

Fuller, Thicker, Bolder Lashes: Plants versus Prostaglandins

Dr. Tracy Offerdahl



Financial Disclosures

- Non-salaried affiliation agreement with NuSkin/Pharmanex

All financial relationships have been mitigated

If you have any questions

email to drofferdahl@gmail.com

text/call: 267-241-9146

Introduction

- More research is being done on human eyelashes
 - Lashes are considered a key element of beauty
 - Various beauty and cosmetic procedures enhance them:
 - Lash "perms" (A)
 - Lash extension!
 - False lashes
 - Lash dye
 - Lash (& brow) serums
- Even if you have never been involved in "esthetics" (American English) or "aesthetics" (British English) there is a strong movement in optometry to integrate this into general and specialty optometric practices

TOP SECRET

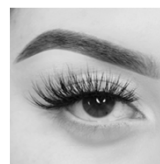
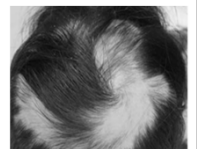


goodbye mascara, hello lashes.

EYES
ARE LIKE CAKE
WITHOUT EYES

Indications

- Chemotherapy – induced eyelash loss
- Alopecia areata
- Hypotrichosis
- Trichotillomania
- Cosmetic



Are dietary supplements regulated?

(quoted from Office of Dietary Supplements: National Institutes of Health: Fact Sheet on Dietary Supplements/Background Information)

- The DSHEA defines and establishes the regulation of dietary supplements, which it reaffirms as a food category
- It is intended to prohibit the manufacture and sale of adulterated and misbranded dietary supplements and prohibit dietary supplement manufacturers from making false claims on supplement labels
- Supplement ingredients sold in the United States before October 15, 1994, are not required to be reviewed by FDA for their safety before they are marketed because they are presumed to be safe based on their history of use by humans
- FDA can either refuse to allow new ingredients into or remove existing ingredients from the marketplace for safety reasons.



United States versus Europe and the rest of the developed world

WE ALLOW MANY MORE BANNED INGREDIENTS!!!

**This includes food additives
AND
Cosmetic additives**



STILL relevant today!

Presence and Quantity of Botanical Ingredients With Purported Performance-Enhancing Properties in Sports Supplements

Potter A, Cohen, MD¹, Braithwaite A, PhD², Kucur K, PhD³, GJL

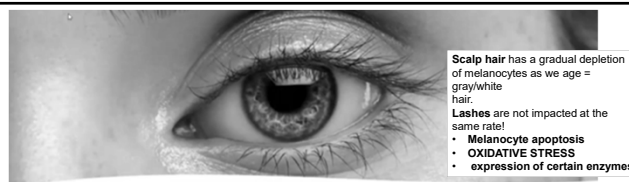
JAMA Netw Open. 2023;6(7):e2323879. doi:10.1001/jamanetworkopen.2023.23879

Cohen PA, Avula B, Katragunta K, Travis JC, Khan I. Presence and Quantity of Botanical Ingredients With Purported Performance-Enhancing Properties in Sports Supplements. *JAMA Netw Open*. 2023;6(7):e2323879. doi:10.1001/jamanetworkopen.2023.23879

- **23/57 products (40%)** did not contain a detectable amount of the labeled ingredient
- Of the products that contained detectable amounts of the listed ingredient
 - the actual quantity ranged from **0.02% to 334%** of the labeled quantity

Eyelashes: Form and function

- **Lower lid:** 75-80 lashes in 3-4 rows
- **Upper lid:** 90-160 lashes in 5-6 rows
- **Considered to be terminal hairs**
 - Coarse, more pigmented
- Lashes form a barrier between external and internal eye environments, as part of the **lid margin anatomy** (like Meibomian glands, lid skin, and biofilm...)
- Important for eye health maintenance
 - If any part is inflamed = inflammatory cascade = dry eye disease
 - **MAINTAINING OCULAR SURFACE HOMEOSTASIS CAN BE IMPACTED BY WHAT WE DO TO A PATIENT'S EYELASHES, SO KNOWING WHAT IS IN A PRODUCT IS IMPERATIVE!!**



Scalp hair has a gradual depletion of melanocytes as we age = gray/white hair.

