SYNTHESIS OF MELANIN

- Melanin, the skin pigment is synthesized in melanocytes present in the basal layer of skin.

![Diagram of melanin synthesis](image-url)
DISORDERS OF MELANIN PIGMENTATION

Disorders of melanin production may take the form of:

- Hypermelanosis or hyperpigmentation
- Hypomelanosis and depigmentation

PATHOGENESIS OF HYPERPIGMENTATION

Hyperpigmentation results from increased melanin which may occur in the epidermis, dermis or both

- Normally the melanocytes are present in the basal layer of the epidermis and an increase in number or activity will cause *epidermal hyperpigmentation*

- Formed melanin may be transferred to the dermis, or in some cases, dermal melanocytes are present. An increased activity or number of melanocytes in these instances will lead to *dermal hyperpigmentation*

- Also a combination of the above may take place, resulting in *mixed hyperpigmentation*

From training material on hyperpigmentation
CAUSES OF GENERALIZED HYPERPIGMENTATION

- Genetic
- Radiation (ultraviolet radiation)
- Hormonal
- Metabolic
- Malabsorption and biliary cirrhosis
- Drugs

CAUSES OF PATCHY HYPERPIGMENTATION

- Hereditary
- Acquired

CAUSES OF HEREDITARY PATCHY PIGMENTATIONS

- Freckles
- Peri-orifacial lentigenes (Peutz Jeghers disease)
- Incontinenti Pigmenti (Bloch Sulzberger syndrome).
- Albright’s syndrome

FRECKLES

- Appear at about the age of 5 years as small brown macules on the sun-exposed skin
- More common in fair complexion or in red haired individuals
ACQUIRED PATCHY PIGMENTATIONS

- Solar lentigo
- Post inflammatory pigmentation.
- Chloasma (melasma).
- Acanthosis Nigricans
- Lentigines
- Peri-orbital hyperpigmentation

SOLAR OR ACTINIC LENTIGO

- A macular area of brown pigmentation appearing after acute or chronic sun exposure
- Commonly seen on sun exposed sites
POST INFLAMMATORY PIGMENTATION

- Inflammatory diseases as eczema and lichen planus
- Hyperpigmentation occurs especially in the pigmented races


Picture from training material on hyperpigmentation
CHLOASMA (MELASMA)

- Common disorder of the facial skin
- Pigmentation occurs mainly in women
- Highest incidence during reproductive years
- Precipitated by pregnancy & oral contraceptive
- Sunlight and genetic factors are important

Zaidi, ZH, 2005, Manual of Dermatology, International composers and printers, Karachi
MELASMA

From training material
LENTIGINES

- Brown macules
- Appear in childhood
- Flat or slightly raise

ACANTHOSIS NIGRICANS

- Associated with insulin resistance
- Hyperpigmentation of the axillae, groins, sides of the neck and palms of the hand
- Skin becomes thick with pronounced ridging
- Velvety or in severe cases a warty appearance

Zaidi, ZH, 2005, Manual of Dermatology, International composers and printers, Karachi
PERI-ORBITAL HYPERPIGMENTATION

- Pigmentation may be genetic with an autosomal dominant inheritance
- May extend to involve the eyebrows and the cheeks
- Periorbital pigmentation may be due to cosmetics or it may be a part of generalized disorder such as Addison’s disease

TREATMENT OF HYPERPIGMENTATION

- Topical hydroquinone
- Hydroquinone may be used in combination with tretinoin and dexamethasone
- Exposure to sunlight should be avoided
- Sun block should be used daily
- Chemical peels may induce temporary bleaching

HYDROQUINONE

MECHANISM OF ACTION:

- **Inhibition of melanin synthesis:**
  It inhibits tyrosinase enzyme which is involved in the synthesis of melanin

- **Bleaching effect:**
  Of the bleaching agents hydroquinone is the most safe

- **Inhibits production of active oxygen species**
  Mediates its effects partly by release of radicals

SUNSCREENS
BENEFITS OF SUNSCREENS

- Used for protection against solar radiation not only in normal skin but also in patients with photodermatitis.
- They reduce UV-induced immunosuppression, which is considered to have a role in cutaneous carcinogenesis.
- Sensitization and elicitation phases of immune responses can be preserved by sunscreens.

TYPES OF SUNSCREENS

Sunscreens are of two types

i. Those that absorb ultraviolet radiation:
   - Para aminobenzoic acid (PABA)
   - Cinnamates and benzaphenones

ii. Those that reflect ultraviolet radiation
   - Zinc oxide
   - Titanium dioxide

Zaidi, ZH, 2005, Manual of Dermatology, International composers and printers, Karachi