

# **Dry Skin and Moisturizers**

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# History of using skin moisturizers

- Depending on geographic locations they used **avocado oil, palm oil, olive oil, sesame seed oil and animal fats**

استخدمو المرطبات هشاشة موجودة من أيام جداً، كانوا يستخدمون أنواع مختلفة من الزيوت حسب المتواز، هنا بما ذكرنا كانوا يستخدمون أكثر استقراراً.

- Olive oil → Quran and Prophet Mohammed PBAH
- Olive oil was popular among ancient Greeks, ancient Olympics were conducted by men greased with olive oil
- Galen, a famous physician in ancient Rome, is credited with the formulation of the forerunner of cold cream (he added as much water as could be incorporated into a mixture of beeswax and olive oil) *→ this is old formula → Oil + water + Surfactant*

# History of using skin moisturizers

↑ Vaseline

- Petroleum jelly was discovered in the mid-1800s in Pennsylvania by a chemist called Chesebrough. He discovered that a gooey substance was causing problems to the oil rig workers since it stuck to the drilling rigs, he also noticed that this substance had the property to heal cuts and burns--> by 1870, Chesebrough was marketing his new product called Vaseline
- The first significant advancement of simple moisturizers occurred in the 19<sup>th</sup> century when emulsifiers were developed to create stable emulsions
- Silicone oils were started to be used during the 20<sup>th</sup> century

\* كان زمان بن استخدمو الـ vaseline لتأهيل المعدة ( orally )

# Key concepts

- Moisturizers are designed to:
  1. Improve the skin quality
  2. Maintain or restore the moisture content of the SC
  3. Keep SC smooth and pliable
  4. Aid in alleviating the symptom of dry skin

حُسْنَةٌ فِي اِنْتَهَىٰ

# Key concepts

- The term **moisturizer** is a generic term used to describe ingredients that add moisture to the skin.  
*\* add ↓ and Keep moisture in the Skin*
- Three types of moisturizers are distinguished based on their: physical and chemical properties and mechanism of action:
  - **Humectants**
  - **Emollients**
  - **Occlusives**

# Key concepts

- Most of these formulations are emulsions, including both low-viscosity lotions and higher-viscosity creams المُسْتَحْرِرُ يَكُونُ فِيهِ طَوْرٌ مَاءٌ وَطَوْرٌ زَيْتٌ وَبَعْدَنَ يَتَحَمَّلُ بِالْمَرْزُومَةِ
- The most commonly tested performance parameters include the ~~moisturizing effect and aesthetic properties of the products~~ أَنَّ مَعْنَى أَنْتَكَ أَنَّهُ مُسْتَحْرِرُ التَّرْطِيبِ يَتَعَيَّنُ مِنْحُ عَنْ طَرِيقِ تَجْرِيبَتِهِ عَلَى بَشَرَةِ مِنَ النَّاسِ دَأْبَمْ وَعَكَنْ أَعْقَارَنَهُ مَعَ مُسْتَحْرِرٍ مُعْجَبَدٍ أَمْهَدَ بِالْمَرْزُومَةِ رَحْ بَدَرِ دَنَافِنِ.
- Skin rejuvenators ingredients can also be added هُنَّ أَسْيَادُ اخْتِفَافِهِ لَكُنْ اخْتِفَافَهُ إِلَى المُسْتَحْرِرِ مِنْ اخْتِفَافِ <sup>niacinamide</sup> vitamins أَوْ أَوْ وَجْدَمُ حَمَمْ .

# Dry Skin

- Also known as xerosis
- Can be a congenital or acquired condition
- It can be mild or so severe that it leads to skin breakdown and infection *in winter, or when use anti acne product.*
- Mild dry skin is a condition that affects many patients
- Over \$1 billion a year is spent in the United States on moisturizing skin-care products

متلازمة dry skin هي متلازمة منتشرة كثيرة بين الناس، واستخدام الماء البارد لعلاج هي المتلازمة كثيرة خصوصي  
ما يعيش أحدها وأتركها لأنها حكنا تؤدي إلى مضاعفات خطيرة.

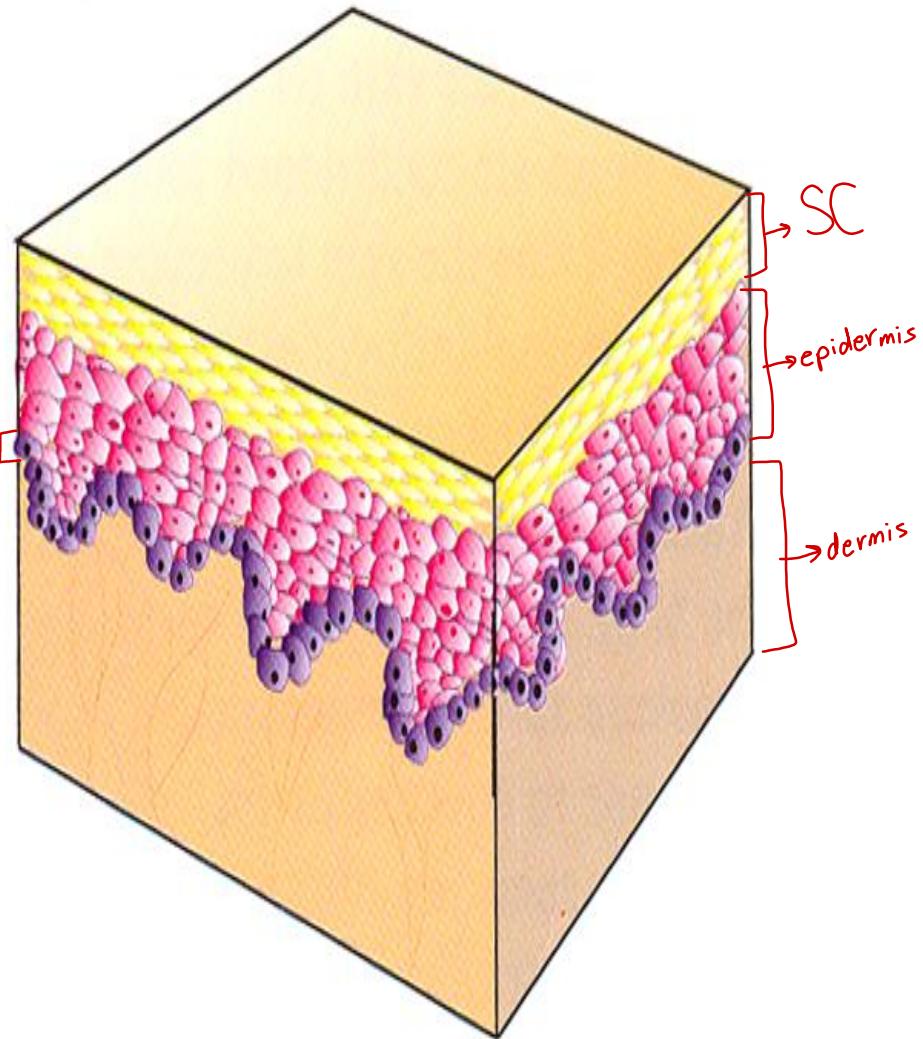
Water content of keratinous layer: 10-30%

Water content of dermis and epidermis: 80%

حيث تعمق كل خلية فيها إلى خلستان ورقة تتصل بالطبقة базال basal layer وهي المسؤولة عن تجدد الخلايا موجودة فيها stem cells

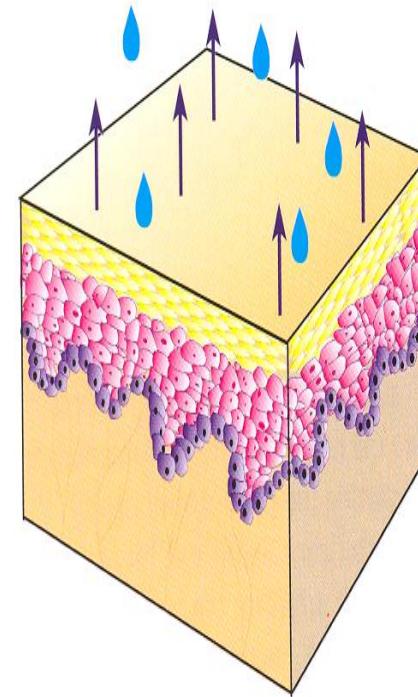
للأعلى باتجاه SC ، خلال عملية انتقالها للأعلى ينضي عليهم مادة keratinization ويتغير خلية مختلفة تماماً بحيث أنه ما يكون فيها cytoplasm ولا nucleus ، ويكون مادة keratin وموارتها lipids من تغير بالوظيفة منها وهي حماية الجلد .

