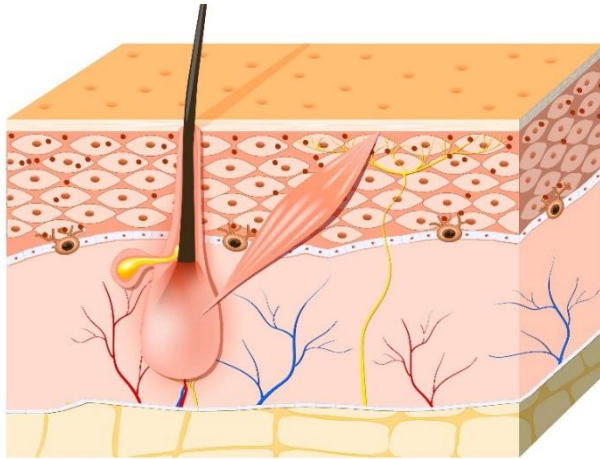


SKIN CONDITIONS -HYPERPIGMENTATION



How is pigment produced?

Melanogenesis (the process that produces pigment) begins when the pituitary gland stimulates the release of tyrosine, then attaches to tyrosinase which forms L-DOPA. L-DOPA produces eumelanin (dark or brown color) or pheomelanin (red or yellow). Once synthesis is complete, melanin granules pack into vessels called melanosomes. Melanosomes then carry the pigment through dendrites to the keratinocytes.

The difference or intensity of people's skin color does not depend upon the number of melanocytes, but the amount and density of pigment or melanin. Albinos still have melanocytes but do not produce pigment.

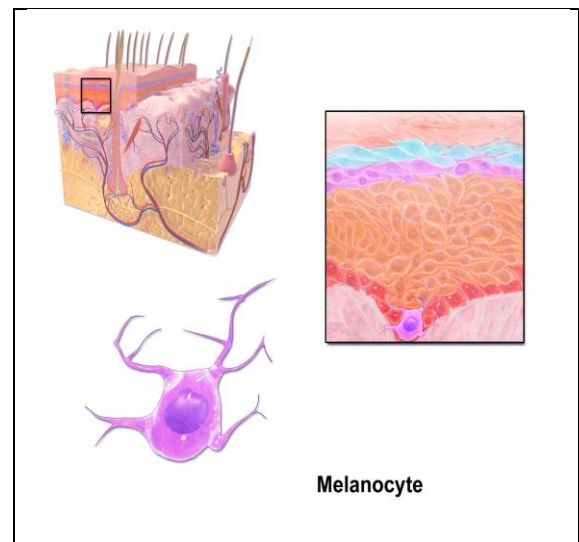
What determines the overproduction of pigment?

There are two causes:

1. Internal: medications, hormones*, inflammation, cell or mitochondria death**
- **After age 35 we lose 10-20% per year of correct DNA melanin
2. External: excessive UV exposure, certain cosmetics

Terminology:⁽²⁾

- **Melanogenesis:** the process of producing melanin
- **Melanosomes:** once synthesized, organelles that move melanin to keratinocytes through dendrites which transfer melanin into cells
- **Keratinocytes:** cells on the stratum corneum receive melanin on the top layer (stratum corneum)
- **Melanocytes:** melanin-producing cells in stratum basal layer of the epidermis
- **Melanin:** pigment granules
- **Tyrosinase:** an enzyme that acts upon tyrosine
- **Tyrosine:** amino acid needed to produce melanin
- **DOPAquinone:** precursor of melanin (enzyme)
- **Adenohypophysis:** is a hormone found in the pituitary gland that stimulates melanocytes



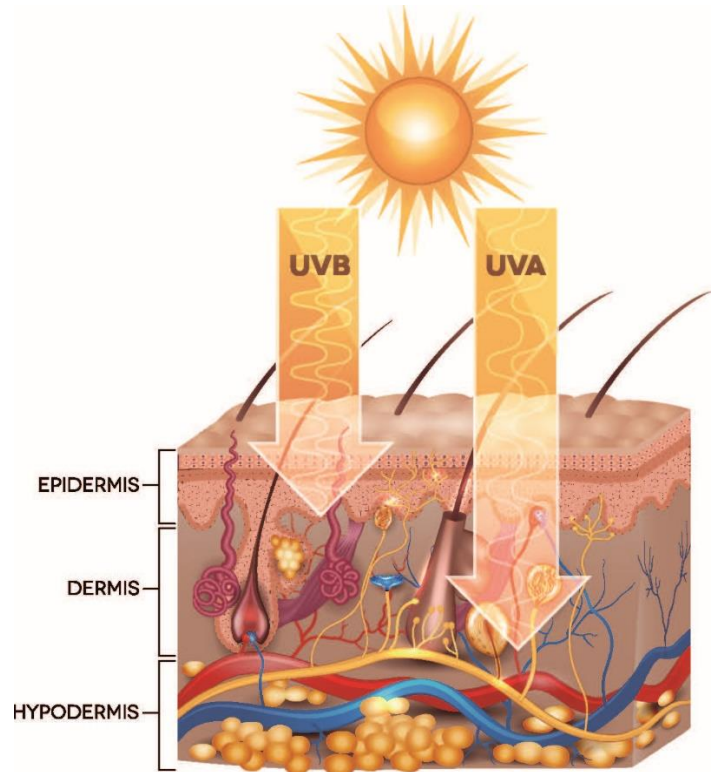
What is the difference between UVA and UVB radiation?

