Argireline is usually formulated into anti-aging products with Matrixyl. It slows the damage-producing movements while the Matrixyl builds up the dermis to reduce the depth of the wrinkles. Argireline is beneficial used between Botox injections, also. Applied daily in the patient's home care regimen, tests have shown that it extends the life of the Botox treatment, something the patients appreciate.

Both Eyeliss and Regu-age have proven to synergistically reduce puffiness around the eyes by 67% initially (4-12

weeks), with continued improvement over time, and the dark circles under them by 60%, with continued improvement over time. They also decrease the inflammatory-aging phenomena in the area by reducing free radicals. They should be in all anti-aging eye products and in products to reduce dark circles around the eyes. Patients are always surprised (and pleased) when one day they no longer need cover makeup under their eyes!

Melanostatin-5 produces noticeable and speedy lightening when formulated into a lightening product by at least 33% initially, with continued improvement over time. This safe and reliable lightening agent has the potential of changing the lightening protocols in our industry.



The one problem with peptides is that they are not instantaneous—they take time to do their work, according to the condition of the skin (4-12 weeks, with continuing improvement over time after initial changes). Thus, if the skin care professionals and patients do not understand this phenomenon, they may say "peptides do not work." They do, however. They just take time. They

do their job and in noticeable amounts. Because they take time, however, the patients may not notice the dramatic changes, nor may the professional. For that reason, I encourage use of cameras for before and after pictures. The proof is in the pictures. Education of how peptides work is important to the patients'

Matrixyl is considered a must-use in anti-aging regimen products because of the proven capabilities in developing the dermis.

happiness—they must have appropriate expectations or they will not "stay the course" and allow the peptides to do their work.

Will the changes maintain if the person ceases using the products? No, and the patients need to know this. Our skin continues to change, according to its health and aging risk factors. The product must be used continually to maintain the change.

WHAT TO LOOK FOR

Your patient says to you, "Why can't I use (an OTC or multiple level product)? It has peptides in it, the ads say so, and it is so much less expensive!" Your answer is, "Less expensive means lower amounts of the important ingredients." Peptides are expensive ingredients to formulate, and the costs are of course passed on to the consumer. But they must be percentage-specific in their formulation or they do not perform. Lower percentages are "label dressing," ingredients placed in the formulation but are low in percentage, below performance requirements. However, they are on the ingredient

list so they can be mentioned in marketing.

Along with the peptides, formulations should be anti-oxidant and hydration-rich. They should contain ingredients such as sodium hyaluronate, butyl glycol, and PCA for hydration, and CoQ10, vitamins C and E, Green Tea and alpha lipoic or idebenone as antioxidants.

The patient regimen should include a separate hydration product and an SPF 30 product, as well as a good cleanser and a weekly scrub for home use. Some professionals add a low percentage exfoliation product, such as a low percentage glycolic or retinol product, to encourage turnover of epidermal cells.

ANTI-AGING UPSIDE DOWN

Until recently, anti-aging treatments quickly and deeply exfoliated the skin with the patient leaving the office red and irritated. And, in her handbag was a bottle of 10-15%, sometimes 20%, glycolic home care to keep the exfoliation going until her next treatment. Peeling and flaking between treatments were seen as "a good thing." But now we are hearing voices which are saying, "Stop the constant irritation." The new theory is that "irritation causes aging," that purposely causing chronic irritation triggers excessive and ambient free radicals which cause aging, even though the product is currently bringing younger-looking cells to the surface and plumping up the skin for the present.

Peptides are the darlings of the "control the irritation" theory. First, the patient is pre-treated with peptides before the series or laser treatment to

Following are the minimums of each peptide which must be present in a formulation to achieve actual results.

Matrixyl - 5%
Argireline – 10%
Rigin – 3%
Eyeliss – 3%
Regu-age – 5%
Melanostatin-5 – 2-4%

These percentages are in the ingredient list mid-level, to high (the higher the percentage, the higher in the list). Ask your product company for the percentages in the product you are purchasing. They should be willing to tell you.

"wake it up" to respond to the treatment to its highest capabilities and with lighteners to suppress the melanocytes. The day of the treatment, the skin is treated with the appropriate resurfacer—a mid-level resurfacer—or laser, and the patient may take home a lower percentage of exfoliative home care product to continue some turnover of cells, but not enough to cause chronic irritation. The peptides are continued during the series and after it is final to continue the dermal building. The dermis is stimulated by these home care peptides, not high levels of acids. The goal is to build up the dermis, maybe with mild exfoliation of the epidermis. The result is younger-looking, plumper, more beautiful skin—without the ambient free radicals.

New resurfacers are being developed which contain lower percentages of acids formulated with peptides. These products exfoliate the

skin while dramatically stimulating the dermal matrix. The new generation of resurfacers, they are a successful marriage of both worlds of treatment care, bringing healthy, glowing, and younger-looking skin to the patient without irritation, potential hyperpigmentation, and aging in the future.

In the "stop the irritation" aging theory, no irritation is triggered purposely; instead the skin is calmed immediately, post treatment, and free radicals are captured by the high levels of antioxidants formulated into the peptide product. The skin is not red, nor does it peel or flake. Instead, it is glowing and healthy. Within 2-12 weeks, it is plumper and more even toned than it has ever been, looking healthier than it has in years. Also, it is younger and more beautiful. And best of all, no chronic irritation is causing free radical activity in the skin. **ATI**

Sam Dhatt, M.S., M.B.A., is CEO of DermaQuest Skin Therapy and a highly respected and award-winning anti-aging cosmeceutical chemist. Dhatt has formulated and manufactured skin care products for over 700 companies during his 20-year career as a sought-after formulator. His product line, DermaQuest Skin Therapy, Hayward, CA, a highly results-oriented product line with spa and physician levels of care, is sold only to physicians, medical spas, and clinical estheticians. For more information please address correspondence to: DermaQuest Skin Therapy, 800.213.8100 p, or visit them online at: www.skintherapydq.com.