وطبعاً أي خطأ مغير بهذه العملية لا يؤدي إلى حدوث أمراض مثل الصدفية ، اللichen ، وغيرها إن الخلايا تتسلق من الطبقة базال basal layer لل SC بسرعة كبيرة بحيث ما يتاح الخلايا تغير شكلها ، فما راح تقدر تعمق بوطنيتها بالفعل الصحيح



*The water content of the skin.*

- When the water content of the skin is normal, the skin appears soft and smooth
- There is a continuous movement of water from the deep layers of the skin to the superficial layers where the water evaporates from the surface



### *Evaporation of water from the skin surface.*

الماء ينتقل من طبقات الجلد السفلية إلى العليا  
مسبب *Passive diffusion* من الأكتر تركيز إلى الأقل تركيز بحركة  
مستمرة، بالوسم الطبيعي الصبغة الخارجية من الجلد تكون قادرة  
على ازها لحافظ على نسبة معينة من الماء داخل الجلد حتى  
تحل محله من الكيغاف.

# Natural factors that prevent skin dryness:

## (1) Intercellular lipids of the horny layer (SC):

composed mostly of free fatty acids, cholesterol, and ceramides

عندان يمنع فقدان الماء من تجن لعوق

## (2) Natural moisturizing factors (NMF) that retain water content of the horny layer:

Small hygroscopic compounds inside the cells of the horny layer

بس توصل املاء عندها ينتمي عتاد تحافظ على نسبة محبنة من الماء في ال SC , في خاص يكون عنده مرافق اسهم جمل السكرة , يكون جامع داهم جاف و يكون flakes , صدروں يكون جسم خر قادر على تصريح ال NMF , فهمول بعثشو كل مياديم على المغشيات والمرطبات .

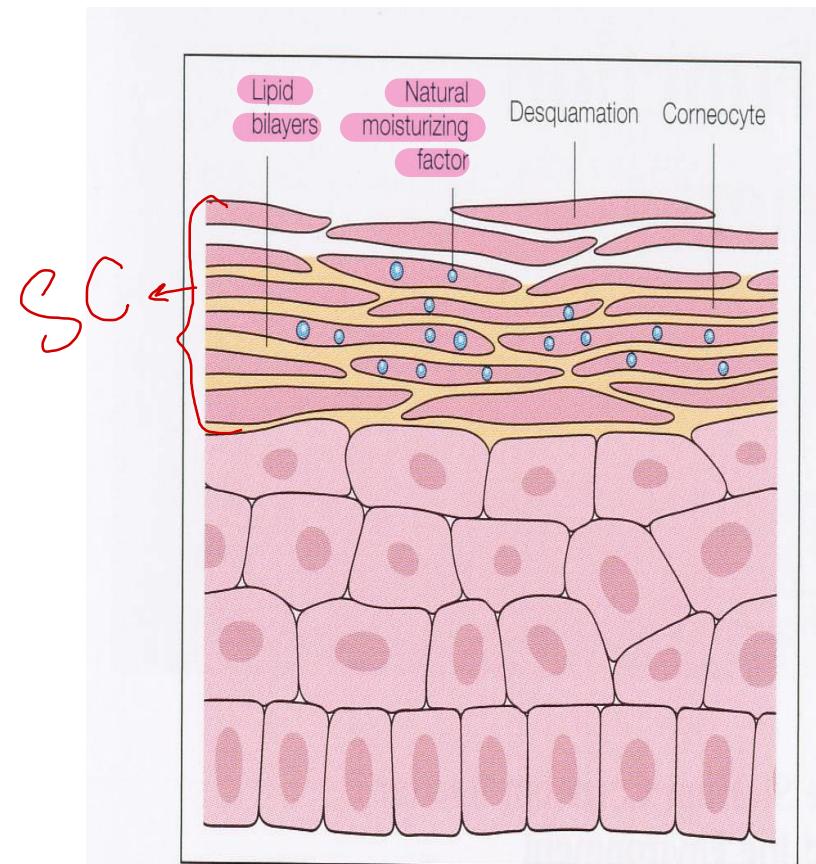


Fig. 2.2 The four key processes for the formation and functioning of the stratum corneum

## Chemical composition of natural moisturizing factor within corneocyte

### Concentration >5%

- Free amino acids
- Pyrrolidone carboxylic acid (PCA)
- Lactate
- Sugars
- Urea
- Chloride
- Sodium

### Concentration <5%

- Ammonia
- Uric acid
- Glucosamine
- Creatine
- Calcium
- Magnesium
- Phosphate
- Citrate
- Formate

**Box 14.1** Chemical composition of natural moisturizing factor within corneocyte

# What causes dry skin?

## A. External causes:

- **exposure to dry environment and wind**
- **artificial indoor heating** → the skin tends to be dryer in the winter “winter itch”
- **air-conditioned room (cold dry air)** → cause the skin to become dry
- **Frequent washing**
- **exposure to certain substances: e.g. certain medical treatments (such as some acne treatment) cause drying of the skin**

اتساع الارض طبيعة عليهم يتطلب انهم يخلو ابريقج باسترار مثل اصحابه والمرضى والذى يستغلون بالتجربة

# Environmental agents that can lead to Dry Skin

## *Environmental Agents That Can Lead to Dry Skin*

- Hot water
- Detergents
- Friction from clothing
- Frequent air travel
- Pollution
- Other chemicals
- Air conditioning

# What causes dry skin?

\* Ichthyosis Vulgaris (الجلد المموج)

## B. Internal causes

### ■ Dermatitis (eczema)

\* aging



اداً الى عالجتها مع العنت رجعه عن المرض تتعافى  
bleeding > cracking > desquamation



Figure 13. Cracking—Grade 10.

# What causes dry skin?

- It is characterized by the lack of moisture in the SC
- Barrier perturbation causes an increase in TEWL allowing excessive water to be lost to the atmosphere
- Skin with a normal water content will shed off dead cells naturally *desquamation = shed off*
- Decreased water content in the stratum corneum leads to abnormal desquamation of corneocytes
- Patients with dry skin have a perturbation in the normal bilayer structure of lipids which is associated with increased fatty acid and decreased ceramide levels

Trans Epidermal Water Loss

في بعض الدراسات أكدتُوا أنه سبب الجفاف ودخولها في حالة eczema يكون بسبب اختلال في الترتيب bilayer lipid، وهي أحياناً بعض مستحضرات الترطيب يكون مكتوب عليها أنها غنية بالceramide.

# Ceramide

- Constitutes 40% of the human SC lipids
- Six classes
- Basic structure is a fatty acid covalently bound to a sphingoid base
- Ceramide 1 is non-polar and contain linoleic acid (*fatty acid*)
- It has been shown that ceramides applied externally, in the form of moisturizers, can effectively reduce dry skin symptoms

