

# THE SKIN BARRIER

---

LET'S START AT  
THE VERY  
BEGINNING .



# A VERY GOOD PLACE TO START

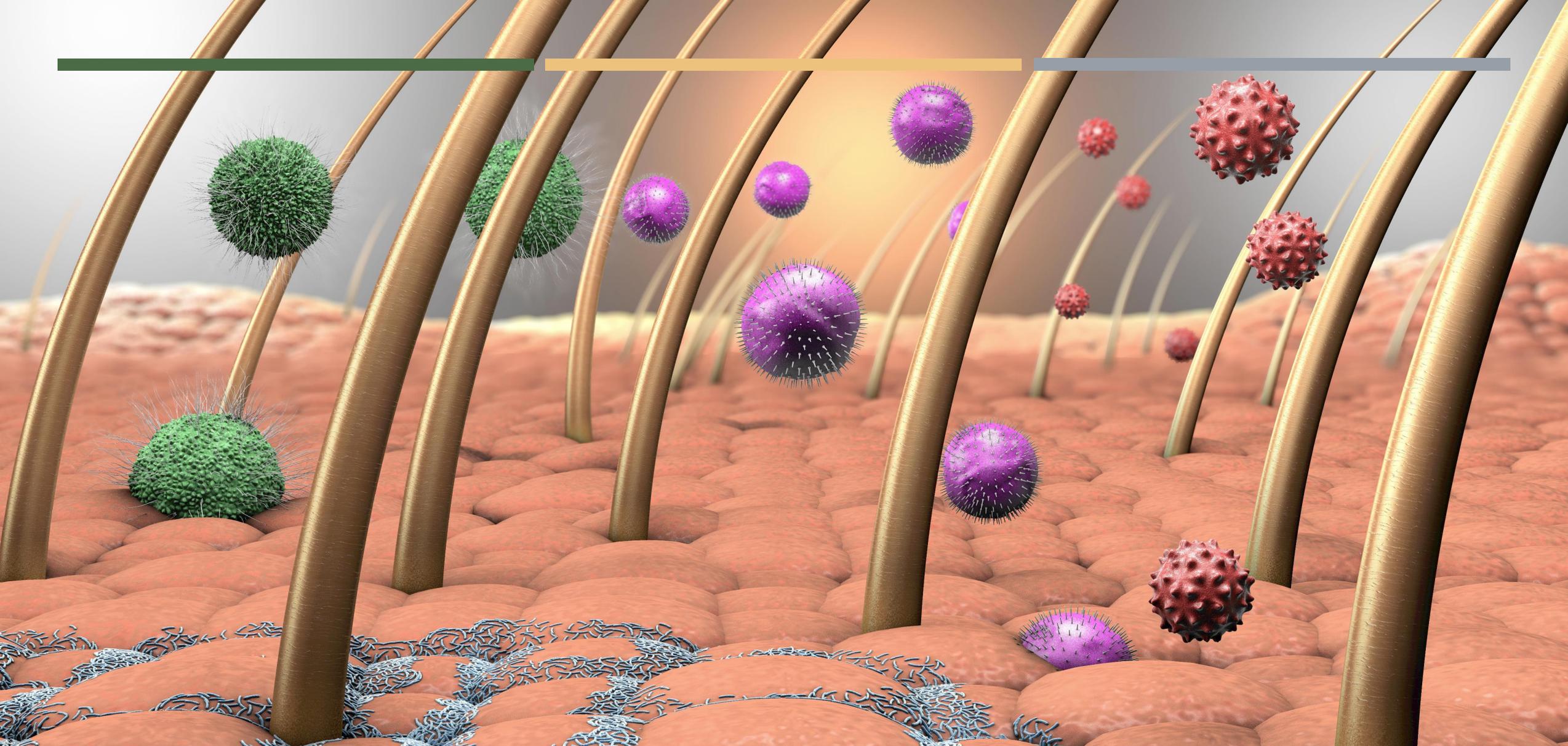
Vernix has a highly variable makeup but is primarily composed of sebum, cells that have sloughed off the fetus's skin and shed lanugo\_hair. 12% of the dry weight of vernix is composed of branched chain fatty acids, cholesterol and ceramide. Vernix of term infants has more squalene and a higher wax ester to sterol ester ratio than preterm infants. Comparison of lipid components of vernix caseosa, stratum corneum and skin surface (sebaceous):

Lipid fractions	Vernix caseosa lipids	Stratum corneum lipids	Skin surface lipids
<a href="#">Cholesterol esters</a>	30.6	-	3.0
<a href="#">Ceramides</a>	17.9	40.0	-
<a href="#">Triglycerides</a>	15.1	-	41.8
<a href="#">Cholesterol</a>	7.5	25.0	-
<a href="#">Free fatty acids</a>	6.5	25.0	18.4
<a href="#">Phospholipids</a>	6.1	-	1.5
<a href="#">Wax esters</a>	6.0	-	20.3
<a href="#">Squalene</a>	4.0	-	12.2
Wax diesters	3.7	-	-
<a href="#">Cerebrosides</a>	2.4	-	-
Cholesterol sulfate	0.3	10.0	-
<a href="#">Alkanes</a>	-	-	2.8



# A VERY GOOD PLACETO START

- ❖ Increasing evidence on early microbial contact suggest that human intestinal microbiota is seeded before birth,
- ❖ When the birth process begins, colonization of the body surfaces commences during passage through the birth canal
- ❖ The vernix coating on the neonatal skin protects the newborn skin and facilitates extra-uterine adaptation of skin in the first postnatal week if not washed away after birth.
- ❖ It consists of water-containing corneocytes embedded in a lipid matrix.
- ❖ Acting as a protective biofilm by minimizing friction of foetal parts during delivery and as an anti microbial cover against the bacteriologically rich environment of the mother's genital tract along with the insulating effect on the foetus.
- ❖ Vernix like the epidermis and acid mantle, contains anti microbial peptides such as Cathelicidins, and has a direct role in defence against bacteria.
- ❖ Lactoferrin (found in colostrum) and **Lysozyme** are the other innate immune proteins present in vernix.



