



**STONEGATE
HEALTHCARE**

Leading Innovations in Anti Aging Dermatology

OneSkin's OS-01, GlycoProteMim™ and Pitera™

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www.stonegatehealthcarepartners.com

Executive Summary

The landscape of treating age-related skin problems is set for a revolutionary shift, blending cutting-edge technology with personalized and holistic approaches. This evolution promises more effective, targeted, and safer treatments, allowing individuals to maintain youthful, healthy skin well into their advanced years. The US anti-aging market is forecasted to reach \$12.5 billion by 2024, highlighting the robust growth prospects and the immense potential of this transformative shift in skincare.

We believe in this new paradigm, novel topicals like OneSkin's OS-01, Sirona Biochem's GlycoProteMim™ and SK-II's Pitera™, will gain traction for their unique, scientifically-backed benefits. Just three years into its launch, OneSkin's OS-01 has already surpassed \$100 million in sales. These novel topicals offer multi-faceted skin benefits — from deep hydration and cellular renewal to robust protection against environmental stressors — without the aggressive side effects often linked to retinoids. These advanced novel topicals hold immense potential in transforming skincare treatments and are poised to take significant market share from well-established treatments such as Retinoids, Toxins, and Dermal fillers.

We are especially excited about Sirona Biochem's GlycoProteMim which operates on a fundamentally different principle than its predecessors. While Retinoids work by promoting cell turnover and collagen production, and dermal fillers and toxins mainly provide volume and temporarily paralyze facial muscles, GlycoProteMim offers a multifaceted approach. It not only targets the surface-level appearance but also addresses the underlying cellular mechanisms that contribute to skin aging. It acts as a true rejuvenation treatment, restoring cells and their functions to their original youthful state before the deleterious effects of age.

Moreover, the development of GlycoProteMim is a testament to the broader trend of leveraging biotechnology and biomimetics in skincare. Researchers are increasingly looking to nature and the body's natural processes for inspiration, creating compounds that work in harmony with the skin's physiology rather than against it. This not only enhances efficacy but also reduces potential side effects, making treatments safer for a broader range of individuals. GlycoProteMim is a biomimicry of glycoproteins found in Antarctic fish that protect them from harsh environmental stressors including nutrient deprivation and oxidative stress.

Advances in genomics and skin diagnostics have ushered in a new era of personalized skincare, allowing for treatment plans tailored to an individual’s unique skin type, genetic makeup, and lifestyle, thus enhancing effectiveness and alignment with specific needs. This shift towards a holistic approach integrates nutritional science, mental health, and overall wellness, recognizing their critical roles in maintaining youthful skin. Skincare professionals are now recommending dietary changes, stress management, and lifestyle adjustments alongside topical treatments. Rapid developments in technology, such as AI-driven diagnostic tools and advanced delivery systems like microneedling with nanotechnology, are revolutionizing the field by providing precise skin analyses and ensuring deeper penetration of active ingredients. This new paradigm in skincare focuses on understanding and modifying the underlying processes of skin aging, emphasizing a science-driven, personalized, and effective approach that empowers individuals to maintain youthful, radiant skin and live healthier, more confident lives.

The landscape of treating age-related skin problems is set for a revolutionary shift, blending cutting-edge technology with personalized and holistic approaches. This evolution promises more effective, targeted, and safer treatments, allowing individuals to maintain youthful, healthy skin well into their advanced years. We are especially excited about advanced novel topicals like GycoProteMim and Pitera, and peptides like OS-01 which we believe will continue to take share from Retinoids, Toxins and Dermal fillers which have been entrenched in the market.

Anti Aging Treatment Landscape: A Comparative Analysis

	Retinoids	Toxins	Dermal Fillers	Advanced Novel Molecules Topicals	Peptides
Efficacy	Proven, "gold standard"	Highly effective	Effective	Potentially Superior	Promising, less evidence
Safety	Significant side effects: irritation, dryness, sun sensitivity	Side effects: bruising, swelling, drooping	Side effects: bruising, swelling, lumps	Generally well-tolerated	Generally well-tolerated; mild irritation.
Pricing	\$10-\$100+	\$300-\$1,000+ per treatment	\$500-\$2,000+ per treatment	\$100-300+	\$20-\$200+
Convenience	Topical, daily use	In-office, every 3-6 months	In-office, Every 6-12 months	Topical, Daily Use	Topical, Daily Use
Example Brand	Established- <i>Retin-A (Tretinoin)</i> ,	Established- <i>Botox (Allergan)</i> ,	Various brands- <i>Juvéderm (Allergan)</i> ,	GlycoProteMim™ (Sirona), Pitera™ (SK-II)	Various brands- <i>Matrixyl</i>

	<i>Differin (Adapalene) etc</i>	<i>Dysport (Galderma) etc</i>	<i>Restylane (Galderma) etc</i>		<i>(Sederma), OS-01 (OneSkin) etc</i>
Distribution	Widely available, OTC & Rx	Through Medical professionals only	Available through Medical professionals only	Potentially Widely available	Widely available, mostly OTC

