Reversal of Chronic Inflammatory Skin Disorders

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Healthy Skin

- "**Your skin is the fingerprint of what is going on inside your body**, and **all skin conditions**, from **acne** to **psoriasis** to **aging**, are the **manifestations of your body's internal health status**." *(Georgiana Donadio, https://www.webmd.com1)*
- **The health of your skin** is an **internal issue, not an external one.**
  A healthy body inside means healthy skin on the outside.
- **Skin** is the body's **largest vital organ** and also **the largest eliminatory organ**.
  Skin functions range from **temperature control, protection** to **elimination**.
- **The skin ➔ "third kidney."**
- Your **skin** should **eliminate as much toxic waste/**day as **lungs, kidneys**, and **bowels** do. This **elimination** is in the form of **mucus, toxins (acids)** and **gases.**
- **Foods** and **by-products** can **congest** and **inflame your body** including **Skin**.
- **Skin conditions** are **only symptoms** of this **elimination process ➔ dandruff, pimples, rashes, eczema** and all **dermatitis; Psoriasis** and **Skin Cancer**.
  Psoriasis and **skin cancer being the most toxic** of all the **skin conditions.**
  (https://nimarsti.com/2019/03/06/link-between-psoriasis-and-acid-waste-build-up-in-the-body/)

Inflammatory Skin Disorders

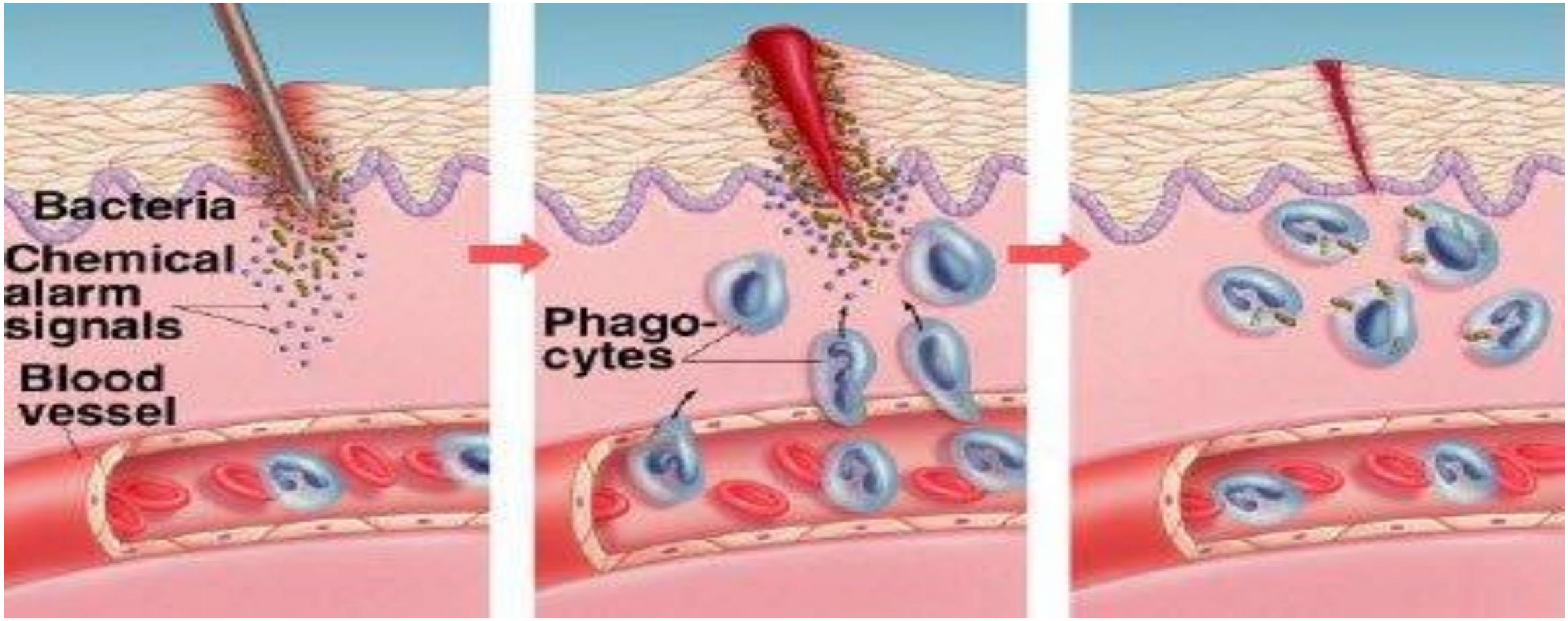
- **The most common problem in dermatology,** affect > 35 million Americans with over $2 billion/yr. to **treat their symptoms**.
- **Acute inflammation** (occasional rashes accompanied by skin itching and redness) can result from exposure to UV radiation (UVR), ionizing radiation, allergens, or to contact with chemical irritants (soaps, hair dyes, etc.), typically **resolved within 1-2 wks**. with **little** accompanying **tissue destruction.**
- **Chronic inflammation** such as **dermatitis (eczema), rosacea, seborrheic dermatitis,** and **psoriasis** results from **a sustained immune cell mediated inflammatory response** within the skin itself. This inflammation is **long lasting** and can cause **significant and serious tissue destruction**.

Inflammation: Tissue Response to Injury

- "**Inflammation** is one of **the most important mechanisms of host defense** since it marshals the **attack on the injurious agent** and **leads to repair of the affected tissue.**"
- **Inflammation** occurs in **response to physical trauma, intense heat, irritating chemicals, toxins** and **infection** (viruses, bacteria, etc.).
- **The inflammatory response** is **a natural defense mechanism** that is triggered **whenever body tissues are damaged in any way**.
- **Most** of the body **defense elements** are **located in the blood.**
- **Inflammation: body defense cells** and **defense chemicals leave the blood** and **enter the tissue around the injured or infected site.**

Skin Inflammatory Process

- The skin is exposed to **a "triggering" stimulus** (such as UVR, irritants (e.g. soaps or fragrances), toxins or allergens), the skin cells produce a variety **of inflammatory "hormones"** called **cytokines** and **chemokines.**
- These **"inflammatory messengers"** bind to specific receptors on target cells and stimulate the production of additional **inflammatory signaling "hormones"** → cause vasodilation, activate nerve cells, etc.
- Some **cytokines** cause **immune cells** to **leave the blood and migrate into the skin** where they then produce **more inflammatory hormones**, as well as **enzymes, free radicals,** and **chemicals** that **damage the skin**.
- **The end result** is the **amplification of a large inflammatory response,** designed **to help the skin fight infection/irritants/toxins** → **causes considerable damage to the skin.**



The inflammatory process begins with **chemical "alarms"** a series of **inflammatory chemicals** (**histamine, kinins, prostaglandins, complement, and lymphokines**) from **injured tissue cells, phagocytes, lymphocytes, mast cells** and **blood proteins**.

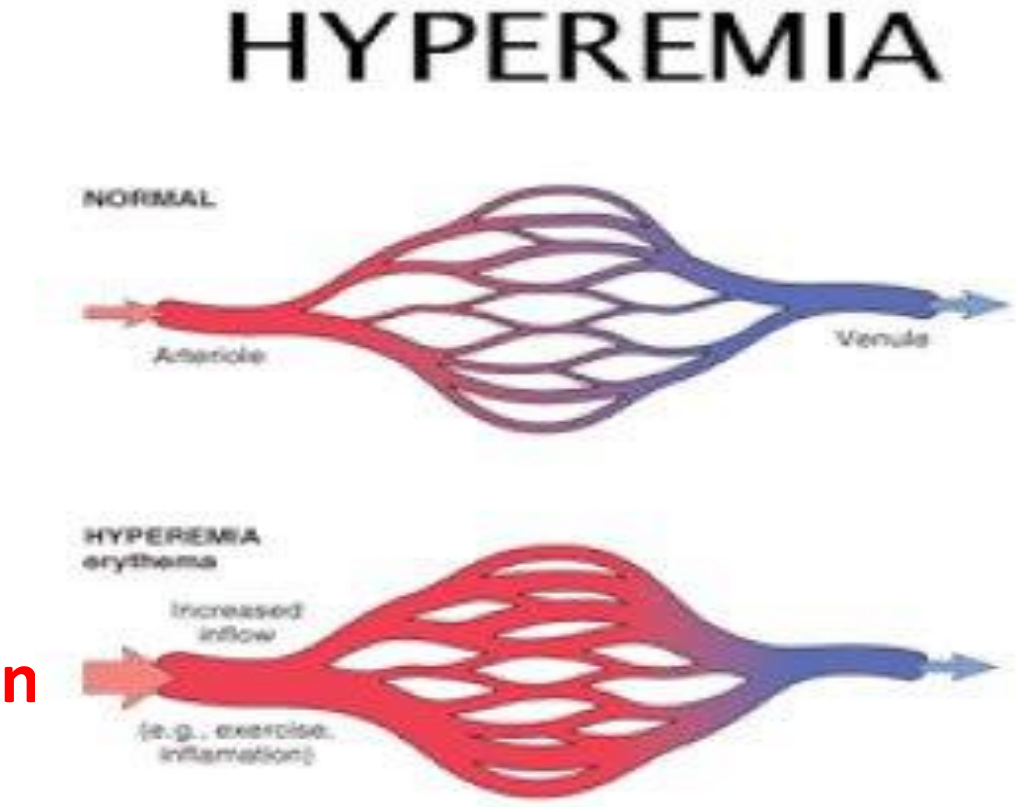
Inflammation: Tissue Response to Injury

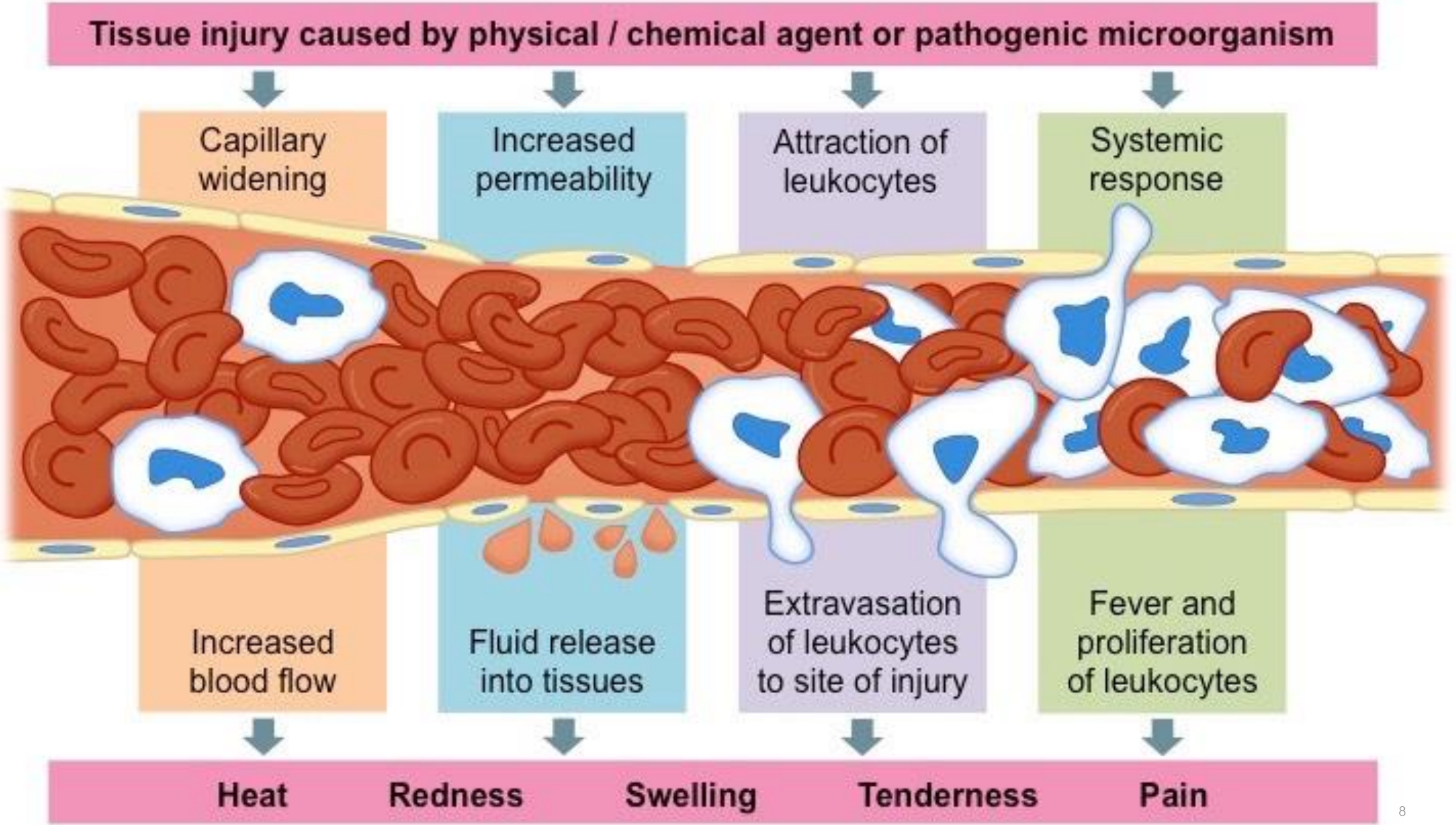
- **Tissue Injury → chemical mediators release** (histamines, kinins, PGs) → **↑capillaries permeability → exudate formation** (proteins, clotting factors, antibodies, etc.) → **edema/ swelling → compress nerve endings → pain** (also from bacterial toxins, effects from PGs, kinins) → **limit movement of joint(s)** (necessary for proper healing)