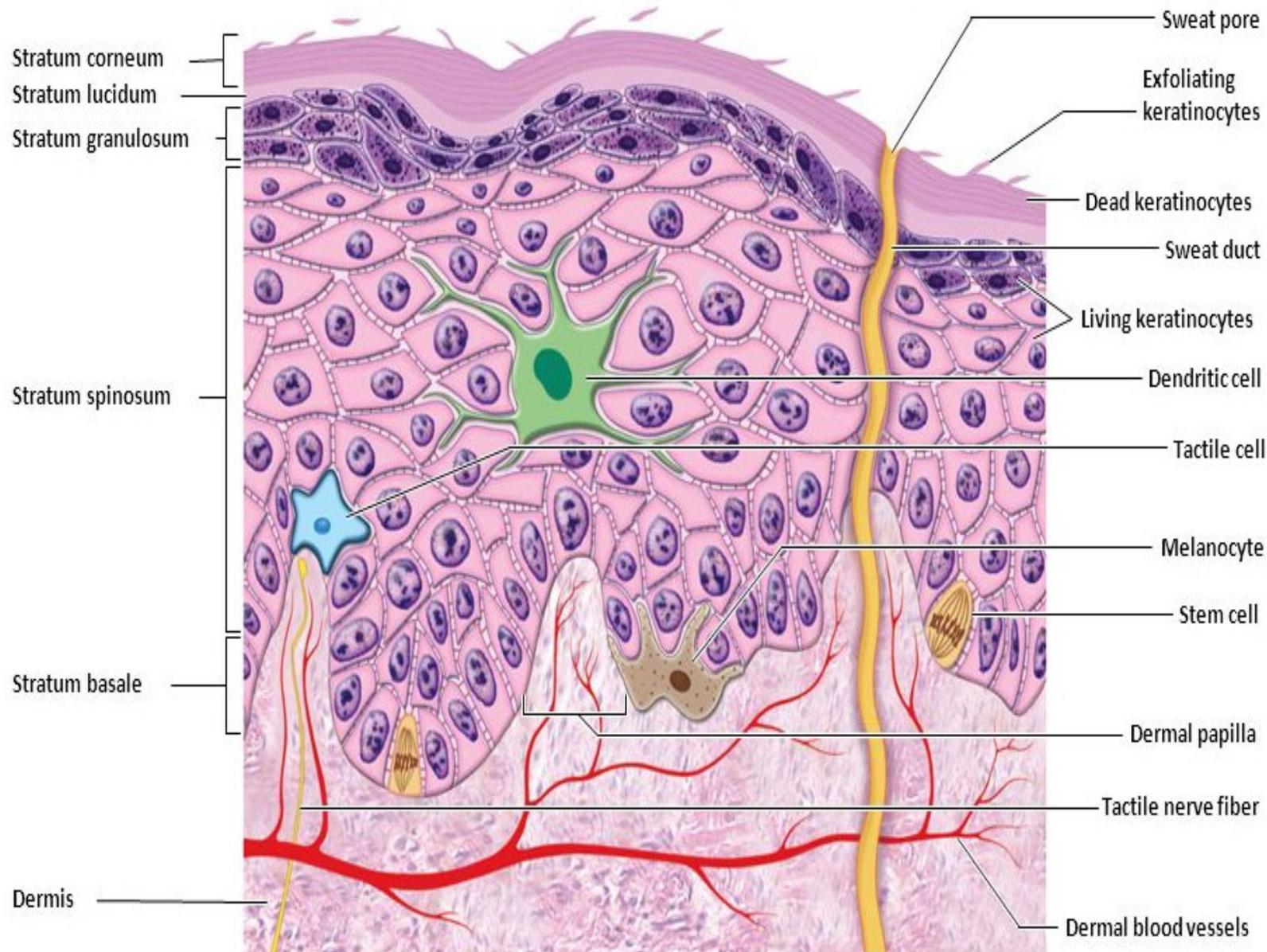
The Skin Barrier Protection protection protection



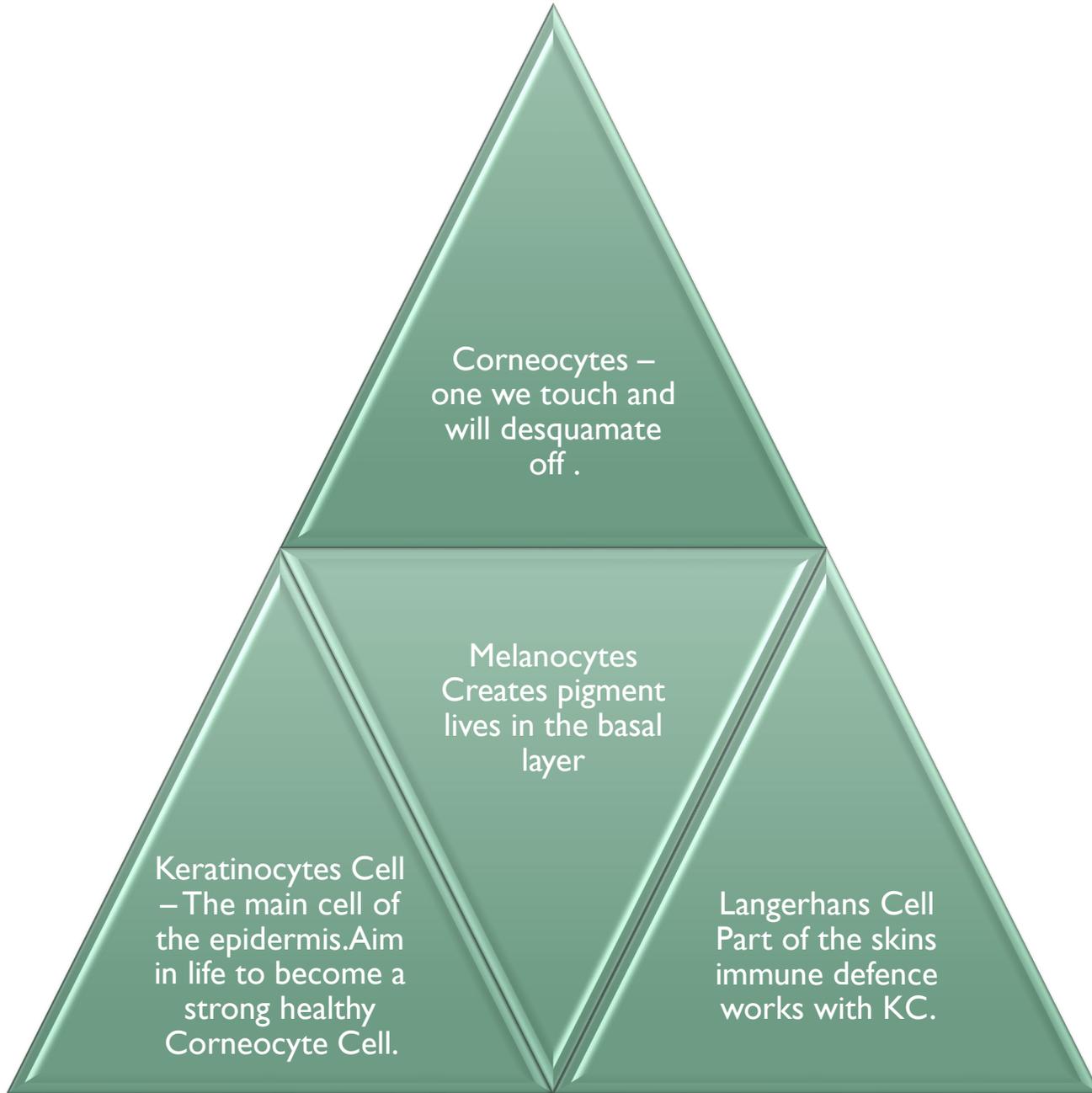
MOTHER  
NATURE HAD IT  
ALL WORKED  
OUT .



DON'T UNDERESTIMATE  
MOTHER NATURE..



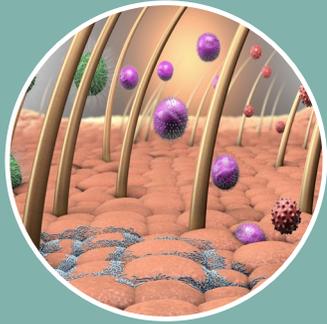
WHAT DID  
MOTHER  
NATURE  
CREATE ?



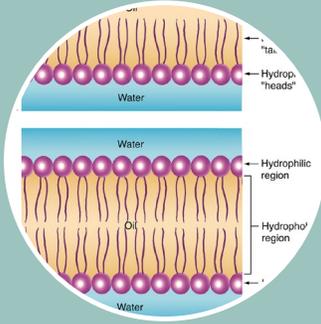
THE MAIN CELLS  
OF  
THE EPIDERMIS

Corneocytes  
Melanocytes  
Keratinocytes  
Langerhans

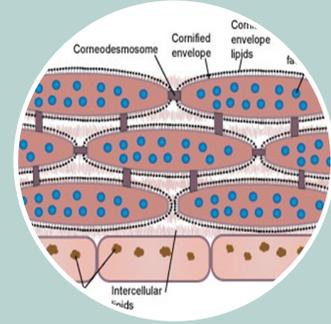
# The End Product: Our Epidermal Barrier



Acid Mantle / pH Microbime



Multi  
Lamellar Lipid Structure.