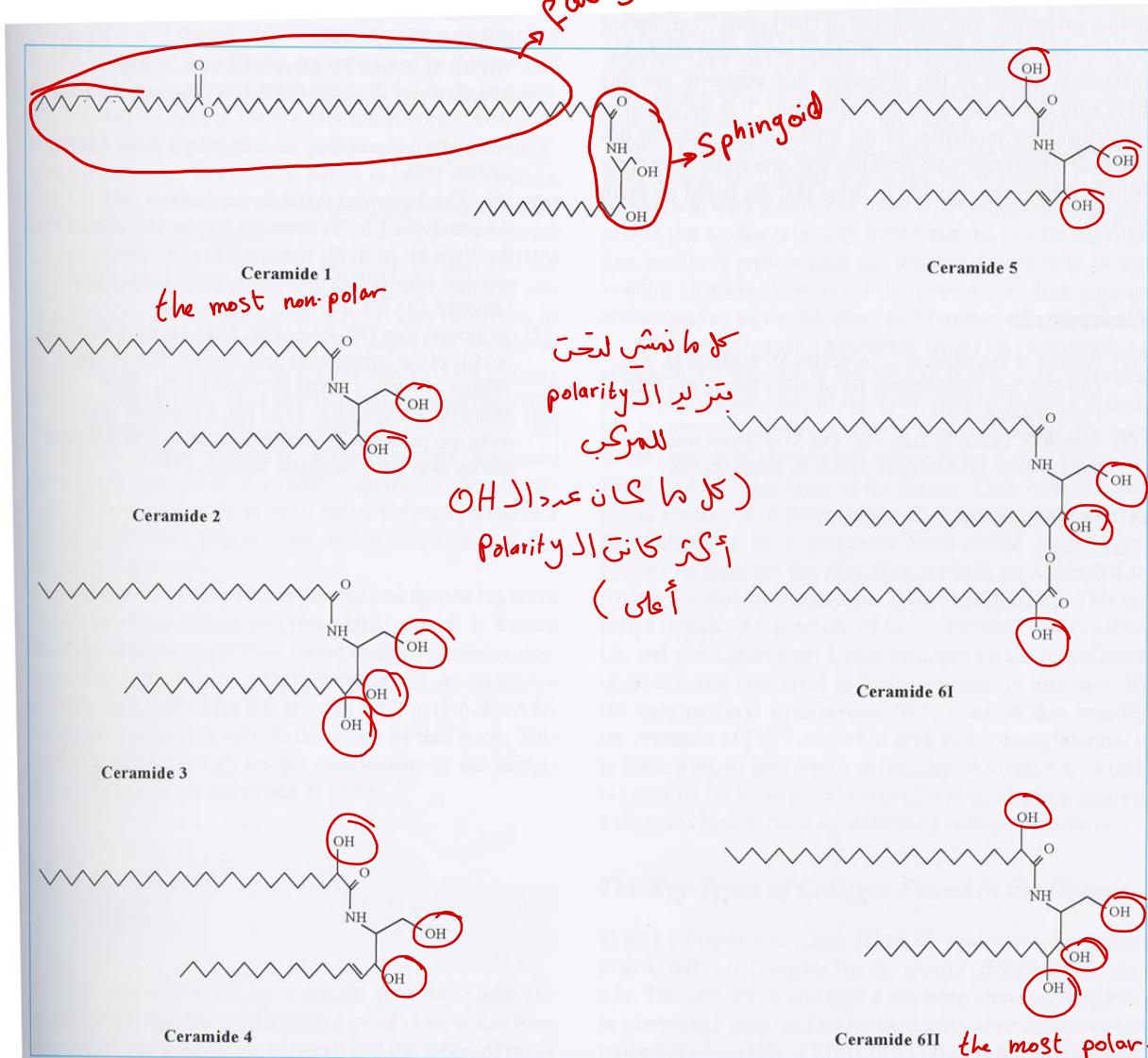


Figure 1-4.

Ceramides 1 to 6. Ceramide 1 is the most nonpolar. The polarity of each ceramide increases until ceramide 6, which is the most polar of the ceramide forms. There are two forms of ceramide 6: ceramide 6I and ceramide 6II.

# What causes dry skin?

In dry skin:

- Scales → dead cells do not shed off easily and remain attached الخلايا بالوضع الطبيعي بصير الـ skin جاف بتصير خلايا ايجي بترفع منوق بيفن بس لما يهس الـ skin بتصير خلايا ايجي بترفع منوق بيفن as single cells
- Fissures → interfere with its function as a protective layer → increased water loss → the skin become dryer
- The condition is worst in areas of the body with relatively few oil glands (e.g. arms, legs, and trunk) (Sebum helps in moisturizing the skin.)



fissures



# Moisturizers:

- Mild dry skin is a condition that affects many patients
- Incidence of Dry skin has increased:
  - People bathe and shower more frequently
  - Fragrance bubble baths and bath salts are used more commonly
- The symptoms of dry skin can be treated by increasing the hydration state of the SC with occlusive or humectant ingredients and by smoothing the rough surface by an emollient

أعماق الجلد dry skin بغير لها يكون عدي متلازمة بالbarrier الماء الخارجى بالجلد بين بطل قادر لحفظ بكتيريا الماء الخارجى

# Moisturizers:

- **Moisturizers Components:**
- Occlusive ingredients: form a hydrophobic film on the skin surface → retards water loss
- Humectant ingredients: attract water into the epidermis وهي المكونات التي تجذب الماء من الهواء أو من الماء أو من الماء أو من الماء
- Emollient ingredients: fill in effect to smooth the rough surface of the dry skin
- Most moisturizers contain a combination of occlusives and humectants.

# Occlusives

- They coat the SC to retard TEWL
- They ~~are usually oily substances~~
- An occlusive is one of the best choices to treat dry skin because it provides an emollient effect as well as decreases TEWL
- Effective only while present on the skin
- Petrolatum and mineral oil

بختلو بقدرجم ۱۸۰۰۰ جنماد جامد

## Occlusive agents



### Hydrocarbon oils/waxes

- Petrolatum
- Mineral oil
- Paraffin
- Squalene
- Silicone derivatives:  
Dimethicone  
Cyclomethicone

### Wax esters

- Lanolin
- Beeswax
- Stearyl stearate

### Vegetable waxes

- Carnauba
- Candelilla

### Fatty alcohols

- Cetyl alcohol
- Stearyl alcohol
- Lanolin alcohol

### Fatty acids

- Stearic acid
- Lanolin acid

### Phospholipids

- Lecithin

### Sterols

- Cholesterol

### Polyhydric alcohols

- Propylene glycol

Occlusive and solvent.

### Box 14.2 Occlusive agents

# Occlusives: Petrolatum

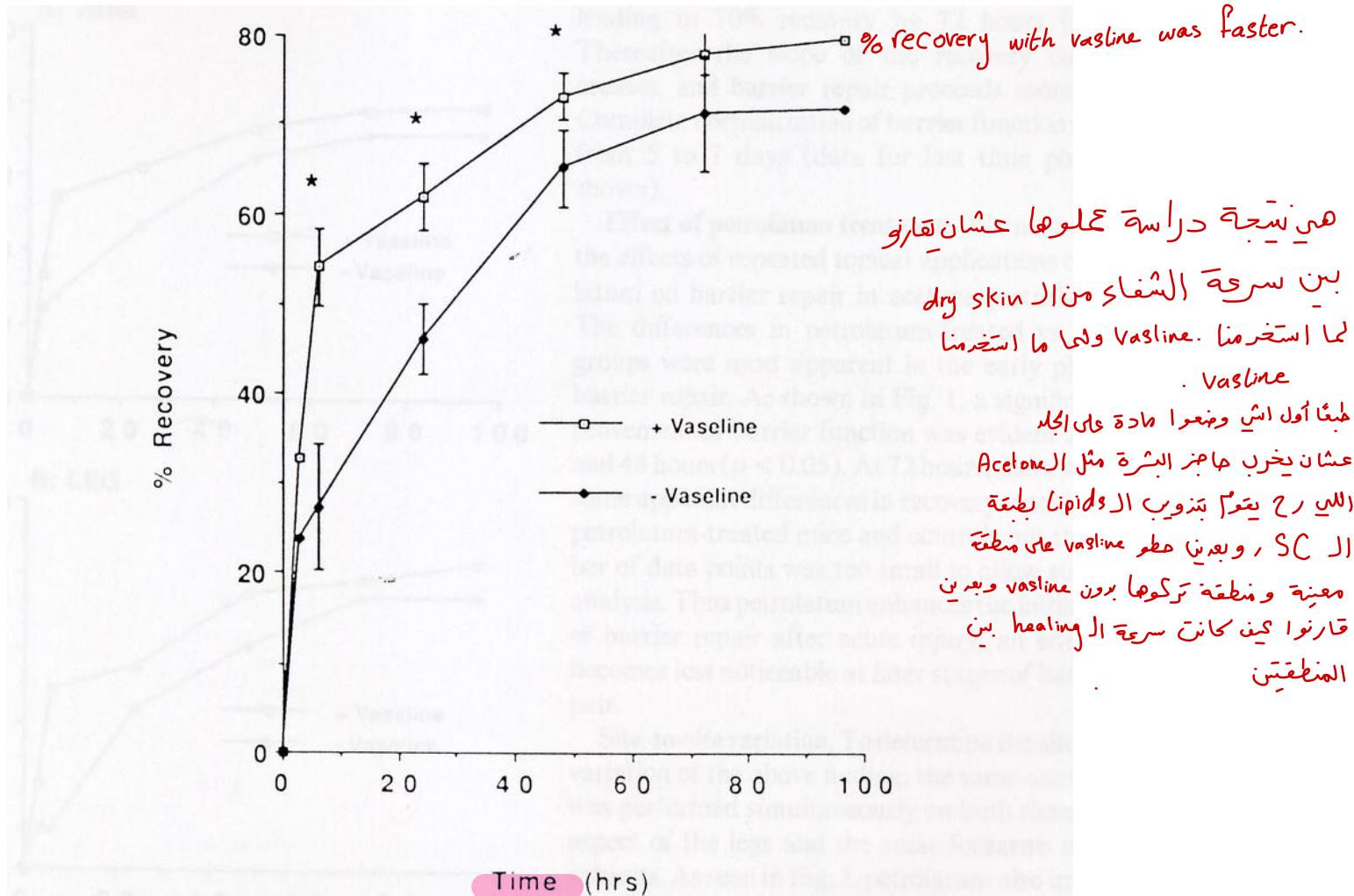
- Considered by many to be one of the best moisturizers
- Used in skin care products since 1872
- It is a purified mixture of hydrocarbons that is derived from petroleum
- Has a greasy feeling
- Noncomedogenic and does not cause allergic reactions
- It is often combined with other ingredients to decrease the greasy feeling