- **Some inflammatory mediators promote vasodilatation → ↑blood flow & Hyperemia** (**redness & heat** in the injured area)

→ The 4 cardinal signs of inflammation: **redness, heat, swelling and pain**

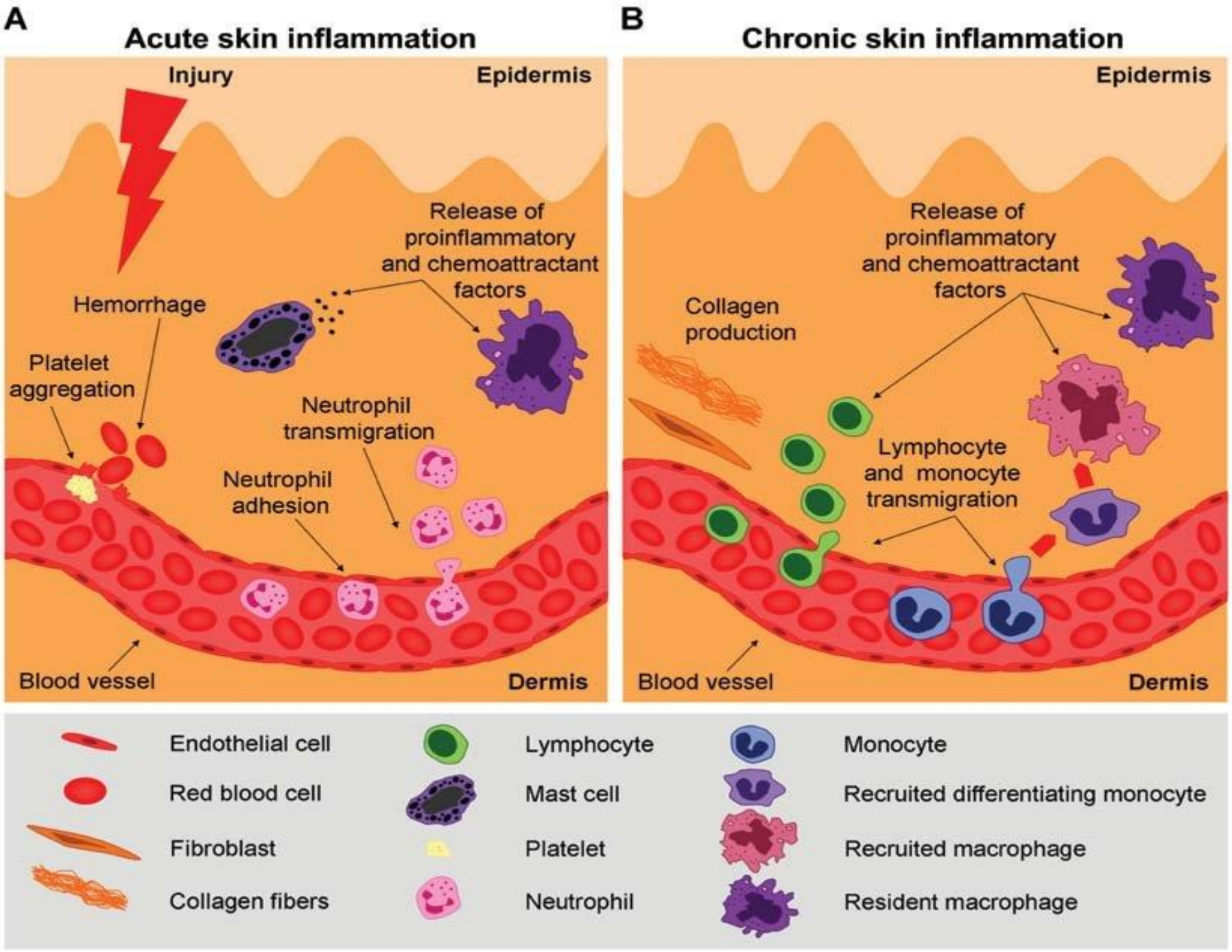
→ the 5th cardinal sign = **impairment of function**




Tissue injury caused by physical / chemical agent or pathogenic microorganism
Capillary widening
Increased permeability
Attraction of leukocytes
Systemic response
Increased blood flow
Fluid release into tissues
Extravasation of leukocytes to site of injury
Fever and proliferation of leukocytes
Heat
Redness
Swelling
Tenderness
Pain

Chronic Inflammation

- **… an inflammatory response** of **prolonged duration--weeks, months, or even indefinitely.**
- The extended time course is **caused by persistence of the causative stimulus to inflammation** in the tissue, **repetitive use of anti-inflammatory drugs**, **a weakened immune system**, or an **improper nerve supply**.
- **Chronic inflammation inevitably causes tissue damage** and is **accompanied by simultaneous attempts at healing and repair**.
- The **exact nature, extent and time course** of **chronic inflammation** is variable and depends on **the balance between the causative agent and the attempts of the body to remove it**.



The cascade of acute and chronic skin inflammation.
(a) **the initial skin injury** triggers intravascular processes, promote **neutrophil** adhesion and transmigration. Resident **macrophages & mastocytes** release **pro-inflammatory factors** and **chemo-attractants**.
(b) **lymphocytes & monocytes** enhance adhesion capacities and further transmigrate into the extravascular space
➔**resident macrophages secrete pro-inflammatory factors & chemo-attractants, stimulating collagen production**
(https://www.researchgate.net)

Skin Inflammatory Mediators

- **The most important skin inflammatory mediators** are **TNF-alpha** and **PGE-2.**
- While **TNF-alpha** plays a key role in **Psoriasis**, **PGE-2** is a major participant in **all types of skin inflammation** and the most important mediator in **sunburn**.
- **PGE-2: → Pain, Redness** and **Swelling** and a key participant in the development of **skin cancer**.
- **PGE-2 suppresses collagen formation in the skin → photoaging.**
- **Chronic exposure to the sun (UVR) → ↑ PGE-2** in **skin cells → Premature Aging** and **Skin Cancer.**

Common Chronic Inflammatory Skin Disorders

Persistent Inflamed

Acne: the most common skin disorder in the U.S, caused by blocked hair follicles and sebaceous glands, often triggered by hormonal changes.

Seborrheic Dermatitis

dry flakes (dandruff) or greasy diffuse scaling of the skin regions with **high density of sebaceous gland** and scalp, unclear pathogenesis but associated with ***Malassezia,*** a normal skin yeast.

Rosacea

a chronic swelling of the face, with redness, prominent blood vessels, and pimples. **Immune system**, vein problems and/or **environmental issues** can cause it, **only symptomatic Rx.**

Common Chronic Inflammatory Skin Disorders

Psoriasis (a T helper type 1 (**Th1**) and/or T helper type 17 (**Th17**) immunological response in psoriatic plaque) Chronic skin condition that **speeds up the life cycle of skin cells,** causes skin cells to build up rapidly. The **extra skin cells** form **scales and red patches** that are itchy and sometimes painful, may involve scalp, nails and joints, **no cure, only symptomatic Rx.**

Atopic Dermatitis (**immunological imbalance** with predominance of T helper type 2 (**Th2**) cells in acute skin lesions). One of the most common forms of **Eczema** in children, **unknow exact cause**, but may involve **genetics, the environment**, and/or the **immune system. Dry, scaly and itchy skin** on face, hands, feet and skin folds, thickened skin on areas with constant scratching. **Only symptomatic Rx**.

Chronic Skin Inflammation & Drugs

Current **treatment regimens for most inflammatory skin diseases** are dominated by **topical** or **oral corticosteroids**, typically used **for only short periods** of time because of their **negative side effects on skin**, including:

- **Topical steroid withdrawal (TSW): exacerbated eczema** when stop using steroid.
- **Anti-proliferative/thinning effect on the skin (Atrophy)**
- **Vasodilatation (Telangiectasia)**
- **Suppression of the skin's ability to respond to infection (immunosuppression).**
- **Elevation of blood glucose levels (hyperglycemia).**
- **Impairment of adrenal gland function**.

Steroid induced dermatitis – erythema, telangiectasias, atrophy.
(Tatu AL. Long term use of clobetsol propionate cream on facial skin. Our Dermatol Online. 2017;8(1e):e2.)