Potential Winners Among Anti Aging Skincare Products

Product	Company/Brand	Key Ingredients	Price (Oz)	Key Information
TNS Advanced+ Serum	SkinMedica (Allergan)	Dimer Tripeptide-43, Trifluoroacetyl Tripeptide-2	\$295	Uses innovative, clinically tested ingredients, including patented TNS (Tissue Nutrient Solution) growth factor technology
SkinPower Cream	SK-II	Pitera, Niacinamide, Infinitpower Technology	\$94	Launched in 2023; contains SK-II's exclusive ingredient PITERA™, derived from yeast fermentation
GlycoProteMim	Sirona	Biomimicry of naturally occurring glycoproteins found in nature.	NA	Clinically tested, globally patented ingredient with true rejuvenating changes to aged skin. Improves all key parameters in aged skin. Preparing for launch 2025.
SISLEÿA L'INTEGRAL ANTI-AGE	Sisley Paris	Soy Peptide	\$430	Luxury anti-aging serum targeting wrinkles and fine lines
OS-01 FACE Topical Supplement	OneSkin	OS-01 Peptide	\$72	Features the OS-01 peptide, which repairs cellular damage from UVB radiation, suppresses a key aging gene, and activates collagen and hyaluronic acid production genes

Highlighted Companies and Products



SkinMedica, an Allergan Aesthetics company, develops and markets skincare products. Their line includes creams, cleansers, and other aesthetic solutions that promote skin health rejuvenation. Notably, their TNS Essential Serum and TNS Recovery Complex are renowned for their transformative effects on skin appearance. For more information, visit <https://www.skinmedica.com>



SK-II

SK-II is a Japanese-based multinational cosmetics brand launched in the early 1980s. Its products, primarily popular in ingredient based on a compound derived from yeast fermentation, Pitera in simple cosmetic forms. Suitable in normal to dry skin as well as North Asian and European skin types and climates. For more information, visit <http://www.sk-ii.com>



Sirona Biochem is a leading cosmetic ingredient and drug discovery company specializing in stabilizing carbohydrate molecules for commercial use in cosmetic, food, nutraceutical, and pharmaceutical industries. Based in efficacy and safety. Their recently developed anti-aging compound, GlycoProteMim™, has been clinically proven to offer remarkable anti-aging results. A product line containing this proprietary molecule for OTCs launches through the company's wholly-owned subsidiary, Sirona Laboratories. For more information, visit <https://www.sironabiochem.com>





ONE SKIN OneSkin is a longevity company on a mission to transform the way we think about skin and aging. Founded by a team of four female PhDs, OneSkin's products focus on skin longevity. OneSkin's proprietary peptide, OS-01, is a unique ingredient designed to restore skin's biological age by improving the skin barrier, supporting DNA damage repair, and preventing the accumulation of aged cells. For more information, visit <https://www.oneskin.co>



CTEK Sisley, better known as Sisley Paris, is an independent French luxury cosmetic skincare, hair care, and perfume company. The firm develops products based on active ingredients derived from plants for many skin types and different uses: moisturizing, anti-aging, sun care, and makeup. For more information, visit <https://www.sisley-paris.com>



Current and Future Treatments for Age-Related Skin Problems

Age-related skin problems often include wrinkles, sagging, age spots, and dryness. Treatments for these problems have evolved significantly and currently include:

1. **Topical Treatments:** These are the most common and include retinoids, hyaluronic acid, and peptides. Retinoids, derived from Vitamin A, stimulate collagen production and cell turnover. Hyaluronic acid and peptides help in hydration and firming up the skin.
2. **Procedures:**
 - a. **Botox and Dermal Fillers:** Botox is used to relax facial muscles that cause wrinkles, while dermal fillers plump up sagging skin and fill fine lines.
 - b. **Chemical Peels:** These treatments remove the outer layer of skin, promoting new skin growth that appears more youthful and even-toned.
 - c. **Laser Therapy:** This includes laser resurfacing and intense pulsed light (IPL) therapy. They help reduce wrinkles, age spots, and skin laxity.
 - d. **Microneedling:** Tiny needles create micro-injuries in the skin, promoting collagen production and elastin growth.
3. **Skincare Routines:** Sunscreen use, gentle cleansing, and moisturization have become standard recommendations to protect and maintain skin health.
4. **Hormonal Treatments:** Hormone replacement therapy (HRT) helps in combating dryness and loss of elasticity that come with reduced hormone levels during menopause.

In the next decade, we anticipate even more advanced and personalized treatments for age-related skin problems:

1. **Advanced Topical Treatments:**
 - a. **Nanotechnology:** Enhancing the delivery systems of active ingredients can make topical treatments more effective. Nanoparticles can penetrate deeper and target specific cells.

- b. Smart Skincare: Products that release active ingredients based on real-time skin needs, detected through embedded sensors.
 - c. Peptides and advanced novel molecules like GlycoProteMim.
- 2. Holistic Approaches:
 - a. Integrative Medicine: Combination of traditional treatments with holistic approaches such as nutritional therapy, herbal treatments, and stress management techniques.
 - b. Probiotics and the Microbiome: Research into skin microbiome health might lead to treatments that balance skin bacteria, improving overall skin health and appearance.
- 3. Biotech Advances:
 - a. Stem Cell Therapy: Research is showing promise in using stem cells to regenerate and repair aging skin. These can potentially rejuvenate the skin at a cellular level.
 - b. Gene Editing (CRISPR): The potential to edit genes associated with aging could revolutionize skin care, slowing down or even reversing age-related changes.
- 4. AI and Personalized Medicine:
 - a. Data-Driven Skincare: AI can analyze individual skin types and conditions to recommend personalized skincare routines and products. This ensures higher efficacy and satisfaction.
 - b. Lab-Grown Skin: Using biotechnology, it may become possible to grow personalized skin grafts that can replace damaged or wrinkled skin.
 - c. 3D Printing: The potential to 3D print skin tissues or structures that can be applied to replace or support aging skin provides an exciting frontier.

