

- Cir B, 2025,30(2):e271-e281.
- [38]Sermboonsang C, Benjakul S, Chantarapanich N, et al. Effects of miniscrew location on biomechanical performances of bone-borne rapid palatal expander to midpalatal suture: A finite element study[J]. Med Eng Phys, 2022,107:103872.
- [39]Rodrigo N, Magno A S D, Pía M S, et al. Midpalatal suture bone repair after miniscrew-assisted rapid palatal expansion in adults[J]. Prog Orthod, 2022,23(1):35.
- [40]Anonymous. New deep learning methods for annotation - efficient medical image analysis[R]. Notre Dame: University of Notre Dame, 2024.
- [41]Jiang S, Sun Y, Xu S, et al. Metal artifact correction in industrial CT images based on a dual-domain joint deep learning framework[J]. Appl Sci, 2024,14(8): 3261.
- [42]Arabi H, Zaidi H. Deep learning-based metal artefact reduction in PET/CT imaging [J]. Eur Radiol, 2021,31:6384-6396.
- [43]曾维, 周善洛, 郭际香, 等. 基于深度学习的口腔颌面部CT图像金属伪影消除与临床验证[J]. 中华口腔医学杂志, 2023,58(6):540-546.
- [44]Yu L, Zhang Z, Li X, et al. Deep sinogram completion with image prior for metal artifact reduction in CT images[J]. IEEE Trans, 2020,40(1):228-238.
- [45]韩莹瑶, 羊月祺, 李鑫, 等. 医工人员在医学影像检查结果互认工作中的职能定位探索[J]. 现代仪器与医疗, 2022,28(6):7-11.
- [46]Gao L, Chen Z, Zang L, et al. Midpalatal suture CBCT image quantitative characteristics analysis based on machine learning algorithm construction and optimization[J]. Bioeng, 2022,9(7):316.

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## 前列腺素与脱发的相关性研究及治疗进展

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**[摘要]** 脱发是临床常见疾病, 包括雄激素性脱发 (Androgenetic Alopecia, AGA)、斑秃、休止期脱发等。不同类型脱发的发病机制不同, 关于前列腺素 (Prostaglandins, PGs) 与脱发的相关性研究早有报道且逐年增多, 作用机制可能与PGs合成酶及不同类型PGs在毛囊周期和毛发生长中发挥不同作用相关, 包括COX-2、PGD<sub>2</sub>、PGE<sub>2</sub>、PGF<sub>2α</sub>等。同时, PGs及其类似物治疗脱发已有许多研究报道, 如盐酸西替利嗪、盐酸左西替利嗪、拉坦前列素、比马前列素等。因此, 本文主要围绕PGs在脱发过程中的作用机制, 以及PGs在治疗脱发方面开展的药物研究进行概述。

**[关键词]** 前列腺素; 脱发; 机制; 治疗进展

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## Prostaglandins in Alopecia: Mechanisms and Therapeutics

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**Abstract:** Hair loss is a common clinical disease, including AGA, alopecia areata, and telogen effluvium. Distinct pathogenic mechanisms underlie various forms of alopecia. The researches on PGs and hair loss have been reported and increased each year. The mechanistic interplay likely involves differential regulatory roles of PGs synthases and specific PGs subtypes—including COX-2, PGD<sub>2</sub>, PGE<sub>2</sub>, and PGF<sub>2α</sub>—during hair cycle modulation and follicular morphogenesis. Concurrently, therapeutic applications of PGs analogs have garnered significant research attention, exemplified by pharmacological agents such as cetirizine hydrochloride, levocetirizine hydrochloride, latanoprost, and bimatoprost. This article mainly focuses on the mechanism of PGs concerning hair loss, as well as drug researches carried out by PGs in the treatment of hair loss.