Chronic Skin Inflammation & Drugs

- There are **more drugs** designed to **fight inflammation** in the human body **than any other single category of drugs**.
- **Corticosteroids are commonly abused** and **over prescribed for the treatment of allergies, autoimmune diseases** and **inflammatory conditions.**
- **Steroids cause allergies** and **inflammation to disappear instantly by direct suppression of the immune system.**
- **Corticosteroids are immunosuppressive ➔ reduce the activity of immune system** (which helps defend our body against bacteria, viruses, and cancer) **➔ ↑ susceptibility to infection** and **interfere with the healing process**.
- **Steroids are toxic, weaken immunity, cause dependence, SUPPRESS, RATHER THAN CURE DISEASE, and REDUCE THE CHANCE OF HEALING by natural treatment.**

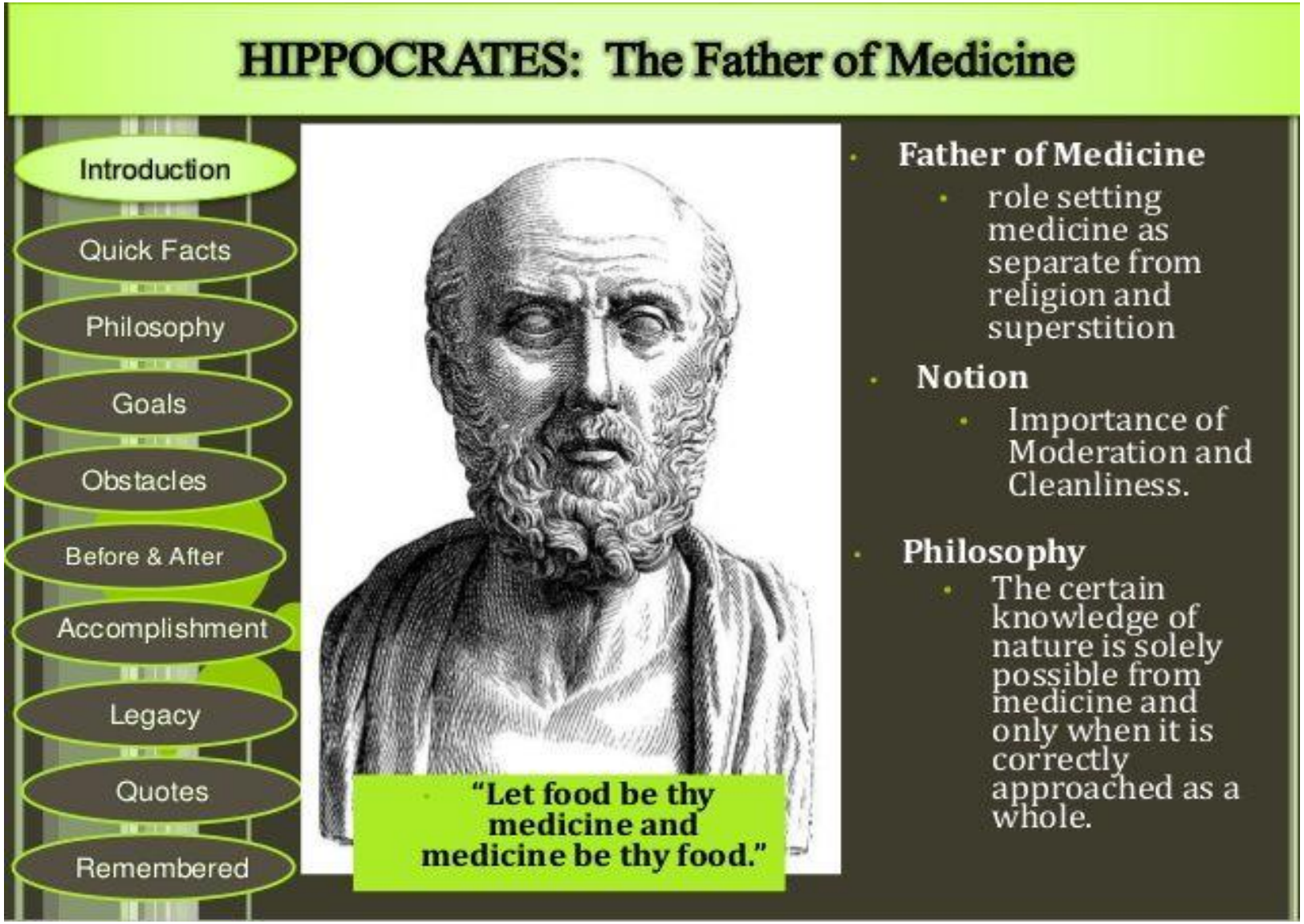
Chronic Skin Inflammation & Drugs

- **The immune suppressive drugs:** such as topical **Protopic** and **Elidel,** effectively **control** atopic dermatitis **symptoms** but can cause **serious side effects** by their **potent immunosuppressive effects**.
- **Injectable drugs:** such as **"Biological response modifiers"** or **"Biologics",** available to treat **psoriasis** and **arthritis,** by **targeting and inhibiting the action of an inflammatory cytokine, TNF-alpha** (a key role in immune cells that cause many of the symptoms of **psoriasis**) => **↓ the symptoms**
- **Natural Antioxidant & Anti-Inflammation Compounds: Curcumin** (**anti-inflammatory** and **anti-cancer effects**, in Turmeric), **Quercetin** (in apples), **Resveratrol** (in wine, grape seed), **Epigallocatechin Gallate** (in green tea), and **Bisabolol** (in Chamomile).



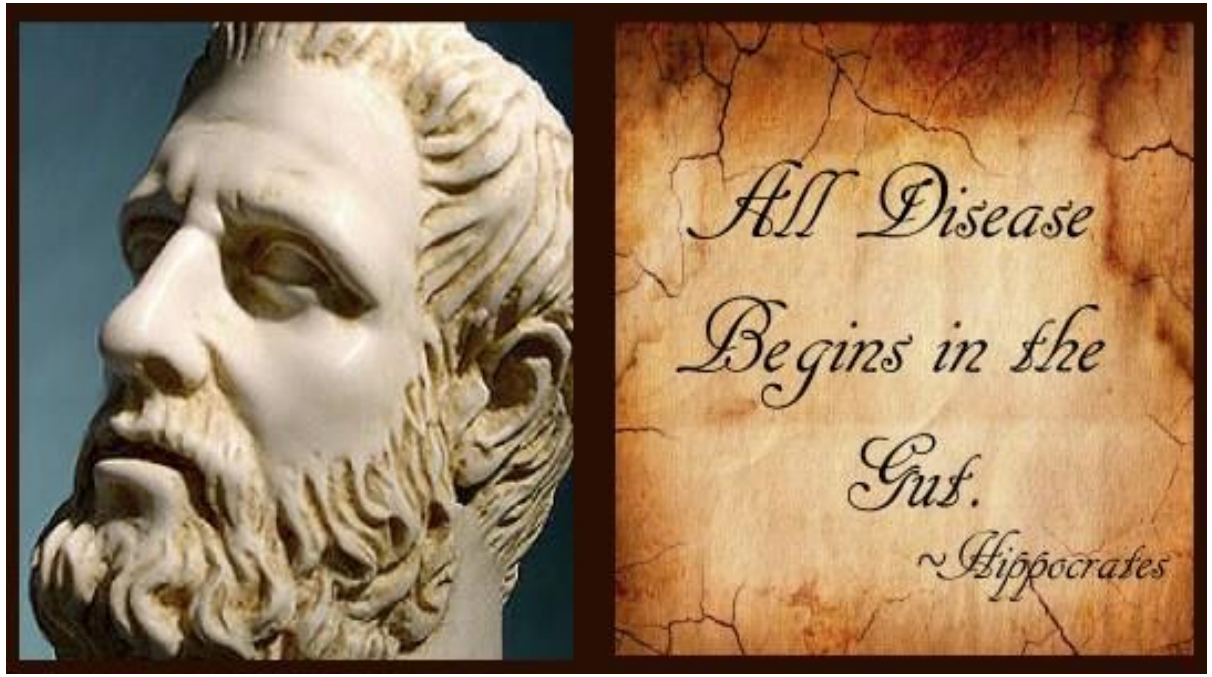


“Let Food be thy Medicine and Medicine be thy Food.”



“Our Body is The BEST HEALER.”
Support the body systems, don’t interfere it (with allopathic drugs).

All Disease Begins in the GUT…Hippocrates



DEATH SITS IN THE BOWEL

CYTOPLAN
EDUCATION

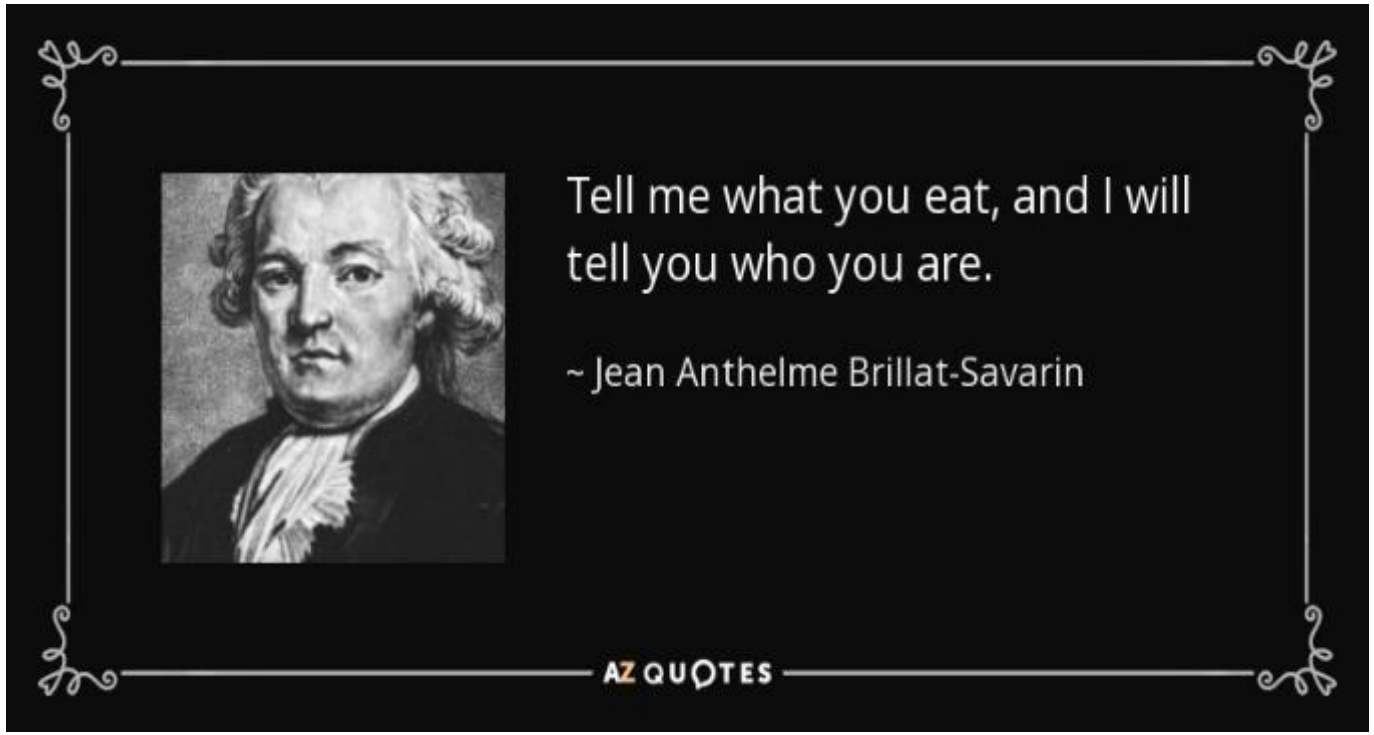
"All disease begins in the gut"
"A bad digestion is the root of all evil"
"Death sits in the bowel"
Hippocrates, circa 400 BC

"All Disease Begins in The Gut." …

…Hippocrates (ancient Greek physician, the Father of Medicine, 460-375 BC.)