# ***Petrolatum, USP***

- ***is a purified mixture of semisolid hydrocarbons obtained from petroleum.***  
يختلف باللون حسب مكونات المزيج mixture من الهيدروكربونات hydrocarbons
- **vary in color from yellowish to light amber.**
- It melts at 38°C to 60°C and may be used alone or in combination with other agents as an ointment base.
- Petrolatum is also known as yellow petrolatum and petroleum jelly.
- A commercial product is Vaseline.

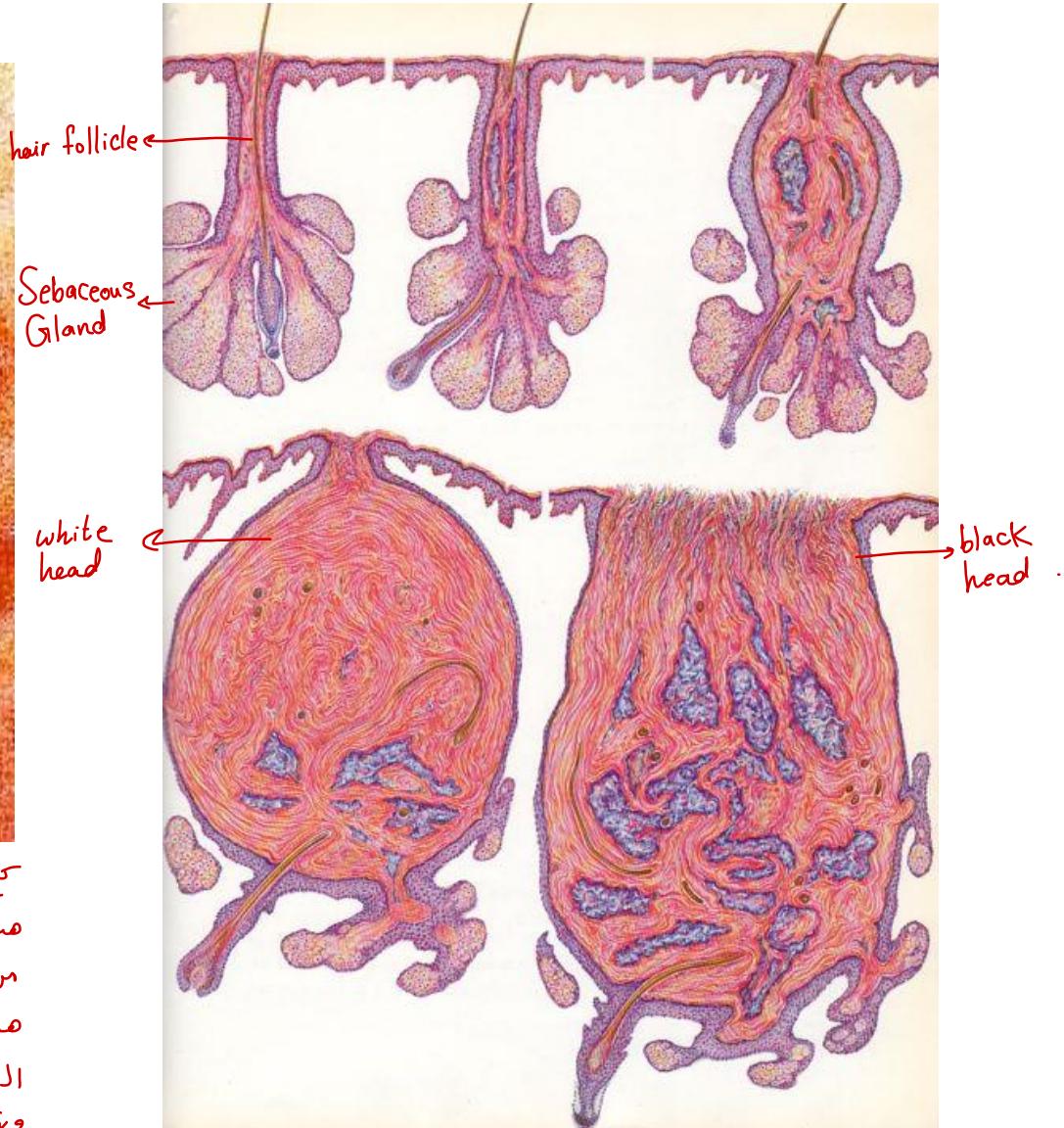
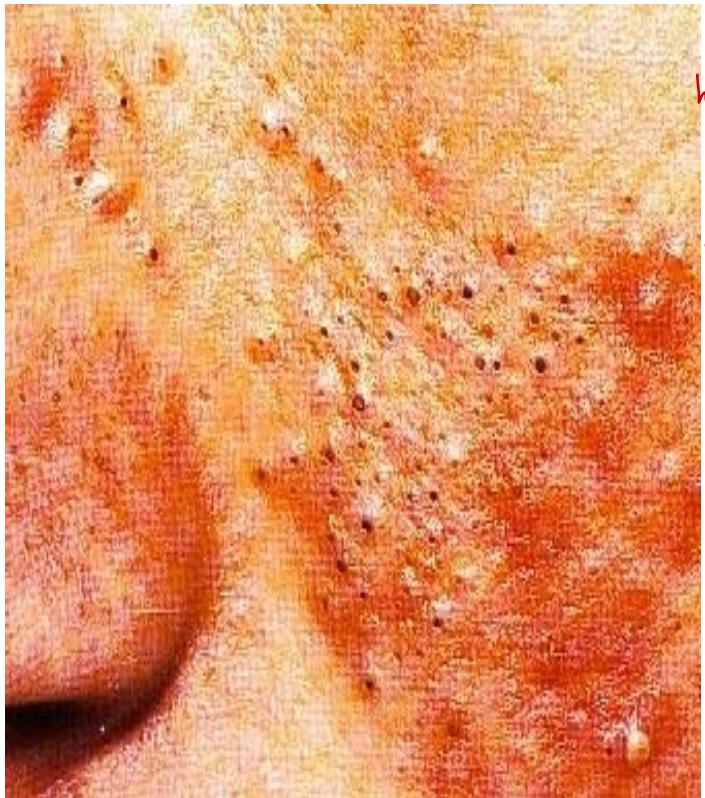
# ***White Petrolatum, USP***

- ***Is a purified mixture*** of semisolid hydrocarbons from petroleum that has been ***wholly or nearly decolorized***.
- ***It is used for the same purpose as petrolatum, but because of its lighter color, it is considered more esthetically pleasing by some pharmacists and patients.***
- ***White petrolatum is also known as white petroleum jelly.***
- ***A commercial product is White Vaseline***



# Comedogenic vs. Noncomedogenic

- Comedogenic: the tendency of a topical ingredient or product to cause the development of comedones, possibly leading to or worsening acne eruptions
- Comedone: clogged pore
- The ingredient or product is unlikely to cause comedone development (*non-Comedogenic*)