The Aging Market

The process of aging is an intrinsic and universal aspect of life that affects all living organisms, characterized by progressive changes at the molecular, cellular, tissue, and organismal levels over time. Aging impacts the skin in various ways, reflecting the broader process of aging that affects all tissues and organs in the body.

Skin aging is influenced by both intrinsic (internal) and extrinsic (external) factors. Intrinsic aging, also known as chronological aging, is driven by biological processes inherent to the body, such as genetic factors and hormonal changes. Extrinsic aging, on the other hand, is caused by environmental factors such as UV radiation, pollution, smoking, and lifestyle choices like diet and skincare habits. Both intrinsic and extrinsic factors contribute to the visible signs of aging in the skin.

Aging leads to structural changes in the skin, including thinning of the epidermis (outer layer) and dermis (middle layer), reduction in collagen and elastin production, and loss of fat and moisture. These changes result in the appearance of wrinkles, fine lines, sagging skin, and loss of firmness and elasticity. Additionally, the skin becomes more fragile and prone to bruising, tearing, and other injuries as it ages.

At the cellular level, aging affects the function and behavior of skin cells, including keratinocytes, fibroblasts, and melanocytes. Cellular turnover slows down, leading to a buildup of dead skin cells and a dull, uneven complexion. Fibroblasts, which produce collagen and elastin, become less active, resulting in decreased skin firmness and resilience. Melanocytes may become dysfunctional, leading to uneven pigmentation and age spots.

Aging is associated with chronic inflammation and oxidative stress in the skin, which contribute to accelerated aging and tissue damage. Inflammatory cytokines and reactive oxygen species (ROS) generated during the aging process can disrupt cellular function, degrade collagen and elastin fibers, and impair the skin's natural repair mechanisms. This can exacerbate the visible signs of aging and increase the risk of skin diseases and disorders.

MARKET FOR ANTI-AGING AGENTS

The Rise of Anti-Aging Products

Anti-aging products, encompassing skincare and haircare formulations, play a pivotal role in reducing and preventing signs of aging. These products are formulated with potent ingredients like retinol, peptides, and antioxidants, designed to relax facial muscles and promote younger-looking skin.

Market Dynamics and Trends

The global anti-aging products market is experiencing significant investments from conglomerate companies due to increasing consumer demand for cosmetic products. Technological advances, such as laser treatment systems and innovations in manufacturing effective anti-aging products, have significantly contributed to market growth.

Technological Advancements

Technological advancements, including laser treatment systems and innovative manufacturing techniques, are driving advancements in anti-aging product development. These innovations contribute to the efficacy and accessibility of anti-aging solutions, further fueling market growth.

Investment Landscape and Opportunities

The allure of the anti-aging segment has attracted substantial investments, totaling \$4.6 billion. This financial interest underscores the immense potential and demand for anti-aging solutions. Companies developing innovative and efficacious products stand to capitalize on this burgeoning market, as consumers increasingly prioritize youthful skin and seek products that deliver tangible results while ensuring safety and tolerability.

Market Projection and Growth

The anti-aging market is a formidable segment within the cosmetic industry, poised for substantial expansion. By 2024, the US anti-aging market is forecasted to reach a valuation of \$12.5 billion, indicating robust growth prospects. Notably, anti-aging products command a significant share, comprising 70% of all cosmetic products.

Growth Drivers

1. The increasing older population is a significant driver of the anti-aging products market growth.
2. Advancements in medical care, improved living conditions, and declining fertility rates contribute to the rising elderly population.
3. People in the age group of 30s to 45s are seeking products to maintain a youthful appearance due to concerns over signs of aging, such as loss of skin elasticity, wrinkles, and hyperpigmentation.

KEY ANTI-AGING AGENTS

Here's a breakdown of the market for anti-aging agents based on five broad categories:

1. Toxin-based (like Botox):

- Botulinum toxin, commonly known as Botox, is a neurotoxin that temporarily paralyzes muscles, thereby reducing the appearance of wrinkles and fine lines.
- Botox injections are one of the most popular cosmetic procedures worldwide, particularly for targeting dynamic wrinkles caused by facial expressions.
- Other toxin-based products may include similar neurotoxins used for cosmetic purposes, such as Dysport and Xeomin.

2. Retinol-based Products:

- Retinol is a derivative of vitamin A known for its ability to stimulate collagen production, reduce wrinkles, and improve skin texture.
- Products containing retinol range from over-the-counter creams and serums to prescription-strength formulations.
- These products are widely used for their effectiveness in reducing the signs of aging and improving overall skin health.

3. Dermal Fillers:

- Dermal fillers are injectable substances used to add volume, plump up skin, and smooth out wrinkles and folds.
- Common types of dermal fillers include hyaluronic acid-based fillers, calcium hydroxylapatite fillers, and poly-L-lactic acid fillers.
- These fillers are popular for restoring facial volume lost due to aging, enhancing lips, and contouring facial features.

4. Peptides:

- Peptides are short chains of amino acids that can have beneficial effects on skin health and appearance.
- In skincare, peptides are used to stimulate collagen production, improve skin firmness, and reduce the appearance of wrinkles.
- Peptide-based products may include serums, creams, and masks designed to target specific aging concerns and promote overall skin rejuvenation.

5. Advanced Novel Topicals:

- Targeted small molecule emulsions refer to topical formulations containing small molecules that penetrate the skin to target specific aging concerns.
- These products often contain ingredients such as antioxidants, vitamins, and peptides formulated to improve skin elasticity, hydration, and texture.
- Small molecule emulsions are available in various forms, including creams, lotions, and serums, and are commonly used as part of daily skincare routines.