**Keywords:** prostaglandin; hair loss; mechanism; therapeutic advancements

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常见脱发疾病包括AGA、斑秃、休止期脱发等，多数脱发疾病都与毛囊周期循环异常有关<sup>[1]</sup>。其中发病率最高的AGA以前额和头顶的毛囊微型化与毛发进行性减少为主要表现，而生长期缩短、毛囊缩小是源于毛囊提前进入退行期，以及延迟从休止期转换至生长期<sup>[2]</sup>。毛囊的周期转换是一个复杂的过程，从生长期到休止期的有组织转变过程是对多种分子信号的响应<sup>[3]</sup>。目前，许多研究发现PGs与毛发生长关系密切，PGs衍生物在治疗脱发方面取得了确切疗效。一项关于PGs类似物治疗脱发的系统回顾和荟萃分析显示，局部应用PGs类似物可显著改善毛发长度和密度，其疗效和安全性优于安慰剂<sup>[4]</sup>。因此，本文基于两者的相关性，探讨PGs在脱发中的作用机制及研究进展。

### 1 前列腺素的生物合成

花生四烯酸经过环氧酶（Cyclooxygenase, COX）催化后生成PGG<sub>2</sub>、PGH<sub>2</sub>，随后在PGs合成酶的作用下生成内源性配体前列腺素PGD、PGE、PGF、TXA<sub>2</sub>等。PGs广泛存在于人体各种组织内，可以作为变态反应性接触性皮炎和免疫反应的潜在介质，参与皮肤的炎症过程<sup>[5]</sup>。COX是PGs及其他类PGs物质的关键合成酶，COX-1介导基础水平PGE<sub>2</sub>合成，参与维持各种生理功能平衡<sup>[6]</sup>，COX-2介导炎症性PGE<sub>2</sub>合成，参与肿瘤细胞转化、生长、凋亡及免疫反应调节等过程<sup>[7]</sup>。

### 2 前列腺素与毛发的关系

毛囊中存在所有PGs受体，大部分受体广泛表达于培养细胞和整个毛囊中<sup>[1]</sup>。研究发现COX-2可以通过介导PGs合成参与毛囊的生物学过程，人毛囊表达mPGES-1、mPGES-2及cPGES，它们催化PGH<sub>2</sub>、PGG<sub>2</sub>转化为PGE<sub>2</sub>、PGF<sub>2α</sub>等，且PGE<sub>2</sub>、PGF<sub>2α</sub>合成与转化的主要场所为毛乳头上皮<sup>[8]</sup>。Chovarda等<sup>[9]</sup>分别对AGA患者和健康人群进行头皮活检，发现AGA患者的秃发区PGD<sub>2</sub>、PGI<sub>2</sub>水平高于未秃发区，PGE<sub>2</sub>和PGF<sub>2α</sub>水平则低于未秃发区，并且这种失调随着AGA的进展而逐渐加重。研究表明PGE<sub>2</sub>和PGF<sub>2α</sub>能够促进毛发生长<sup>[1, 10]</sup>，而PGD<sub>2</sub>会抑制毛发生长<sup>[11]</sup>。研究还证实增加PGE<sub>2</sub>、PGF<sub>2α</sub>或抑制PGD<sub>2</sub>能够明显促进毛发生长<sup>[12]</sup>。PGs可能参与毛囊分化与毛发生长过程，调控毛囊生长周期<sup>[13]</sup>。见图1。

### 3 前列腺素对毛发生长的调控作用及相关药物研究

3.1 COX：研究发现COX-2转基因小鼠表现出毛发失调的特征，过表达COX-2的转基因小鼠出现了脱发、毛囊密度降低、皮脂腺增生等表现，加速了毛囊的退行期和异常状态，用COX-2抑制剂治疗后头发恢复生长<sup>[14-15]</sup>。实验表明白芩多糖能改善AGA小鼠的毛发生长周期和毛囊形态，增加毛发长度，减轻炎症和氧化应激，降低双氢睾酮（Dihydrotestosterone, DHT）含量以及调节雄激素受体（Androgen receptor, AR）活性。网络药理学研究显示白芩多糖可能通过COX-2调节NF-κB信号通路和氧化应激从而