كيف تكون الـ Comedone  
 هذا يعني بالكل تكون الـ Sebaceous gland اللي يعمر بالفراز الـ Sebum  
 مربوطة مع الـ hair follicle بالجلد وبيتم إفراز العرق الخارج عن طريقها  
 إذا هيـ الـ hair follicle مهـر فيها Clogging يعني سكرن دهـ يغلـ  
 الـ Sebum قادر إنه يطـلـع لـ بـرا وـ رـجـ يـتـجـعـ حولـ الـ hair follicle  
 ويـكونـ الـ Comedone .  
 منـجـ للـ الهـواءـ الـ بـجـيـ فـيـمـنـ الـ Comedonesـ نوعـنـ وـيـكونـ لـ وـرـنـ أـسـودـ مـنـ الـ black headsـ  
 يـكونـ سـكـرـ تـامـاـ غـيرـ مـرـجـنـ الـ الهـواءـ  
 وـيـكونـ لـ وـرـنـ أـبـيـضـ مـنـ الـ white headsـ

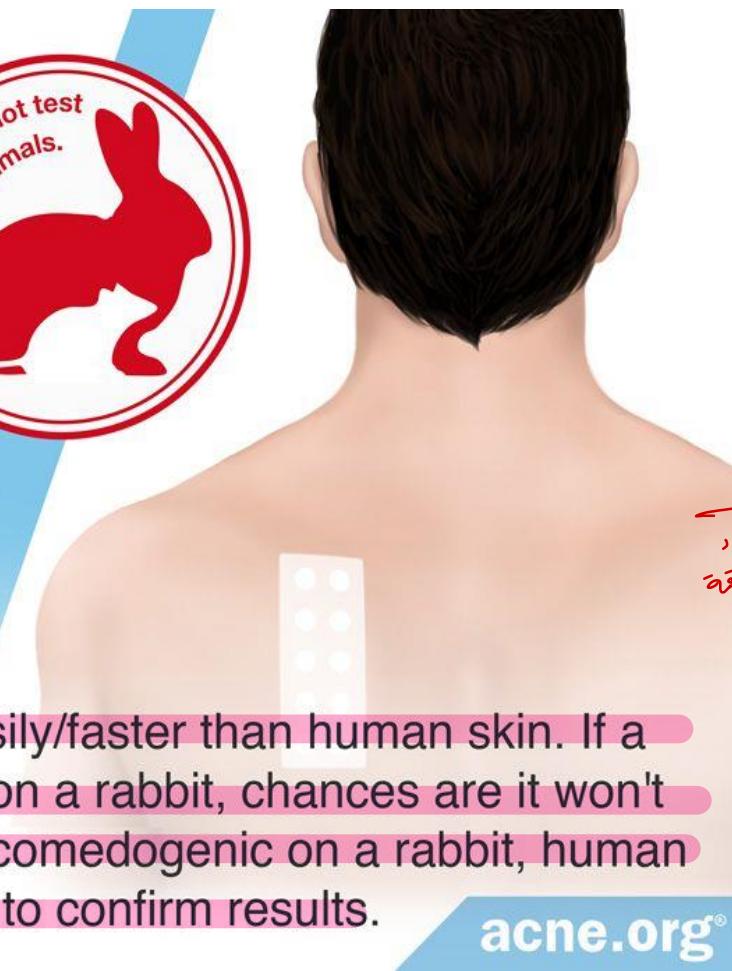
10/21/2023

## Illustration of the formation of open and closed comedones

Saja Harned, Ph.D

كيف أعرف إذا المستحضر تبعي Comedogenic أو لا ؟

ـ بختره على أذن الأرنب  
(طبعاً ما يهاد الأذن لمنع بس في  
ناس يتعلمهون).  
طبعاً اختربنا أذن الأرنب لأنها معاشرة  
جداً للبشرة Comedogenic يعني يمس علىها  
بشرة ، فإذا ظهر عيوب بالـ oil test  
(المستحضر non-comedogenic لا يمس ببشرة الأرنب).  
كثير كبس (أن يكون بريء)  
بس على non-comedogenic  
بس لو كان على الأذن  
فهذا ما يعني أنه رجع يكون  
أذن الأرنب على non-comedogenic  
أذن الأرنب حساس أكثر من الأذن.



يمكن أعد test  
على ظهر الإنسان وصار  
التجربة ونتائجها موثوقة  
มาก .

Rabbit-ear skin clogs more easily/faster than human skin. If a substance is not comedogenic on a rabbit, chances are it won't be on a human. However, if it is comedogenic on a rabbit, human testing is required to confirm results.

هون بیحکیلک اول ای ای Comedogenic & acne فی هاین ای استخراً Vaseline (1) تنفع بعد ای استخراً درج تریب الوضع سوو.

- Although its non-comedogenic however according to the American Academy of Dermatologists, **Vaseline** can trigger outbreaks if you have **acne-prone** skin. Don't put **petroleum jelly** on your face if you're having an active breakout. There are plenty of other moisturizing options if you have **acne-prone** skin.

# However another study shows the opposite of AAD

*J. Soc. Cosmet. Chem.*, 47, 41–48 (January/February 1996)

بيان في هي الدراسة اللي انهم عتان يشوفو تأثير  
non-comedogenic وجدوا ان acne على vaseline

## Petrolatum is not comedogenic in rabbits or humans: A critical reappraisal of the rabbit ear assay and the concept of “acne cosmetica”

هاد مطالع رج فنكير عه بعدين صور يتعلق بال acne اللي بتغير بسبب استخرا  
مستحضر تجميل  
ALBERT M. KLIGMAN, Department of Dermatology, University of  
Pennsylvania School of Medicine, Philadelphia, PA 19104.

Accepted March 8, 1996.

### Synopsis

The objective was to find out whether petrolatum, previously reported to be comedogenic in the rabbit ear model, would worsen acne. Vaseline petrolatum jelly (Vaseline®, Chesebrough-Ponds) and Vaseline petrolatum jelly cream (Creamy Vaseline®, Chesebrough-Ponds) were applied to separate groups of ten acne patients each twice daily for eight weeks.

No evidence of comedogenic potential was found by the follicular biopsy technique. Papulo-pustules significantly decreased in both groups.  
نوع من أنواع ال acne تكون صبغة صفراء مجيبة قيحة

Greasiness cannot be equated with comedogenicity. The admonition for acne patients to seek “oil-free” skin care products has no scientific merit with regard to comedogenicity. Cosmetics are an unlikely cause of the relatively high prevalence of post-adolescent female acne.

# However another study shows the opposite of AAD recommendations

هي نفس الدراسة اللي فوق بس  
بالأذرقاً .

- Three recorded no change.
- Six recorded slight improvement.
- One recorded moderate improvement.