Botox

Botox, derived from the bacterium *Clostridium botulinum*, has emerged as a leading cosmetic treatment for age-related skin issues. While it is widely known for its use in reducing the appearance of wrinkles and fine lines, its therapeutic applications extend beyond cosmetic enhancement. Botox primarily functions by temporarily paralyzing muscles, thereby smoothing out wrinkles caused by repetitive facial expressions, such as frown lines, crow's feet, and forehead creases.

There are 7 different types of botulinum toxin: A, B, C (C1, C2), D, E, F, and G. The FDA has approved several botulinum toxin products for various medical and cosmetic uses. Many products contain botulinum toxin type A (BoNT-A), they have different potencies and are not interchangeable and so they are used carefully to avoid medication errors.

One of the key advantages of Botox is its ability to provide quick and noticeable results. Patients typically experience visible improvements within a few days of treatment, with optimal results appearing within two weeks. This rapid onset of action makes Botox an attractive option for individuals seeking immediate wrinkle reduction without the downtime associated with surgical procedures.

Moreover, Botox offers targeted treatment, allowing healthcare providers to precisely address specific areas of concern while preserving natural facial expressions. By strategically injecting Botox into targeted muscles, practitioners can tailor treatments to each patient's unique facial anatomy and aesthetic goals. This customization ensures natural-looking results that enhance rather than mask the individual's facial features.

Another significant advantage of Botox is its longevity. While results are temporary and typically last for three to four months, some patients may experience prolonged benefits for up to six months or longer with repeated treatments. This extended duration of action provides patients with lasting wrinkle reduction and allows for fewer maintenance treatments over time.

Furthermore, Botox treatments are minimally invasive and generally well-tolerated by most patients. The procedure involves a series of small injections administered with a fine needle, causing minimal discomfort and requiring no anesthesia. Patients can resume their daily activities immediately following treatment, making Botox a convenient option for individuals with busy lifestyles.

We Expect Usage of Botox To Decline

While Botox is widely used for cosmetic and medical purposes, there are several potential problems related to skin ailments that could impact its future usage:

1. **Adverse Skin Reactions:** Some individuals may experience adverse skin reactions, including rashes, itching, and redness at the injection site. In rare cases, more severe skin conditions like dermatitis can occur, deterring potential users.
2. **Allergic Reactions:** Botox contains botulinum toxin, which can cause allergic reactions in some individuals. Symptoms can range from mild skin irritation to more severe reactions like hives or anaphylaxis.
3. **Infection Risk:** Injections breach the skin barrier, which can lead to infections if not performed under sterile conditions. Infections can result in abscesses, cellulitis, or other skin complications, potentially leading to reduced confidence in Botox procedures.
4. **Bruising and Swelling:** Common immediate side effects of Botox include bruising and swelling at the injection sites. While usually temporary, these effects can be aesthetically displeasing and may discourage repeat treatments.
5. **Skin Thinning and Weakening:** Repeated Botox injections over time can lead to skin thinning or weakening, particularly in individuals with already delicate or aging skin. This can increase the risk of skin damage and may limit the long-term use of Botox.
6. **Development of Antibodies:** Some users may develop antibodies against botulinum toxin, reducing the effectiveness of Botox over time. This can lead to increased dosages and more frequent treatments, which can amplify skin-related side effects.
7. **Misuse and Overuse:** Improper use of Botox, especially by unqualified practitioners, can result in overuse and poor injection techniques. This can cause uneven skin texture, unnatural appearance, and other skin irregularities, diminishing the popularity of Botox treatments.

8. **Impact on Adjacent Skin Areas:** Botox can sometimes migrate from the injection site to adjacent skin areas, leading to unintended effects such as drooping eyelids or uneven facial expressions. This can create a negative perception and reduce the appeal of Botox.
9. **Long-Term Effects Uncertainty:** Although Botox is generally considered safe, the long-term effects of repeated injections are not fully understood. Potential unknown risks could arise, leading to a decline in its use as more information becomes available.
10. **Alternative Treatments:** Advances in skincare and non-invasive cosmetic procedures may offer safer or more effective alternatives to Botox. Emerging treatments like laser therapy, micro-needling, and topical agents could shift consumer preferences away from Botox.

The following are the key Botox competitors:

Brand Name	Type	Manufacturer	Approved Uses
Botox®	OnabotulinumtoxinA	Allergan	Wrinkles
Dysport®	AbobotulinumtoxinA	Ipsen	Glabellar lines
Xeomin®	IncobotulinumtoxinA	Merz Pharmaceuticals	Glabellar lines, chronic drooling
Jeveau®	Type A	Evolus Inc	Moderate-to-severe glabellar lines

The market is dominated by Botox® (OnabotulinumtoxinA), followed by Dysport® (AbobotulinumtoxinA) and Xeomin® (IncobotulinumtoxinA).

Retinoid Based Products

Retinoids are a class of compounds derived from vitamin A or having a chemical structure and biological activity similar to vitamin A. Types of retinoids include:

- Retinol: An over the counter (OTC) form of retinoid found in many skincare products.
- Tretinoin (Retin-A): A prescription-strength retinoid used to treat acne and signs of aging.

- Adapalene (Differin): A prescription retinoid used to treat acne, now available OTC in some countries.
- Tazarotene: A prescription retinoid used to treat acne, psoriasis, and signs of aging.
- Isotretinoin (Accutane): An oral prescription retinoid used to treat severe acne.

Retinoids increase cell turnover and promote collagen production, leading to improved skin texture and reduced fine lines and wrinkles, helps unclog pores and reduce acne breakouts, fades dark spots and hyperpigmentation by inhibiting melanin production & enhances skin repair and regeneration.

