TECH OFFER

Plant-derived Senolytics and Senomorphics Targeted for Longevity Cosmeceuticals and Nutraceuticals

OVERVIEW

Cellular Senescence (ageing) is attributed by several phenomenon including the proliferation of inflammatory cytokines, proteases, inhibitory molecules, metabolites and tissue dysfunction. When a senescent cell has lost its cellular function, it is commonly termed as “Zombie cells”, incapable of being removed, at the same time afflicting cellular damage to neighboring cells. In the quest for longevity solutions, geroscience research has made progress in the development of druggable therapeutic targets and non-drug alternatives.

Senolytics work by eliminating senescent cells to promote tissue regeneration, while senomorphics aim to suppress or neutralize senescence-associated secretory components and inflammation without killing the cells. This reduces the harmful effects on neighboring cells. This technology has identified plant-derived active ingredients with both senolytic and senomorphic properties, coupled with liponiosome-based encapsulation techniques for enhanced delivery and stability. These ingredients have been validated for safety and efficacy in human skin models and clinical trials and have been formulated for topical skincare serums.

For nutraceuticals, separate senolytic and geroprotective products have been developed. These have been tested in cells, skin tissues, and *C. elegans* (for lifespan extension), and are currently undergoing clinical trials to assess long-term safety and anti-aging benefits in middle-aged volunteers.

The technology owner is looking to collaborate with:

- Cosmetic, nutraceutical companies seeking to incorporate scientifically proven anti-aging ingredients or co-develop new products.
- Research institutes and universities interested in collaborating on research related to aging biology and product development.

TECHNOLOGY FEATURES & SPECIFICATIONS

- This anti-aging technology integrates scientifically and clinically validated active ingredients into cosmeceutical and nutraceutical products. Key innovations include plant-derived active compounds that target senescent cells and key aging hallmarks such as inflammation and mitochondrial dysfunction. In cosmeceuticals, liponiosome-based encapsulation techniques are employed to enhance the stability and delivery of these ingredients, ensuring deep skin penetration for optimal anti-aging effects.

- In addition, advanced efficacy and safety testing services are available, utilizing human skin models, including 3D reconstructed and *ex vivo* human skin. These models evaluate the performance of active ingredients, cosmetics, and supplements for anti-aging benefits, skin rejuvenation, and safety, ensuring that product claims are substantiated and meet regulatory standards.

POTENTIAL APPLICATIONS

This anti-aging technology applies to cosmetics, nutraceuticals, and wellness industries, offering longevity-focused solutions that target aging hallmarks and enhance beauty, health, and longevity.This technology and its active ingredients can be customized for companies in the anti-aging nutraceutical and cosmeceutical sectors, targeting Gen X and Y consumers (aged 35-65) who seek research-backed beauty and health solutions.

MARKET TRENDS & OPPORTUNITIES

The global anti-aging market is projected to reach over $88 billion by 2026, driven by rising consumer demand for scientifically backed, effective solutions that address the root causes of aging. This technology is highly attractive due to its unique approach, which targets cellular aging hallmarks such as senescent zombie cells, offering more profound results than traditional products.

With increasing awareness of longevity and wellness, active ingredients, cosmeceuticals and nutraceuticals focused on extending healthspan are in high demand. This technology provides a competitive edge by offering scientifically and clinically validated products that cater to the growing market for premium, research- backed anti-aging treatments, appealing to both B2C consumers and B2B partners, including cosmetic manufacturers, nutraceutical companies, and wellness providers.

UNIQUE VALUE PROPOSITION

This technology delivers science-backed, drug-level efficacy through its Senolytic and Senomorphic active ingredients, targeting cellular aging and key hallmarks of aging with award-winning innovations from Paris, Switzerland, and Thailand. Developed by researchers specialized in aging biology, these ingredients and products have been rigorously validated in cells, human skin, and clinical trials, ensuring proven safety and superior performance.

On Senolytic Cosmeceutical Actives:

- Eliminates aged senescent cells by 46%, comparable to the efficacy of the experimental anti-cancer drug Navitoclax.
- Restores mitochondrial function by 60%, revitalizing cellular energy.
- Increases the elimination of senescent "zombie" cells by 255%.
- Stimulates hyaluronic acid production by 484%, significantly enhancing skin hydration and plumpness.
- Boosts collagen production by 94%, improving skin elasticity and firmness.
- Reduces inflammation by 40-55%.
- Inhibits melanin production by 38%.
- **Clinical Results:** Non-irritant and hypoallergenic.

On Senomorphic Cosmeceutical Actives:

- Reduces senescent cells by 75%.
- Decreases aging-related inflammation by 32-47%.
- Stimulates hyaluronic acid production by 173%.
- Boosts collagen production by 103%.
- Reduces melanin production by 59%.
- **Clinical Results:** Non-irritant.

On Senolytic Cosmeceuticals:

- Promotes the removal of senescent cells by 158% in aged human skin (*ex vivo*)
- Boosts collagen synthesis by 79% in aged human skin (*ex vivo*)
- Suppresses aging-related inflammation by 50-85% in aged human skin (*ex vivo*).
- Reduces melanin production by 29% in 3D pigmented skin models
- **Clinical Trial Results (56 Days)**:
    - Reduced wrinkles by 33.1%.
    - Improved skin hydration by 36.1%.
    - Increased skin elasticity by 20.5%.
    - Non-irritant and hypoallergenic.

On Senomorphic Cosmeceuticals:

- **Alleviating Damage from UV, Blue Light, and PM 2.5 (*ex vivo* human skin)**:
    - **Inflammation Reduction**: Decreases inflammation by 58-60% (IL-6 and MMP-1 markers).
    - **Free Radical Reduction**: Lowers ROS production by 20%.
    - **Hyaluronic Acid Synthesis**: Boosts hyaluronic acid production by 36%.
- **Clinical Trial Results (56 Days)**:
    - Reduced wrinkles by 23.6%.
    - Improved skin hydration by 40.5%.
    - Increased skin elasticity by 16.1%.
    - Enhanced skin brightness by 6.2%.
    - Non-irritant.

On Senolytic Supplement:

- Destroys 60% of zombie cells (tested in senescent human fibroblasts).

- Increases zombie cell clearance by 75x, comparable to Navitoclax and Dasatinib + Quercetin (tested in aged *ex vivo* human skin).
- Restores mitochondrial energy by 102% (tested in free radical-damaged fibroblasts).
- Decreases free radical production by 64% and reduces inflammation by 27-34% (tested in aged ex vivo human skin).
- Reduces melanin production by 22% (tested in melanoma cells).
- **Clinical Results:** Brightened and hydrated skin after 10 days of use.

On Geroprotective Supplement:

- Reduces senescent cells by 75% (tested in senescent human fibroblasts).
- Decreases aging-related inflammation by 32-47% (tested in aged *ex vivo* human skin).
- Stimulates hyaluronic acid production by 173% (tested in aged *ex vivo* human skin).
- Boosts collagen production by 103% (tested in aged *ex vivo* human skin).
- Reduces melanin production by 59% (tested in 3D pigmented skin models).
- **Clinical Trials:** Undergoing clinical trials for long-term safety and anti-aging benefits in middle-aged volunteers.

The technology owner has commercialized finished products in the range of cosmetics and geroprotector supplements using a combination of senolytics and senomorphics formulations, tested for its safety and efficacy.