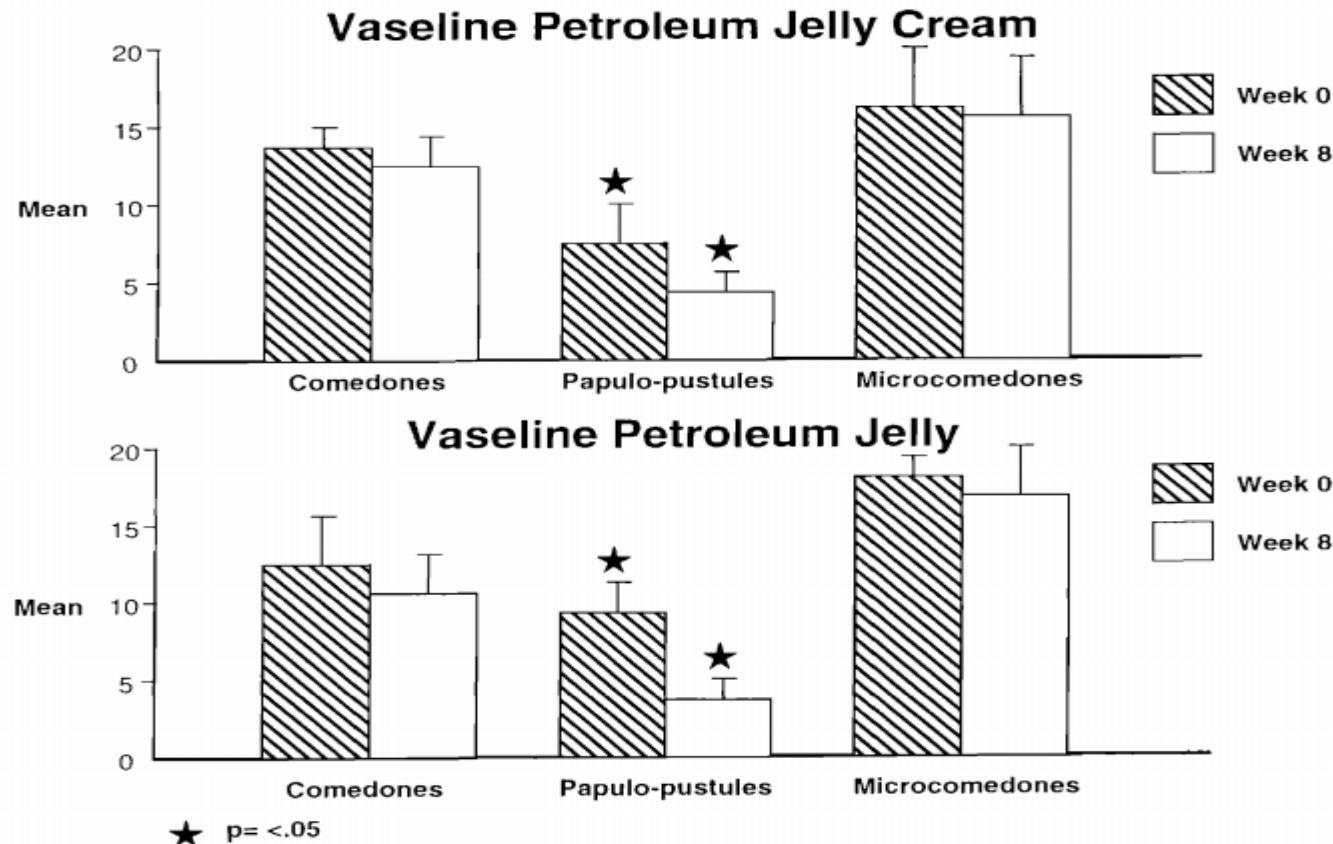


Figure 1. Effect of petrolatums on acne lesion counts after twice-daily applications for eight weeks. Comedones were not affected. Both products significantly reduced papulo-pustules.

# Is Petroleum Jelly Comedogenic?



- Repeated analyses show that Vaseline® petroleum jelly **does not** possess pore-clogging potential



• acne و guidelines عن اد قيّمها

# Take home message

- Petrolatum and mineral oil should be cosmetic grades
- COSMETIC GRADE petrolatum has no contaminants and is non-comedogenic.
- Don't use thick layer on face

لأنه يمكن الشعاب الموجودة في الـ Vaseline تكون سبب الـ acne من الـ Vaseline.

# Occlusives: Lanolin

- Is a complex natural product that cannot be synthesized
- Derived from the sebaceous secretions of sheep
- Lanolin contains cholesterol
- A number of people have developed contact sensitization to lanolin *أدى إلى اتساع حساسية بعض الناس للازنون*
- Some moisturizing products are now labeled as lanolin-free *طبعاً لا يحتوي إلا على الماء*
- The use of lanolin is limited by odor, expense and potential allergenicity



Lanolin is a good occlusive.



Is Lanolin comedogenic or not ??

# Humectants

- Water soluble materials with high water absorption capabilities
- They draw water into the skin causing a slight swelling of the SC that give the perception of smoother skin with fewer wrinkles
- They attract water from the atmosphere (if atmospheric humidity is greater than 80%) and from the underlying epidermis or from the product itself.  
اما بالذر من الرطوبة ما  
يتوصل اليه السطحة
- They work better when combined with occlusives
- They also prevent product evaporation and thickening
- E.g. glycerin, sorbitol, sodium hyaluronate, urea, propylene glycol,  $\alpha$ -hydroxy acids, and sugars

طبعاً للزرم دائمًا نستخدم Occlusive مع ار humectant بالمستحضر، لأنّه لما المستحضر يسحب الماء سواء من الجو أو من محيطات الجلد الداخلية للزرم يكون في طبقة عازلة على الطبقة الخارجية تساعد على حفظ الماء داخل SC وتحمّل تبخره، فإذا occlusive من موجود رح يسحب الرطوبة من طبقات الجلد الداخلية وبين يطلع لفوق رح يتاخر ورح يعمل مع الوقت حفاف بالجسم.



# Humectants: Glycerin

- A strong humectant and has a hygroscopic ability that closely resembles that of NMF (Natural Moisturizing Factor)
- Natural product from soap production
- Long history of safe use
- Effective treatment for dry skin at 5% and higher
- Two high glycerine moisturizers were compared by Orth et al. to 16 other popular moisturizers in 394 patients with severely dry skin. The high glycerin products were superior to all other products because they rapidly restored dry skin to normal hydration. They also helped prevent the return to dryness for a longer period than the other formulations (Orth D &Appa Y. Glycerine: a natural ingredient for moisturizing skin, 2000)  
moisturizing effect  
• glycerin  
• نابضة بالطريقة التغذوية (يطلع على الماء) ماء  
• الـ

# Humectants: Urea

- It is a component of the NMF
- Humectant and mild antipruritic effect
- Exfoliating properties
- In larger concentrations, it may cause sensitivity
- 3% and 10% urea cream was more effective in dry skin than the vehicle control

$> 5\% \rightarrow$  for legs.  
 $< 5\% \rightarrow$  for face (not recommended).



		specifications.	
<b>Urea</b>	57-13-6	a) Cosmetics intended to be diluted in bath water b) Other cosmetics	b) 10%
<b>Urea (carbamide) peroxide</b>	124-43-6	See " <a href="#">Peroxide and peroxide-generating compounds</a> "	

- The CIR Expert Panel did note that Urea can increase the percutaneous absorption of other ingredients and that this should be taken into account when conducting product safety assessments.
  - Urea is a permeation enhancer.
  - Like allergens.
- Urea is ~~CI~~ <sup>Contraindicated</sup> in neonates due to risk of systemic absorption

# Humectants: Hydroxy Acids

أعماض الفواكه

- **$\alpha$ -Hydroxy acids** are a family of naturally occurring organic acids that function as **humectants** as well as having **exfoliating** properties
- Glycolic acid (sugar cane) and lactic acids (sour milk)
- Other: malic acid (apples), citric acid (acid fruits), and tartaric acid (grapes)

هي مواد ضبيعية يتم استخلاصها من الفواكه لكن المسخنة فعليها في المستحضرات هي مركبات تم تهيئتها بالختير والها نعم المعالجة.

قهيب السكر

# Humectants: Hydroxy Acids

وَعِنْهُ التَّحْلِيمُ وَنَحْلَاتُ الْجَنِّ الْمَيْتَةِ .

- They promote desquamation
- Research suggests that prolonged use of AHAs may increase skin photosensitivity
- It is known that exfoliants lower the MED of the skin
  - the minimal dose of UV light required to cause erythema in your skin
  - that means that your skin will be more sensitive for the sun.
- Use in conjunction with sun protection

يُنْهَجُ بِاستِهْرَارِهِ كَعَلَاجٍ لِّمُسْكَمَةِ سُنَّةِ سُنَّةِ كَاسْتِهْرَارِهِ دِيَوْمَى

# FDA studies on short term photo-toxicity An investigation of the effects of topical treatment with an $\alpha$ -hydroxy acid (AHA) on the sensitivity of human skin to UV-induced damage

The conclusion of this study was that treatment of the skin daily with a 10% glycolic acid preparation at pH3.5 for 4 weeks resulted in a significant increase in the sensitivity of normal skin to the damaging effects of UVB as judged by a reduction in the MED and an increase in the numbers of SBC's. Sensitivity returned to normal 1 week after cessation of treatment.

↳ Sun Burn Cells

The data generated from the above study was reviewed by the FDA<sup>22</sup>. The verity of the statistical treatment and conclusions were confirmed. Additionally, note was made of two earlier studies coded 3800 and 3813. In study 3800, a 5 day mid back exposure to a 10% glycolic acid solution produced statistically significantly higher mean log(SBC's) than exposure to a moisturiser or no treatment. In study 3813, a 12 week mid back exposure to a 10% glycolic acid solution produced statistically significantly higher mean log(SBC's) than exposure to a moisturiser, sponge, vehicle, or no treatment. These results were consistent with the results of study 4275.



onlinecollectibles4u

- AHAs are most effective at promoting cell turnover only in the un-ionized form. Maximum cell turnover is obtained at pH 3. Therefore, products containing AHAs stimulate the highest rate of cell turnover at a pH ranging from 2.8-4.8.

