SeduSkin HYLAGEN 3

HYLAGEN³ – Collagen Biostimulation & Firming Solution

Composition and Mechanism: HYLAGEN³ is formulated as a **collagen-rich biostimulator**, featuring a combination of bioactive **collagen (Types I and III)**, targeted peptides, and hyaluronic acid. The name suggests "HylaGen" = Hyaluronic + Collagen (gen referring to collagenogenesis) and the superscript 3 implies a focus on Type III collagen or a triad of components (Collagen I, III, and peptides). In essence, HYLAGEN³ provides the building blocks and stimuli for dermal **neocollagenesis** (new collagen formation).

Collagen Types I and III are the primary structural proteins in the dermis: approximately 80% of normal dermal collagen is Type I (which imparts tensile strength), while about 15–20% is Type III (which provides flexibility and elasticity)[xvii]. With age and certain hormonal changes, there is a decline in both Type I and III collagen production by fibroblasts, leading to thinning of the dermis, wrinkles, and loss of firmness. By introducing exogenous collagen into the dermis, HYLAGEN³ aims to **replenish the dermal matrix** and simultaneously stimulate the skin's own fibroblasts. The collagen in this product is of non-animal origin (produced via bio-fermentation to ensure biocompatibility and avoid immune reactions), and is formulated in minute fragments/peptides that can integrate into the dermal tissue. These injected collagen fragments can act as a scaffold that reinforces the dermis and also as a chemotactic signal – fibroblasts detect the presence of collagen fragments and may increase their activity (somewhat analogous to how an injury with collagen breakdown would signal fibroblasts to produce new collagen). Indeed, studies on injectable collagen fillers (such as formulations of human collagen I/III) have shown they can persist in tissue for months and provide a matrix for cell infiltration, with clinical improvements in skin plumpness and texture lasting beyond the presence of the material[xviii].

In addition to actual collagen protein, HYLAGEN[3] contains **bio-mimetic peptides** that further boost collagen synthesis. These are short sequences of amino acids designed to target cell receptors or mimic parts of extracellular matrix proteins, thereby triggering fibroblast receptors to upregulate collagen production. For example, certain peptides (often used in cosmeceuticals) are known to stimulate production of Type I procollagen and elastin by fibroblasts, effectively "coaching" aging cells to behave like younger ones[xix]. One well-known peptide in skincare, palmitoyl tetrapeptide (part of the Matrixyl family), has been shown to increase collagen I, fibronectin, and HA synthesis in fibroblast cultures[xx]. While the exact proprietary peptides in HYLAGEN[3] are not listed, their role is to act as **signal amplifiers** – complementing the physical presence of collagen with biochemical stimulation of new collagen, elastin, and glycosaminoglycans. Over time, repeated stimulation can counteract fibroblast senescence (the slowing of fibroblast function with age)[xxi] and lead to a net gain in dermal collagen content. The hyaluronic acid in the formula serves to improve injection ease and provide baseline hydration; it also ensures the peptides and collagen diffuse nicely through the tissue.

In summary, HYLAGEN[3] works through **biostimulation and bioreplacement**: it directly adds collagen to the dermal scaffold and concurrently induces the skin to generate more of its own structural proteins. This makes it distinctly a *firming and strengthening* booster, as opposed to a purely hydrating one.

Clinical Indications: HYLAGEN[3] is indicated wherever the primary concern is loss of dermal density, early sagging, or the need for structural skin support without resorting to volumizing fillers. Typical indications include:

- **Mild to moderate skin laxity, especially in the cheeks and midface:** Patients who notice their cheeks are less firm or early jowls forming (but who are not yet candidates for surgical lifts) can benefit from HYLAGEN[3]. By increasing collagen I and III in the dermis, the product can improve skin tensile strength and elasticity, giving a subtle lift and better contour to areas like the midface and jawline.
- **Nasolabial fold softening without volume addition:** Some individuals have prominent nasolabial lines due to skin laxity rather than fat loss. Instead of filling these folds with HA filler (which adds volume), using HYLAGEN[3] can tighten the skin in that area, **reducing the depth of folds by improving skin firmness[xxii]**. This is ideal for those who want a natural look without adding puffiness to the face.
- **Perimenopausal or hormone-related thinning of skin:** Women in their late 40s to 50s often experience accelerated collagen loss due

to estrogen decline, leading to crepey skin and fine lines. HYLAGEN[3] specifically addresses collagen depletion, making it suitable for peri- and post-menopausal skin that has become thinner or less elastic[xxiii]. It helps rebuild dermal thickness, which can soften fine wrinkles and restore a more youthful resilience.

- **Loss of facial volume/density after significant weight loss:** After losing weight, some patients find their face looks gaunt or lax due to reduction in fat and collagen. This product can assist in **rebuilding the dermal support** that was lost with fat, improving facial tautness and contour[xxiv]. It's not a volumizer like a filler, but by improving skin firmness, it can indirectly enhance facial fullness.
- **Repetitive expression lines (etched lines) without deep folds:** For example, early crow's feet or forehead lines in someone not ready for toxin or in conjunction with toxin. HYLAGEN[3] can fortify the skin's resistance to dynamic wrinkles by increasing its elasticity and strength[xxv]. The skin becomes less prone to creasing.
- **Neck and décolleté revitalization:** The neck and upper chest often develop fine wrinkles and a "crepey" texture due to sun exposure and thin skin. Collagen stimulators here can yield good improvements in smoothness. HYLAGEN[3] can be injected in a microdroplet technique across the neck and chest to improve the structural integrity of these areas[xxvi].
- **Sensitive or barrier-compromised skin (e.g. mild atopic dermatitis):** Off-label, HYLA-PDRN can be considered in patients with chronic mild dermatitis or fragility in the skin barrier. The anti-inflammatory properties of PDRN coupled with HA's soothing hydration may aid epidermal barrier restoration and reduce redness or itching[xxvii]. (Severe active eczema or psoriasis would be contraindicated for injections until controlled.)