There could be side effects such as skin irritation, redness, dryness, and peeling, especially during the first few weeks of use, increased sun sensitivity, making sunscreen use essential. It is not recommended for use during pregnancy due to potential birth defects.

Retinoids are considered a "gold standard" in skincare due to their proven efficacy in treating various skin concerns. However, they may not be suitable for everyone, particularly those with sensitive skin or certain medical conditions. It is essential to consult with a dermatologist or skincare professional before incorporating retinoids into a skincare routine.

Benefits of retinoids are limited by the fact that a truly effective dose is not well tolerated so it is often supplied at a lower potency dose that is well tolerated by most but poorly effective. Also, not all antiaging concerns are not addressed by this therapy. Full results may take six months or up to a year.

The Decline of Retinoids

Retinoids have long been heralded as the gold standard in skincare for their anti-aging and acne-fighting properties. The advancement of skincare technologies, the rise of innovative ingredients, increasingly educated and eco-conscious consumers, and heightened regulatory scrutiny collectively signal a paradigm shift. So despite the prominence of Retinoids in the past, emerging trends and advancements in skincare suggest that retinoids may lose significant market share over the next decade. This projected decline can be attributed to several factors, including innovations in skincare technology, the rise of novel ingredients, evolving consumer preferences, and regulatory scrutiny.

Innovations in Skincare Technology

The skincare industry is experiencing a technological revolution. Newer, more advanced ingredients such as peptides, growth factors, and stem-cell technology are entering the market, offering similar or superior anti-aging benefits without the common side effects associated with retinoids, such as irritation, dryness, and sun sensitivity. These modern alternatives often provide a more targeted action, addressing specific skin concerns at a cellular level, making them more appealing to consumers seeking effective and gentle solutions.

The Rise of Novel Topicals

Novel Topicals like OneSkin, GlycoProteMim™ and Pitera™, will gain traction for their unique, scientifically-backed benefits. These novel topicals offer multi-faceted skin benefits — from deep hydration and cellular renewal to robust protection against environmental stressors — without the aggressive side effects often linked to retinoids. As consumers become more knowledgeable and discerning, the demand for these sophisticated, multi-benefit topicals is expected to rise, eroding retinoids' market stronghold.

Evolving Consumer Preferences

The rise of "skinalism" — a trend promoting minimalistic and gentle skincare routines — is in stark contrast to the sometimes harsh and multi-step regimens involving retinoids. With a focus on simplicity and gentleness, consumers are likely to favor products that offer effectiveness without compromise.

Regulatory Scrutiny and Safety Concerns

Retinoids are often under scrutiny due to potential side effects and contraindications, especially during pregnancy and breastfeeding. Regulatory bodies are becoming more stringent about the safety profiles of skincare ingredients. Countries like Canada and the European Union already have strict regulations surrounding the concentration of retinoids in over-the-counter products. As these regulations tighten globally, the appeal and accessibility of retinoid-based products may diminish.

While retinoids have enjoyed a lengthy tenure at the pinnacle of anti-aging skincare, the future landscape appears less accommodating. Retinoids, though likely to maintain a niche market due to their established efficacy, will face stiff competition from newer, safer, and more versatile alternatives. As the skincare industry evolves, so too will consumer preferences, paving the way for the decline of retinoids in favor of next-generation skincare solutions.

Company	Product	Technology	Concentration	Price (USD)
Johnson & Johnson (USA)	Retin-A (Tretinoin) Cream	Cream	0.025%, 0.05%, 0.1%	Varies by prescription
	Renova (Tretinoin) Cream	Cream	0.02%	Varies by prescription
GlaxoSmithKline (UK)	Alitretinoin (Toctino) Capsules	Oral capsules	10mg, 30mg	Varies by prescription
Galderma (Switzerland)	Differin (Adapalene) Gel	Gel	0.1%, 0.3%	~\$13 for 0.5oz (OTC)
	Epiduo (Adapalene/Benzoyl Peroxide) Gel	Gel	0.1%/2.5%, 0.3%/2.5%	Varies by prescription
Bausch Health Companies Inc. (Canada)	Retin-A Micro (Tretinoin) Gel	Microsphere technology	0.04%, 0.1%	Varies by prescription
Boots UK Limited (UK)	No7 Advanced Retinol 1.5% Complex Night Concentrate	OTC	1.5%	~£34 for 30ml
SkinCeuticals (L'Oréal, France)	Retinol 0.3	OTC	0.3%	~\$67 for 30ml
	Retinol 0.5	OTC	0.5%	~\$80 for 30ml
	Retinol 1.0	OTC	1.0%	~\$92 for 30ml
RoC Skincare (Johnson & Johnson, USA)	Retinol Correxion Deep Wrinkle Night Cream	OTC	Not specified	~\$24 for 1oz
SkinMedica (Allergan, an AbbVie company, USA)	Retinol Complex 0.25	OTC	0.25%	~\$62 for 1oz
	Retinol Complex 0.5	OTC	0.5%	~\$78 for 1oz
	Retinol Complex 1.0	OTC	1.0%	~\$93 for 1oz
La Roche-Posay (L'Oréal, France)	Redermic R Retinol Cream	OTC	Not specified	~\$40 for 30ml
Olay (Procter & Gamble, USA)	Olay Regenerist Retinol 24 Night Serum	OTC	Not specified	~\$29 for 1oz

Peptides

Peptides are short chains of amino acids are the building blocks of essential proteins like collagen and elastin, which contribute to the skin's firmness, elasticity, and youthful appearance.