Corneocyte Cell /Cornified  
Envelope

If the skin barrier is not working the Innate System will kick in.

---

## EPIDERMAL BARRIER. THIS “FORCE FIELD,” WHEN FUNCTIONING AT FULL CAPACITY, POSSESSES THE ABILITY TO

- Retain the good within
- To keep the bad out
- To recognize the difference between the two
- .The epidermal barrier permits percutaneous absorption of water and other essential nutrients in the skin
- Prevents certain important substances in the skin from diffusing outward
- Also blocks certain noxious substances and infectious organisms from gaining access to the inner more fragile layers of the skin.
- The SC is the major epidermal component of the so called “epidermal barrier” and is directly involved in several barrier functions. Without a fully function epidermal barrier we would all look like shit . Well the skin would .



# The Functions of the Epidermal Barrier

## Simultaneous Multitasking:

### PERMEABILITY BARRIER

Maintenance of water gradient, calcium gradient, acid mantle (acidic pH)

Response of primary proinflammatory cytokines to impairment of permeability barrier

Maintenance of an acidic skin pH decreases skin colonization by pathogenic bacteria and yeasts .

Antibacterial activity of stratum comeum lipids (e.g., free fatty acids, sphingosine, others)

Genetically encoded primary antimicrobial peptides (defensins, cathelicidins, dermcidins) synthesized in SC, present in sebum and in sweat (dermicidin-derived)

### ANTIMICROBIAL BARRIER

Formation of stratum comeum lipids in specific ratio from precursor lipids

Production of lamellar bodies packaging precursor lipids and some antimicrobial peptides

Formation of natural moisturizing factor from filaggrin (converted from profillagrin)

Formation of cornified envelope and the comeocyte-lipid envelope

### IMMUNE RESPONSE BARRIER

Dendritic cells involved in immune surveillance and antigen recognition (e.g., plasmacytoid dendritic cells, myeloid dendritic cells, Langerhans cells)

Toll-like receptors involved in recognition of microbial pathogens and other agonists

### PHOTOPROTECTION BARRIER

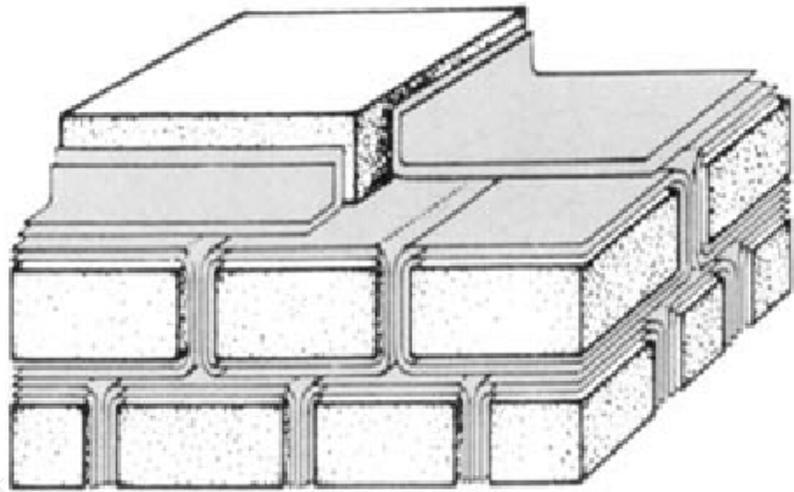
Epidermal melanin barrier (degree of protection related to Fitzpatrick skin type) 4

Stratum comeum protein barrier

Antioxidants within stratum comeum (protection against photo-oxidative stress)

Optical reflective properties of the stratum comeum (stratum comeum thickness more important than epidermal thickness for protection against ultraviolet/solar radiation)

An intricate complex multi functional self renewing organ



## Understanding the Architecture of the Epidermis

I feel the days of describing the skin as bricks and water is an old model

Our understanding of the skin has progressed  
the skin is like

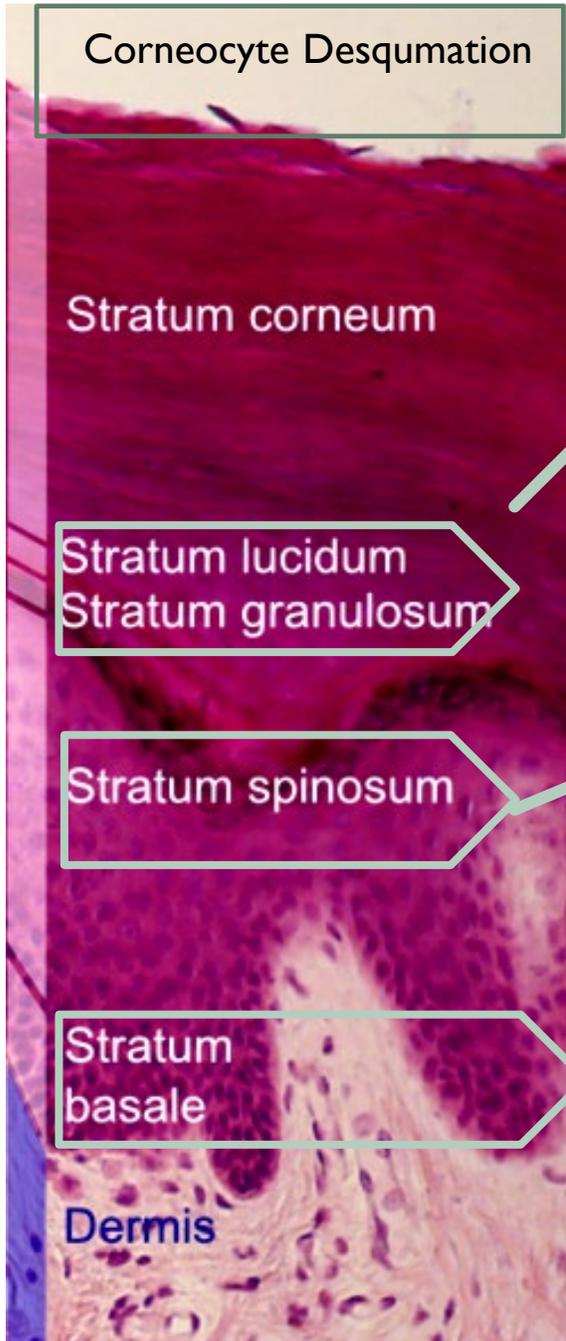
St Paul's it is bricks and mortar but way more intricate complicated and something to admire



But remember Information isn't Knowledge.

I can give you all the information your brain will absorb it is up to you to turn it in to KNOWLEDGE.

