

# BEAUTIFICATION INSIDE-OUT VS OUTSIDE-IN



## *MOOD DISORDERS ACCELERATE SKIN AGING*

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Pr Dr University Paris Sud-11 and Genopole Evry France

\* *No conflict of interest*

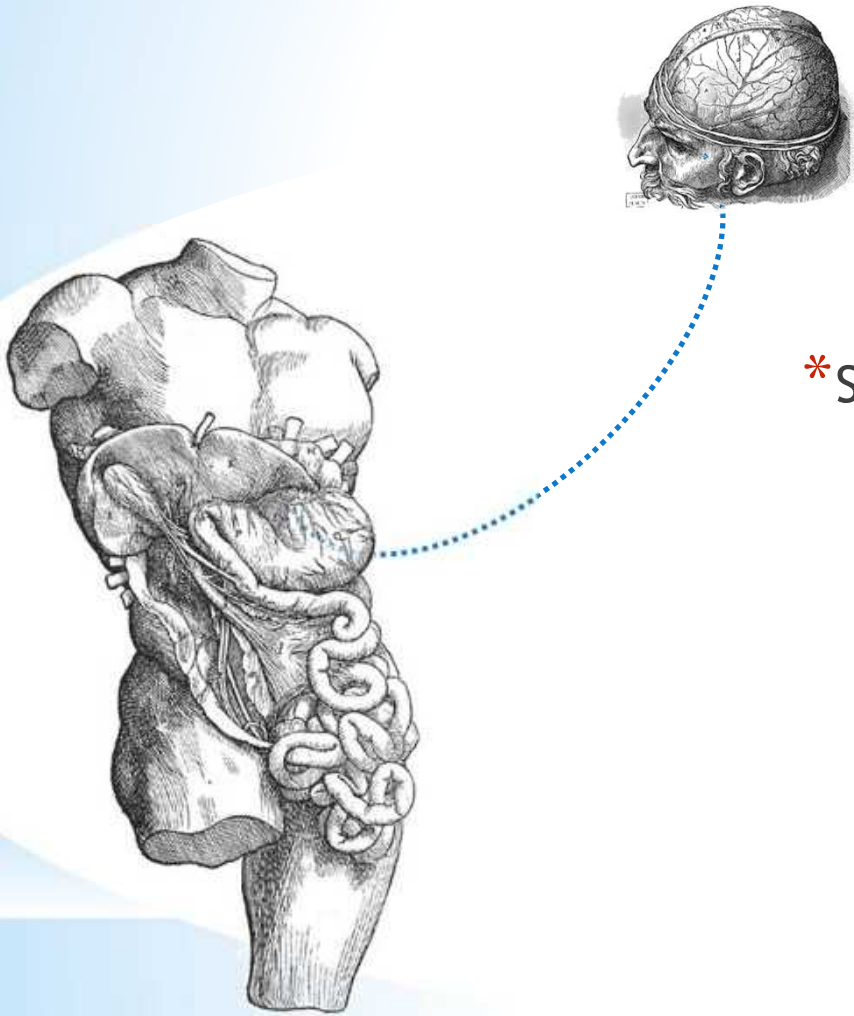
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- \* What is mood ?
- \* What is a **mood disorder** ?
- \* How does it occur?
- \* Does it affect skin beauty?
- \* How does it work ?
- \* Is it reversible ?



# \*Stress is primordial

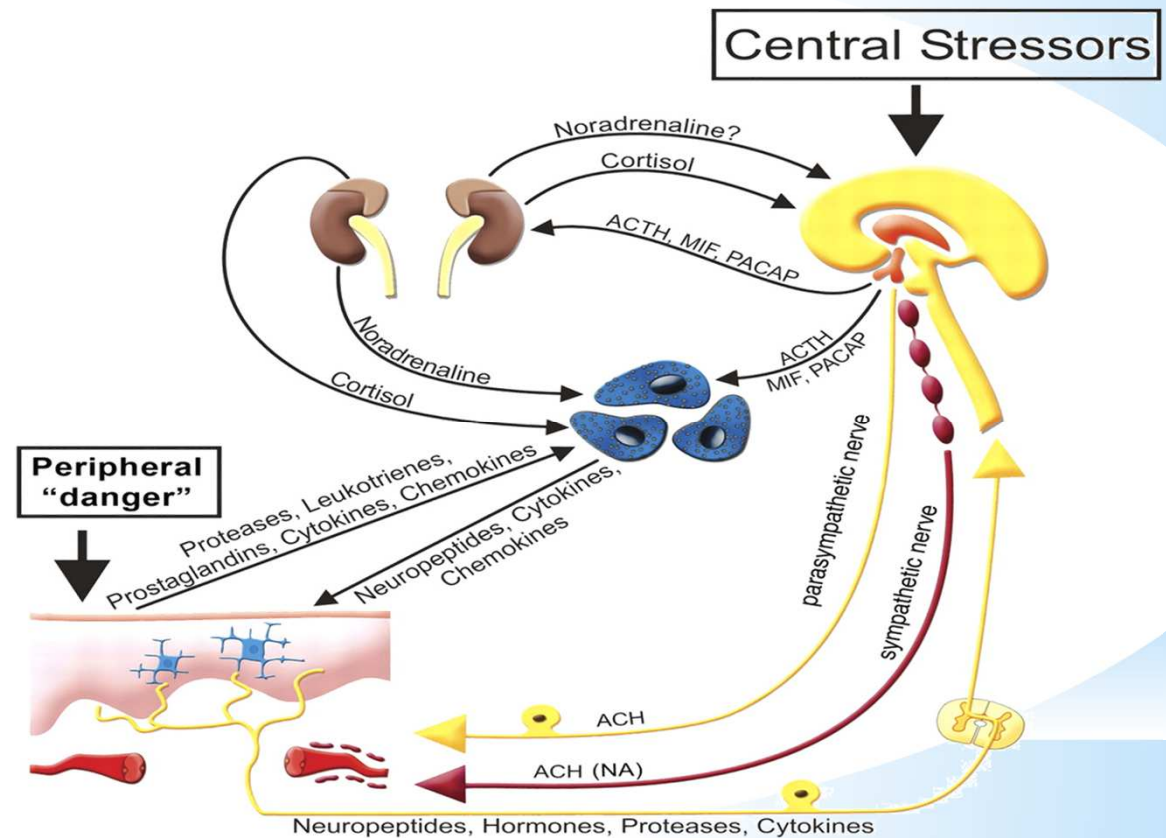


\*Stress is managed by several actors in the body :