Lashes are not impacted at the same rate!
• **Melanocyte apoptosis**
• **OXIDATIVE STRESS**
• **expression of certain enzymes**

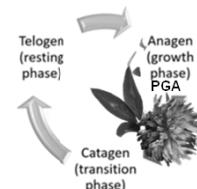
Eyelashes Are Hairs

- Comprised of protein—keratin—that instead of shedding pushes outward
- As hair they are prone to:
 - Reduced growth cycles
 - Poor anchoring
 - Brittleness and breakage

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6147748/>

Eyelash Growth Cycle

- The anagen phase (4 and 10 weeks)
 - A typical eyelash grows approximately 1 mm per week
 - Lashes ≤12 mm before falling out
- The catagen phase (15 days)
 - Hair stops growing and the follicle begins to shrink.
- The telogen phase (4-9 months).
 - Eyelash falls out.



<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6147748/>

Lash Options

Lash Lift/Perm

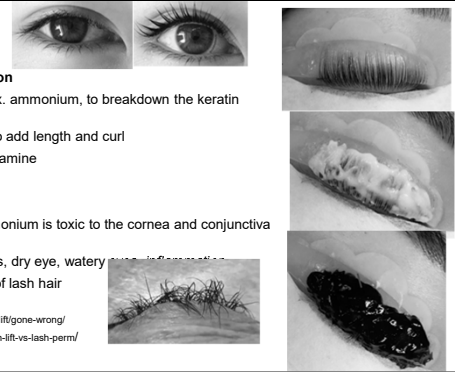
• AKA eyelash lamination

- Uses chemicals (ex. ammonium, to breakdown the keratin shaft) and curved silicone to add length and curl
- Tint: p-phenylenediamine
- Lasts 6-12 weeks

• Side Effects: Ammonium is toxic to the cornea and conjunctiva

blisters, rash, redness, dry eye, watery eyes, irritation, brittle lash hair, loss of lash hair

<https://www.pmuhub.com/lash-lift/gone-wrong/>
<https://sundaybeauty.com/lash-lift-vs-lash-perm/>



Eyelash Extensions

- Eyelash extensions are semi-permanent lashes that are hand-glued on top of your natural lashes

- **Glues:** butyl cyanoacrylate, octyl cyanoacrylate, or formaldehyde

- **Side Effects:** traction alopecia (loss of lashes due to the constant weight of repeated eyelash extensions), allergic reactions, damage to lashes



Photo: The Powder Blog/Facebook

<https://mypost.com/2022/08/24/i-had-zombie-eyes-was-blind-after-botched-lash-extensions/>

Prostaglandins...NOT a surprise

- **Endogenous** prostaglandins have a lot of influence over key natural bodily processes
 - **pain levels and inflammation**
 - normal inflammatory process is your body's way of protecting itself from further damage.
- Prostaglandins have a short half-life and have a short duration of action
 - = only affect cells that are close by
- **excessive amounts of prostaglandins = prolonged inflammation and intense pain**
 - high levels of prostaglandins can lead to chronic conditions and unpleasant symptoms

EXOGENOUS Prostaglandins in/on the eye:

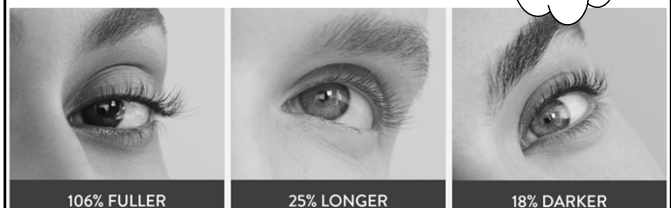
The body is NOT FOOLED!
BIMATOPROST

- **Lowers IOP**
 - Meibomian gland dysfunction, DED
 - Darkening of iris (hazel eyes), lashes
 - ↑ expression of melanin
- **Lengthen lashes**
- **Darken lashes**
 - Periorbital fat loss
 - Darkening of lid skin
 - Redness and swelling in and around the eye



A well known prostaglandin lash product... Of COURSE the results would be fantastic...