$pH \leq 3.5 \rightarrow$  highly acidic  $\rightarrow$  for professional use  $\rightarrow$  عد طیب ایجاد

# Humectants: Propylene glycol

## Humectant agents

- Glycerin (glycerol)
- Honey
- Sodium lactate
- Ammonium lactate
- Urea
- Propylene glycol
- Sodium pyrrolidone carboxylic acid (sodium PCA)
- Hyaluronic acid
- Sorbitol
- Polyglycerylmethacrylate
- Panthenol
- Gelatin

Box 14.3 Humectant agents

- An odorless liquid that functions as both a humectant and an occlusive
- May be irritant under occlusive patches → not a concern in cosmetics diaper rash هون لازم أنتي انه ما بتر استخراج مستحضرات علاج الـ diaper rash عن اعراض
- The consumer with damaged barrier were at higher risk developing irritation reactions
- Can also increase percutaneous absorption → works as permeation enhancer

# Emollients

- They soften and smooth the skin
- They fill the spaces between desquamating corneocytes to create a smooth surface
- Leads to a smoother surface with less friction and greater light refraction
- Many emollients function as humectants and occlusive moisturizers
- Lanolin, mineral oil, and petrolatum: occlusive and confer emollient effect

# Emollients

- Long chain alcohol (e.g. cetyl alcohol, stearyl alcohol)
- Ester type emollients (e.g. octyl stearate, isopropyl myristate, oleyl oleate)

## Compounds with emollient properties

■ Diisopropyl dilinoleate	■ Dimethicone
■ Isopropyl isostearate	■ Cyclomethicone
■ Castor oil	■ Isopropyl myristate
■ Propylene glycol	■ Octyl octanoate
■ Octyl stearate	■ Isopropyl palmitate
■ Glyceryl stearate	■ Decyl oleate
■ Jojoba oil	■ Isostearyl alcohol

Box 14.4 Compounds with emollient properties

# Collagen and Polypeptide Ingredients

- Many expensive moisturizers contain collagen
- Some manufacturers claim that collagen in such moisturizers can replace the collagen that is lost during aging process *→ this is wrong.*
- Most of the collagen extracts have a MW of 15,000 to 50,000 daltons
- Only substances with a MW of 5000 daltons or less can penetrate the SC

# Collagen and Polypeptide Ingredients

- The collagen and other hydrolyzed proteins and polypeptides leave a film on the skin that fills in the surface irregularities
- After the product dries, the protein films shrink slightly causing a subtle stretching out of fine skin wrinkles
- This effect is temporary and can be enhanced with the addition of humectants to further temporarily plump out the tiny wrinkles
- These products are usually labeled as firming creams as well as moisturizers
- They have little effect on TEWL



كلة *filler* هي علاجٌ على قصبةِ بأمرِيـكا لـتـرـةِ دـورـيـالـ  
لـذـنـمـ النـاسـ فـكـرـاـ اـنـهـارـ تـعـطـيـ نفسـ تـأـيـرـ اـبـرـ الـ*filler*  
فـرـفـعـواـ عـلـيـهـمـ قـصـبـةـ اـنـهـمـ بـيـخـرـعـواـ بـالـنـاسـ.



## Pros and Cons of Hyaluronic Acid

→ polymer → large molecules → can't penetrate the skin

## PROS

Strong humectant  
→ but weaker than glycerin.

Nonimmunogenic

Forms reservoirs in the epidermis

May effect cytokines

Enhances drug delivery

Various biological/medical applications

## CONS

Penetration into skin depends on size

Does not penetrate into the dermis

→ So it can't compensate the hyaluronic acid that been lost from the skin.

High consumer recognition

Dehydrates skin in a dry environment

→ must be used with occlusive.

Reproduced from Cosmeceutical and Cosmetic Ingredients by Leslie Baumann, 2015

كانوا زمان يستخرجونه من عرق الدب، لكن لونه أُحقر، لكن حالياً صاروا يصنعونه باستخراج الـ

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# L'Oreal to face lawsuit over wrinkle-smoothing collagen claims

By Jonathan Stempel



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# L'Oreal to face lawsuit over wrinkle-smoothing collagen claims

By Jonathan Stempel

NEW YORK, Sept 27 (Reuters) - L'Oreal SA ([OREP.PA](#)) on Tuesday failed to persuade a U.S. judge in Manhattan to dismiss a proposed class action lawsuit accusing the company of defrauding shoppers by suggesting that two topical collagen products help smooth wrinkles.

The plaintiffs Rocio Lopez and Rachel Lumbra sued in August 2021, claiming that L'Oreal violated New York and California consumer protection laws by deceiving them into overpaying for its Collagen Moisture Filler Day/Night Cream and its Fragrance-Free Collagen Moisture Filler Daily Moisturizer.

According to the complaint, topically applied collagen is too large to be absorbed by the epidermis, the uppermost layer of skin, making the products incapable of helping "smooth wrinkles" and "restore skin's cushion" as the labels suggest.

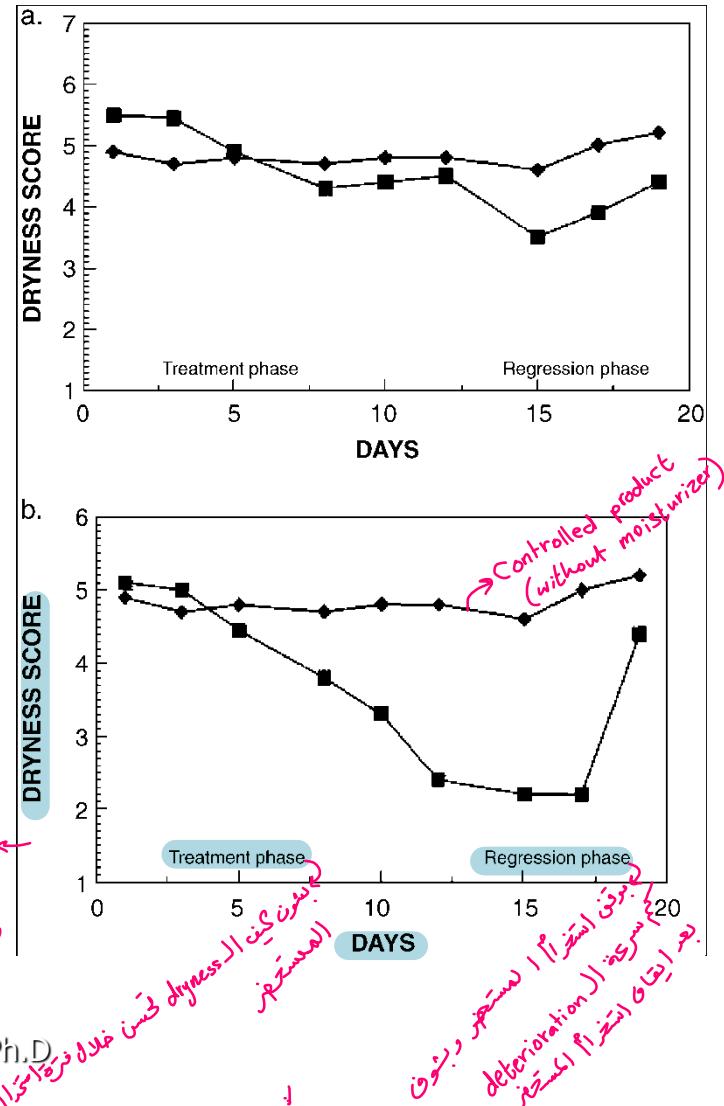
L'Oreal sought a dismissal, claiming it did not say a moisturizer containing collagen would penetrate the skin or stimulate collagen production, and that reasonable consumers would not believe otherwise from the products' names.