Incorporating peptides into skin care routine can offer several advantages:

1. Strengthening the skin barrier, which protects against external aggressors.
2. Reducing the appearance of wrinkles and fine lines by stimulating collagen production
3. Improving skin elasticity by supporting elastin fibers
4. Reducing inflammation and evening out skin tone
5. Helping to clear breakouts due to their antimicrobial properties

Peptides work by penetrating the outer layer of the skin and signaling cells to produce more collagen and elastin. Peptide serums or moisturizers allow prolonged contact with the skin. Peptides work well with other ingredients like vitamin C, niacinamide, antioxidants, and hyaluronic acid, but may be less effective when combined with alpha-hydroxy acids (AHAs).

Peptides are becoming increasingly popular in skin care products due to their potential benefits for the skin. While peptides are often promoted as a "miracle cure" and compared to Botox, they are not as effective as the latter in blocking muscle contractions. Additionally, peptides can be expensive, and research on their efficacy is still developing compared to other well-established ingredients like AHAs and retinol. High manufacturing costs often result in lower commercial concentrations, leading to reduced effectiveness. Moreover, peptides typically have poor skin penetration, which can limit their clinical results.

Peptides are a promising skin care ingredient that can help improve skin firmness, reduce the appearance of wrinkles, and support overall skin health. However, more research is needed to fully understand their effectiveness, and it's crucial to consider individual skin concerns and consult with a professional when incorporating peptides into a skin care routine.

Product Name	Key Ingredients	Benefits	Size	Price
Medik8 Liquid Peptides	10 peptides, hyaluronic acid	Firms, plumps, and smooths skin	30 ml	\$64
Eighth Day Regenerative Serum	24 peptides, amino acids, growth factors, neuropeptides, nonapeptide, niacinamide, glycolic acid, alpha lipoic acid	Relaxes muscles, smooths expression lines, inhibits excess pigment formation	15, 30, 50 ml	\$325
Charlotte Tilbury Charlotte's Magic Serum Crystal Elixir	Replexium (2 peptides), polyglutamic acid, vitamin C, niacinamide	Smooths wrinkles and fine lines	8, 30, 100 ml	\$85
Biba de Sousa Los Angeles The Plant Stem Cell Serum with Peptides	2 peptides, hyaluronic acid, panthenol, echinacea plant stem cell	Restores skin's supportive matrix, enhances collagen production, non-comedogenic	30 ml	\$95
Biossance Squalane + Hyaluronic Acid Copper Peptide Rapid Plumping Serum	Copper peptides, hyaluronic acid, polyglutamic acid, squalane	Supports long-term collagen production, immediate plumping and hydration	50 ml	\$68
Youth to the People Triple Peptide Hydrating + Firming Oasis Serum	3 peptides, 4 types of hyaluronic acid, malachite-derived minerals, cactus stem water	Stimulates collagen production, reduces lines and wrinkles, suitable for sensitive skin	30 ml	\$57
RéVive Brightening Serum Vitamin C Niacinamide + Bio-Renewal Peptide	Vitamin C, niacinamide, hyaluronic acid, Bio-Renewal Peptide	Fades discoloration, evens out skin tone, mimics cellular renewal process	30 ml	\$285
Dr. Dennis Gross DermInfusions Fill + Repair Serum	4 peptides, niacinamide, hyaluronic acid, ectoin	Triggers collagen and elastin production for lifting and volume restoration	30 ml	\$75
Peter Thomas Roth Peptide Skinjection Amplified Wrinkle-Fix Refillable Serum	Nearly 30% peptides (peptide complex, peptide compound), squalane, glycerin, phytosterols	Triggers collagen production, interferes with muscle movement to reduce expression lines	30 ml	\$65
StriVectin Anti-Wrinkle Peptide Plump Line Filling Bounce Serum	Single proprietary peptide, red algae extract, turmeric root extract	Encourages production of collagen, elastin, and hyaluronic acid for immediate and long-term plumping	30 ml	\$89
Doctor Babor Lifting Collagen Peptide Derma Filler Serum	Peptide complex, low molecular weight hyaluronic acid, ginseng extract, quinoa extract	Stimulates production of four types of collagen for	30 ml	\$143

		360-degree firming and smoothing		
Drunk Elephant Protini Powerpeptide Resurfacing Serum	10% lactic acid, 11 peptides, squalane, hyaluronic acid, green tea seed oil	Addresses sun damage, fine lines, and pores, hydrates and soothes	30 ml	\$82
Skin Power Cream	Pitera, Niacinamide, Vitamin C, retinoids,	Anti-aging, promotes collagen production	80 ml	\$255
The Ordinary Multi-Peptide + Copper Peptides 1% Serum	5 peptides (including copper peptide), hyaluronic acid	Stimulates collagen and elastin production, immediate plumping, affordable	30 ml	\$32
Lancer Triple Peptide Drops with Vitamin E + Niacinamide	Triple peptide complex, hyaluronic acid, vitamin E, niacinamide	Time-released peptides for lasting benefits, multitasking serum	30 ml	\$125
Sisley Sisleÿa L'Intégral Anti-Age	Soy Peptide, glycoproteins, vitamins, minerals	Smooths wrinkles, firms, brightens	30 ml	\$430
OneSkin OS-01 Topical Supplement	OS-01, niacinamide, hyaluronic acid, vitamin E	Targets skin aging at the molecular level, reduces wrinkles, improves texture and firmness	50 ml	\$120

Dermal Fillers

Dermal fillers are injectable substances used to add volume, smooth wrinkles, and enhance facial features. They are a popular non-surgical cosmetic treatment. They are used for reducing facial wrinkles and folds, such as nasolabial folds and marionette lines, enhancing and restoring volume to cheeks, temples, and lips, reshaping the nose, chin, and jawline & improving the appearance of recessed scars.