Works on
anagen
 or growth
 phase of lash
 growth cycle



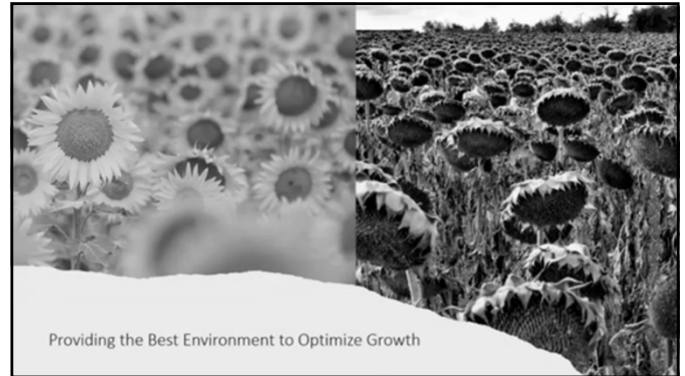
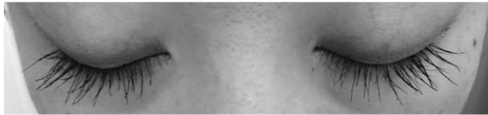
BUT SO ARE THE SIDE EFFECTS!!

Comparison of "brand" versus "generic"
* Side effects and efficacy

<https://webeye.ophth.uiowa.edu/eyeforum/cases/181-prostaglandin-orbitopathy.htm>

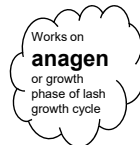


<https://www.teawithmd.com/2014/09/review-of-latisse/>



Synthetic Prostaglandins

- When we know better, we do better!
 - *Isopropyl cloprostenate*
 - *Isopropanol Phenyl-hydroxy-pentene*
 - *Dihydroxy-cyclopentyl-heptenate*
 - *Dechloro Dihydroxy Difluoro Ethylcloprostenolamide*
- PLUS conditioning and "boosting" ingredients like biotin, panthenol, sodium hyaluronate and other "proprietary compounds"



A \$38,000,000.00 Settlement has been reached in three class action lawsuits alleging that [redacted] failed to disclose information ...



Mechanisms MATTER! What is DRIVING the "IMPROVEMENT?"

• Our FIRST MEDICINES came from PLANTS!

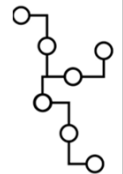
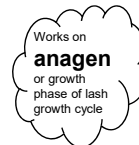
- Many of the medicines we use today are still plant-based!
- "Let food be your medicine..."
- **FUNCTIONAL MEDICINE** is "all the rage"
 - Many people WANT to the QUICK FIX for everything (that is one of the reasons WHY **pharmaceuticals** are so popular)
 - Many want the supplemental form of the "fix", which is why **supplements** are so popular
 - **SOME OF THEM WORK!**
 - Reactive oxygen species and antioxidant mechanisms



Products containing POLYPEPTIDES

What do PEPTIDES do for lashes?

- stimulate eyelash growth
 - stimulating keratin production (key structural protein of hair)
- May also help promote delivery of "key" ingredients to lashes
 - Improves anchoring of lash in follicle
 - Improves eyelash length
 - Improved eyelash diameter
 - Strengthens eyelashes
- **Examples:**
 - Myristoyl pentapeptide-2/-16/-17
 - Myristoyl octapeptide-1
 - Copper tripeptide-1
 - Acetyl tetrapeptide 3



Miscellaneous Ingredients

- **Oils**
 - Sunflower oil
 - Castor oil
 - Argan oil
 - Coconut oil
- **Biotin**
- **Panthenol**
- **Selenium**
- **Arginine**
- **Hyaluronic Acid**
- **Vitamin E**
- **Caffeine**



Plant Ingredients

- **Red clover**
- **Larch wood**
- **Camelia sinensis leaf extract**
- **Clover sprout extract**
 - Mung bean oil
 - Ginseng root
 - Soybeans
 - Pumpkin seed extract
 - Cannabis seed extract
 - Linoleic acid