- \* The brain
- \* The HPA-axis\*
- \* Cortisol
- \* The gut and its barrier
- \* The microbiota
- \* Mucosal immunity
- \* The vagal system

\*Hypothalamo-pituitary-adrenal axis

# \* There is a stress-related brain-skin connection!



Bioengineering in Wound Healing:  
A Systems Approach(book), 2017

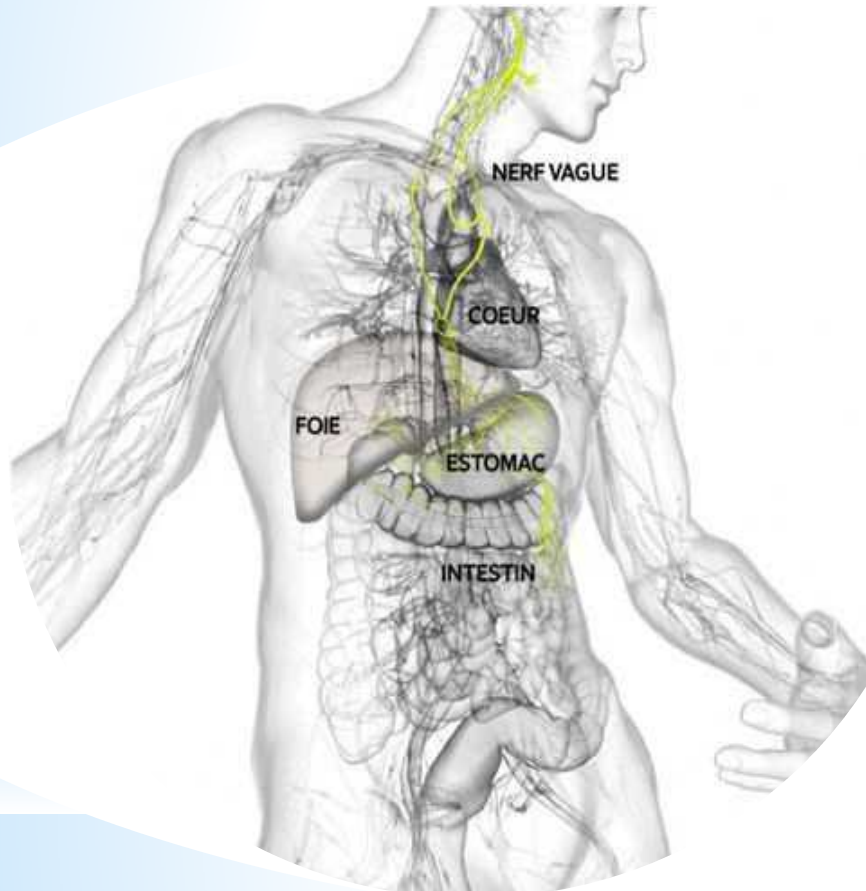


Thanks to **cortisol**,  
normally you do not realize  
you are under **stress**





# \* Anatomical gut-brain link, the *Vagus* nerve

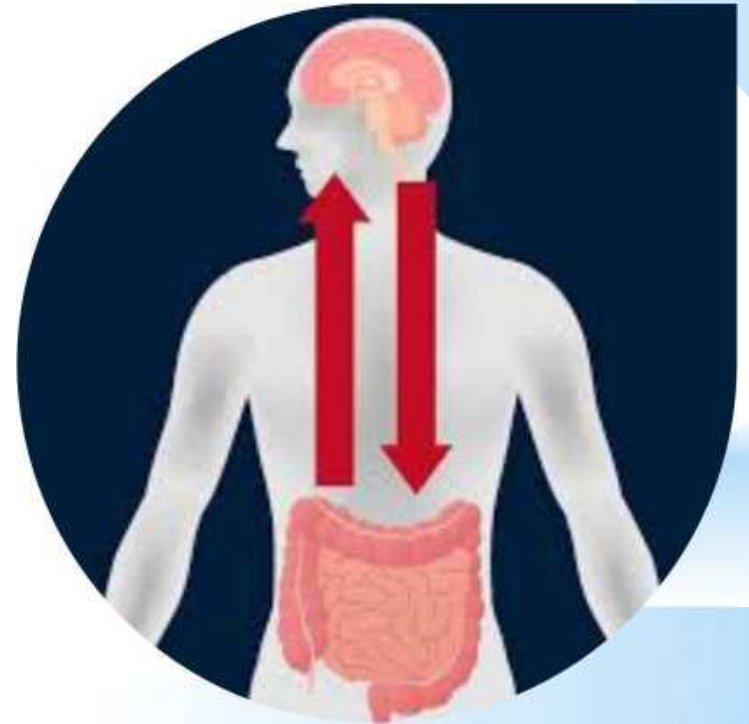


◆ The *Vagus* system directs a bi-directional communication between the gut microbiota, the gut, and the brain