# Combination approaches

- Most moisturizers contain a combination of emollients and humectants. *and occlusives.*
- A synergistic alleviation of dry skin can be achieved by combining glycerol with a mixture of lipids (1% Phospholipids, 2% Cholesterol, 1% Stearic acid) *Lipid-glycerol combination* تطهير ذاتي من الماء

على الـ dry Skin ، فوجدوا انه قلل من dryness بنسبة ٣٠٪ خلال فترة استخدامه ويرجعه قدر يحافظ على مفعوله لفترة منيعة بعد ايقاف استخدامه .

وبهذه قدر حافظ على مفعوله لفترة منتظمة بعد انتفاف الاستخدام.



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**Curél Therapeutic Moisturizing Lotion** is clinically proven to deliver superior\* moisturization. Its unique cationic formula penetrates deeply to rehydrate dry skin.

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- **Provides 12 hours of moisturizing effectiveness**
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Non-Greasy • Will Not Clog Pores • Gentle Enough to Use on the Face

\*Compared to leading lotions

Directions: Apply as needed to dry skin. Re-apply often to especially rough, chapped areas. For external use only.

INGREDIENTS: WATER, GLYCERIN, DISTEARYLDIMONIUM CHLORIDE, PETROLATUM, ISOPROPYL PALMITATE, CETYL ALCOHOL, DIMETHICONE, SODIUM CHLOPIDE, FRAGRANCE, METHYLPARABEN, PROPYLPARABEN.

preservative. preservative. emollient and occlusive. emollient and occlusive. emollient and emollient. humectant. occlusive. auxiliary emulsifier and emollient. viscosity enhancer. preservative.

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# How to select a moisturizer?

## ■ 1. Skin type:

### ■ Dry facial skin:

Oily moisturizers containing **occlusive components** in addition to humectants are required

### ■ Oily facial skin:

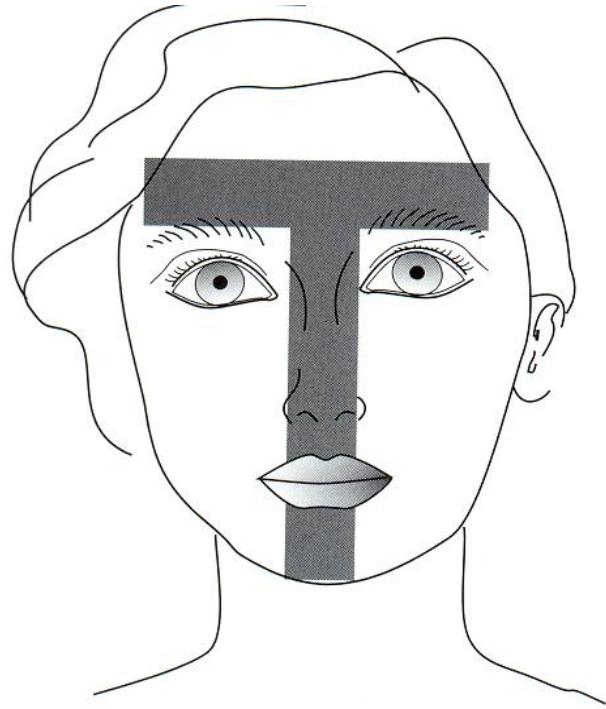
does not need a moisturizer (except at times when the face becomes drier due to external factors i.e. seasonal change)

### ■ Combined facial skin:

Avoid applying moisturizers in the T-zone

On the rest of the face, use non-oily products

هذه لوبيشرة دهنية لا يجب مس بجافتها لترطيبها لأنه يمكن يكون حاجز البشرة غير قادر على الحفاظ على نسبة الماء بالبشرة  
لما بدأ أي من مستحضرات ترطيب البشرة بصورة بطيئة يحاول أنه يكون More humectant و less Lipid و يستخدم gel emulsion vehicle كبدل



*The T-zone: forehead, nasal bridge, nose and centre of the chin.*

# How to select a moisturizer?

- **2. The product's texture:**
  - A product that is not pleasant to the touch (i.e. feel sticky or oily) should not be selected
- **3. Additives:**
  - Fragrances and preservatives
  - Hypoallergenic preparations

# How to select a moisturizer?

## 4. Sunscreens:

- No need for moisturizer containing sunscreens for evening or night use
- Moisturizers with sunscreen for daytime

## ■ 5. Exotic ingredients:

لِمَنْ (لِمَنْ) لِمَنْ لِمَنْ

- Vitamins
- Proteins
- *Exotic ingredients are not superior to conventional compounds in retaining skin moisture*

# How to select a moisturizer?

- Selection is subjective in most cases
- Water based formulas for oily skin (lotion or gels)
- Products with humectants only is not enough for dry skin → it may worse the condition too (use humectant with occlusive)

# Does oily skin need moisturizer?

- Especially after using skin care products that remove oils and dry out the skin
- Look for water-based non-comedogenic formulation

# Guidelines for use of moisturizers:

- Individuals with dry skin should avoid frequent washing of the face with soap  
لأنه يضر باهتز البشرة →
- Apply moisturizers after skin cleansing
- Frequency of application determined according to skin type: Dry skin → more frequent application
- Moisturizers that contain relatively large amounts of water (liquid emulsions or creams) should not be applied just before exposure to cold weather → evaporates water → cooling effect → may harm facial skin
- Apply the moisturizer 20 minutes before exposure to cold, dry weather

# What is the difference between moisturizers for the face and those for the rest of the body?

- There is no significant difference between them
- Applying moisturizer to the body involves much larger areas:  
liquid emulsions vs. creams  
Not a rigid rule

بالعادة المستحضرات المائية لترطيب الجسم تكون less viscous و تميل أكثر إلى الـ Lotion بس ما في rigid rule  
وبرضه مرطبات الجسم ما بنحط فيها exotic ingredient مثل الفيتامينات وغيرها، صن المواد بتكون مجرد مستحضرات لترطيب العوام.

# What is the difference between day moisturizer and night moisturizer ?

ادا بس مرطب لجفاف عادي ما يفرق لكن اذا بدئ استفسر منه باشي تاني مثل   
 انه يكون معه واقفي سمس

# Do you know what is meant by?

- **W/Si emulsion** → for oily skin.
- **Macroemulsion** → the molecules in the product are in macro range
- **Microemulsion** → the molecules in the product are in micro range
- **Nanoemulsion** → the molecules in the product are in nano range
- **w/o/w (claimed benefit? Sustained release and use of incompatible material in same formulation)**
- **What are the benefits of W/Si**
  - For oily and sensitive skin
  - Silicone is noncomedogenic
  - Dry fast and leave the skin feeling smooth

## ■ Barrier creams?

- Are used to avoid unpleasant reactions and prevent irritant dermatitis
- Debatable use with lack of evidence and may induce additional irritation
- w/o for preventing aqueous soln (heavier in occlusives and emollients compared to regular moisturizers (petrolatum jelly, lanolin, silicones as dimethicone))
  - زى متى ( diaper rash) منه اغطس على عنق
- For oil protection: non-oil soluble film formers as gum acacia or sodium alginate can be used with glycerin as plasticizer to the gum film

# Are they considered cosmetics or drug in USA



# Are they considered cosmetics or drug in USA

- Mineral oil, petrolatum and dimethicone are listed in the OTC monograph for skin protectants
- The monograph specifies the ingredients that can be used with their individual concentration
- If the conc of the ingredient falls into the specified range, the formulations are considered OTC drugs in the US

■ Do we need coloring agent in face moisturizer? *No*

■ Tinted? *Contain ferric oxide ?*

ممكن وغالبا في مستحضرات بالسوق تكون مرطب وبنفس الوقت فيها لون  
وينتمي لجنة مثل الـ *foundation*

# Summary

- The ultimate purpose of all moisturizers is to enhance the hydration state of the SC
- Occlusives coat the SC and reduce water loss
- Humectants attract water from the atmosphere and from the underlying epidermis to hydrate the skin
- Emollients soften and smooth the skin
- Correlation of specific formulations with “skin type” is important

# Summary:

- **Moisturizers are made compatible with skin type by adjusting oil-water ratios and the occlusive ingredients**
- **The skin tends to dry with age**
- **An individual who did not require moisturizers in the past may require them later in life.**
- **Seasonal changes may cause one to feel a need for moisturizers such as in winter**

# Summary:

- **Ingredients causing safety concerns regarding skin moisturising products include fragrance, lanolin, urea, propylene glycol, and herbal extracts**

- Hyaluronic acid in cosmetic formulas  
(personalcarescience.com.au)