UVA: (Aging) ⁽¹⁾

- causes immediate and delayed tanning and contributes little to erythema and burning
- constant throughout the day and year
- longer wavelengths which penetrate deeper reaching dermis and subcutaneous fat
- chronic exposure causes connective tissue degeneration
- can penetrate window glass
- interacts with topical chemicals and medications

UVB: (Burning) ⁽¹⁾

- produces the most harmful effects and is greatest during the summer
- snow and ice reflect UVB and delivers a high amount of energy to the stratum corneum and superficial layers of the epidermis
- manifests as a sunburn, suntan, inflammation, pigment changes
- most intense when the sun is directly overhead (10 AM - 2 PM)
- is absorbed by window glass



Upon exposure to UV radiation, DNA damage triggers cytokines, growth factors and other inflammatory factors to stimulate melanin production. Melanin forms in specialized cells called melanocytes. Melanocytes are especially abundant in the basal layer of the epidermis and underlying dermis and are responsible for the pigmentation of the skin. The melanocytes, by increasing the production of intracellular nitric oxide (NO), they trigger signal transduction cascades to initiate melanogenesis through a series of oxidative reactions involving the amino acid tyrosine in the presence of the enzyme tyrosinase. This leads to the production of melanin.

Melanin granules synthesized in the melanocytes transfer from the cytoplasm of the melanocytes to the basal cytoplasm of the keratinocytes through dendrites. They thus form a protective covering in the inner layers of the epidermis, absorbing UV rays and inhibiting their penetration. ⁽¹⁾

There are two issues concerning pigmentation.

1. The production
2. The metabolism or destruction of that pigmentation

How can peptides work on pigment?

1. Basically, the cell is damaged in some way, so it responds by creating messages (cytokines, growth factors.) which in turn produces Melanocyte Stimulating Hormone (MSH). This messenger binds to a receptor on the melanocyte to produce a response - which is melanin production (protecting it from future damage). Once the damaging factor has subsided the melanin production ceases, and the produced melanin starts to metabolize.

One of the first goals of peptides is to **block or modulate the MSH stimuli at the receptor site of the melanocyte cell.** If a peptide mimics the MSH molecule and sits on the receptor site without actually activating the receptor, (therefore the chemical cascade that leads to melanin production) it could modulate the overproduction of melanin. ⁽⁴⁾

This process is not intended to inhibit but compete. This is important to note as melanin protects the cell. Many times, messages of damage are being sent from deteriorating cells that have not gone through apoptosis (cell death). **The goal of some peptides is to 'block' the message until the mutated cells eventually die through necrosis and the melanin-producing signals along with them.** ⁽⁴⁾

2. The second issue involved with melanin is the breakdown or metabolism of it. This is what we visibly see on the surface. Remember what you see on the surface is approximately 30+ days old (think cellular turnover from cell in the dermis to epidermis). This is one of the reasons why it takes a few weeks to see results. You are looking at the surface, not all the processes in the lower layers.

To target surface issues, **chelators** can disrupt a stable form of melanin produced when in contact with certain elements naturally occurring within the skin. These chelators bind to these over stabilizing complexes and disrupt them to allow for natural metabolism to proceed. ⁽⁴⁾

PEPTI-correct Hp effectively addresses the client's concerns related to dark spots. The collective blend of Oligopeptide Hp, antioxidants, and chelating agents provide a powerful approach for balancing skin tone.

Benefits

Improves dark spots, uneven skin tone, photoaging
Addresses PIH from previous acne lesions

Ingredient	Function
Oligopeptide - Hp	Helps to reduce the appearance of pigmented areas
Propanediol	Provides skin conditioning, humectant, solvent, and viscosity agent
Azelaic acid	Organic acid targeting tyrosinase and lipofuscins
Benzoic acid	Chelating agent to stabilize and preserve
Citric acid	Anti-oxidant, skin brightener, regulates pH

Ingredients: Aqua (Water), Propanediol, Oligopeptide-Hp (Arginine, Alanine, Aspartic Acid, Cysteine, Glycine, Lysine, Proline), Xanthan Gum, Azelaic Acid, Benzoic Acid, Citric Acid, Succinic Acid, Disodium EDTA, Diazolidinyl Urea, Iodopropynyl Butylcarbamate

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