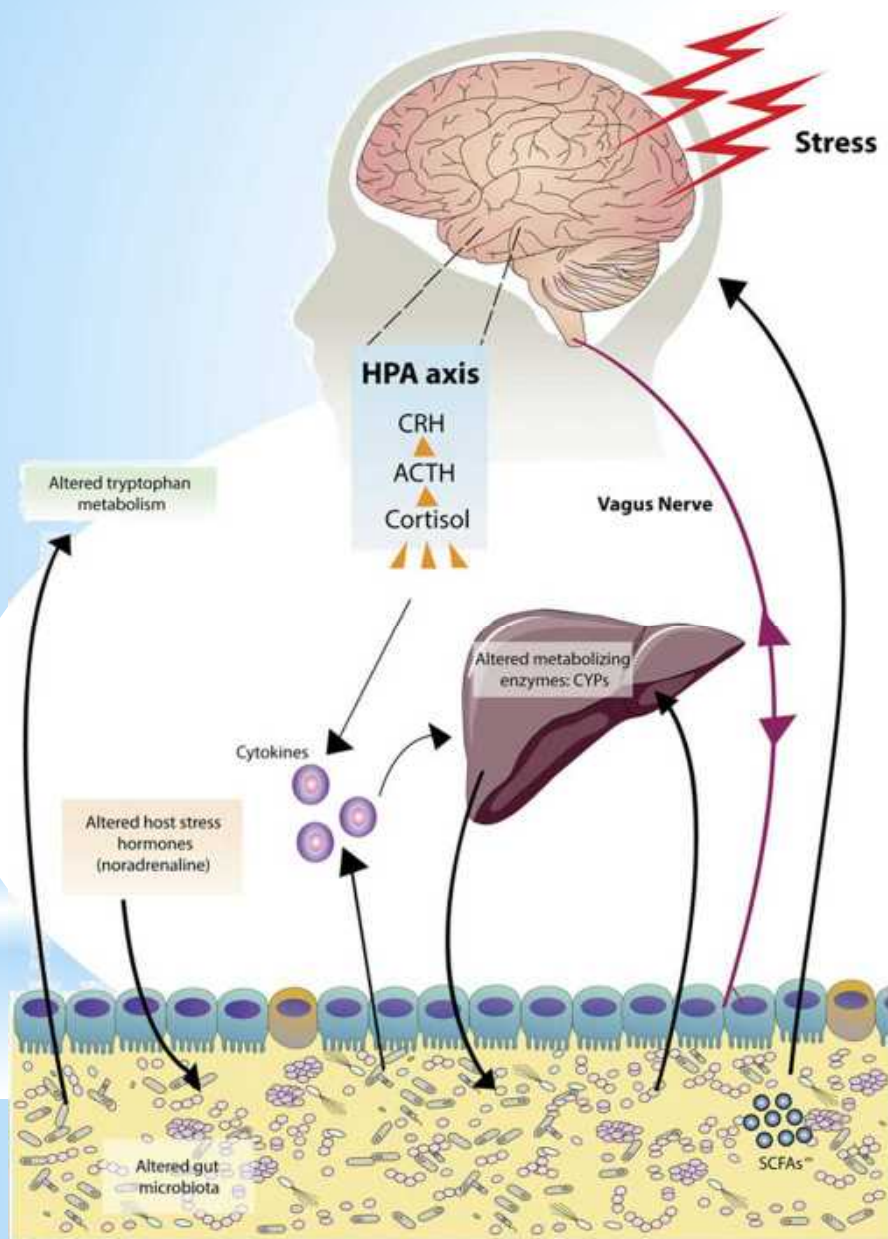
- ◆ through its **systemic branch** (HPA system)
- ◆ through its **neural branch** (*Vagus* nerve)

## \* Functional gut-brain link : the microbiota

- ◆ Endocrine-, neurocrine- and inflammation-related signals generated by the gut microbiota affect the brain.
- ◆ In turn, **the brain can influence the microbial composition** and function - again *via* endocrine and neural mechanisms.







Stress management is introducing imbalance in the gut-brain connection

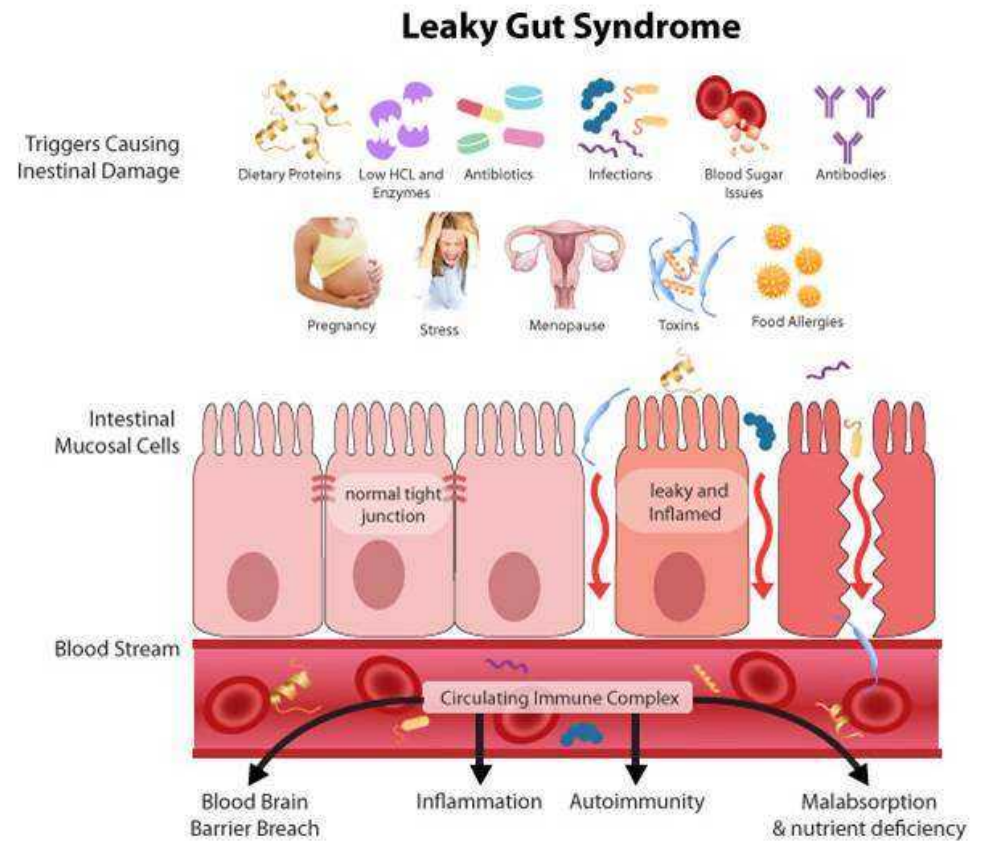
## STRESS COPING MECHANISMS (CORTISOL) INDUCE *in fine* A GENERALIZED INFLAMMATION