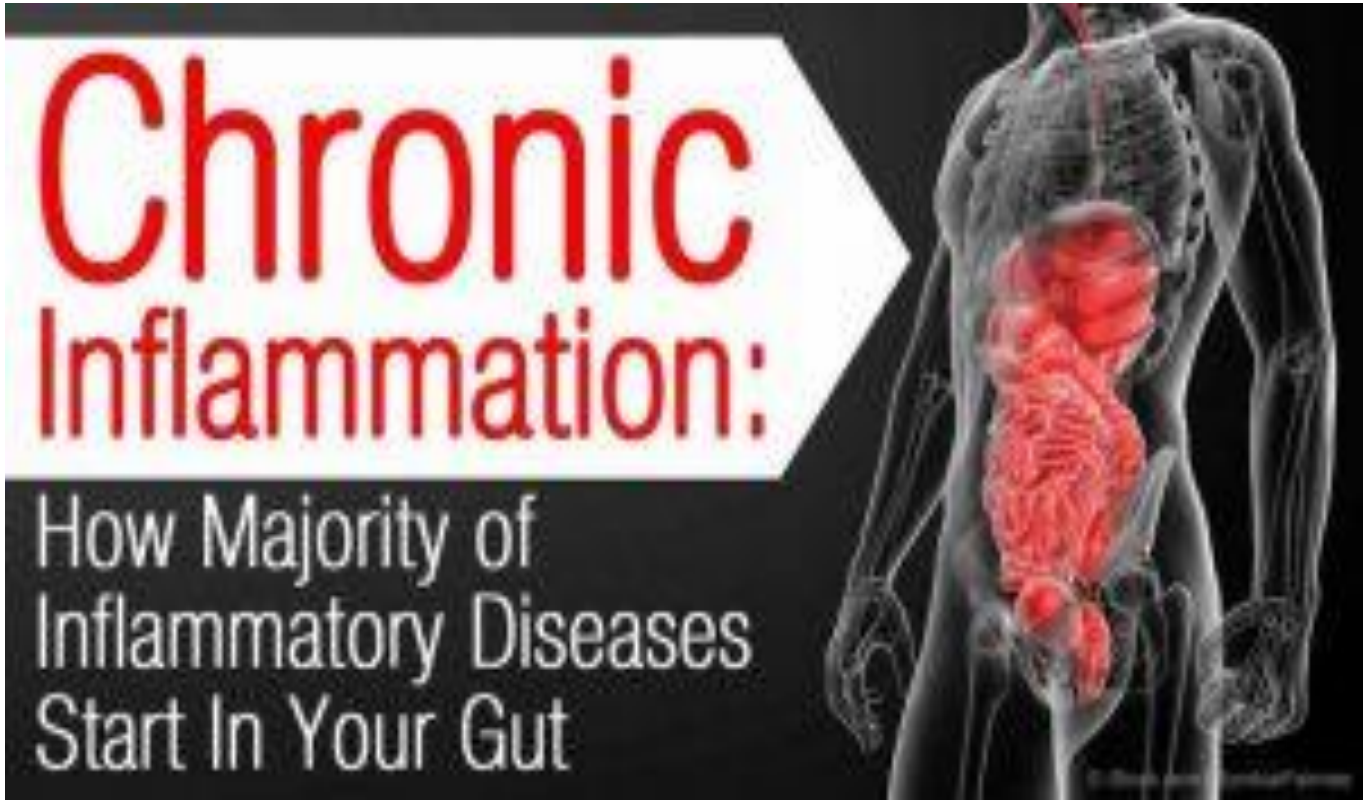
➔ **"Heath Starts from the Gut."**

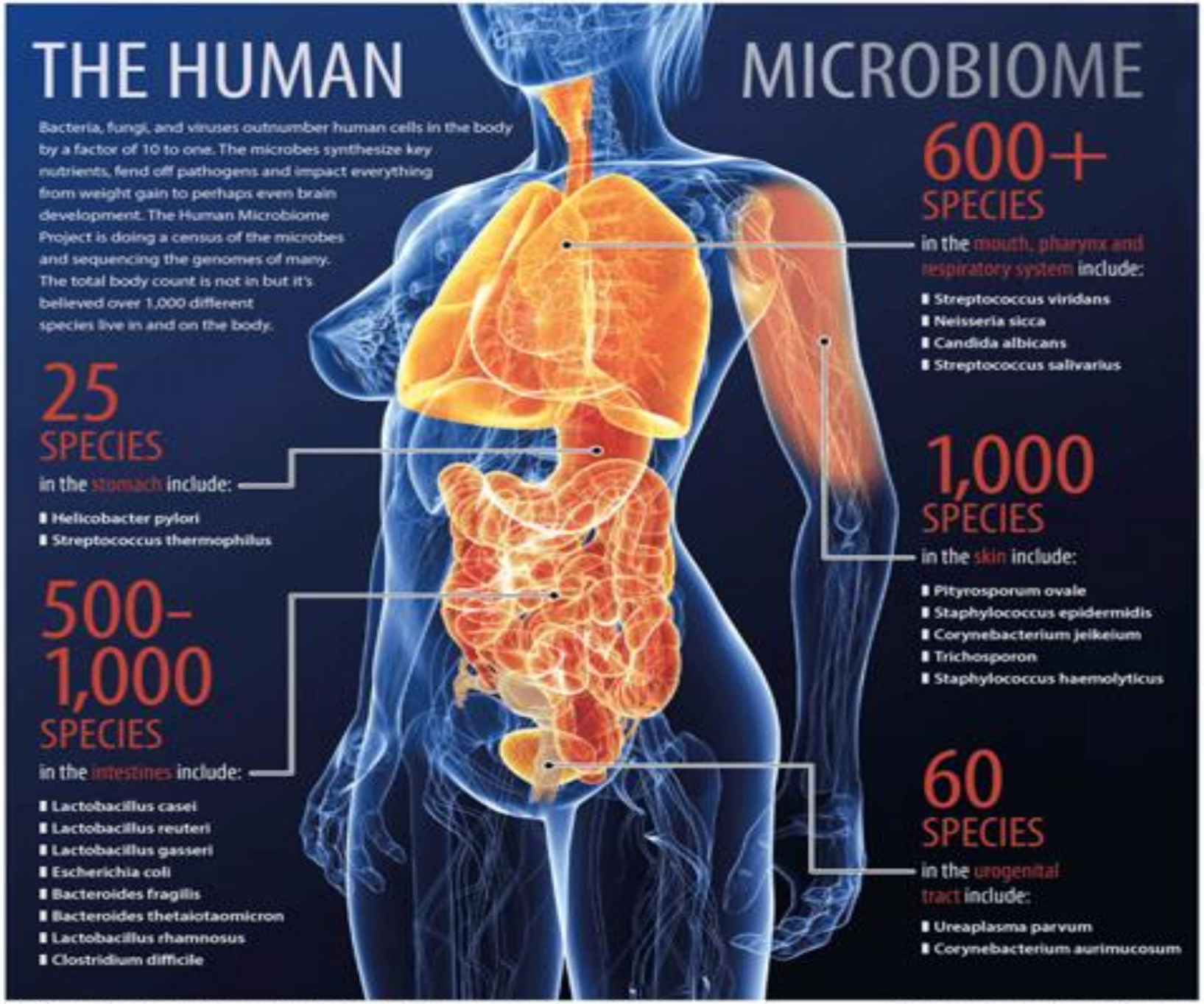
“Health Starts from the Gut.”
“You are What You Eat.”



"Dis-moi ce que tu manges, je te dirai ce que tu es." [**Tell me what you eat and I will tell you what you are**]. **Anthelme Brillat-Savarin** wrote, in *Physiologie du Gout, ou Meditations de Gastronomie Transcendante, **1826**.*

“Health Starts from the Gut.”
“You are What You Eat.”





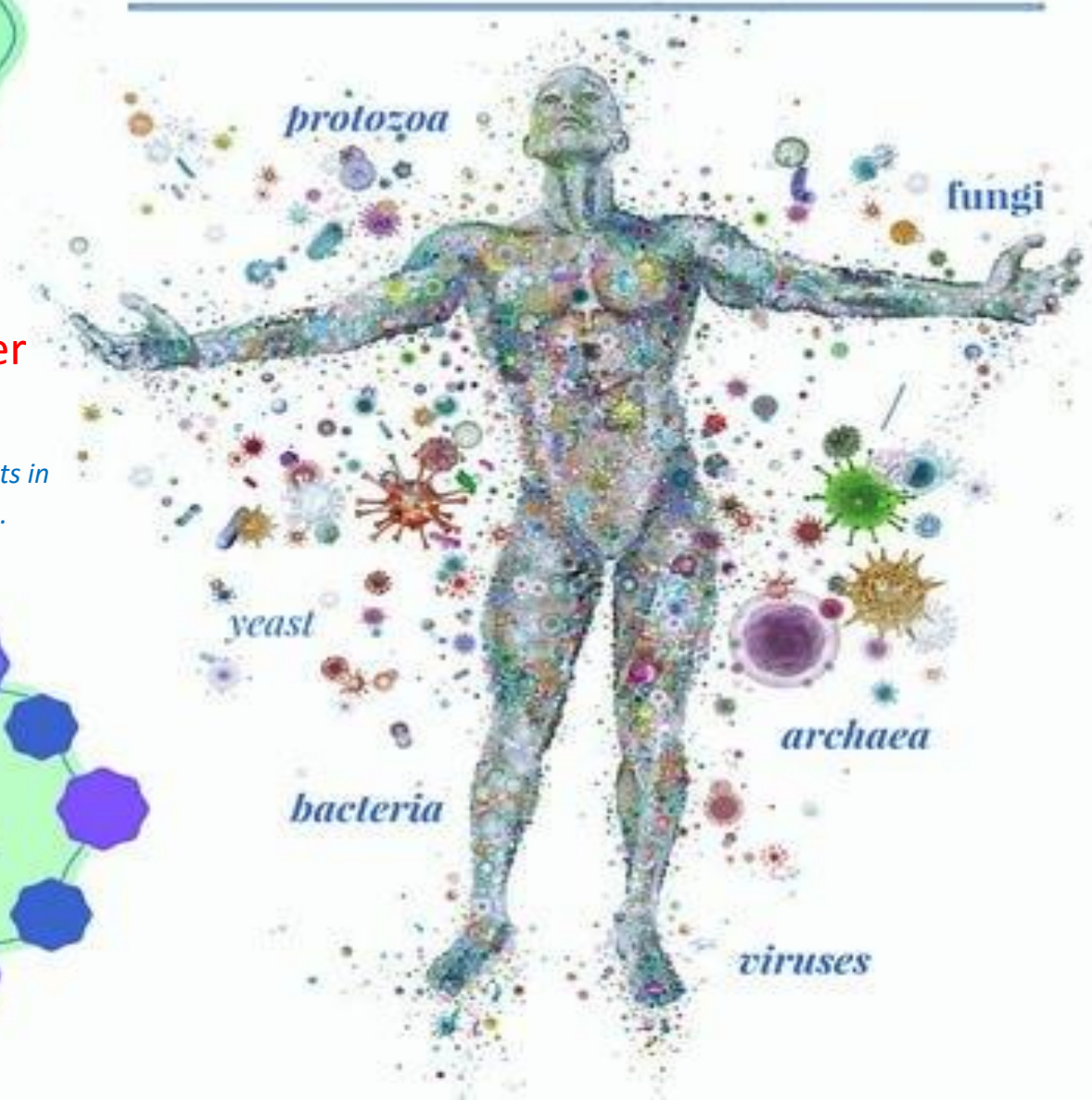
The Human Microbiome

Bacteria, fungi and viruses **outnumber human cells by 10 to 1.** The microbes **synthesize key nutrients, fend off pathogens** and **impact everything** from wt. gain to brain development.

