Research Specification Sheet

This document provides a scientific overview of the key active and functional ingredients included in the Ridgehart skin serum. Each ingredient is described in terms of its chemical nature, mechanism of action, dermal benefits, and functional role within the formulation. The purpose of this overview is to demonstrate the rationale for ingredient selection in relation to skin barrier support, cellular renewal, dermal rejuvenation, and overall product performance.

Water (Aqua) serves as the primary solvent within the formulation, providing the medium in which water-compatible actives dissolve. Its presence ensures proper dispersion, stability, and bioavailability of hydrophilic compounds. Mannitol, a naturally occurring polyol derived from plant sources, contributes to osmotic regulation and cellular protection. Mannitol functions as a humectant and antioxidant, improving ingredient stability and providing hydration benefits that support peptide and protein longevity within the serum.

Caprylic/Capric Triglycerides, lightweight esters synthesized from coconut-derived fatty acids and glycerin, provide an elegant emollient profile. These triglycerides contribute to skin barrier replenishment and facilitate the transport of lipophilic actives such as retinol. Their non-comedogenic nature and rapid absorption enhance formulation aesthetics. Glycerin, a widely studied humectant, draws moisture from the environment into the stratum corneum. By improving corneocyte hydration and elasticity, glycerin also enhances penetration of other actives and strengthens barrier resilience.

Epidermal Growth Factor (EGF) is a bioidentical polypeptide that plays a critical role in cellular communication and tissue regeneration. As a ligand for the epidermal growth factor receptor (EGFR), it initiates a cascade of intracellular signaling events that promote keratinocyte proliferation, accelerate wound repair, and stimulate fibroblasts to increase collagen and elastin synthesis. The inclusion of EGF in topical formulations has been associated with improved skin density, enhanced barrier recovery, and a visible reduction in fine lines. Its small molecular size, compared to other growth factors, enables more efficient receptor binding and supports its role as a regenerative agent within skincare applications.

Oat (Avena Sativa) Beta-Glucan is a high-molecular polysaccharide with notable anti-inflammatory and wound-healing properties. It provides superior hydration due to its film-forming capability and can outperform certain forms of hyaluronic acid in moisture retention. Beta-glucan soothes irritation, moderates inflammatory responses, and promotes collagen synthesis, making it ideal for sensitive or compromised skin. Hydrolyzed Collagen consists of collagen peptides broken into smaller molecular fragments for improved dermal penetration. These fragments enhance hydration, increase suppleness, and support the skin's natural moisture matrix.

Dipotassium Glycyrrhizate, derived from licorice root, functions as a potent anti-inflammatory and skin-soothing agent. Its ability to mitigate irritation and reduce erythema makes it particularly valuable in formulations containing retinoids or strong actives. Additionally, it assists in brightening the skin through the inhibition of melanin-triggering pathways. Phospholipids, biomimetic lipids that mirror natural cellular membranes, contribute to enhanced delivery of actives. Their lamellar structure supports liposomal encapsulation, improving penetration and stabilizing sensitive molecules such as retinol.

Soluble Collagen, a purified water-soluble form of collagen, acts on the outer layers of the skin to boost moisture retention and create a smoothing, film-forming effect. Its synergy with hydrolyzed collagen contributes to both surface plumping and deeper hydration. Diaminobutyryl Benzylamide Diacetate, a biomimetic peptide often referred to as a SYN-AKE analogue, reproduces the temporary muscle-relaxing action of temple viper venom peptides. By reducing micro-contractions in facial muscles, it visibly smooths expression lines and contributes to a "botox-like" effect without invasive procedures.

Retinol, a well-established vitamin A derivative, represents one of the most studied and effective anti-aging actives. It accelerates epidermal turnover, stimulates fibroblast activity, increases collagen deposition, and reduces the appearance of fine lines, wrinkles, and hyperpigmentation. Given retinol's sensitivity to oxidation and potential for irritation, the presence of phospholipids, triglycerides, and glycyrrhizate in the formula helps stabilize and buffer its effects.

Oligopeptide-1, commonly known as Epidermal Growth Factor (EGF), is a bioidentical peptide involved in cellular repair and regeneration pathways. It enhances fibroblast proliferation, accelerates wound healing, and improves dermal density, making it a valuable component in advanced anti-aging formulas. Acetyl Hexapeptide-8, also known as Argireline, is another peptide that targets expression wrinkles by inhibiting neurotransmitter release in facial muscles. When combined with SYN-AKE–type peptides, it provides synergistic smoothing effects.

Human stem-cell derived peptides represent a class of biomimetic signaling molecules engineered to imitate the paracrine messengers naturally secreted by human stem cells. These peptides influence cellular renewal, dermal remodeling, and extracellular matrix repair by modulating fibroblast activity and enhancing the synthesis of structural proteins such as collagen, elastin, and glycosaminoglycans. Their ability to interact with cell surface receptors makes them highly effective in addressing age-related decline in regenerative capacity. Formulations containing these peptides often demonstrate improvements in firmness, elasticity, and overall tissue resilience, making them particularly relevant in advanced anti-aging systems.