Pharmacological Reviews 2019;71:198-224

\* Barrier dysfunction =  
dysbiosis

Cortisol

Mood  
disorders



\* Mood is depending on  
the gut-brain axis balance

loss of memory,  
anxiety  
refusal to meet social events,  
obsessional thoughts  
difficulty to concentrate,  
depression  
chronic fatigue syndrome,  
sleeplessness,  
loss of interest,  
obsessional neurosis



\* Gut barrier dysfunction is at the origin of « sickness disease »

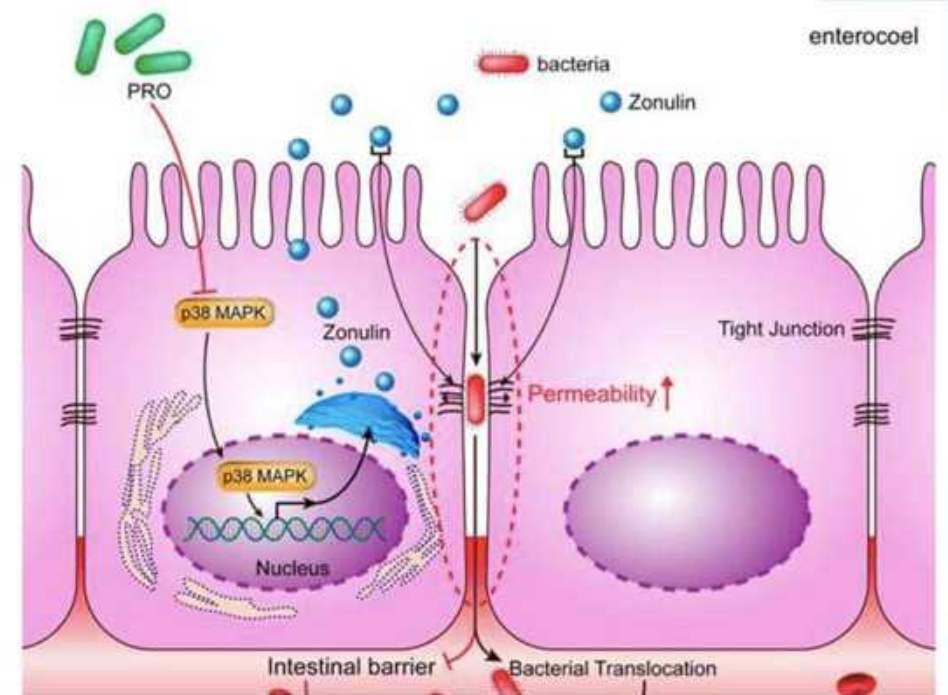
# \*Zonulin assay

**Zonulin** - discovered in 2000 by [Alessio Fasano](#). University of Maryland; modulates the permeability of [tight junctions](#) between enterocytes.

Implicated in the pathogenesis of [coeliac disease](#) and [diabetes mellitus type 1](#) it is also sign of dysbiosis.

Measured following the activation by [gliadin](#) (glycoprotein present in wheat) leading to increased [intestinal permeability](#) to macromolecules.