- **600+ species in the mouth, pharynx and respiratory system**
- **1,000 species in the skin**
- **25 species in the stomach**
- **500-1,000 species in the intestine**
- **60 species in the urogenital tract**

4 pounds

THE HUMAN MICROBIOME



90% bacteria

The **microorganism population** is **10 times larger** of the total number of our **somatic and germ cells.** *(Serena Schippa., Dysbiotic Events in Gut Microbiota: Impact on Human Health. Nutrients. 2014 Dec; 6(12): 5786–5805)*

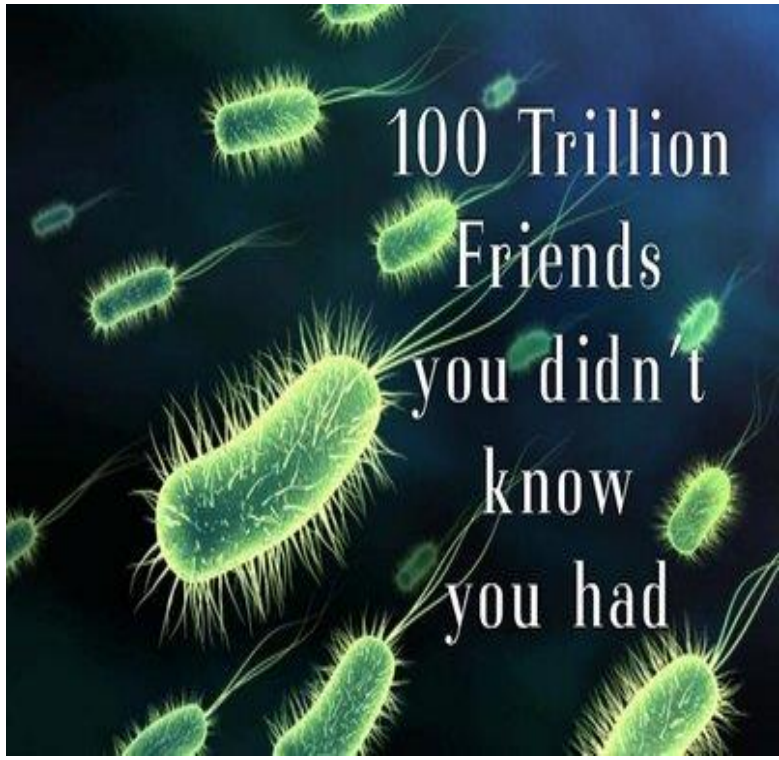
By some estimates, **100 trillion microbes** live within each human individual. *(Tierno PM., The secret life of germs. New York:2001)*

10:1

More bacterial DNA

Microflora-Microbiota-Microbiome

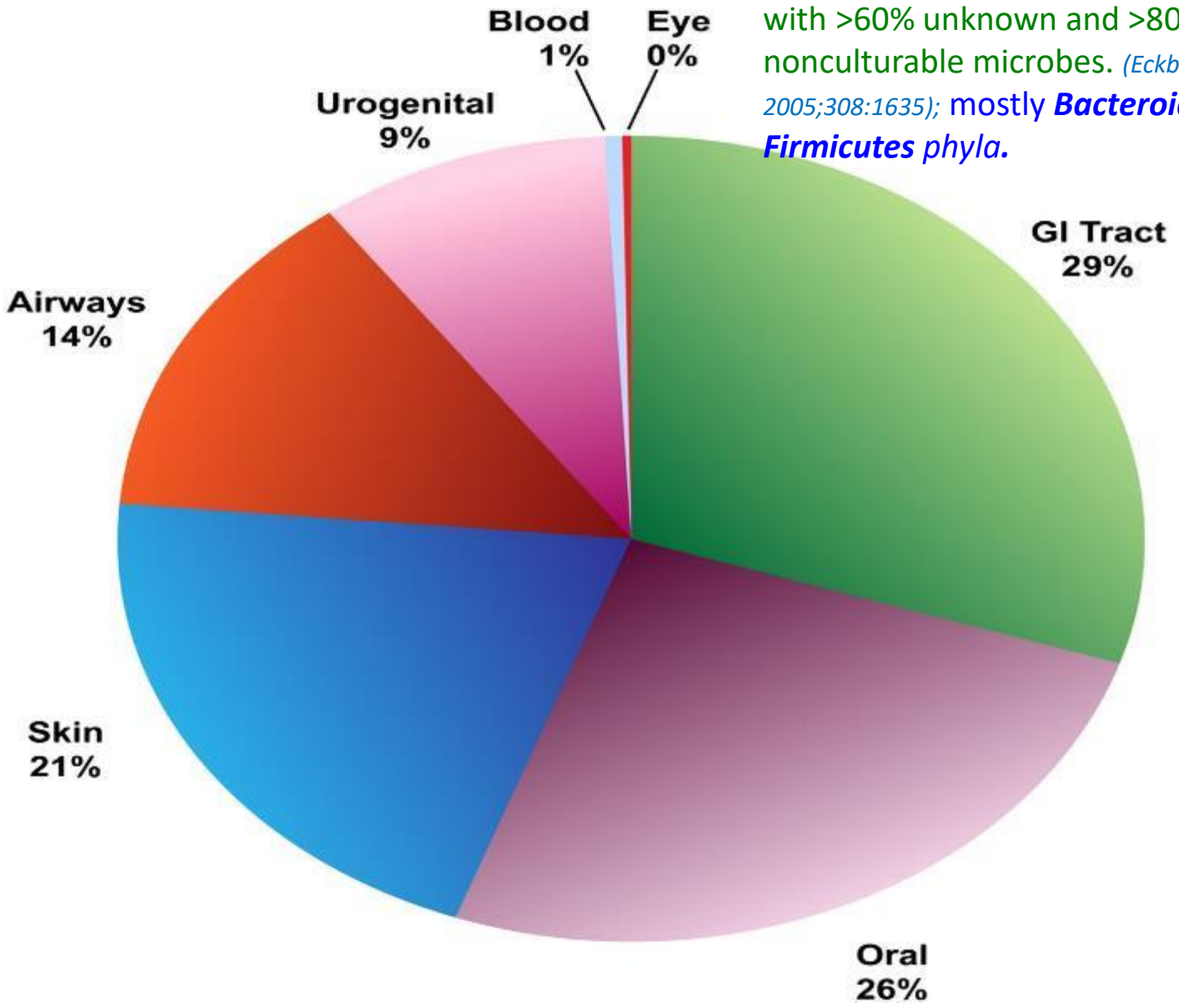
- **'Microflora':** in older times, **bacteria** were classified in the **'Plant' Kingdom**, thus the term **'Flora'.**
- **'Microbiota': a collection or community of microbes, the microbial inhabitants of an certain location,** (modern term of microflora).
- **'Microbiome'**: all the microbes in a community or **the full collection of genes of all the microbes in a community**
  → **a counterpart to the human genome** (all of our genes).
  The genes in microbiome outnumber the genes in our genome by 100 to 1!



Bacterial distribution by body site.

Human GI tract contains a complex microbiota, **800-1,000 bacterial species**, with >60% unknown and >80% of nonculturable microbes. *(Eckburg PB, Science. 2005;308:1635);* mostly ***Bacteroidetes*** and ***Firmicutes*** *phyla.*

Skin on **human forearm, a less complex microbiota area**, may foster **> 182 bacterial species**. *(Gao Z, Proc Natl Acad Sci USA, 2007;104:2927)*

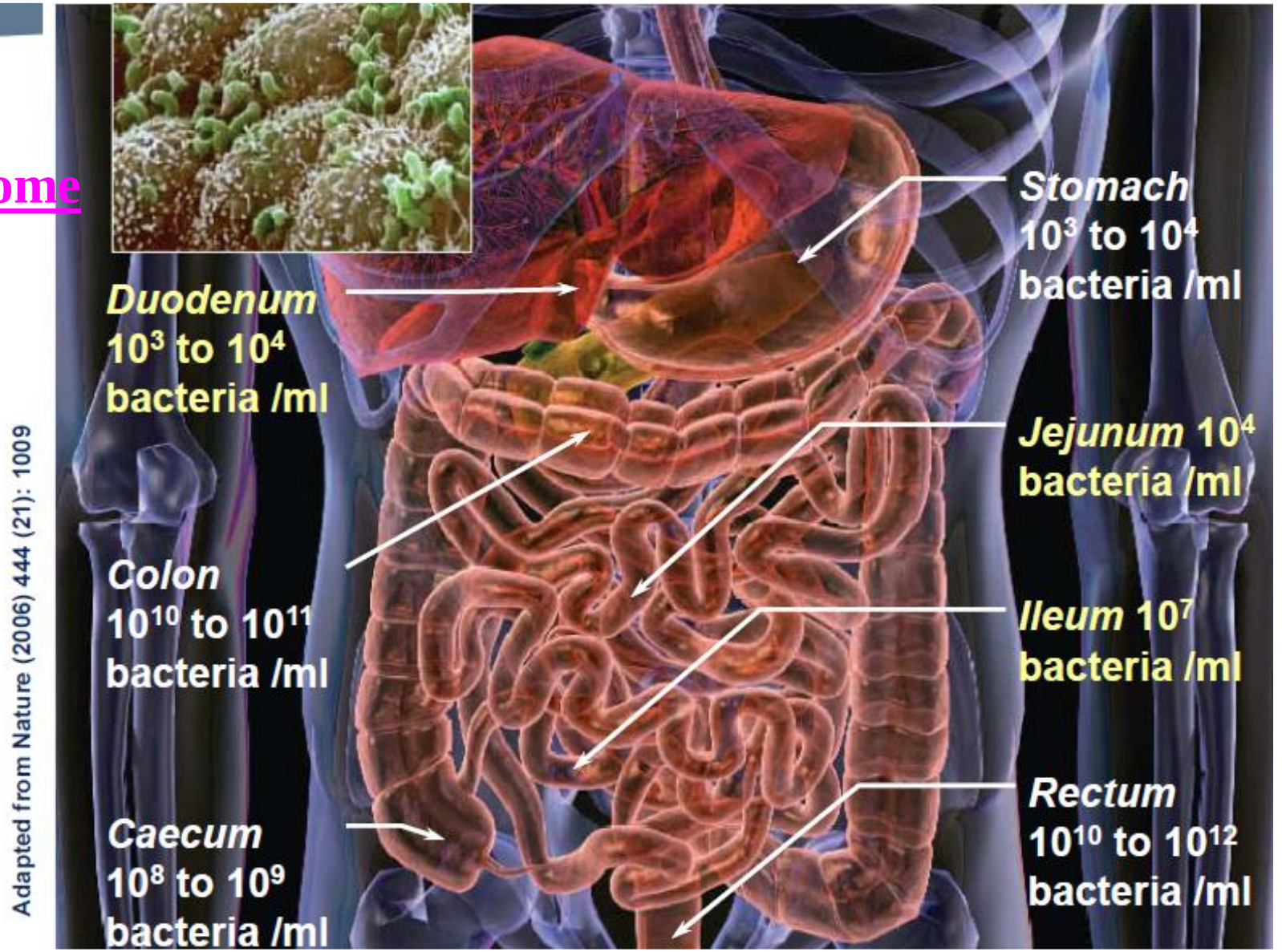


(The NIH HMP Working Group et al. Genome Res. 2009;19:2317-2323)

Skin Microbiome

- The skin microbiome: **bacteria, fungi, viruses** and **archaeal** communities. *(Kong HH, et al. Performing skin microbiome research: a method to the madness. J Invest Dermatol. 2017;**137**:561-568)*
- The **skin microbiome** is influenced by **age, gender, ethnicity, climate, UV exposure** and **lifestyle factors**. *(Zhu TH, et al. Epithelial barrier dysfunctions in atopic dermatitis: a skin–gut–lung model linking microbiome alteration and immune dysregulation. Br J Dermatol.2018;179(3):570-581)*
- Significantly diverse bacterial phyla exist on healthy skin with **site-specific: *Propionibacterium*** species are **predominantly** found in **acidic pH & sebaceous sites**, ***Corynebacterium*** and ***Staphylococcus*** species occurring in **moist microenvironment** (armpit, behind the knee)**.**
- **Dry areas** of the skin have the **lowest absolute number of bacteria.**
- ***Malassezia*** represents the **predominant fungal flora on human skin**. *(Byrd AL, et al. The human skin microbiome. Nat Rev Microbiol. 2018;**16**:143-155.)*
- **Extrinsic factors: geographic location, diet, occupation, the use of antibiotics** or **cosmetics** can **influence skin microbiota**. Studies indicate that **ALTERATIONS IN SKIN MICROFLORA** play a significant role in conditions such as **ATOPIC DERMATITIS, PSORIASIS, ACNE AND SKIN CANCER.** *(Zeeuwen PL, **Microbiome and skin diseases**. Curr Opin allergy Clin Immuol 2013;13:514-420.), (Yu Y, et al. The role of the cutaneous microbiome in skin cancer: lessons learned from the gut. J Drugs Dermatol 2015;14(5):461-465)*

The GI Microbiome



"**The colon**" is the **highest** recorded for any **microbial habitat**."