Dermal fillers are often used in combination with other cosmetic treatments, such as botulinum toxin injections (e.g., Botox), laser treatments, and skin resurfacing, to achieve optimal results and address multiple signs of aging.

The most common technology used in dermal fillers is hyaluronic acid, a naturally occurring substance that attracts and binds water, providing volume and hydration. Other technologies include calcium hydroxylapatite, poly-L-lactic acid, polycaprolactone, and PMMA microspheres, which work by stimulating collagen production or providing a longer-lasting scaffolding effect.

Dermal filler market leaders

Company	Brand	Technology	Approximate Cost (per syringe/vial/unit)
Allergan (AbbVie)	Juvederm	Hyaluronic acid	\$500-\$800
	Belkyra (Kybella)	Deoxycholic acid	\$1,200-\$1,800 (per treatment)
Galderma (Nestlé Skin Health)	Restylane	Hyaluronic acid	\$500-\$800
	Sculptra	Poly-L-lactic acid	\$800-\$1,000 (per vial)
Merz Aesthetics	Radiesse	Calcium hydroxylapatite	\$650-\$800
	Belotero	Hyaluronic acid	\$500-\$700
Teoxane Laboratories	Teosyal	Hyaluronic acid	\$500-\$700
Sinclair Pharma (Huadong Medicine)	Ellansé	Polycaprolactone	\$700-\$1,000
Suneva Medical	Bellafill	Polymethylmethacrylate (PMMA) microspheres	\$1,000-\$1,500
Medytox	Neuramis	Hyaluronic acid	\$400-\$600
	Innotox	Botulinum toxin type A	\$10-\$15 (per unit)
Croma-Pharma GmbH	Princess	Hyaluronic acid	\$400-\$600
Prollenium Medical Technologies	Revanesse	Hyaluronic acid	\$400-\$700
Filorga (Collagen)	Filorga	Hyaluronic acid	\$500-\$800

Cell Therapy Products

Historical Perspective on Cell Therapy Products

Cell therapy has its roots in the early 20th century, initially explored for its potential to rejuvenate and repair damaged tissues. Early cell therapy techniques involved the use of animal cells, which were believed to have regenerative properties when introduced into the human body. These initial experiments were rudimentary and faced significant skepticism due to inconsistent results and limited understanding of cellular mechanisms.

By the late 20th century, advances in biotechnology and a deeper understanding of human cellular biology propelled cell therapy into a more scientifically rigorous phase. Researchers began to isolate and culture human cells, particularly stem cells, which possess the remarkable ability to differentiate into various cell types and promote tissue regeneration. This breakthrough led to the development of early cell-based anti-aging treatments, which focused on using autologous (self-derived) cells to rejuvenate the skin and repair age-related damage.

Current Landscape of Cell Therapy Products

Today, cell therapy products have become an integral part of the anti-aging market, driven by advancements in stem cell research and tissue engineering. Modern cell therapy involves the use of mesenchymal stem cells (MSCs), fibroblasts, and other cell types to promote collagen production, enhance skin elasticity, and reduce wrinkles. These treatments are often administered through injections, targeting specific areas of the skin to deliver concentrated doses of regenerative cells.

Products such as platelet-rich plasma (PRP) therapy, which utilizes the patient's own blood components to stimulate cellular repair, have gained popularity for their efficacy in skin rejuvenation. Additionally, bioengineered tissues and cell-based scaffolds are being developed to support the regeneration of aging skin structures, offering promising results in clinical trials.

Future Prospects of Cell Therapy in Anti-Aging

The future of cell therapy in the anti-aging market is poised for significant advancements, driven by ongoing research and technological innovations. One promising area is the development of induced pluripotent stem cells (iPSCs), which are derived from adult cells and reprogrammed to an embryonic-like state. iPSCs hold the potential for creating patient-specific cell lines, minimizing the risk of immune rejection and maximizing therapeutic efficacy.

Another exciting frontier is the use of gene editing technologies, such as CRISPR-Cas9, to enhance the regenerative capabilities of stem cells. By precisely modifying genes associated with aging and skin health, researchers aim to create supercharged cells that can more effectively combat the signs of aging.

Moreover, the integration of 3D bioprinting and tissue engineering is expected to revolutionize the production of cell-based therapies. These technologies enable the creation of complex skin structures and cellular constructs that closely mimic natural tissue, offering more comprehensive and long-lasting anti-aging solutions.

Advanced Novel Topicals

In the quest to combat age-related skin concerns, we believe two groundbreaking topical agents, Pitera™ and GlycoProteMim™, will emerge as potential frontrunners. Both Pitera™ and GlycoProteMim™ represent significant strides in the field of dermatology, offering promising solutions to age-related skin issues. Pitera™, with its nutrient-rich profile, enhances skin vitality and youthfulness, while GlycoProteMim™ brings robust anti-aging effects inspired by nature's own survival mechanisms. As research progresses, the synergistic incorporation of these ingredients could potentially redefine the standards of topical treatments for age-related skin concerns, heralding a new era of youthful, resilient skin.