Faeces >78 ng/mL      Serum > 48 ng/mL





# \*Food is primordial

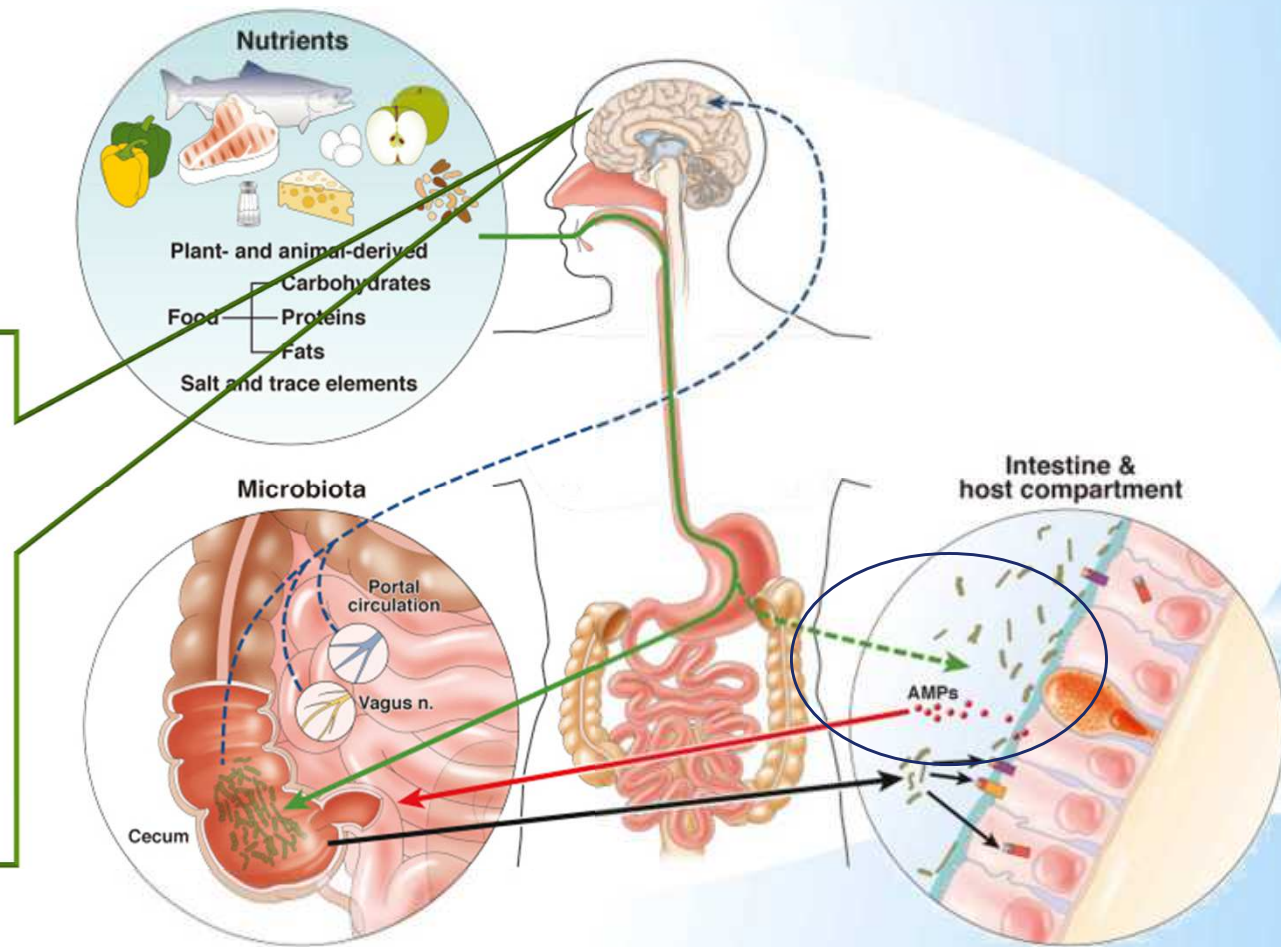
Network : food, immunity, microbiota

**Intake** initiates the connection between

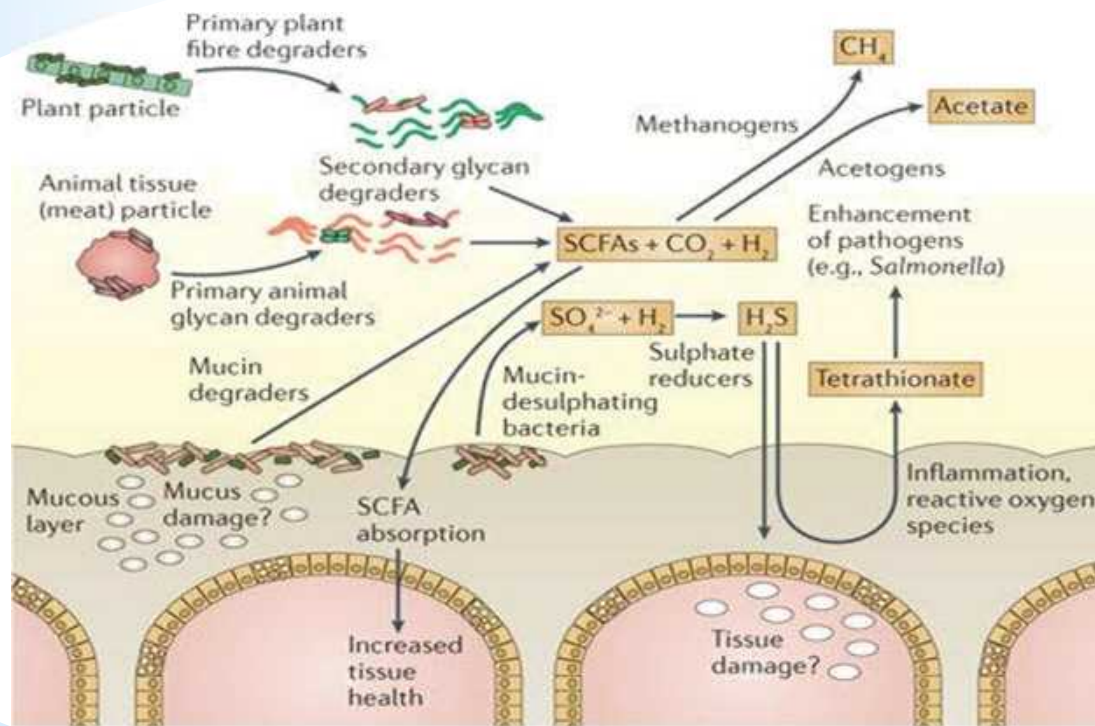
- ◆ gut-brain signaling
- ◆ The *Vagus* nerve feed-back

via the intervention of the microbiota

Gastroenterology 2015;148:1107–1119



# \* Microbiota metabolites are essential for anti-inflammation, anti-aging & cancer



Butyrate, Folate,  
Propionate produced by:

*Bifidobacteria*

*Clostridii*

*Enterobacterium*

*Enterococcus*

*Ruminococcus*

*Roseburia*



# \*The gut-brain axis between stress management & skin beauty



“To summarize, because food intake activates complex signalling pathways, it places itself as the starting point between skin youth and its relationship with the gut.”

AESTHETIC FEATURE | INFLAMMATION | 114

## THE GUT-BRAIN AXIS AND SKIN AGEING

Patrizia A d'Alessio explains how the gut-brain relationship can be the cause and possible solution to issues around inflammation and skin ageing

**ABSTRACT**  
The gut-brain connection influences skin health through the microbiome, immune system, and stress management. The gut-brain axis is the communication pathway between the gut and the brain. It is a complex system that involves the gut, the brain, and the immune system. The gut-brain axis is a bidirectional communication system that involves the gut, the brain, and the immune system. The gut-brain axis is a complex system that involves the gut, the brain, and the immune system. The gut-brain axis is a complex system that involves the gut, the brain, and the immune system.

**W**HAT WILL BE COVERED IN THIS ARTICLE? WELL, WE WILL discuss the relationship between the gut and the brain. If the dialogue between the gut and the brain is healthy, the progression of skin ageing is delayed. Conversely, if the dialogue is unhealthy, the progression of skin ageing is accelerated. Let us begin with anatomy. Not of the brain, of course, nor the skin, but of the connections between the two strategic organs that determine outcomes for general health as well as specific functionalities of the skin. Indeed, the anatomical gut-brain link is ensured by the vagus nerve, whereas the functional gut-brain link relies on the gut microbiome and its signaling.