# The Formation of the EPIDERMIS to the Epidermal Barrier



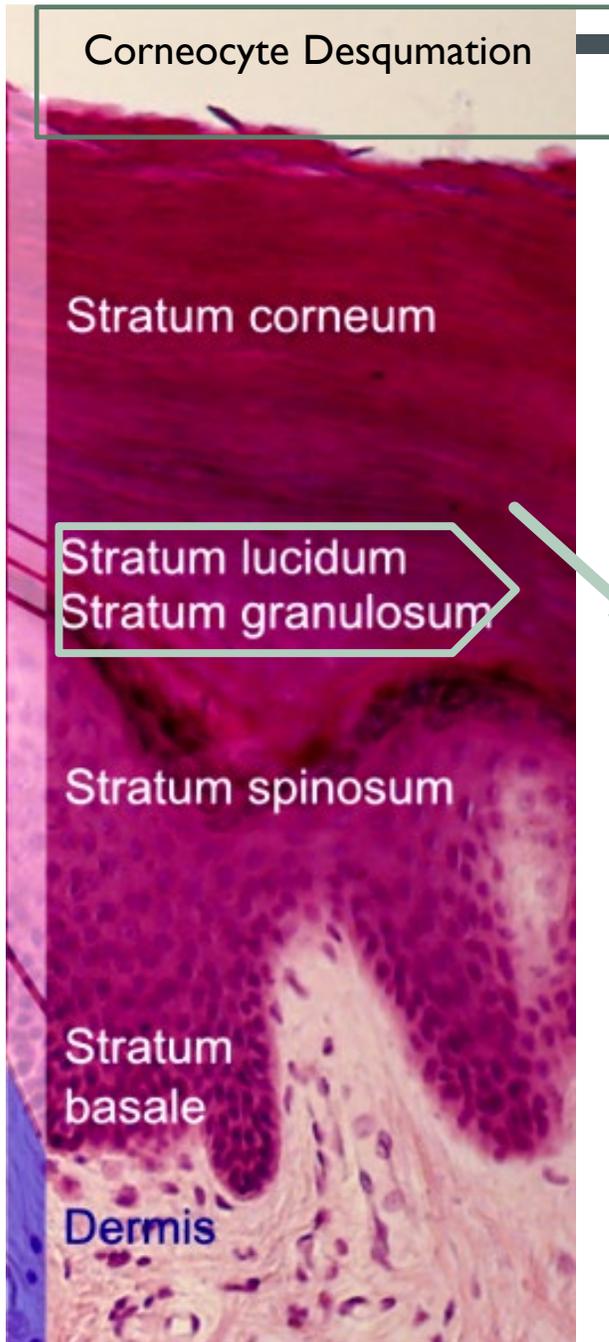
The stratum granulosum (or granular layer) is a 3-5 layer of cells in the epidermis. The layer of skin is a very important in creating a type of granule called **Lamellar bodies/ Odland bodies** (containing ceramides, free fatty acids and cholesterol sulfate). This is created from the break down of our cell membrane. That was made from Phospholipids  
An other granule in this layer creates a protein called **Fillagrin**. This has two jobs one to create the cornified envelopes of the corneocyte cell and the other is to create the **Natural Moisturizing factor (NMF)**  
NMF is known as the water phase or the interstitial fluid of the epidermis and found in the corneocyte cell. Without the NMF the skin will not desquamate and clients will think they are dry. Remember we need water and oil.  
The Desmosomes start to dissolve at this stage to allow the desquamation of the cells in the Stratum Corneum. This is a carefully controlled process as we are not snakes and need to shed at a controlled rate .We need water/NMF to make this happen and it is called an enzyme activity but we have to be careful of the ph/ acidity of the skin as these enzymes can be sensitive.  
Summarise we have created a Lipid Oil phase made by the Odland bodies and we have a water phase made bu Fillagrin to create our NMF. If you remember nothing else REMEMBER WE ARE WATER AND OIL AND OIL SITS ON WATER . .

The stratum spinosum responsible for cellular interaction between melanocyte and keratinocyte. Importance of cell to cell communication  
Keratinization begins in the stratum spinosum.  
5-10 layers of it largest and thickest one of the most important layers  
Each cell is connected by desmosomes  
Langerhan cells residues here

The stratum basal is a continuous layer of cells. It is often described as one cell thick.  
The stratum basal is primarily made up of basal keratinocyte cells, which can be considered the stem cells of the epidermis .  
They divide to form the keratinocytes of the stratum spinosum, which migrate superficially.  
Is held by the hemi desmosomes to the Epidermal junction/ basal Lamina  
Home of the melanocyte .  
Cellular regeneration



# The Formation of the Granulosum



The stratum granulosum (or granular layer) is a 3-5 layer of cells in the epidermis. The layer of skin is a very important in creating a type of granule called **Lamellar bodies/ Odland bodies** (containing ceramides, free fatty acids and cholesterol sulfate). This is created from the break down of our cell membrane. That was made from Phospholipids this will eventually form our Lamellar Lipid Layer

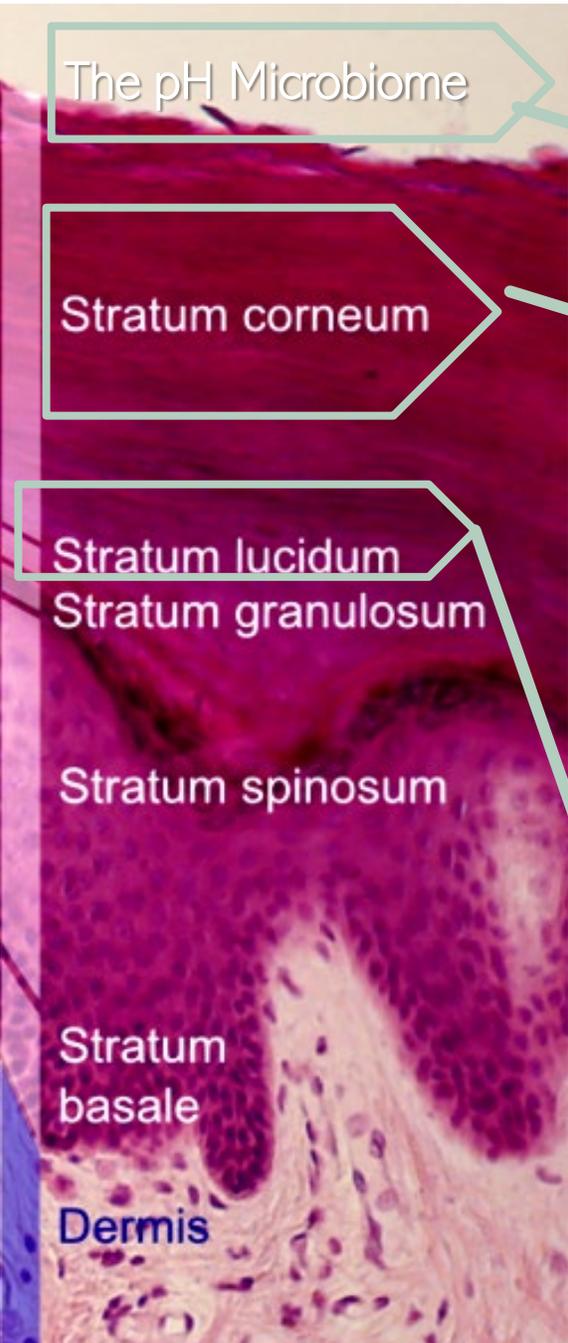
An other granule in this layer creates a protein called **Profilaggrin**. This has two jobs one to create the **Cornified Envelopes** of the corneocyte cell and the other is to create the **Natural Moisturizing factor (NMF)**

NMF is known as the water phase or the interstitial fluid of the epidermis and found in the corneocyte cell. Without the NMF the skin will not desquamate and clients will think they are dry. Remember we need water and oil.

The **Desmosomes** start to dissolve at this stage to allow the desquamation of the cells in the Stratum Corneum. This is a carefully controlled process as we are not snakes and need to shed at a controlled rate. We need water/NMF to make this happen and it is called an enzyme activity but we have to be careful of the pH/ acidity of the skin as these enzymes can be sensitive.

Summarise we have created a Lipid Oil phase made by the Odland bodies and we have a water phase made by Fillagrin to create our NMF.

If you remember nothing else REMEMBER WE ARE WATER AND OIL AND OIL SITS ON WATER . .



The pH Microbiome

The pH The Skin Microbiome the end result of the keratinocyte cell to create a Hydrolipidic film.