1.0 GlycoProteMim:

Origin and Composition

GlycoProteMim™ is a biomimicry of glycoproteins found in Antarctic fish. These glycoproteins are known to protect the fish against environmental stressors, which likely contributes to the compound's anti-aging properties. GlycoProteMim is inspired by nature's resilience in the harsh Antarctic environment, hence it is a mimic of compounds found in organisms that thrive in extreme cold conditions. The compound addresses the root causes of aging by heightening cellular response to reactive oxygen species (ROS), boosting SOD2, enhancing hyaluronic acid synthesis, and increasing the collagen 1 network. It is a clinically proven breakthrough compound that effectively reverses skin aging, offering a non-invasive alternative to other anti-aging treatments.

Research and Development:

GlycoProteMim™ was developed and perfected over 23 years of dedicated research by Dr. Géraldine Deliencourt-Godefroy an award winning French scientist. Her extensive study and expertise have resulted in an advanced ingredients that offers significant anti-aging benefits and skin protection.

Benefits:

GlycoProteMim™ claims to provide comprehensive anti-aging effects by repairing cellular damage from UV radiation, suppressing key aging genes, and increasing collagen and hyaluronic acid production. This results in improved skin structure and reduced signs of aging. Clinical trials have shown the following benefits of GlycoProteMim™:

1. Increased Skin Density (Collagen) by 37%.
2. Decreased deep wrinkle depth by 12% and volume by 14%.
3. Decreased inflammation by 54%.
4. Reshaped face due to skin tightening potentially leading to a more youthful appearance.
5. Decreased oxidation by 54%.
6. Reduce oval face sagging by 14%.
7. Visibly reduced fine lines and wrinkles and improve skin texture
8. Increased skin radiance by 25% that can contribute to a more youthful and vibrant appearance.
9. Tolerated by 100% of participants, even on sensitive skin.
10. 80% of the subjects felt that their skin was firmer
11. 90% of subjects observed an increase in skin quality

There are several advantages of using GlycoProteMim™ compared to alternatives:

1. Safety: It is claimed to be safe, with 100% tolerance in clinical trials.
2. Anti-aging efficacy: The patented compound is claimed to not only have powerful anti-inflammatory and anti-oxidative effects but also to reverse aging effective on a cellular level and repair skin, offering a comprehensive and solution, unlike alternatives that provide limited anti-aging benefits without reparative properties.
3. Non-invasive application: As a topical application, it avoids the need for invasive injections required for toxins and dermal fillers, offering a more convenient and user-friendly experience. Truly rejuvenating effect like a strong chemical peel without injuring the skin.

4. Multifaceted benefits: In addition to improving skin laxity and quality, it is claimed to provide UV protection and enhance the skin barrier, making it a more versatile choice compared to alternatives like retinoids, which may cause skin irritation and have a lengthy onset period.

2.0 Pitera

Origin:

Pitera™, a revolutionary skincare ingredient, is derived from the yeast fermentation process used in sake brewing. It was discovered by SK-II scientists after they observed the remarkably youthful-looking hands of elderly sake brewers. This serendipitous observation led to the extraction and refinement of Pitera™.

Composition:

Pitera™ is rich in over 50 micro-nutrients, including essential vitamins, amino acids, minerals, and organic acids. These components closely resemble the skin's Natural Moisturizing Factors (NMF), making Pitera™ highly effective in promoting skin health.

Research and Development:

The discovery and development of Pitera™ were spearheaded by SK-II scientists, inspired by their observation of sake brewers' youthful hands. This unique ingredient continues to be a cornerstone in SK-II's skincare products, backed by ongoing research and innovation.

Benefits:

Pitera™ provides multiple skincare benefits, such as reducing dark spots, improving skin texture, minimizing oxidative damage, and increasing cell renewal on the skin's surface. These combined effects contribute to a more radiant and smooth complexion.

Comparative benefits of all Products

Retinoids, GlycoProteMim™ and Pitera™ offer a wide range of benefits for youthful appearance and skin rejuvenation, including improved collagen production, fine lines and wrinkles, skin texture, tone, and radiance. However, continuous use is required to maintain results.

Toxins (e.g., Botox) are highly effective for reducing dynamic wrinkles but have limited effects on other aspects of skin rejuvenation. Results typically last 3-6 months. Toxins have to be given regularly to maintain the effect.

Dermal fillers provide immediate improvements in facial volume, contours, and wrinkles, with results lasting 6-18 months. However, they are minimally invasive and may cause side effects like bruising and swelling. Dermal fillers need to be applied regularly to maintain the effect.

Peptides offer a gentler approach to improving collagen production, skin texture, firmness, and elasticity, with fewer side effects compared to retinoids. Continuous use is required for optimal results.

Factor	Retinoids	GlycoProteMim™	Toxins	Dermal Fillers	Peptides
Collagen production	✓	✓			✓
Hyaluronic acid production		✓		✓ (hyaluronic acid fillers)	
Fine lines and wrinkles	✓	✓	✓ (dynamic wrinkles)	✓	✓
Skin texture	✓	✓		✓	✓
Skin tone and radiance	✓	✓			✓
Skin firmness and elasticity		✓		✓	✓
Skin hydration		✓		✓ (hyaluronic acid fillers)	
Skin barrier function		✓			✓
Antioxidant effects	✓	✓			
Anti-inflammatory effects		✓			✓
Facial volume and contours		✓		✓	
Reduction of dynamic wrinkles		✓	✓		
Duration of effects	Continuous use required	Continuous use required	3-6 months	6-18 months	Continuous use required
Potential side effects	Irritation, dryness, sun sensitivity	No side effects reported	Bruising, swelling, drooping	Bruising, swelling, lumps	Mild irritation (less common)
Invasiveness	Non-invasive (topical)	Non-invasive (topical)	Minimally invasive (injections)	Minimally invasive (injections)	Non-invasive (topical)

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