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How does dysbiosis undermine skin health and beauty ?  
Because the brain alerted by the gut, talks to the skin ...

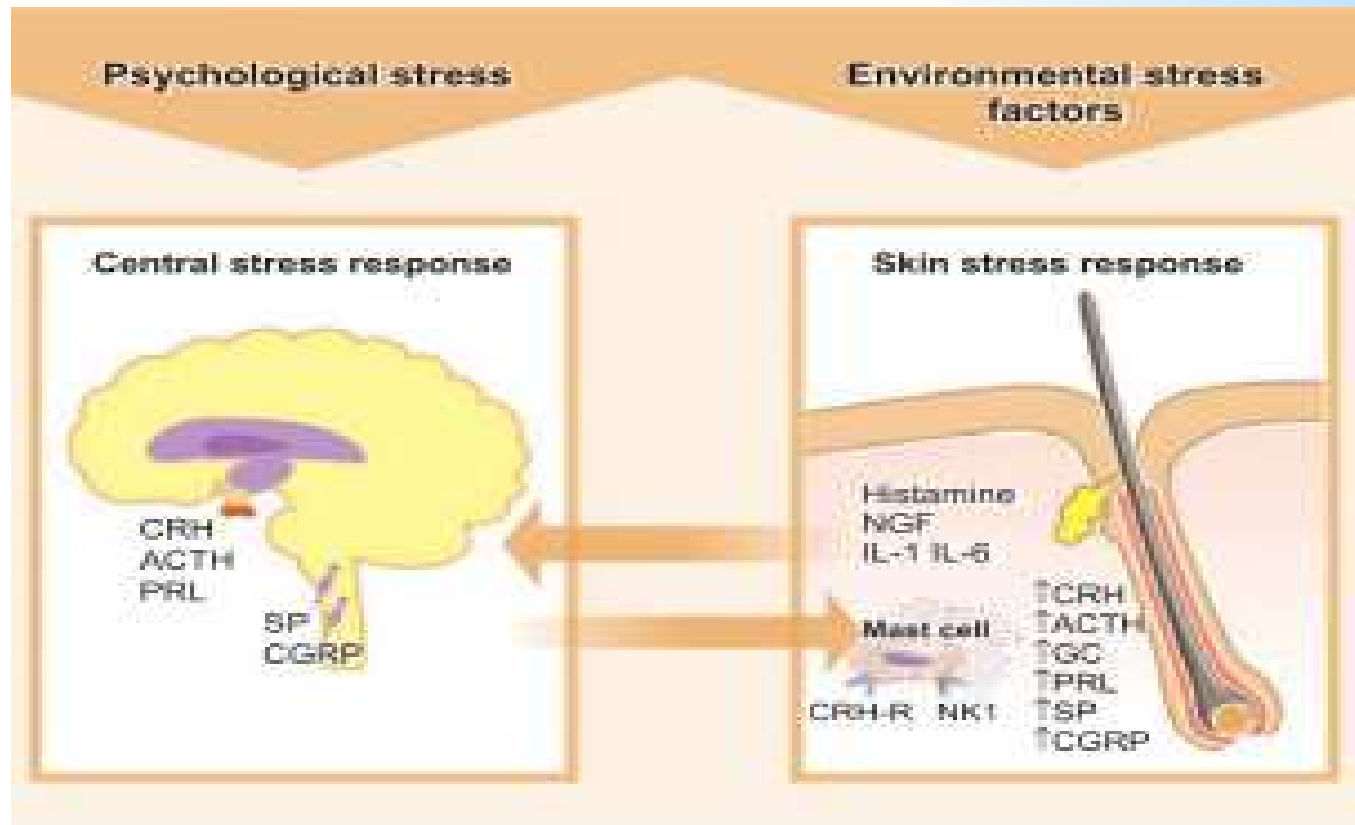
\* Via the hair follicle's neuro-endocrinology the skin displays a fully functional peripheral HPA system\*

\* Hypothalamo-pituitary-adrenal axis

#### Neuroimmunology of Stress: Skin Takes Center Stage

Petra C. Arck<sup>1</sup>, Andrzej Slominski<sup>2</sup>, Theoharis C. Theoharides<sup>3</sup>, Eva M. J. Peters<sup>1</sup> and Ralf Paus<sup>4</sup>

*Journal of Investigative Dermatology* (2006) **126**, 1697–1704. doi:10.1038/sj.jid.5700104



\* In ancient times the food/skin link had already been observed



Dr George Cheyne  
(1671-1743)

At the edge of the 17th - 18th century, **vegetarianism** became a treatment for obesity and gout for rich people consuming a lot of meat.

It turned out as a **solution to prevent wrinkles and lack of radiance of the skin.**

# ◆ In modern times « psychobiotics » restore dysbiosis and mood ! How about skin ?



## Barrier function restoration

**Table 1**

AISA: significant effect on **strengthening the epithelial barrier function**

	Control	AISA			
		75 $\mu$ M	150 $\mu$ M	750 $\mu$ M	1500 $\mu$ M
R <sup>t</sup>	107 $\pm$ 3%	106 $\pm$ 4%	112 $\pm$ 3%	132 $\pm$ 3%	153 $\pm$ 4%
n	9	6	6	6	6
p		n.s.	n.s.	<0.001	<0.001

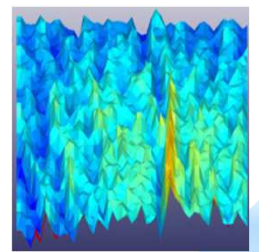
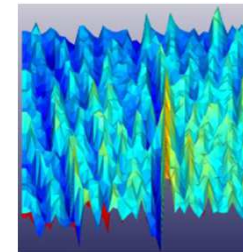
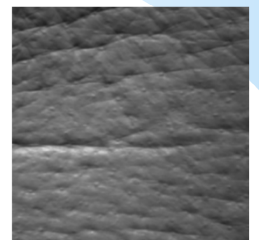
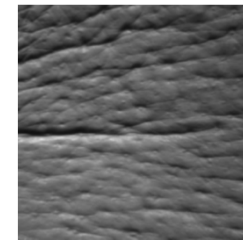
Evaluation of the electrical resistance ( $\Omega \cdot \text{CM}^2$ )  
percentage of the initial resistance : Rt.