Anti-aging oligopeptides consist of short chains of amino acids designed to influence specific biochemical pathways relevant to dermal aging. These peptides can function as signal peptides, neurotransmitter-inhibiting peptides, or carrier peptides, depending on their sequence and molecular structure. Their actions include stimulating collagen production, reducing micro-muscular contractions that contribute to expression wrinkles, enhancing wound healing, and improving dermal hydration. Due to their targeted mechanisms, oligopeptides provide a controlled and predictable method of improving skin texture and reducing the appearance of wrinkles. Their controlled size and structure also support stable formulation integration and efficient skin interaction.

Propylene Glycol serves multiple functional roles within advanced cosmetic formulations. As a humectant, it enhances hydration by attracting water into the stratum corneum. As a solvent, it aids in dissolving active ingredients that may otherwise be difficult to disperse within aqueous systems. Additionally, propylene glycol functions as a penetration enhancer, facilitating deeper delivery of actives such as peptides and growth factors. Its presence contributes to improved formula stability, consistent texture, and enhanced bioavailability of performance ingredients. The versatility of propylene glycol makes it a foundational component in high-efficacy dermatological products.

Trehalose, a disaccharide known for its ability to protect organisms in extreme environments, offers strong moisture-binding and cell-protective properties. It defends against dehydration and environmental stress while contributing to antioxidant protection. Finally, Disodium Hydrogen Phosphate and Sodium Dihydrogen Phosphate act together as a buffering system. This phosphate pair maintains the serum's pH within an optimal range, ensuring ingredient stability, reducing irritation potential, and preserving the activity of sensitive materials such as retinol and peptides.

Centella Asiatica Leaf Extract provides a complex blend of triterpenoid saponins (including asiaticoside, madecassoside, asiatic acid, and madecassic acid), which have demonstrated wound-healing, anti-inflammatory, and collagen-stimulating properties. These compounds support skin regeneration, reduce irritation, and reinforce structural resilience. Saccharomyces/Rice Bran Ferment introduces bio-fermented metabolites rich in amino acids, vitamins, minerals, and antioxidants. Fermentation increases bioavailability and enhances the mild exfoliative, brightening, and nourishing properties of rice-derived nutrients.

Niacinamide (vitamin B3) plays a multifunctional role, improving barrier function, reducing transepidermal water loss, regulating sebum production, and inhibiting melanosome transfer to help reduce hyperpigmentation. It also demonstrates anti-inflammatory effects and supports dermal protein synthesis. Polydeoxyribonucleotide (PDRN), a bioactive DNA fraction derived from salmon, stimulates tissue repair, enhances cell turnover, and increases fibroblast activity. PDRN has been widely studied for its regenerative and anti-aging potential, making it an important component in formulations aimed at skin renewal.

1,2-Hexanediol and Hydroxyacetophenone act as antimicrobial agents and preservative enhancers, contributing to formula stability while providing mild humectant effects. Butylene Glycol and Propylene Glycol function as additional humectants and penetration enhancers, improving the spreadability and dermal absorption of other actives. Citrus Reticulata (Tangerine) Peel Extract contains flavonoids, vitamin C derivatives, and aromatic compounds that offer antioxidant protection, mild brightening effects, and support an overall refreshed skin appearance.

Arginine, a basic amino acid, contributes to skin repair processes and helps neutralise acidic components, functioning as a pH adjuster. Acetyl Hexapeptide-8, a well-studied neuropeptide analogue, reduces the intensity of expression wrinkles by inhibiting neurotransmitter release at neuromuscular junctions. Its inclusion enhances the anti-aging profile of the essence. Carbomer acts as a rheology modifier, providing structure, viscosity, and a stable gel matrix for the formulation. Polysorbate 80, a nonionic surfactant, functions as an emulsifier and solubiliser, ensuring uniform dispersion of hydrophobic components.

Sodium Polyacrylate contributes additional structural support as a film-forming and viscosity-modifying polymer. It also helps create a smooth, silky sensory finish on the skin. Gentiana Lutea Root Extract brings antioxidant and anti-inflammatory bioactive compounds, supporting skin brightening and soothing benefits. Disodium EDTA serves as a chelating agent to bind metal ions that may destabilize the formula, thereby enhancing overall product longevity and preserving ingredient efficacy.

Ethylhexylglycerin provides mild preservation support and contributes to skin conditioning effects. Selaginella Tamariscina Extract, derived from a resilient "resurrection plant," is rich in biflavonoids and stress-protective compounds that enhance skin hydration, antioxidant capacity, and environmental resilience. Sodium Hyaluronate, the sodium salt of hyaluronic acid, offers deep hydration by binding large quantities of water within the dermal matrix, contributing to plumpness, elasticity, and a smoother skin surface.

Scutellaria Baicalensis Root Extract contains bioactive flavones such as baicalin, baicalein, and wogonin, which exhibit strong antioxidant, anti-inflammatory, and brightening properties. This extract helps protect against oxidative damage, reduce irritation, and support even skin tone, making it a valuable botanical component in a regenerative formula.

Together, these ingredients create a comprehensive essence designed to hydrate, brighten, soothe, and regenerate the skin. The combination of ferment extracts, niacinamide, PDRN, Centella compounds, peptides, and hyaluronic acid positions this formulation as a sophisticated dermal-repair system, suitable for promoting improved barrier function, enhanced elasticity, and long-term skin rejuvenation.