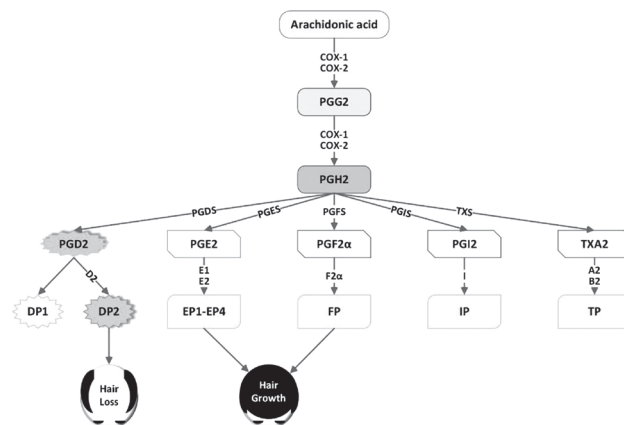


图1 PGs合成及其对毛发的调控作用

影响AGA进展，白芩多糖抑制COX-2的表达，COX-2过表达会拮抗白芩多糖，进而抑制PGE<sub>2</sub>和NF-κB信号通路，改善氧化应激和细胞衰老，减慢AGA进程，促进毛发生长<sup>[16]</sup>。另外，研究人员发现某种植物籽油具有抗皮肤衰老和促进毛发生长的作用，结果显示其可以选择性抑制COX-2<sup>[17]</sup>。

3.2 PGD<sub>2</sub>：Nieves等<sup>[18]</sup>发现AGA男性秃发区的PTGDS、PGD<sub>2</sub>的mRNA、蛋白水平较未秃发区升高，研究小鼠毛囊周期发现PTGDS和PGD<sub>2</sub>的过表达是毛发提前进入退行期的诱因。PGD<sub>2</sub>可能是AGA的重要诱因，且在AR表达中起到关键作用。Jeong等<sup>[19]</sup>发现PGD<sub>2</sub>通过受体DP<sub>2</sub>调控AR相关因子（TGF-β<sub>1</sub>、Creb、LEF1、IGF-1）和AKT信号（GSK3β、Creb）在人毛乳头细胞中的表达，PGD<sub>2</sub>可能介导AKT/GSK3β参与AR表达。Kang等<sup>[11]</sup>还发现降低DP<sub>2</sub>受体表达能减少PGD<sub>2</sub>-DP<sub>2</sub>轴对毛发生长的抑制作用。其次，PGD<sub>2</sub>-GPR44途径可能是脱发的潜在靶点。Nieves等<sup>[18]</sup>发现PGD<sub>2</sub>通过GPR44受体抑制小鼠毛发生长。Nelson等<sup>[20]</sup>也发现PGD<sub>2</sub>介导GPR44抑制创伤后毛囊再生，抑制PGD<sub>2</sub>产生或GPR44信号传导能促进皮肤再生。AGA还可能与PGD<sub>2</sub>的代谢产物15d-PGJ<sub>2</sub>相关。研究发现PGD<sub>2</sub>通过15d-PGJ<sub>2</sub>介导ROS进而诱导毛囊角质形成细胞转化出活性更高的睾酮<sup>[21]</sup>。此外，Ryu等<sup>[22]</sup>发现CXXC5能调控DHT-PGD<sub>2</sub>轴及Wnt/β-catenin信号通路引起脱发。CXXC5是BMP信号的转导靶基因及Wnt/β-catenin信号转导的负调控因子，DHT能增强PTGDS，PGD<sub>2</sub>激活BMP信号诱导CXXC5产生，后者过表达介导PGD<sub>2</sub>引起脱发，抑制CXXC5能改善DHT诱导的脱发。同时CXXC5敲除小鼠可以恢复Wnt/β-catenin信号传导促进毛发再生。PGD<sub>2</sub>诱导脱发的作用机制见图2。

PGD<sub>2</sub>不仅能作为过敏性疾病的重要介导因子，还能将毛囊维持在退化期来抑制毛囊发育导致AGA<sup>[23]</sup>。因此，PGD<sub>2</sub>受体拮抗剂对过敏性疾病和AGA均有治疗作用，抑制PGD<sub>2</sub>合成是治疗脱发的研究方向。西替利嗪作为一种抗组胺药物，具有抑制炎性细胞浸润及降低PGD<sub>2</sub>表达等效应，能通过拮抗PGD<sub>2</sub>抑制毛发生长发挥对毛囊生长的正调控作用。研究发现过敏性鼻炎患者的AGA患病风险显著增加，而使用第二代抗组胺药治疗过敏性鼻炎的患者AGA发