Life Sciences 2013;92:1151-1156

Clinical study 20 women

Before

After



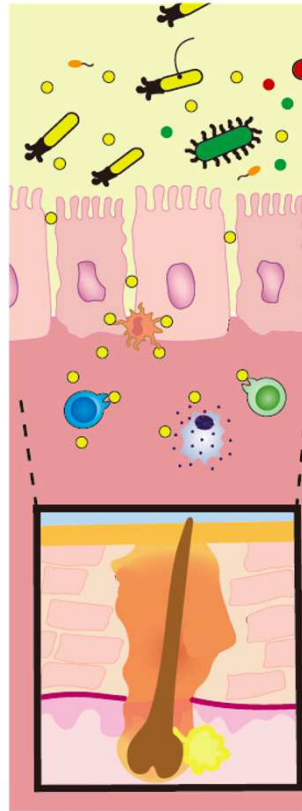
PRIME 2015;11:19-25



# \* Skin dishydrosis of the elderly

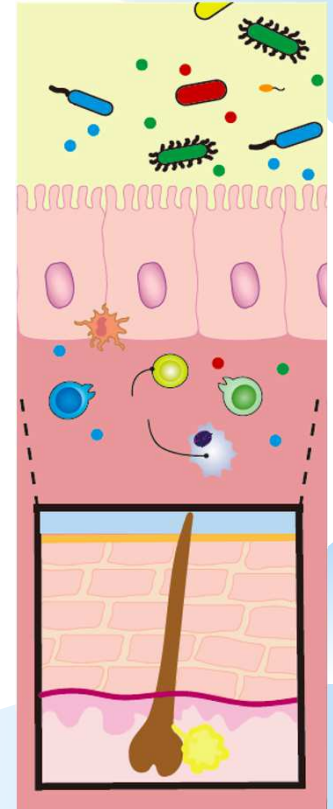
## Gut dysbiosis

directly compromises the barrier function of the **skin**



Anti-inflammatory  
nutraceuticals can preserve  
**gut barrier** function

restoring **skin compliance**





## \* Steps of an announced (*reversible*) dead end



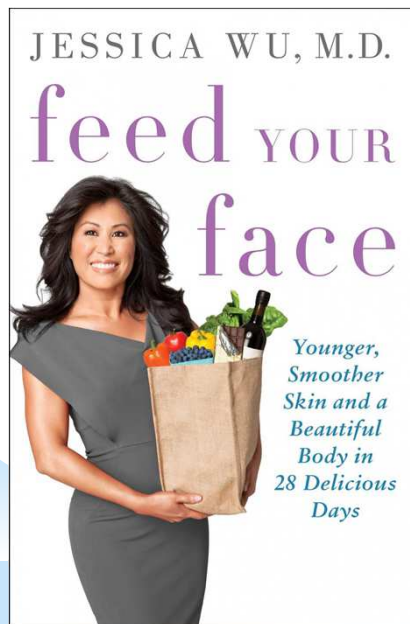
- ◆ Stress *via* cortisol-mediated hyper-adaptation destructurates the barrier function of the gut, site of the mucosal immunity
- ◆ **Generalized inflammatory syndrome** with neuro—inflammation and « sickness disease »
  - episodes of insomnia, depressive state, chronic fatigue syndrome... obsessional thoughts
- ◆ As a result skin health and beauty are undermined.

\*The *reversible* part is the real good news

- \*Triggering senses activates the *Vagus* nerve our anti-inflammatory partner
- \*This is one of the reasons why inhalation of a perfume improves skin quality
- \*Listening to music / a melody you like also changes the expression on your face
- \*Tasting a delicious food will greatly stimulate *Vagus* activation



# \*Feed your beauty



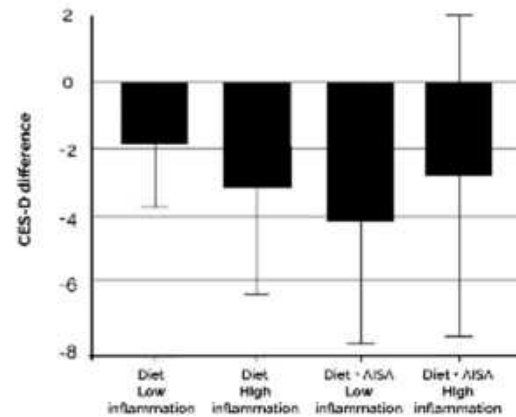
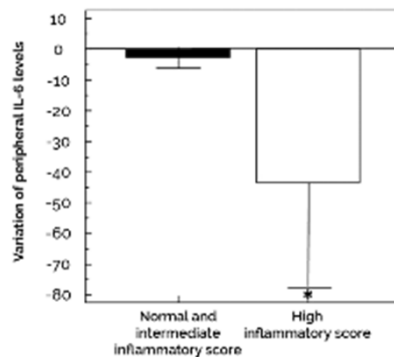
- ◆ Adding nutraceuticals / cosmeceuticals to your (possibly tasty) food - of proven anti-inflammatory effect,
- ◆ ...contributing to mood modulation and skin rejuvenation



# \* Barrier protection & anti-inflammation results in mood modulation

## Mood modulation effect

### Anti-inflammatory effect

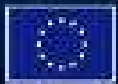


Review

## Terpenoids as Potential Geroprotectors

Ekaterina Proshkina<sup>1</sup>, Sergey Plyusnin<sup>1,2</sup>, Tatyana Babak<sup>1</sup>, Ekaterina Lashmanova<sup>1</sup>, Faniya Maganova<sup>3</sup>, Liubov Koval<sup>1,2</sup>, Elena Platonova<sup>1,2</sup>, Mikhail Shaposhnikov<sup>1</sup> and Alexey Moskalev<sup>1,2,\*</sup>