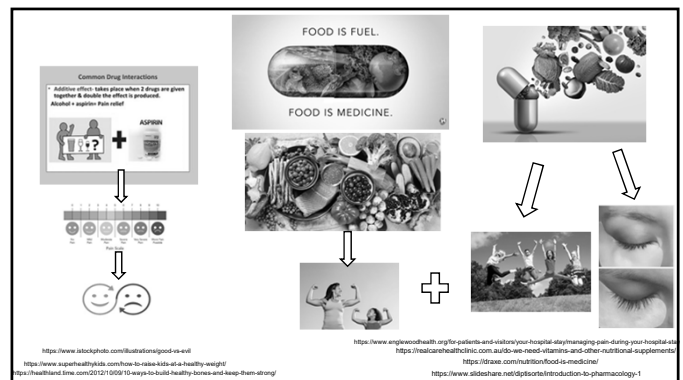
Works on
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or growth
phase of lash
growth cycle



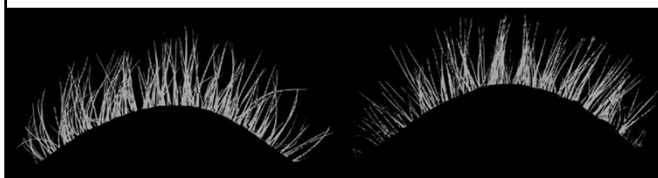
Can we HAVE IT ALL? Efficacy AND Safety?

- **The Plastic Surgeon-Developed:** \$150 for 1-month supply
- **The Peptide-Powered:** \$55 for 1-month supply
- **The Targeted Application:** \$48 for 1-month supply
- **The Preservative-Free:** \$52 for 1-month supply
- **The Mascara Hybrid:** \$45 for 1-month supply
- **The Biotin-Infused:** \$90 for 1-month supply
- **The Vitamin E-Enriched:** \$36 for 1-month supply
- **The New Arrival:** \$150 for 1-month supply
- **The plant-based, prostaglandin free, BAK free, fragrance free, oil free, Phthalate free, paraben free, silicone free, alcohol free:** \$79 for 3-month supply

Adapted from Vogue.com



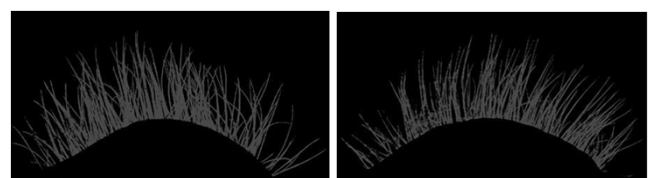
BASELINE



LEFT EYE

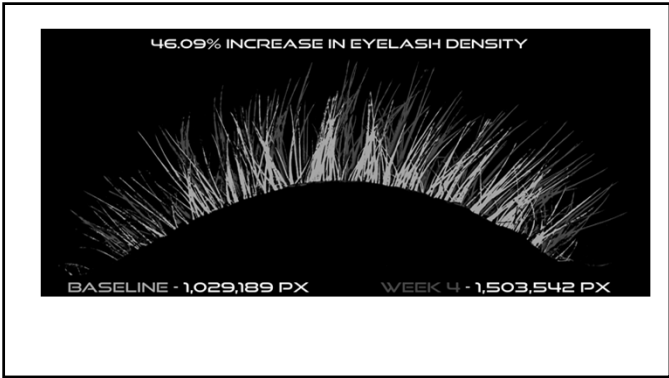
RIGHT EYE

WEEK 4



LEFT EYE

RIGHT EYE



We CAN get this...

'My lashes are conditioned and protected.'	96.7%
'My lashes look thicker and more voluminous.'	96.7%
'My lashes look revitalized.'	96.7%
'My lashes feel nourished and conditioned.'	96.7%
'My lashes look fuller than before using this product.'	100.0%
'My lashes appear healthier after using this product.'	96.7%
'This product lengthens the appearance of my lashes.'	93.3%
'This product strengthens my lashes.'	96.7%
'My lashes look defined and separated.'	96.7%
'This product coats my lashes evenly.'	100.0%
'My lashes look more youthful.'	96.7%