囊微型化, GPR44是PGD<sub>2</sub>抑制毛发生长的受体; PGD<sub>2</sub>可能介导AKT/GSK3 $\beta$ 参与AR表达; PGD<sub>2</sub>通过代谢产物15d-PGJ<sub>2</sub>介导ROS转化出活性更强的睾酮; PGD<sub>2</sub>激活BMP信号诱导产生CXXC5, CXXC5通过Wnt/ $\beta$ -catenin信号通路调控DHT-PGD<sub>2</sub>轴诱导脱发; PGE<sub>2</sub>刺激毛囊干细胞; PGF<sub>2 $\alpha$</sub> 与FP受体结合激活毛囊细胞内的信号通路, 刺激毛囊内真皮乳头细胞; PGF<sub>2 $\alpha$</sub> 刺激毛囊周期转化; PGE<sub>2</sub>与PGF<sub>2 $\alpha$</sub> 拮抗PGD<sub>2</sub>促进毛发生长等, 具体机制仍待进一步探索。目前, PGs及其类似物治疗脱发已有很多相关研究报道, 包括西替利嗪抑制PGD<sub>2</sub>表达拮抗脱发, 盐酸左西替利嗪抑制PGD<sub>2</sub>-GPR44轴、激活AKT/pGSK3 $\beta$ 通路促进毛发生长, PGF<sub>2 $\alpha$</sub> 类似物拉坦前列素、比马前列素延长毛囊生长期治疗毛发脱落等。

