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Prostaglandin analogues such as bimatoprost or latanoprost have historically been used ophthalmically, where they are FDA approved for the use of elevated intraocular pressure. Bimatoprost 0.03% has also been approved for the management of hypotrichosis of the eyelashes. The mechanism of action is prostaglandin analogues interact with prostanoid receptors in the hair follicle. This is thought to stimulate resting follicles in the telogen phase and convert them to the anagen phase (associated with hair growth).<sup>3</sup> This same mechanism of action that increases eyelash growth is thought to be responsible for the growing data to support the use of prostaglandin analogues topically on the scalp for alopecia.

### **Data Regarding Alopecia of the Scalp**

Latanoprost has been studied at a very wide range of concentrations. One double-blind placebo controlled study on topical application of 0.005% latanoprost over a period of 12 weeks found that the application of latanoprost significantly increased hair density and regrowth, though, it didn't demonstrate significant improvement regarding loss of hair.<sup>4</sup> Another double-blind placebo-controlled trial evaluated the efficacy of latanoprost 0.1% for androgenetic alopecia applied daily over 24 weeks. The study found significantly increased hair density at 24 weeks compared to placebo.<sup>5</sup> Unlike the wide range of studied concentrations with latanoprost, bimatoprost has primarily been studied at 0.03%. One study evaluating bimatoprost 0.03% twice daily vs mometasone furoate once daily for alopecia areata found that bimatoprost significantly improved hair regrowth as compared to areas where mometasone furoate was applied.<sup>6</sup> Another study evaluated bimatoprost 0.03% vs minoxidil 5% for androgenetic alopecia. This study was small (with just 8 subjects per group) but it

did note significant increase in terminal hair diameter and count at 12 weeks in the bimatoprost group. Fewer patients presented with erythema in the bimatoprost group as compared to the minoxidil group as well.<sup>7</sup>

## **Latanoprost vs Bimatoprost: Efficacy for Alopecia**

At this time, there has not been a head-to-head study of latanoprost vs bimatoprost for alopecia. One study that evaluated latanoprost 0.005% vs bimatoprost 0.03% once daily for 3 months for the management of glaucoma and ocular hypertension did note that eyelash hypertrichosis was noted earlier and more commonly in the bimatoprost group (13%) vs the latanoprost group (4%).<sup>8</sup> Though this was not the primary endpoint of the study, and therefore must be explored further before anything definitive can be said, it does offer some potential insight into the differences between latanoprost and bimatoprost for this condition.

## **Latanoprost vs Bimatoprost: Stability**

Another place where bimatoprost and latanoprost differ is thermal stability. The package insert of latanoprost commercially available ophthalmic product suggests that, once opened the bottle may be stored at room temperature (up to 25°C) for up to 6 weeks, suggesting some thermal stability.<sup>1</sup> In comparison, the bimatoprost package insert specifies that storage may be between 2-25°C without a specific cap on room temperature storage.<sup>2</sup> In a thermal stability study in which several prostaglandin analogues were tested at 27, 37, and 50°C for degradation, latanoprost was noted to degrade at the 37 and 50°C conditions whereas bimatoprost remained stable for the duration of the test even at high temperatures.<sup>8</sup> Latanoprost has noted pH stability between pH 5-7.<sup>9</sup> Bimatoprost commercially available eye drops are between pH 6.8-7.8, the range where optimal bimatoprost stability has been noted.<sup>2,10</sup> Further information regarding latanoprost and bimatoprost stability in more acidic **environments was not available.**

## **Considerations for Choosing Between Latanoprost or Bimatoprost**

Latanoprost and bimatoprost are both prostaglandin analogues that have been studied for their utility for alopecia, but there are considerations when working with one or the other for alopecia. Latanoprost has been studied at a wide array of concentrations for use for alopecia, whereas bimatoprost has primarily been studied at one. Latanoprost is more susceptible to degradation at elevated temperature than bimatoprost. Bimatoprost also has the advantage of being available as a powder rather than a thick viscous liquid like latanoprost, making it potentially easier to make dilution products with. Another consideration for choosing between bimatoprost and latanoprost for combination products is pH stability. Many ingredients for alopecia have optimal stability at slightly acidic pH, and latanoprost has more demonstrated stability at acidic pH as compared to bimatoprost for which little data on acidic stability is available.

Both bimatoprost and latanoprost have been studied topically for alopecia. The use of one or the other may depend on the characteristics of the preparation, planned storage of the final dosage form, and the other active ingredients, if any, present in your preparation. For more information or further questions regarding bimatoprost and latanoprost and their utility for alopecia, feel free to reach out to us by heading to [www.fagronacademy.us/facts](http://www.fagronacademy.us/facts).

## **Sources:**

1. Latanoprost [package insert]. Tampa, FL: Bausch and Lomb Incorporated. Revised June 20<sup>th</sup> 2022.
2. Bimatoprost [package insert]. Irvine, CA: Allergan Incorporated. Revised March 8<sup>th</sup> 2022.
3. Law SK. Bimatoprost in the treatment of eyelash hypotrichosis. Clin Ophthalmol. 2010;4:349-358. Published 2010 Apr 26. doi:10.2147/opth.s6480
4. Rafati M, Mahmoudian R, Golpour M, Kazeminejad A, Saeedi M, Nakoukar Z. The effect of latanoprost 0.005% solution in the management of scalp alopecia areata, a randomized double-blind placebo-controlled trial. Dermatologic Therapy. 2022. <https://doi.org/10.1111/dth.15450>.

5. Blume-Peytavi U, Lonnfors S, Hillmann K, Garcia Bartels N. A randomized double-blind placebo-controlled pilot study to assess the efficacy of a 24-week topical treatment by latanoprost 0.1% on hair growth and pigmentation in healthy volunteers with androgenetic alopecia. *J Am Acad Dermatol*. 2012; 66(5): 794-800.
6. Zaher H, Gawdat HI, Hegazy RA, Hassan M. Bimatoprost versus mometasone furoate in the treatment of scalp alopecia areata: A Pilot Study. *Dermatology*. 2015;230:308–13.
7. Tabri, Farida & Anwar, Anis & Adriani, Anni & Aryaningrum, Dwi. (2018). The Effectiveness of 0.03% Bimatoprost Solution Vs Minoxidil 5% in Androgenic Alopecia. *Indian Journal of Public Health Research & Development*. 9. 1444. 10.5958/0976-5506.2018.02056.9.
8. Johnson T, Gupta P, Vudathala D, Blair I, Tanna A. Thermal stability of bimatoprost, latanoprost, and travoprost under simulated daily use. *J Ocul Pharmacol Ther*. 2011; 27(1): 51-59.
9. Sakai Y, Yasueda S, Ohtori A. Stability of latanoprost in an ophthalmic lipid emulsion using polyvinyl alcohol. *Int J Pharm*. 2005;305(1-2):176-179. doi:10.1016/j.ijpharm.2005.08.017
10. Jansook P, Loftsson T. Aqueous Prostaglandin Eye Drop Formulations. *Pharmaceutics*. 2022; 14(10):2142. <https://doi.org/10.3390/pharmaceutics14102142>

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