Stratum corneum

The Purpose of this process was to create The stratum corneum (Latin for horned layer) the outermost layer of  
The purpose of the stratum corneum is to form a barrier to protect underlying tissue from infection, dehydration, chemicals and mechanical stress.  
Even though the corneocyte cell has no nucleus it can still communicate with the other layers of the skin via cytokines or growth factors.  
Desquamation is the last and final stage of the epidermis. If the whole differentiation process worked the skin will shed at a healthy rate and we will see a soft spongy skin.  
The epidermis has an 8-10 life cycle from mitosis to the SC. Add 5 or more days for these cells to desquamate (age and life dependant)

Stratum lucidum  
Stratum granulosum

Stratum spinosum

○ The final stage of the keratinisation process when the final cornification takes place.  
The development of the lipid barrier is now taking place.  
Before the nucleus dies the Lucidum has one last job and that is to create the Multilamellae Lipid layer and the NMF. It will also create an cornified enveloped  
The quality of the MLL and NMF ultimately falls on to the quality of the cells and their cell membrane also how the desmosomes dissolve.

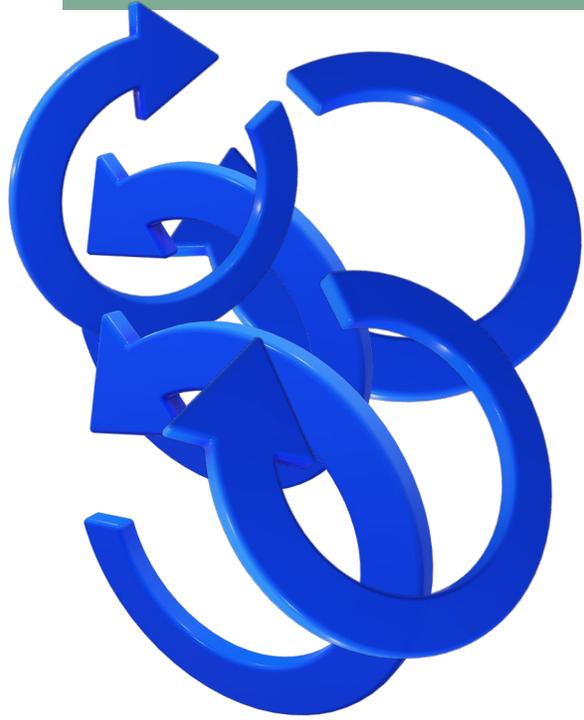
NOTE : Our cell is only as good as what it receives nutritionally.

Stratum basale

Dermis

Everything in the skin is linked and looped together.

---



The Differentiation of the Keratinocyte Cell, to becoming a Corneocyte Cell is a multifaceted process.

To do this job day in day out it needs to be fed with the correct nutrients or not to be fed with things that can make it sluggish.

The Keratinocyte calls all the shots, its communication skills are something to admire.

**The Keratinocyte has ONE JOB. PROTECTION .**

It will make a Stratum Corneum, Epidermal Barrier no matter what,

It will call the Innate Immune System if it has too

Causing an inflammatory response is not a big deal.

It will create more cells if it has too.

Its appearances isn't its main concern.

**SURVIVAL IS ITS GAME**

**PERFECTION IS OUR AIM**

WHERE THERE IS  
INFLAMMATION THE SKIN CAN  
NOT REPAIR.

CELL TO CELL  
COMMUNICATION WILL STOP  
OR SLOW DOWN



WATER IS VITAL FOR A  
CELLULAR ACTIVITY  
NO WATER NO  
ACTIVITY .

■ *If your client doesn't drink water  
or has too many coffees the their  
water activity will be low  
upsetting the homeostasis of the  
skin*



A large, abstract watercolor splash in shades of blue, teal, purple, and pink, centered on a white background. Two horizontal grey bars are positioned at the top left and top right corners of the slide.

It is not surprising if it goes wrong.

Due to the complexity all the skin  
And we haven't even talked about the HUMAN the skin is attached to yet.

Thankful for us if everyone had perfect skin we wouldn't be in work!

---

## THE EPIDERMIS AIM IS PROTECTION

- Protecting from WHOM?
- Affect by External (Exogenous) Internal (Endogenous)

---

## WE ARE ON THE FRONT LINE

- We are hands on, direct access with the Skin
- We are on the FRONT LINE, so we need to understand the skin  
(your choice how much )
- But to be good and a successful skin therapist/educator you have to understand the person you are touching, that is 65% of your work as unless you have a compliant client with the correct expectations it doesn't matter how much you know

Lets break this down we have

On the left side we have

## The skin

Pre disposed conditions

Pre disposed skin colour

Hormonal issues

On the right side we have

## The Person

attached to the skin

Life style

Topical application of products

Oral Drugs for illness skin or pleasure

Diet choices

Sun exposure

Attitude to life

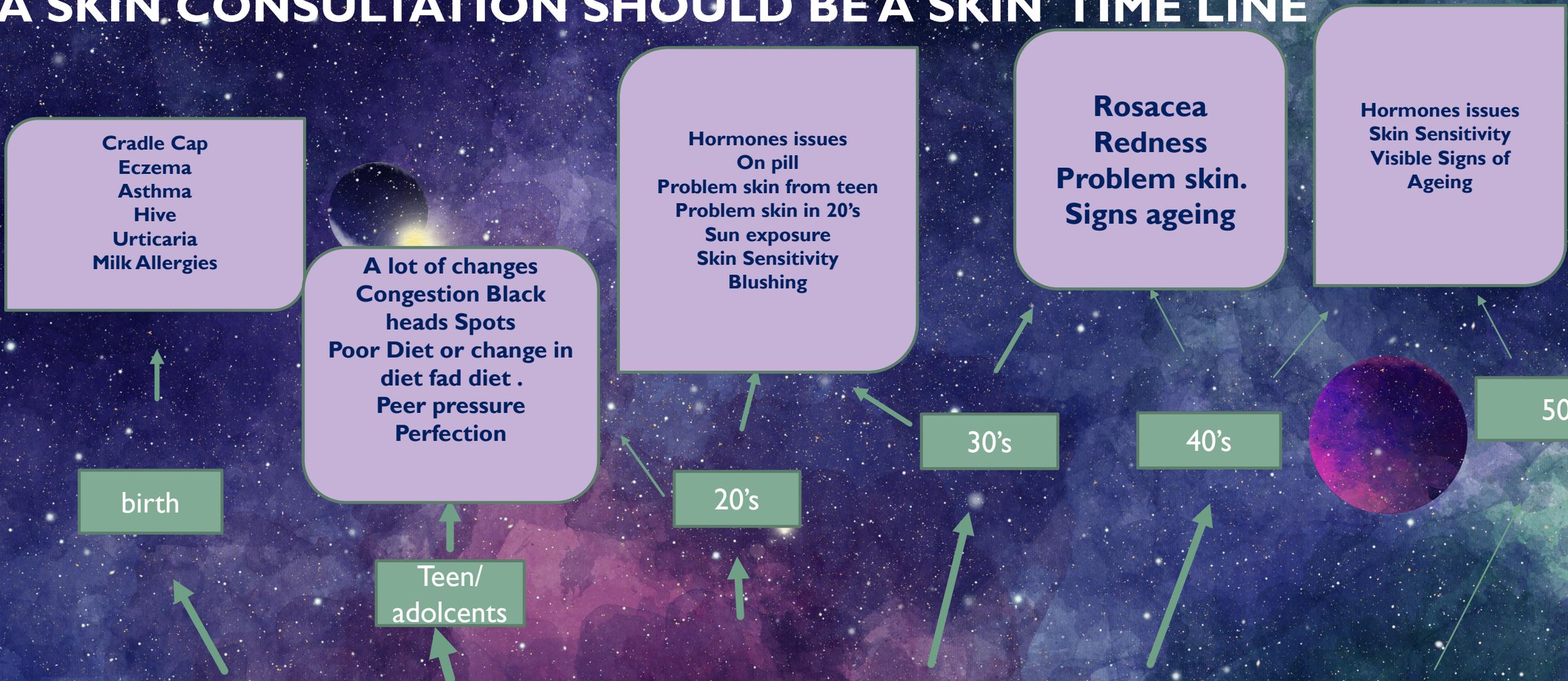
How they deal with stress

Let's look at the variables  
of what A human can do  
to upset the skin  
THEIR SKIN TIMELINE

- The timeline is a Skin Consultation
- Knowing the full history of this skin is vital
- This isn't just for problem skins.
- If you don't know you may trip up later
- You may not get the results
- You may not set expectations
- You may not get a compliant client

Statistically : Not every client that comes to you will be compliment and will have a too high expectation. This is not you. This is that type of client. It is your choice to treat them.