(Serena Schippa, Nutrient 2015)

Functions of Gut Microflora

Development of mucosal barrier

GIT Motility & Function

Immune system activation

Synthesis of vitamins

Inhibition of Pathogen

Reduction in pH in large bowel

Metabolism of bile acids

SCF: butyrate for intestinal epithelial cell proliferation, differentiation

Production of short-chain fatty acids

Digestion and Nutrients Absorption, Metabolism of plants & drugs

GUT INTOXICATION = DYSBIOSIS

- In 400 B.C., **Hippocrates** stated that…**'DEATH SITS IN THE BOWELS'**
  …'Bad digestion is the root of all Evils.'
  ➔ the start of **'BOWEL TOXEMIA'** theory.
- **Excess food intake** or the intake of **wrong types of food** ➔ **INTESTINAL TOXEMIA**
  ➔ **↑growth of bacteria** in bowel ➔ **DISEASE(S).**

"All disease begins in the gut"
"A bad digestion is the root of all evil"
"Death sits in the bowel"
Hippocrates, circa 400 BC

- **Vegetarian** and mostly **raw diet** would **prevent build-up of intestinal toxins** ➔ **prevent/cure disease.** *(Louis Kuhne, naturopath, late 19th century) (Hawrelak J.A., et al., The cause of Intestinal Dysbiosis: A Review. Altern Med Rev; 2004, 9(2): 180-197)*

"GUT MICROBIAL IMBALANCE = DYSBIOSIS"

(Serena Schippa, Dysbiosis Events in Gut Microbiota: Impact on Human Health. Nutrients 2015; Dec;6(12):5786-5805)

Gut Intoxication/Dysbiosis Contributing factors

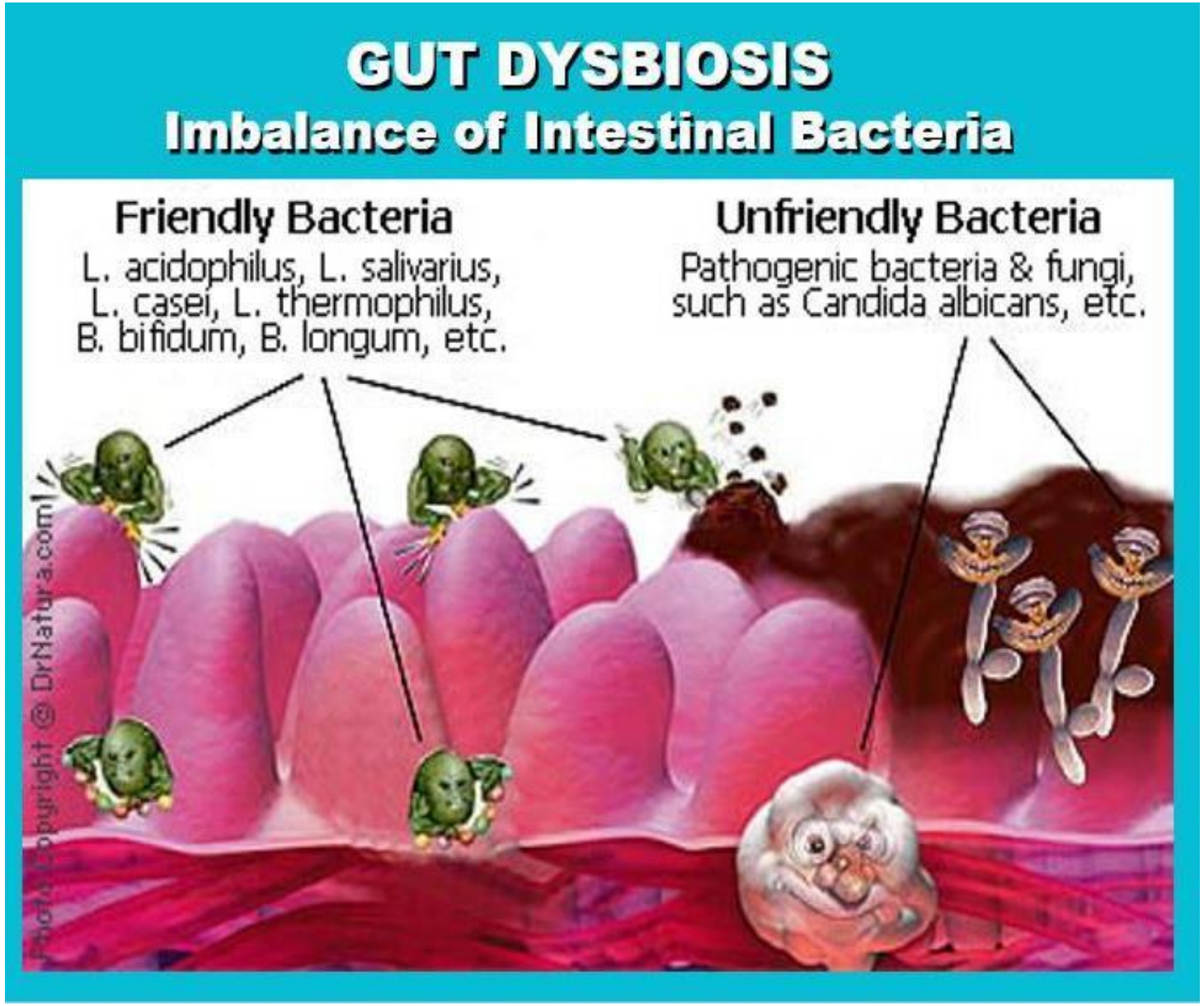
- **(Western) Diet:** rich in **Sugar, Dairy products, animal meat, fat, Processed food, Alcohol, Microwaved food, Soda, low fiber, low vegetables**, etc.
- **Medication: (allopathic drugs** esp**. antibiotics)**
- **Antibiotics:** (broad Spectrum/ in meat products) affecting the composition of the microbial community ➔ **↓natural defense mechanisms ➔ ↑pathogenic bacterial/yeast overgrowth ➔ serious infection**
- **Stress:** Physical/Mental ➔ **compromise immune system**
- **Illness: Malnutrition, ICU patients,** etc.
- **Aging:** ➔ **disruption** of the normal **intestinal microflora**

DYSBIOSIS ➔ impairment of intestinal permeability and **barrier function ➔ LEAKY GUT ➔ ENDOTOXAEMIA**

GUT INTOXICATION = DYSBIOSIS

- **"DYSBIOSIS" = Altered pathogenic bacteria in the Gut → Diseases** including **Aging.** *(Metchnikoff E. (Nobel prize), "The Prolongation of Life: Optimistic studies." London: William Heinemann; **1907**:161-183)*
- **"DYSBIOSIS"** is a condition indicating a **microbial ecosystem** where **bacteria do not live in mutual accord**, when the **"good", bacteria were not successfully controlling the "bad" ones**. *(Serena Schippa, Dysbiosis Events in Gut Microbiota: Impact on Human Health. Nutrients 2015; Dec;6(12):5786-5805)*
- **"DYSBIOSIS" :** a state in which the **microbiota produces harmful effects** via:
  1. **Qualitative & Quantitative changes in the intestinal flora** itself
  2. **Changes in their metabolic activities**
  3. **Changes in their local distribution**

  (Holzapfel WH, et al., Overview of gut flora and probiotics. Int J Food Microbiol 1998;41:85-101)



Dysbiosis = Dysbacteriosis

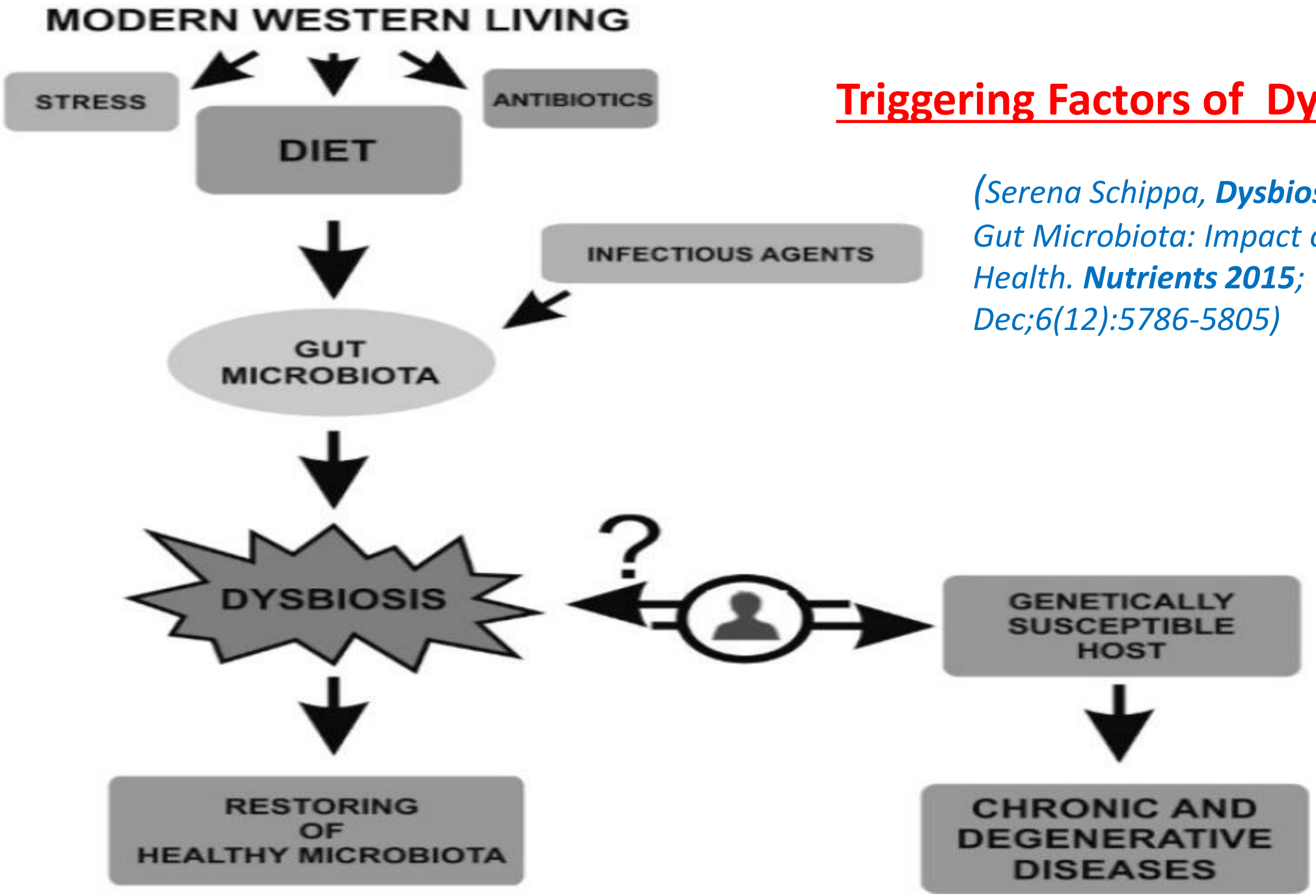
DYSBIOSIS (= **shifts in microbial community composition**) can **destroy the mutualistic relationships**, and **influence host physiology**, **COMPROMISING HUMAN HEALTH STATUS.**

(Hawrelak J.A., The causes of intestinal dysbiosis. Altern. Med. Rev. 2004;9:180–197)