#### [参考文献]

- [1]Xu X G, Chen H D. Prostanoids and hair follicles: implications for therapy of hair disorders[J]. *Acta Derm Venereol*, 2018, 98:318-323.
- [2]马晓敏, 梁丹妮, 张凯云, 等. 氧化应激对雄激素性脱发的发病机制及其研究进展[J]. *中国美容医学*, 2025, 34(2):189-192.
- [3]熊颂扬. 西替利嗪联合5%米诺地尔治疗雄激素性脱发的疗效观察[D]. 青海: 青海大学, 2022.
- [4]Jiang S, Hao Z, Qi W, et al. The efficacy of topical prostaglandin analogs for hair loss: A systematic review and meta-analysis[J]. *Front Med (Lausanne)*, 2023, 10:1130623.
- [5]Yazdanian N, Mozafarpour S, Goodarzi A. Phosphodiesterase inhibitors and prostaglandin analogues in dermatology: A comprehensive review[J]. *Dermatol Ther*, 2021, 34(1):e14669.
- [6]Yang G, Chen L. An update of microsomal prostaglandin E synthase-1 and PGE<sub>2</sub> receptors in cardiovascular health and diseases[J]. *Oxid Med Cell Longev*, 2016:5249086.
- [7]Chen Y. Design and construction of COX-2 specific fluorescent probes[J]. *Mol Cell Probes*, 2019, 48:101472.
- [8]Shin D W. The physiological and pharmacological roles of prostaglandins in hair growth[J]. *Korean J Physiol Pharmacol*, 2022, 26(6):405-413.
- [9]Chovarda E, Sotiriou E, Lazaridou E, et al. The role of prostaglandins in androgenetic alopecia[J]. *Int J Dermatol*, 2021, 60(6):730-735.
- [10]Cheng H, Liu F, Zhou M, et al. Enhancement of hair growth through stimulation of hair follicle stem cells by prostaglandin E<sub>2</sub> collagen matrix[J]. *Exp Cell Res*, 2022, 421(2):113411.
- [11]Kang Y R, Bak S S, Kim M K, et al. Expression level of prostaglandin D2 receptor 2 regulates hair regression[J]. *J Invest Dermatol*, 2019, 139(8):1824-1828.
- [12]Suchonwanit P, Thammarucha S, Leerunyakul K. Minoxidil and its use in hair disorders: a review[J]. *Drug Des Devel Ther*, 2019, 13:2777-2786.
- [13]York K, Meah N, Bhojru B, et al. A review of the treatment of male pattern hair loss[J]. *Expert Opin Pharmacother*, 2020, 21(5):603-612.
- [14]Müller-Decker K, Leder C, Neumann M, et al. Expression of cyclooxygenase isozymes during morphogenesis and cycling of pelage hair follicles in mouse skin: precocious onset of the first catagen phase and alopecia upon cyclooxygenase-2 overexpression[J]. *J Invest Dermatol*, 2003, 121(4):661-668.
- [15]Bol D K, Rowley R B, Ho C P, et al. Cyclooxygenase-2 overexpression in the skin of transgenic mice results in suppression of tumor development[J]. *Cancer Res*, 2002, 62:2516-2521.
- [16]Huang Y, Ding X, Shen Y, et al. Bletilla striata polysaccharide (BSP) promotes hair growth and suppresses oxidative stress and senescence of dermal papilla cells by inhibiting prostaglandin-endoperoxide synthase 2 (PTGS2) [J]. *Int J Biol Macromol*, 2026, 342(Pt 1):150149.
- [17]Ahmed S R, Khojah H, Aldera M, et al. Deciphering the skin anti-aging and hair growth promoting mechanisms of opophytum forskahlii seed oil via network pharmacology[J]. *Int J Mol Sci*, 2025, 27(1):277.
- [18]Nieves A, Garza L A. Does prostaglandin D2 hold the cure to male pattern baldness? [J]. *Exp Dermatol*, 2014, 23(4):224-227.
- [19]Jeong K H, Jung J H, Kim J E, et al. Prostaglandin D2-mediated DP2 and AKT signal regulate the activation of androgen receptors in human dermal papilla cells[J]. *Int J Mol Sci*, 2018, 19(2):556.
- [20]Nelson A M, Loy D E, Lawson J A, et al. Prostaglandin D2 inhibits wound-induced hair follicle neogenesis through the receptor, Gpr44[J]. *J Invest Dermatol*, 2013, 133(4):881-889.
- [21]Mantel A, McDonald J T, Goldsborough K, et al. Prostaglandin D2 uses components of ros signaling to enhance testosterone production in keratinocytes[J]. *J Investig Dermatol Symp Proc*, 2017, 18(2):S81-S84.
- [22]Ryu Y C, Park J, Kim Y R, et al. CXXC5 Mediates DHT-induced androgenetic alopecia via PGD<sub>2</sub>[J]. *Cells*, 2023, 12(4):555.
- [23]Zhang H W, Chang Y T, Kuo Y J, et al. Androgenetic alopecia risk in allergic rhinitis: A cohort study of immune and antihistamine effects[J]. *World Allergy Organ J*, 2026, 19(5):101373.
- [24]Dhurat R S, Sharma R, Shetty C, et al. Topical cetirizine in androgenetic alopecia: a preliminary study[J/OL]. *Skin Appendage Disord*, 2025-12-31[2026-05-04].
- [25]Rossi A, Campo D, Fortuna M C, et al. A preliminary study on topical cetirizine in the therapeutic management of androgenetic alopecia[J]. *J Dermatolog Treat*, 2018, 29(2):149-151.
- [26]Zaky M S, Abo Khodeir H, Ahmed HA, et al. Therapeutic implications of topical cetirizine 1% in treatment of male androgenetic alopecia: A case-controlled study[J]. *J Cosmet Dermatol*, 2021, 20(4):1154-1159.
- [27]Chen X, Xiang H, Yang M. Topical cetirizine for treating androgenetic alopecia: A systematic review[J]. *J Cosmet Dermatol*, 2022, 21(11):5519-5526.
- [28]Gohary Y M, Elkastawy B M M, Osama H, et al. The efficacy of topical cetirizine using microneedling in androgenetic alopecia male patients[J]. *Arch Dermatol Res*, 2025, 317(1):665.
- [29]Zelai N T. Targeted transferosomal delivery of cetirizine: A new approach to alopecia management[J]. *PLoS One*,

2026,21(4):e0347648.

[30]Wen S, Wei J, Bao J, et al. Effect of levocetirizine hydrochloride on the growth of human dermal papilla cells: a preliminary study[J]. *Ann Palliat Med*,2020,9(2):308-317.

[31]韦菊梅, 温斯健, 包家娟, 等. 盐酸左西替利嗪对人毛乳头细胞生长影响的初步研究[J]. *中华皮肤科杂志*,2019,52(6):389-394.

[32]Girdler K, Cabatu A, Olds H, et al. Use of castor oil in dermatology: A Narrative review[J]. *Cureus*,2026,18(2):e103289.

[33]Hwang J H, Chu H, Ahn Y, et al. HMGB1 promotes hair growth via the modulation of prostaglandin metabolism[J]. *Sci Rep*, 2019,9(1):6660.