# A SKIN CONSULTATION SHOULD BE A SKIN TIME LINE



Topical: OTC Rx (prescription) Oral; Rx, Products used, Professional Treatments,  
Family History, Life style, Diet, Sun Exposure, etc .....

---

So your skin is not great and you want help what are your choices .

- Over the counter / Chemist
- GP /Dermatologist
- Herbalist / Alternative Medicine / Nutrition
- Skin Clinic



The skin is the site of response  
It is responding to something.

---

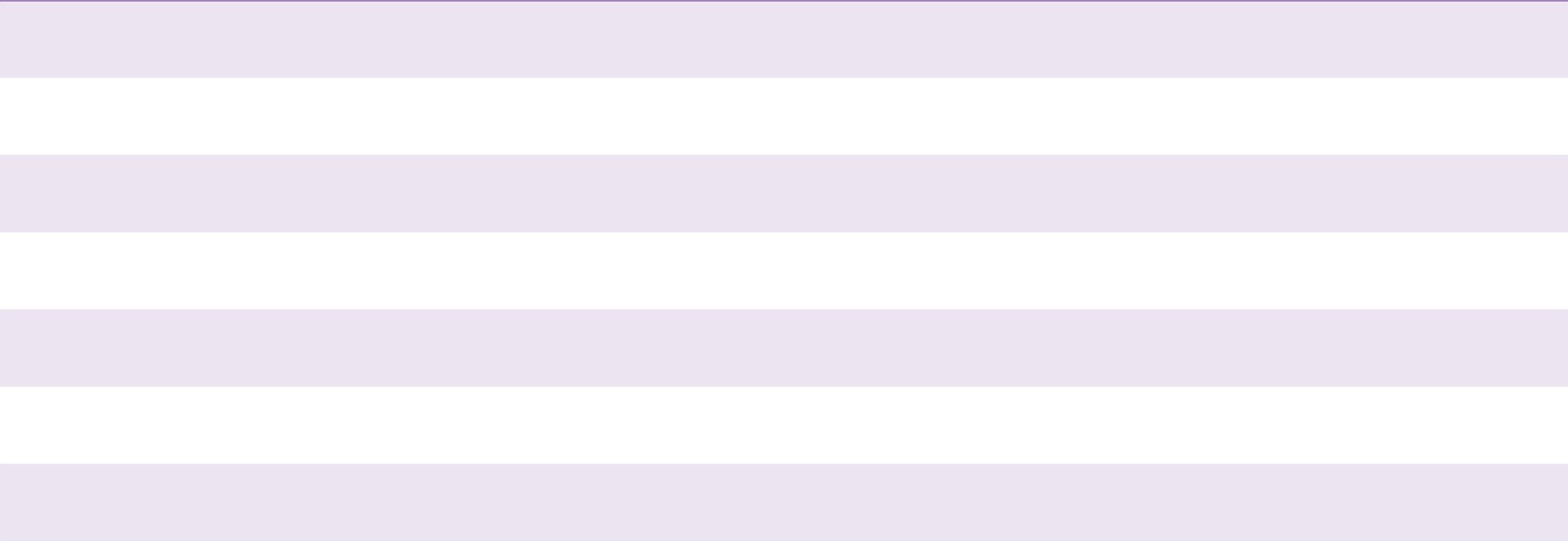
THE CHEMIST WHAT  
CAN THEY OFFER OTC





CAN WE NAME THE TOP PRODUCTS A CONSUMER WOULD OF USED OTC

---



---

---

# CAN WE NAME THE TOP PRODUCTS A CONSUMER WOULD OF USED OTC ACNE ROSACEA ECZEMA RASH

---

Tea Tree

Azelaic acid this will be in a high percentage

AHA'S removes skin

Salicylic Acid aids in the excess skin around the keratin plug of a spot

Benzol peroxide similar to SA but can deal with bacteria

Retinol Strong vit a but an alcohol

Retinoic Acid vit a acid

Washes Scrubs

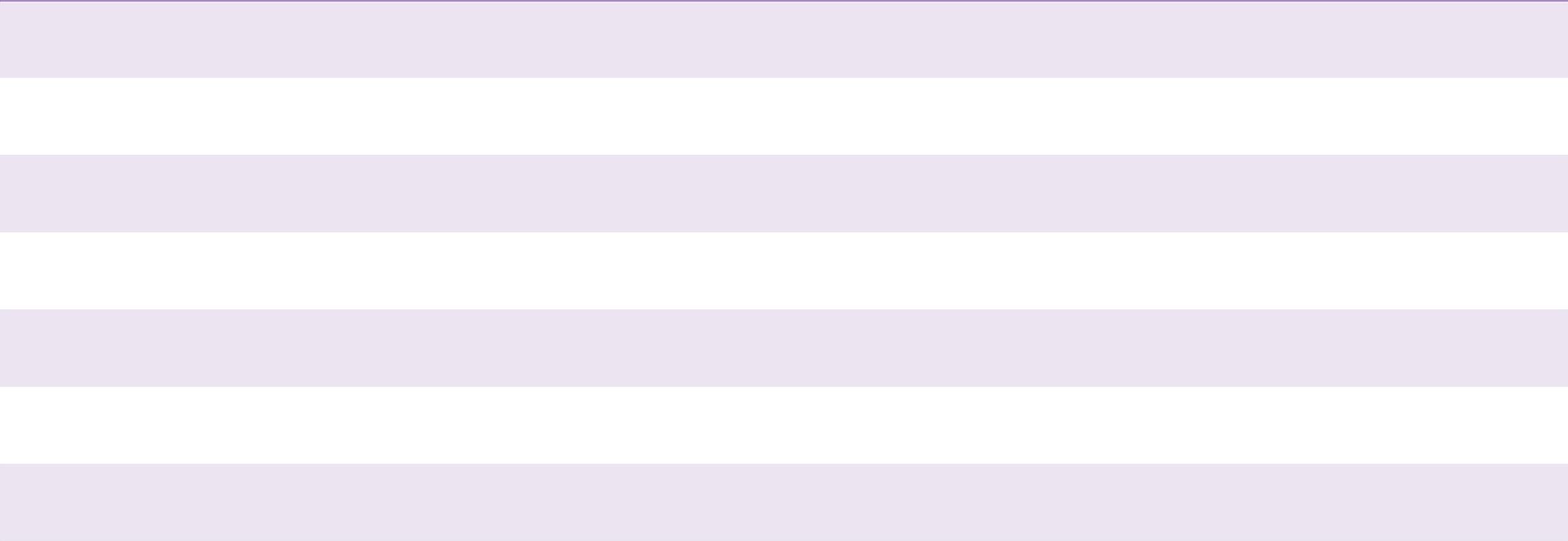
Bicarbonate Of Soda is antiseptic and anti inflammatory