In practice, clinicians choose HYLAGEN[3] when a patient's skin **lacks firmness or "padding,"** but isn't necessarily dehydrated or inflamed. It's more of a "scaffolding" booster. For instance, if comparing to HYLA-PDRN: a patient with purely dull, thin skin and slight sag would get more benefit from HYLAGEN[3] (to build collagen), whereas a patient with acne marks or redness would be better suited to PDRN.

Ideal Patient Profile: The ideal HYLAGEN[3] patient is in the **35 to 60+** age range with early aging signs related to collagen loss. This could be a male or female patient noticing their face is "deflating" or the skin is getting looser, but who may not yet have advanced enough aging to warrant surgical or high-intensity

treatments. It is particularly appealing to patients who have had volumizing treatments (like fillers) and now want to improve overall skin quality – for example, someone who has filler in the cheeks but still sees fine lines and mild sagging in adjacent areas can use HYLAGEN[3] to **enhance skin tightness** in those areas without adding more volume. It's also suitable for individuals on a long-term **preventative anti-aging regimen**: for instance, a 40-year-old starting to see slight nasolabial shadows could start yearly collagen-stimulating mesotherapy to slow progression. Fitzpatrick skin types I to IV are generally suitable (there's no specific limitation, as the product does not target pigment). Patients with **menopausal skin changes** or those who have undergone significant life changes (post-pregnancy skin laxity or post-weight-loss) are good candidates. Because the product is pure protein/peptide-based without inflammatory actives, it's usually well-tolerated; even those with sensitive skin can use it, though as always a history of collagen allergy would be a contraindication (rare with non-animal collagen).

Scientific Rationale and Evidence: The rationale for collagen-based injectables is supported by both historical use and emerging science. Collagen injections were among the first cosmetic injectables (bovine collagen was used in the 1980s for wrinkles), and while early products had issues with immunogenicity and short duration, newer bioengineered collagens are safer and more durable[xxviii]. The key scientific insight is that **dermal fibroblasts can be "reactivated"** by exposure to collagen fragments and peptides. Normally, with aging, fibroblasts reduce output of Type I collagen and focus on maintenance. By providing collagen fragments, one mimics the biochemical environment of a wound (where collagen breakdown products signal fibroblasts to come repair). There is evidence that fibroblasts will increase proliferation in the presence of certain collagen peptides. Moreover, peptides designed to penetrate skin (as in topical use) or delivered via injection can bind to cell surface receptors like integrins or growth-factor receptors, initiating gene expression changes. For example, one study noted that a cosmetic peptide blend led to 20% improvement in skin firmness and 33% increase in skin tone after 2 months, vs placebo[xxix]. Another study on Matrixyl (a palmitoylated peptide) showed increased collagen I and hyaluronic acid production in cell culture[xxx]. In HYLAGEN[3], the peptides are likely chosen to specifically stimulate collagen subtypes I and III – this targeted stimulation addresses the *root cause* of fine wrinkles and sagging.

From a clinical perspective, we know that **collagen is the key to youthful skin structure**. By replenishing Type I and III collagen (which constitute the bulk of dermal collagen[xxxi]), skin becomes stronger and more elastic. For example, a 10-year study of an injectable human collagen I/III product in China showed significant patient satisfaction with improvements in scars and wrinkles, and histology confirmed the

exogenous collagen persisted for many months as it gradually was replaced by the body's own tissue[xxxii]. This demonstrates the concept of a scaffold that gradually turns over into natural tissue (the ideal outcome). Additionally, the presence of HA in the mix means that there is immediate hydration and a template for new collagen fibers to be organized around. The **differentiation** from other boosters is clear: HYLAGEN[3] is not primarily for hydration or pigmentation, but for **structure and support**. It should not be used if the skin is very dehydrated without first addressing moisture (that's where HYLADERM 2% might come in), nor if the issue is active inflammation. However, once basic skin health is ensured, adding collagen stimulation can significantly improve skin quality over a series of treatments, and the effects can be long-lasting (6-12 months) as new collagen remains until it naturally degrades.

Clinical Example: *A Fifty-year-old woman shows early jowling and softening of her jawline, and fine lines around the mouth, but she is hesitant to use more HA fillers because she prefers a natural look. She undergoes three monthly sessions of* HYLAGEN[3] *across the midface, jawline, and neck. By three months after the last session, her skin appears firmer and the contours of her lower face are more defined; the fine smoker's lines around her lips have diminished as the skin thickened. She notes that her face hasn't grown (no added volume), yet she looks "lifted" and her skin feels more resilient. On palpation, the dermatologist finds the cheek skin feels denser. This case illustrates the effect of biostimulation: the patient's own collagen network has been enhanced, yielding tighter skin. Over the next year, gradual collagen turnover will determine how long the effect lasts, but a maintenance session every 6-12 months could prolong the benefits.* No significant downtime occurred aside from mild soreness; the patient's makeup artist commented her skin texture improved. This outcome is consistent with the **collagen-inductive mechanism** of HYLAGEN[3], essentially "building the foundation beneath the skin."