[34]Lai S F, Huang W Y, Wang W H, et al. Prostaglandin E<sub>2</sub> prevents radiotherapy-induced alopecia by attenuating transit amplifying cell apoptosis through promoting G1 arrest[J]. *J Dermatol Sci*, 2023,109(3):117-126.

[35]Villarreal-Villarreal C D, Sinclair R D, Martínez-Jacobo L, et al. Prostaglandins in androgenetic alopecia in 12 men and four female[J]. *J Eur Acad Dermatol Venereol*, 2019,33(5):e214-e215.

[36]Smith J N, Dawson D M, Christo K F, et al. 15-PGDH inhibition activates the splenic niche to promote hematopoietic regeneration[J]. *JCI Insight*, 2021,6(6):e143658.

[37]Lim H W, Kim H J, Jeon C Y, et al. Hair growth promoting effects of 15-hydroxyprostaglandin dehydrogenase inhibitor in human follicle dermal papilla cells[J]. *Int J Mol Sci*, 2024,25(13):7485.

[38]朱立坚, 李海龙, 张婷, 等. 植物提取物防治雄激素性脱发的研究进展[J]. *中国麻风皮肤病杂志*, 2022,38(12):901-907.

[39]刘泠汐, 金双, 陈崑. 前列腺素F<sub>2α</sub>衍生物在皮肤科的应用[J]. *中国麻风皮肤病杂志*, 2022,38(3):195-198.

[40]Ksouri S E, Mahjoub A, Ben Abderrazek A, et al. Efficacy of latanoprost in the treatment of ciliary madarosis[J]. *J Fr Ophthalmol*, 2025,48(10):104573.

[41]Zaky M S, Hashem O A, Mahfouz S M, et al. Comparative study of the efficacy and safety of topical minoxidil 2% versus topical bimatoprost 0.01% versus topical bimatoprost 0.03% in treatment of eyebrow hypotrichosis: a randomized controlled trial[J]. *Arch Dermatol Res*, 2023,315(9):2635-2641.

[42]Suchonwanit P, Thammarucha S. Eyebrow growth pattern analysis in patients with eyebrow hypotrichosis after receiving topical treatment: A retrospective study[J]. *J Cosmet Dermatol*, 2020,19(6):1404-1408.

[43]Murad A, Bergfeld W F. Prostaglandin analogue for eyebrow loss in frontal fibrosing alopecia: a case report[J]. *J Eur Acad Dermatol Venereol*, 2019,33(11):e403-e405.

[44]Ocampo-Garza J, Griggs J, Tosti A. New drugs under investigation for the treatment of alopecias[J]. *Expert Opin Investig Drugs*, 2019,28(3):275-284.

[45]Almutairy B K, Khafagy E S, Aldawsari M F, et al. Spanlastic-laden nanogel as a plausible platform for dermal delivery of bimatoprost with superior cutaneous deposition and hair regrowth efficiency in androgenic alopecia[J]. *Int J Pharm X*, 2024,7:100240.

[46]Li A W, Antaya R J. Successful treatment of pediatric alopecia areata of the scalp using topical bimatoprost[J]. *Pediatr Dermatol*, 2016,33(5):e282-e283.

[47]Nouh A H, Behairy A A E, El-Koumy F B, et al. Enhancing hair regrowth in alopecia areata: the power duo of CO<sub>2</sub> fractional laser and bimatoprost[J]. *Arch Dermatol Res*, 2025, 317(1):723.

[48]El-Ashmawy A A, El-Maadawy I H, El-Maghraby G M. Efficacy of topical latanoprost versus minoxidil and betamethasone valerate on the treatment of alopecia areata[J]. *J Dermatolog Treat*, 2018,29(1):55-64.

[49]滕炎萍, 邵军辉, 张策, 等. 促毛发生长药物的研究进展:传统药物优化与新型疗法探索[J]. *药学研究*, 2026,45(2):204-209,216.

[50]Miranda B H, Khidhir K G, Tobin D J. Prostaglandin F<sub>2α</sub> stimulates the growth of human intermediate hair follicles in ex vivo organ culture with potential clinical relevance[J]. *Front Physiol*, 2025,16:1556431.

[51]Subedi L, Pandey P, Shim J, et al. Preparation of topical bimatoprost with enhanced skin infiltration and in vivo hair regrowth efficacy in androgenic alopecia[J]. *Drug Deliv*, 2022,29(1):328-341.

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