---



HOW ARE THEY MEANT TO HELP THE SKIN

---

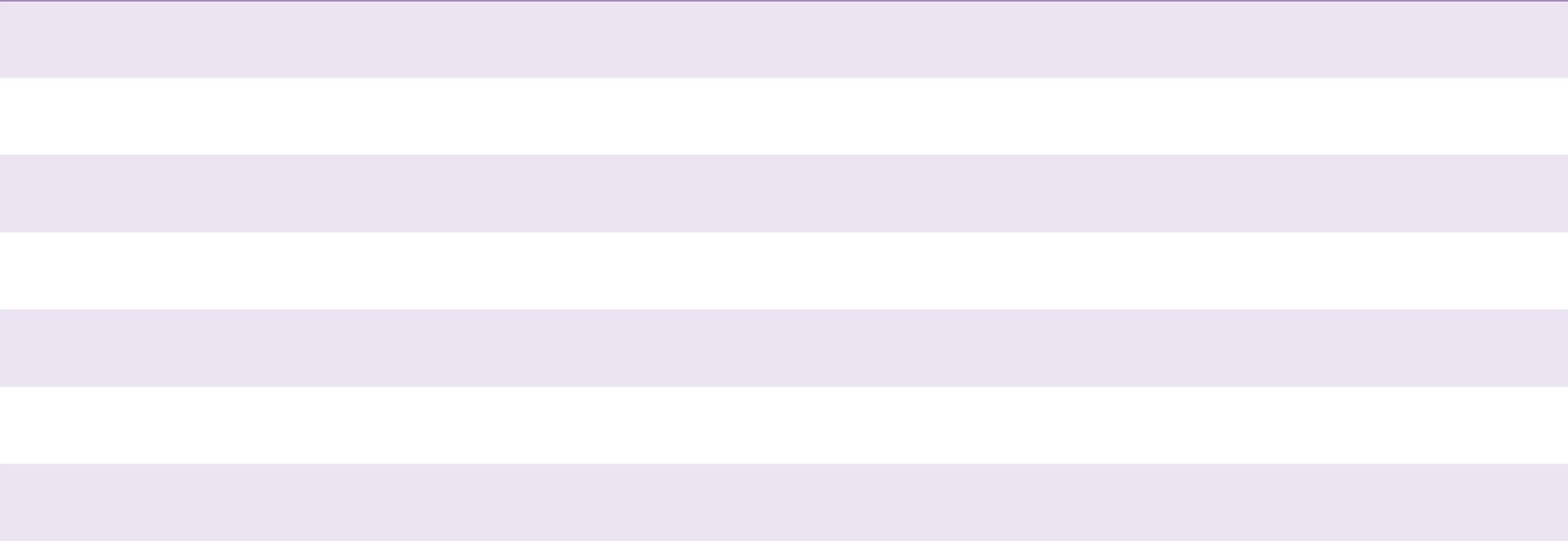


---



HOW WILL THE AFFECT THE SKIN BARRIER

---



---



THE GP OR  
THE  
DERMATOLOGIST

WHAT DO THEY  
HAVE IN THEIR  
BAG



---

CAN WE NAME THE ORAL TOP PRODUCTS IN THE MEDICS BAG.  
FOR ACNE ROSACEA (PIGMENTATION) RASH ECZEMA ETC

---

Antibiotics

Roaccutane Oral Vitamin A (do we know the long term affects)

The Pill

Steroid Injections

**GO TO DRUGS.COM**

---

# CAN WE NAME THE TOP PRODUCTS IN THE MEDICS BAG. ACNE ROSACEA (PIGMENTATION) RASH ECZEMA ETC

## Oral Antibiotics normally slow releasing

### Topical Creams

- metronidazole cream or gel (antibiotic )
- azelaic acid cream or gel azelaic acid is used to treat mild to moderate acne, both comedonal acne and inflammatory acne.<sup>[6][7]</sup> It belongs to a class of medication called [dicarboxylic acids](#). It works by killing acne bacteria that infect skin pores. It also decreases the production of keratin, which is a natural substance that promotes the growth of acne bacteria.<sup>[8]</sup> Azelaic acid is also used as a topical gel treatment for [rosacea](#), due to its ability to reduce inflammation.<sup>[2]</sup> It clears the bumps and swelling caused by rosacea. The mechanism of action is thought to be through the inhibition of hyperactive protease activity that converts [cathelicidin](#) into the antimicrobial skin peptide LL-37.<sup>[9]</sup> Azelaic acid has been used for treatment of skin pigmentation including [melasma](#) and postinflammatory [hyperpigmentation](#), particularly in those with darker skin types. It has been recommended as an alternative to [hydroquinone](#).<sup>[10]</sup> As a [tyrosinase](#) inhibitor, azelaic acid reduces synthesis of [melanin](#).<sup>[11]</sup>
- ivermectin cream (demodex mites )

Finacea 15% Gel (azelaic acid )

Soolantra 1% (ivermectin cream)

Topical Steroids

Differin Cream Topical Vitamin A







## STATINS

- Aim to lower cholesterol but be aware cholesterol is one of the main components of your lamellar lipid layer and alter your conified envelope !



---

## THE PILL

- How does it affect the skin?
- How does the pill stop Spots?
- Suppress a problem and what else ?
- Is it ideal to go on the pill just for your skin as, it's purpose was for contraception, not for skin problems
- When a young girl of 20 comes to you has been on the pill for 5 years due to irregular or heavy periods. What has happened ?
- To Stop the post pill Acne but them on Accumax a month to two before they come off

- 1 in 3 will go on Roaccutane twice
- 1 in 3 will get fantastic the other 2 will suffer for longer
- It was created to Acne Vulgarise not Hormonal Out Breaks
- Long term affects of suppressing sebum for 3-6 months ?
- There is a correlation to Rosacea symptoms and Roaccutane .
- BUT and a BIG BUT. If managed correctly and the client wants this you can work with them





---

# WHY THEY DON'T WORK THAT WELL AND NOT FOR THAT LONG

IT IS ALL TO GENERIC RX ARE A  
LITTLE HIT AND MISS AND DO NOT  
LOOK AT ANY VARIABLES.

MAY BE THE WRONG TOOL FOR THE  
JOB.