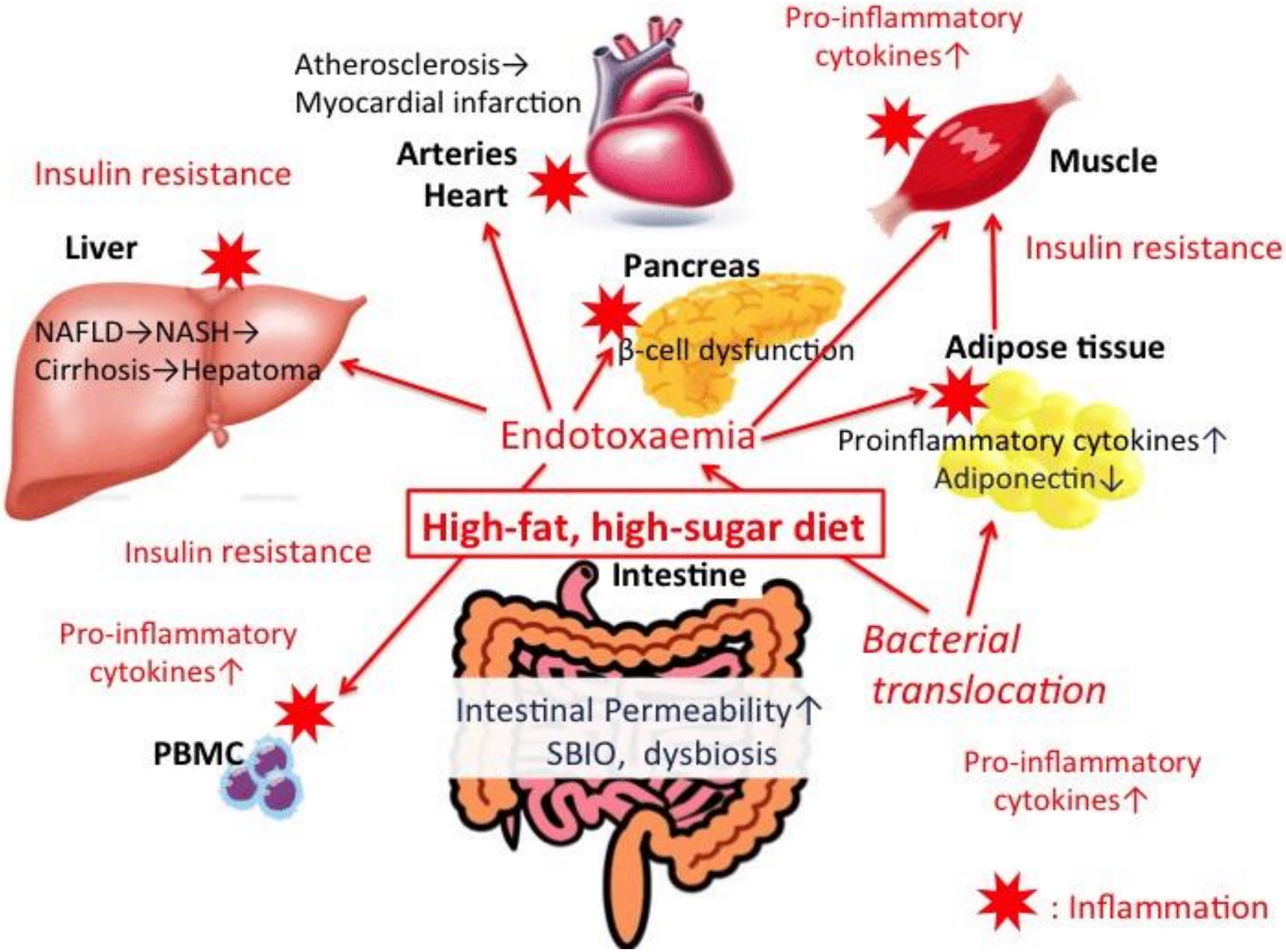
DYSBIOSIS

- **HF/HS diet (Western Diet) led to dysbiosis** in mice:
  ➔ ↑ **Escherichia coli population**
  ➔ ↓ **mucus layer thickness**
  ➔ ↑ **intestinal permeability**
  ➔ ↑ **TNFα secretion** (→ **systemic/acute inflammation**)
  ➔ **a higher ability** of **AIEC** (adherent-invasive E. coli) **bacteria** to **colonize the gut mucosa** and to **induce inflammation**.
- **Western diet** induces ***changes in gut microbiota composition, alters host homeostasis and promotes AIEC gut colonization*** in genetically susceptible mice.
  *(Martinez-Medina M:*High Fat/High Sugar (HF/HS) Western diet effects on gut microbiota composition, barrier integrity and susceptibility to infection in mice. Gut 2014 Jan;63(1):116-124)

Triggering Factors of Dysbiosis



(*Serena Schippa, **Dysbiosis** Events in Gut Microbiota: Impact on Human Health. **Nutrients 2015**; Dec;6(12):5786-5805)*



Gut Dysbiosis

➔ **Intestinal epithelial barrier dysfunction**

➔ **↑ permeability**

➔ **translocation of bacterial fragments & endotoxaemia**

➔ **low-grade inflammation** in various tissues. *(Hiroshi Fukui, et al., The Gut Impacts Diabetic Management Tomorrow: The Recent Messages from Intestine and Microbiota. J of Nutrition & Dietetics. Vol.2 No.4:20, 2016)*

GUT INTOXICATION = DYSBIOSIS

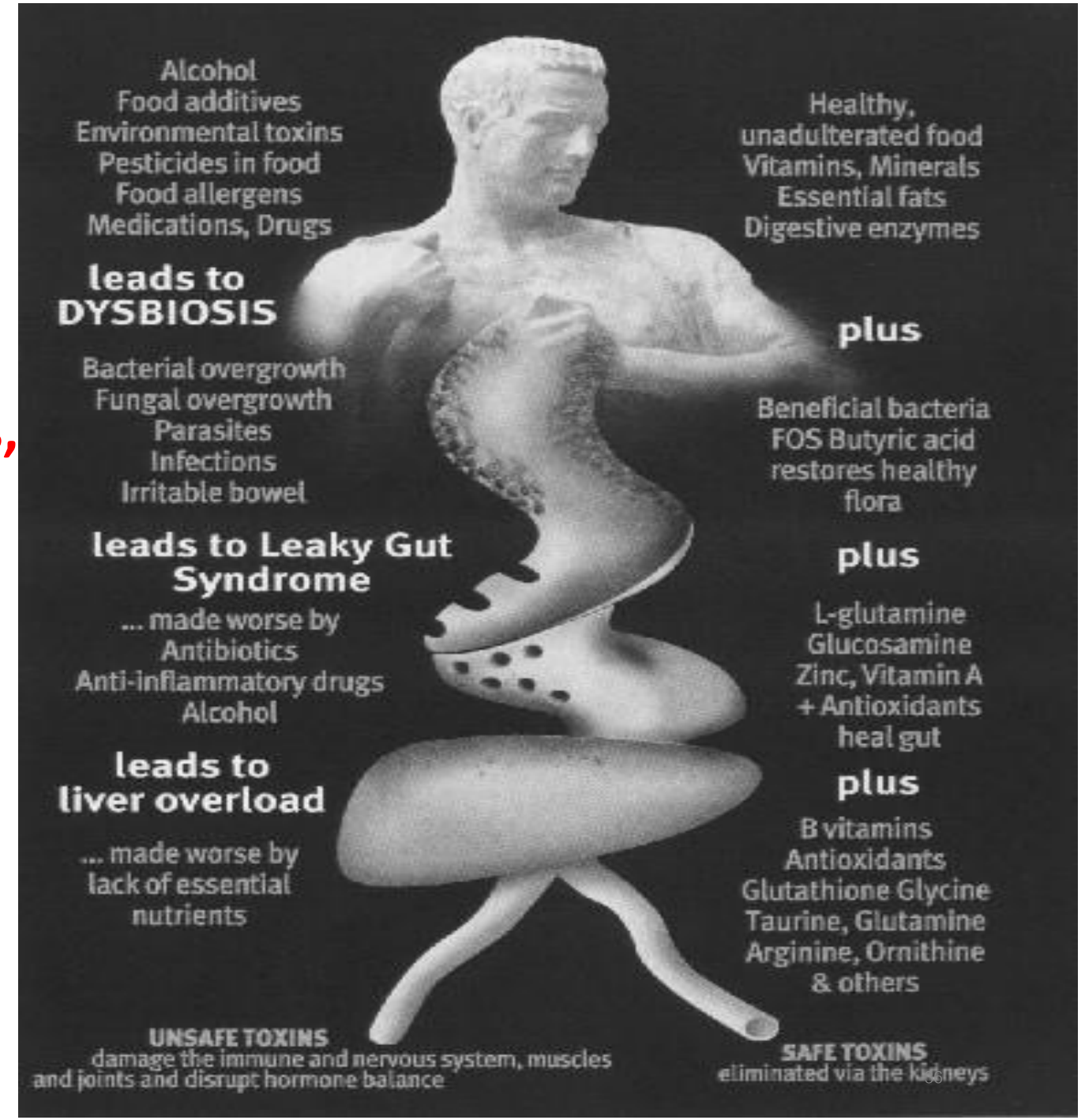
Intestinal 'Dysbiosis' has been linked to **Chronic Degenerative/Inflammatory Diseases** *(Hawrelak J.A., The causes of intestinal dysbiosis: a review. Altern. Med. Rev. 2004 Jun;9(2):180-97.)*, including:

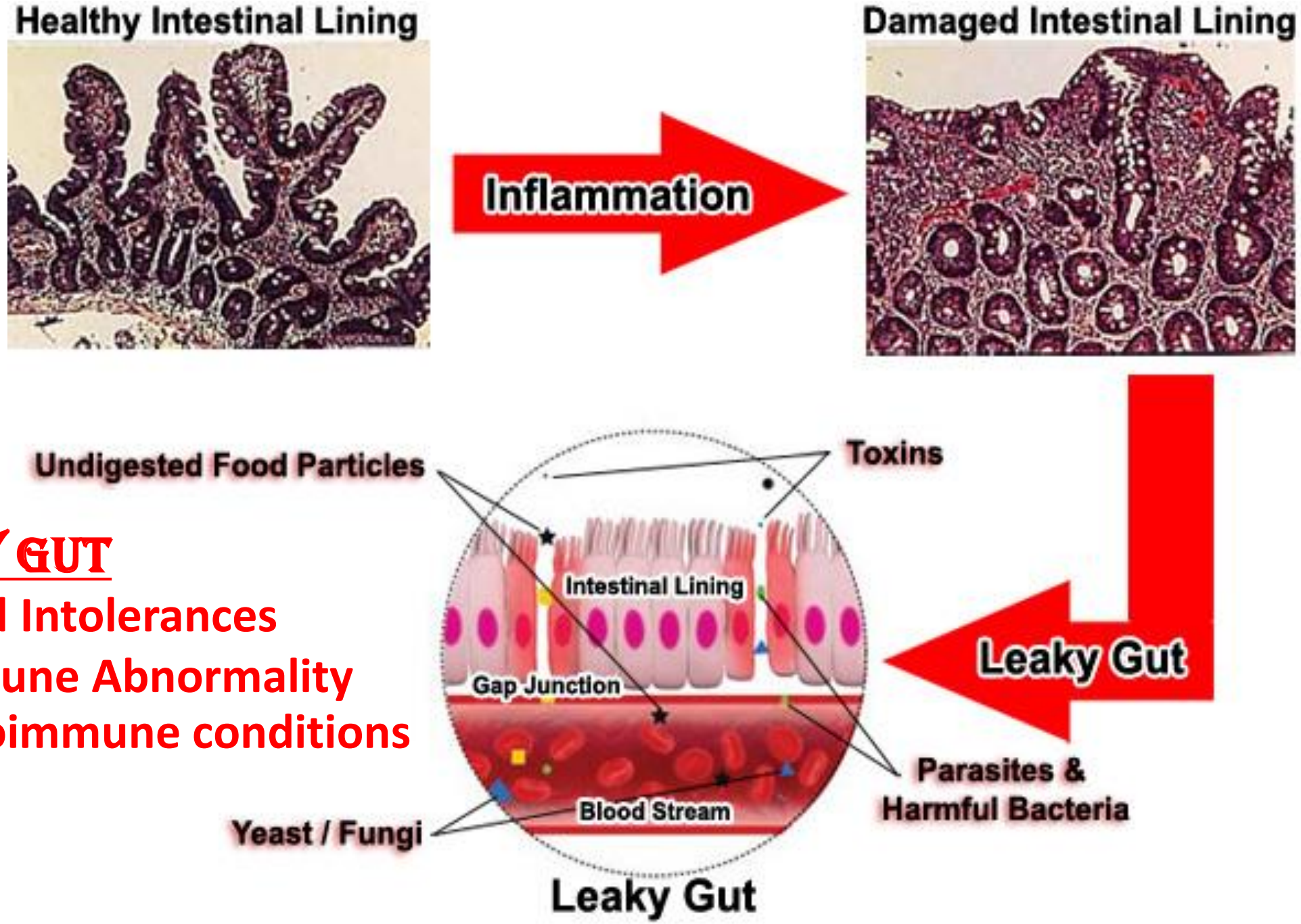
- **Autoimmune and/or autoinflammatory disorders**, such as Inflammatory bowel disease (**IBD**),Irritable bowel syndrome (**IBS**), Rheumatoid arthritis, Ankylosing spondylitis, etc. *(Linskens RK., Scand J Gastroenterol Suppl 2001;234:29-40)* *(Peltonen R. Br J Rheumatol **1997**;36:64-68)*
- **Metabolic disorders**, such as, **obesity**, **type 2 diabetes**, etc. *(Cani P.D., et al., Changes in gut microbiota control metabolic endotoxemia-induced inflammation in high-fat diet-induced obesity and diabetes in mice. Diabetes. 2008;57:1470–1481.)*
- **Allergies** *(Noverr M.C., The "microflora hypothesis" of allergic diseases. Clin. Exp. Allergy. 2005;35:1511-20)*
- **Neurological disorders** *(Frank D.N., et al. Investigating the biological and clinical significance of human dysbiosis. Trends Microbiol. 2011;19:427–434.)*
- **Skin Disorders (Eczema, Acne, Seborrheic Dermatitis, Rosacea, Atopic Dermatitis, Psoriasis,** etc.) *(Alexandra R Vaughn, et al., Skin-gut axis: The relationship between intestinal bacteria and skin health. World J Dermatol. Nov 2, **2017**; 6(4): 52-58)*

