Recombinant Human Type XVII Collagen (10 kDa+), Lyophilized

Structural Protein / Collagen

Cat. No. EV-COL-005 | Version 1.1 | May 2026

Cat. No.	EV-COL-005	**Size**	50 g / 100 g per bag
Storage	≤-20°C, dry and sealed	**Version**	1.1 | May 2026

1. Overview

Recombinant Human Type XVII Collagen (EV-COL-005) is a high-purity 10.0 kDa structural protein fragment produced by recombinant expression in a Pichia pastoris yeast platform carrying a cloned, genetically engineered human COL17A1 gene sequence. The product is supplied as a sterile lyophilized powder with electrophoretic purity ≥95% (SDS-PAGE) and protein content ≥90%. It exhibits excellent water solubility, stability, and hydrophilicity across pH 4–8 (pI 7.54), with low endotoxin levels (≤0.5 EU/mg) resulting from the Pichia pastoris fermentation process. EV-COL-005 is designed for use in trichology research, hair follicle stem cell biology, anti-aging and skin regeneration studies, dermatological biomaterial development, and cosmetic active ingredient research. The recombinant yeast-based production platform provides an animal-component-free, virus-free source with no risk of immunogenic reactions associated with animal-derived material.

2. Mechanism of Action

Type XVII collagen (COL17A1, also known as BP180 or BPAG2) is a transmembrane protein predominantly expressed in the basement membrane zone of epithelial tissues, functioning as a major structural constituent of hemidesmosomes. It anchors basal keratinocytes to the underlying basement membrane, maintaining dermal-epidermal cohesion and tissue structural integrity. COL17 plays a critical role in the maintenance of hair follicle stem cell (HFSC) stemness; downregulation of COL17 is associated with follicle miniaturization and premature hair loss in androgenetic alopecia (AGA). Mechanistically, COL17 supports HFSC quiescence-activation cycling, promotes basement membrane protein expression (laminin-332), and activates cell adhesion and proliferative signaling through integrin β1 and downstream pathways including Wnt/β-catenin and SHH/GLI. The recombinant 10.0 kDa EV-COL-005 fragment is a humanized low molecular weight form engineered for solubility, providing a tractable research tool for investigating COL17 biology in hair follicle, skin regeneration, and anti-aging contexts.

3. Applications

- Trichology research: hair follicle stem cell differentiation, hair cycle regulation, and androgenetic alopecia models
- Hair loss treatment research: prevention of follicle miniaturization and promotion of anagen-phase transition
- Anti-aging cosmetic formulations: basement membrane strengthening, wrinkle reduction, and skin firmness research
- Skin regeneration and wound healing research
- Dermatological biomaterial development including dermal fillers and bioengineered skin grafts
- Scar reduction and tissue repair studies
- In vitro models of autoimmune skin disorders (bullous pemphigoid, epidermolysis bullosa) and collagen biology research

4. Recommended Protocol

#	Details	Notes
1	Equilibrate sealed package to room temperature (20–25°C) for 10–15 minutes before opening; briefly tap or centrifuge to collect material at the bottom.	Prevent moisture absorption
2	Reconstitute in sterile ultrapure water or appropriate buffer (pH 4–8). Recommended starting concentration: 0.1–1.0 mg/mL for cosmetic and topical applications; 1–5 mg/mL for biomedical and scaffold research.	Per application
3	Swirl or rotate gently for 2–3 minutes to initiate dissolution. Avoid vortexing to prevent denaturation and foaming.	Gentle mixing
4	Allow to stand at room temperature for 10–15 minutes for complete hydration; pipette up and down 5–10 times for homogeneity.	Complete hydration
5	Verify pH 4–8 with a calibrated meter; adjust dropwise with sterile 0.1 M HCl or 0.1 M NaOH if needed.	pH verification
6	For filter-sterilization, pass through a 0.22 µm syringe filter into a sterile vessel prior to use.	Optional sterile filtration
7	Aliquot reconstituted solution and store at -20°C; working solution stable on ice for up to 8 hours. Avoid repeated freeze-thaw.	Aliquot and store

For hair follicle stem cell culture supplementation, add reconstituted EV-COL-005 to culture medium at 0.1–1.0 mg/mL working concentration; optimize for your specific cell line and assay. For cosmetic serum formulation, incorporate at 0.1–0.5 mg/mL into the aqueous phase of the formula; avoid heat above 40°C and prolonged exposure to direct sunlight. For transdermal or topical delivery research, prepare at 0.1–2.0 mg/mL in the appropriate vehicle and verify compatibility with excipients. All working concentrations and delivery parameters should be optimized for the specific application by the end user.

5. Quality Control

Test / Parameter	Specification	Status
Appearance	White or off-white lyophilized powder	**PASS**
Electrophoretic Purity	≥95% (SDS-PAGE); band at ~10.0 kDa	**PASS**
Protein Content	≥90%	**PASS**
Solubility	Water-soluble at pH 4–8 (pI 7.54); clear solution	**PASS**
Endotoxin	≤0.5 EU/mg (LAL assay)	**PASS**
Bioburden	≤5 CFU/g	**PASS**
Pathogen Testing	E. coli, S. aureus, P. aeruginosa — not detected	**PASS**
Heavy Metals (total, as Pb)	≤10 ppm; As ≤2 ppm; Hg ≤2 ppm; Pb ≤2 ppm; Cr ≤2 ppm; Cd ≤2 ppm	**PASS**

6. Storage & Stability

- Storage temperature: sealed at ≤-20°C in dry condition
- Shelf life: 1 year under proper storage conditions
- Formulation: sterile lyophilized powder (no buffer salts or excipients added)
- Shipping: cold-chain (dry ice or refrigerated) recommended; short-term ambient transport acceptable if sealed
- General: avoid repeated freeze-thaw of reconstituted material; aliquot upon reconstitution; working solution stable on ice for up to 8 hours; maximum 3 freeze-thaw cycles recommended; avoid prolonged exposure to heat or light

7. Troubleshooting

Problem	Possible Cause	Suggested Action
Incomplete dissolution after standard hydration time	Insufficient mixing time; cold buffer; excessive concentration	Extend hydration to 30 min at 20–25°C; reduce target concentration; verify buffer is at room temperature; gently pipette to homogenize
Cloudy or particle-containing solution	Aggregation from vigorous mixing or out-of-range pH	Centrifuge 10,000 × g, 5 min at 4°C and transfer supernatant; verify pH is 4–8; replace solution if persists
Loss of activity or precipitation	Repeated freeze-thaw; extended room-temperature exposure	Aliquot reconstituted material; limit to 3 freeze-thaw cycles; keep working solution on ice (≤8 h)
Moisture absorption / clumping of lyophilized powder	Package opened in humid environment; not resealed promptly	Open and weigh in laminar flow hood; reseal immediately after sampling; store with desiccant at ≤-20°C
Unexpectedly low biological activity in cell assays	Suboptimal working concentration for cell type; buffer incompatibility	Optimize working concentration (0.1–10 mg/mL range); verify buffer pH and ionic strength are compatible with cell culture conditions

8. Safety Information

For Research Use Only. Not for diagnostic or therapeutic use. Handle according to standard laboratory safety guidelines. Wear laboratory coat, protective gloves, and safety eyewear when handling this product. Lyophilized powder is hygroscopic — keep sealed when not in use. Collagen is generally considered safe; however, individuals with known collagen sensitivity should take appropriate precautions. Refer to the accompanying Safety Data Sheet (SDS) for full hazard information. Dispose in accordance with local, state, and federal regulations.