QUESTION DO ANY OF THEM WORK ?  
CAN THEY BE MAKING THE SITUATION WORSE

WHAT ABOUT THAT DELICATE EPIDERMAL BARRIER

IT IS A SENSITIVE SOUL AND UPSETTING THE WATER  
OIL BALANCE, WILL AND CAN CAUSE AN INFLAMMATORY  
RESPONES

YOU WILL END UP UPSETTING AND UPSET

---

# ALTERNATIVE MEDICINE NUTRITION



---

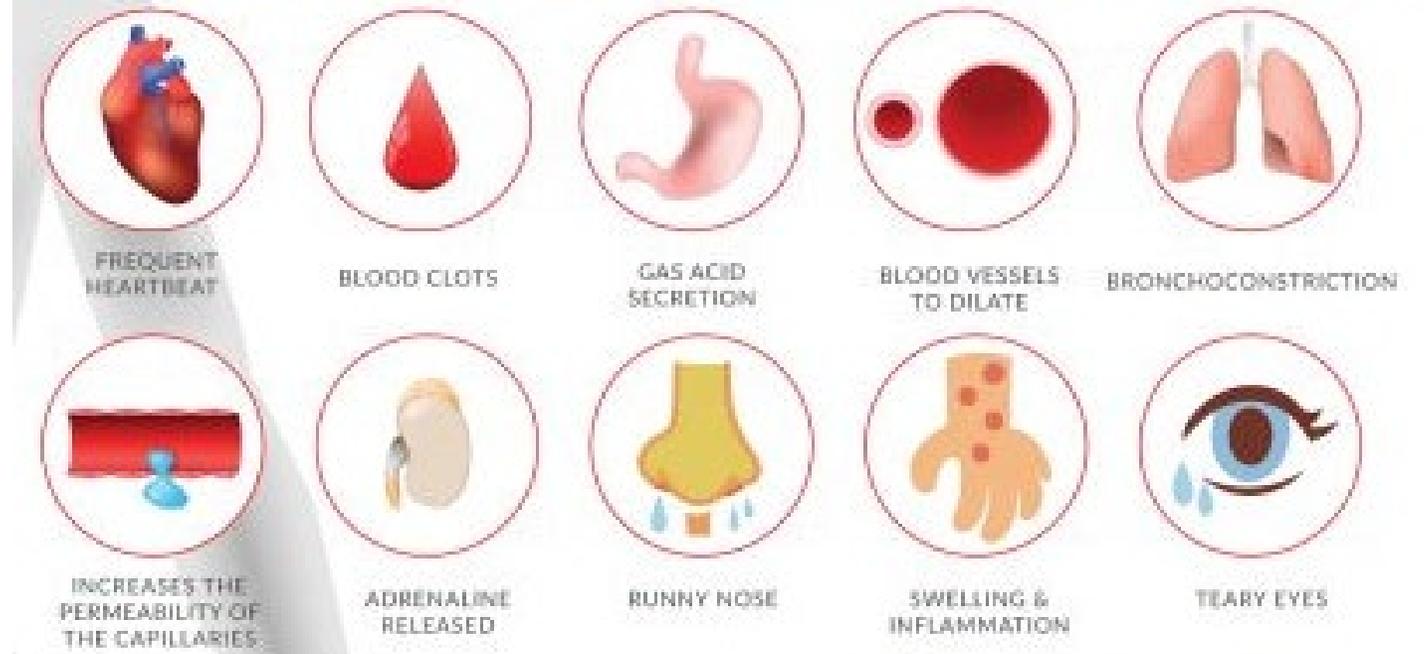
## IT WILL DO NO HARM IN LOOKING AT ALTERNATIVE METHODS

---

- Do Follow the Seal before you Heal Rule
  - Certain skin concerns are without a doubt linked to our food and life style
  - Food intolerance process of elimination
  - Be careful not to be a Jack of All Trades Master of None.
  - Histamine Intolerance is something worth being aware of especially for a rosacea skin or reactive sensitive skin .
-

# WHAT IS HISTAMINE AND WHY YOU NEED TO BE AWARE OF IT .

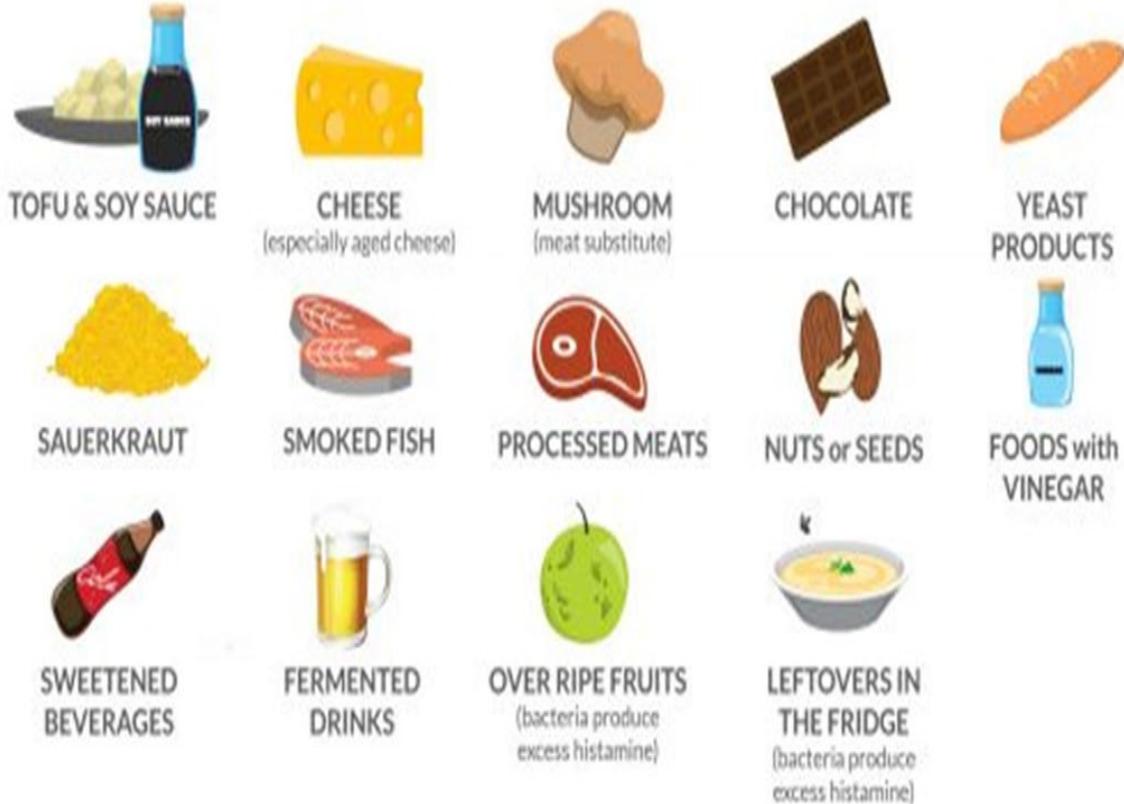
## THE BODY'S RESPONSE TO HISTAMINE RELEASE



Histamine kicks in when our body is fighting of an allergen. This can be a bee sting or even dust. If you have allergies your histamines goes in to over drive due to triggers like pollen

# Histamine Intolerance

## Foods High in Histamine



How does histamine and the skin relate.

- ❖ We know we have histamine receptors in the skin
- ❖ Histamine is released by our mast cells part of the immune system
- ❖ Too high Estrogen can raise Histamine
- ❖ You may eat foods high level of histamine,
- ❖ Our hormones can then increase our histamine
  
- ❖ So lets say you have an inflammatory skin disorder or a poor epidermal barrier function your immune system is already a little reactive
- ❖ Throw some histamine into that Mix
  
- ❖ INFLAMATION RASH REACIVTE RED SKIN



---

## OUR HORMONES

It is not me it is my hormones

---

## HORMONES CAN AND WILL AFFECT US & OUR SKIN.

- ❖ Hormones are HUGE and something too hard to control. We can't and nor can doctors or any other medical profession change our hormones.  
(Naturally)
- ❖ If hormones are a cause of the problem, it doesn't mean you can't change the skin.

As the Skin is the Site of Response  
What we will do is change the skin from responding

With time you will be changing the environment of the skin.  
But you can't change hormones so the underlying problem will still be there.

**Out of Site Out of Mind.**

## TIME: DO WE GIVE OUR SKINS TIME

- Imperfections are no acceptable, so we want them gone
- So we see a spot we have to pick dab and poke
- We feel we look old
- We want changes but we don't want to give it the time.



---

## TIME: DO WE GIVE OUR SKINS TIME

- Our skin is not like our home appliances or our car.
- It is a living complicated organ.
- It can and will not be rushed
- I know I can change a skin but I am realist in how long it will take.



## CLIENT COMPLIANCE

True Expectations

Understanding

Knowing Why

Evidence based Facts