Clin Nutr. 2016;35:812-818



# \* A recent striking case

## Case study :

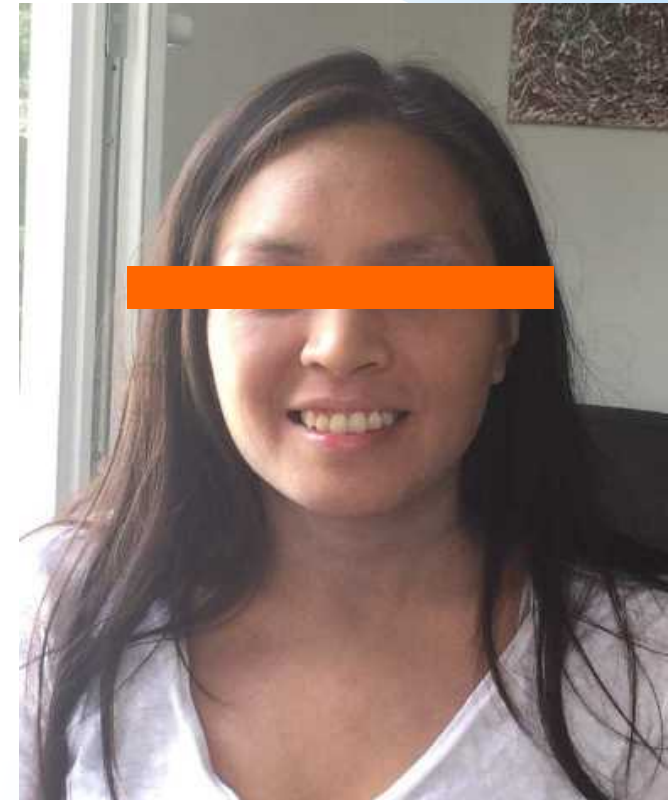
Atopic dermatitis (eczema) worsened  
by repeated topic cortisol treatment

High levels of zonulin / IgG

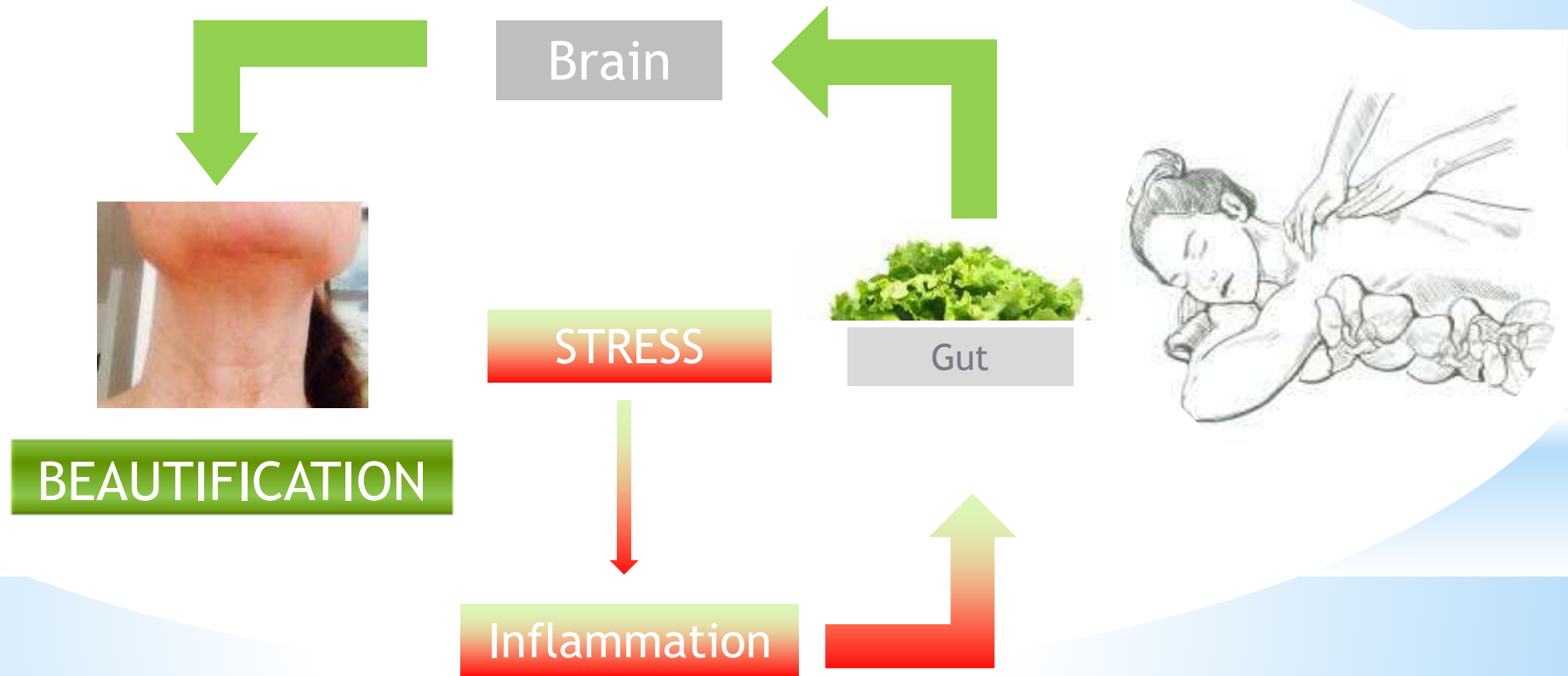
Partial restoration after 10 days cure  
with **anti-inflammatory terpenoids**

**Gut barrier repair**, with restitution of  
skin quality

Visible mood amelioration



# \*The gut-brain connection INFLUENCES skin QUALITY...





STIMULATE your *Vagus* nerve by touch



\* Especially affectionate touch

\*Thank you for your attention

## Questions & Credits ?!



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Institute of Genetics and Biophysics  
Adriano Buzzati-Traverso



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