Leaky Gut Syndrome

= ***an increase of intestinal permeability***

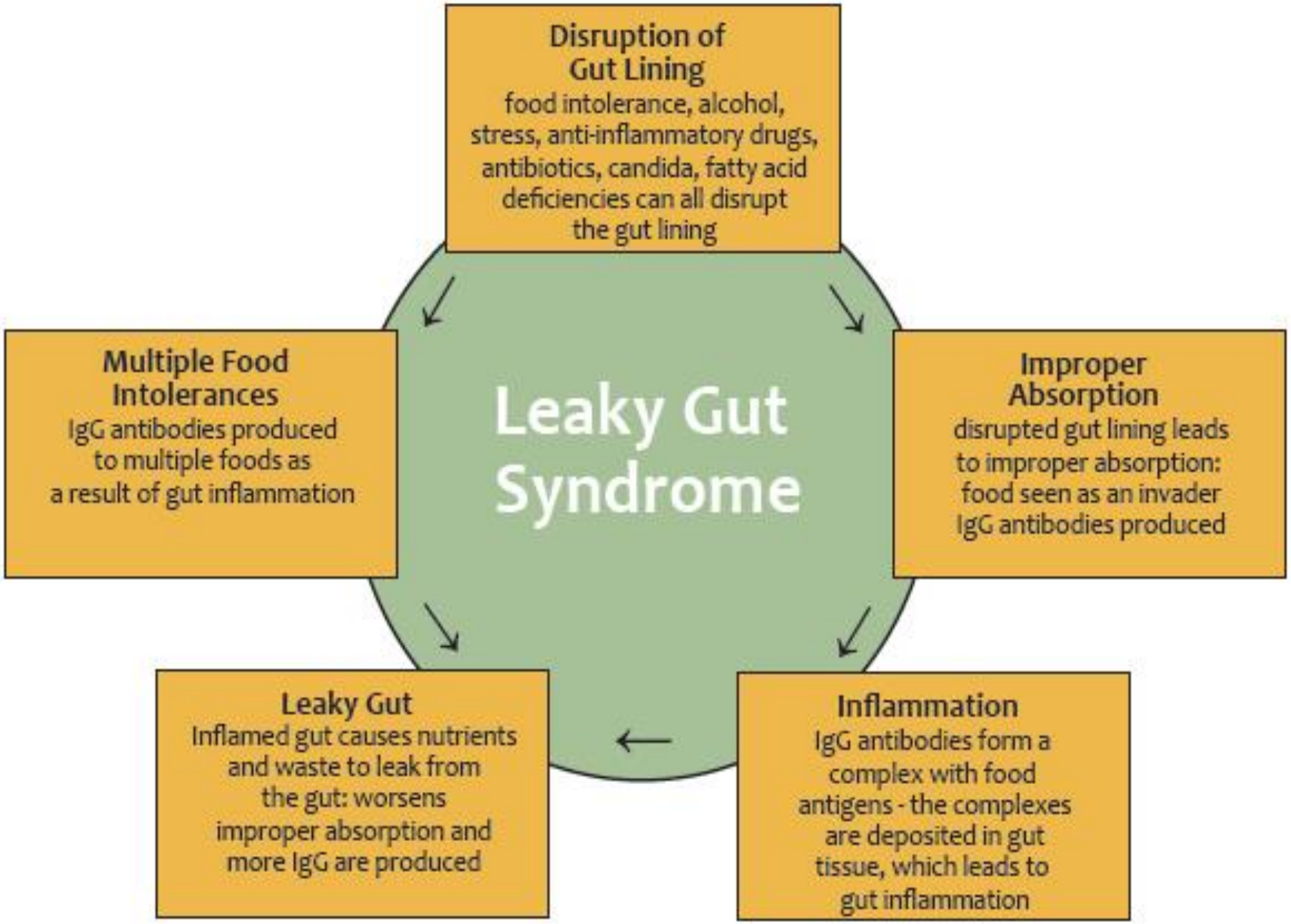
- **Macromolecules, undigested fats, proteins, starches, microbes** and **toxins** leak the gut wall into bloodstream.
- **Overworks the liver**
- **Triggers the immune system**
- **Allergic reactions, Pain & Inflammation all over the body**





LEAKY GUT

- ➔ Food Intolerances
- ➔ Immune Abnormality
- ➔ Autoimmune conditions



Source: http://allergytreatmentservices.com/digestion.html

Leaky Gus causes:
Poor Diet, Alcohol, Stress,
Allopathic drugs
Heavy Metals
➔Dysbiosis
➔ ↑ intestinal permeability
➔ Endotoxin
➔ Inflammation & Degeneration

Current mechanisms for macro-components of the modern diet altering susceptibility to infection, allergy, autoimmunity and systemic inflammation.

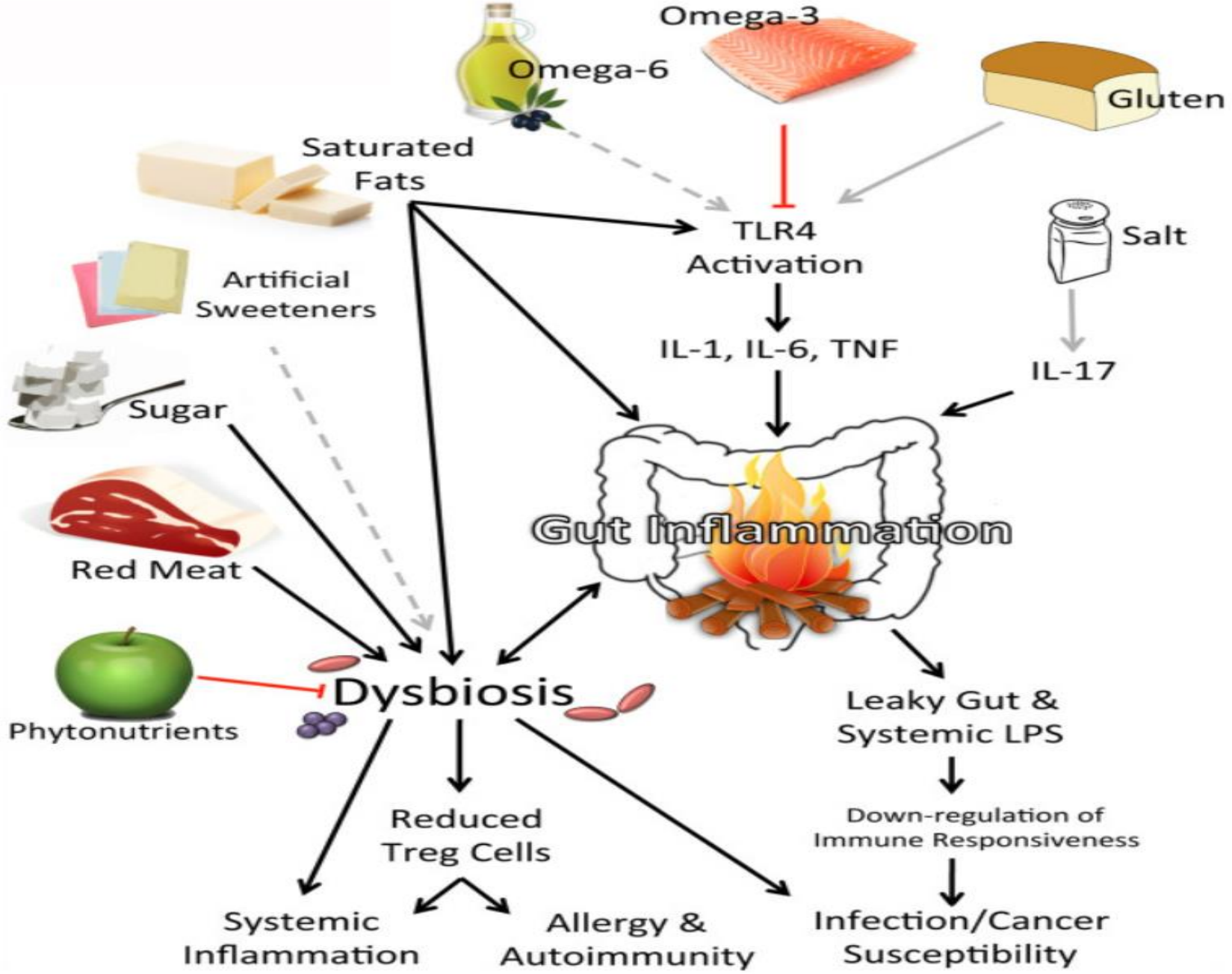
Solid black lines indicate **direct** human evidence for **enhancement** is present;

Solid red lines indicate **direct** human evidence of **inhibition exists**;

Grey lines indicate only **in vitro or animal model evidence** exist currently;

Dotted lines indicate **significant disagreement** within the scientific literature.

TLR4- Toll-like receptor 4; IL-Interleukin;
TNF- tumor necrosis factor;
Treg- T-regulatory cell. *(Nutr J. 2014;13:61)*



https://www.ovarian-cysts-pcos.com/pcos-causes-gut-dysbiosis.html

Health Problems related to Leaky Gut Syndrome

- **IBS, IBD, Ulcerative colitis, Chronic hepatitis, Celiac disease, Crohn's disease, Colon cancer, malnutrition, Pancreatic/liver dysfunction**
- **Chronic skin inflammation, Acne, Rosacea, Hives, Seborrheic Dermatitis, Psoriasis, Atopic Dermatitis,** etc.

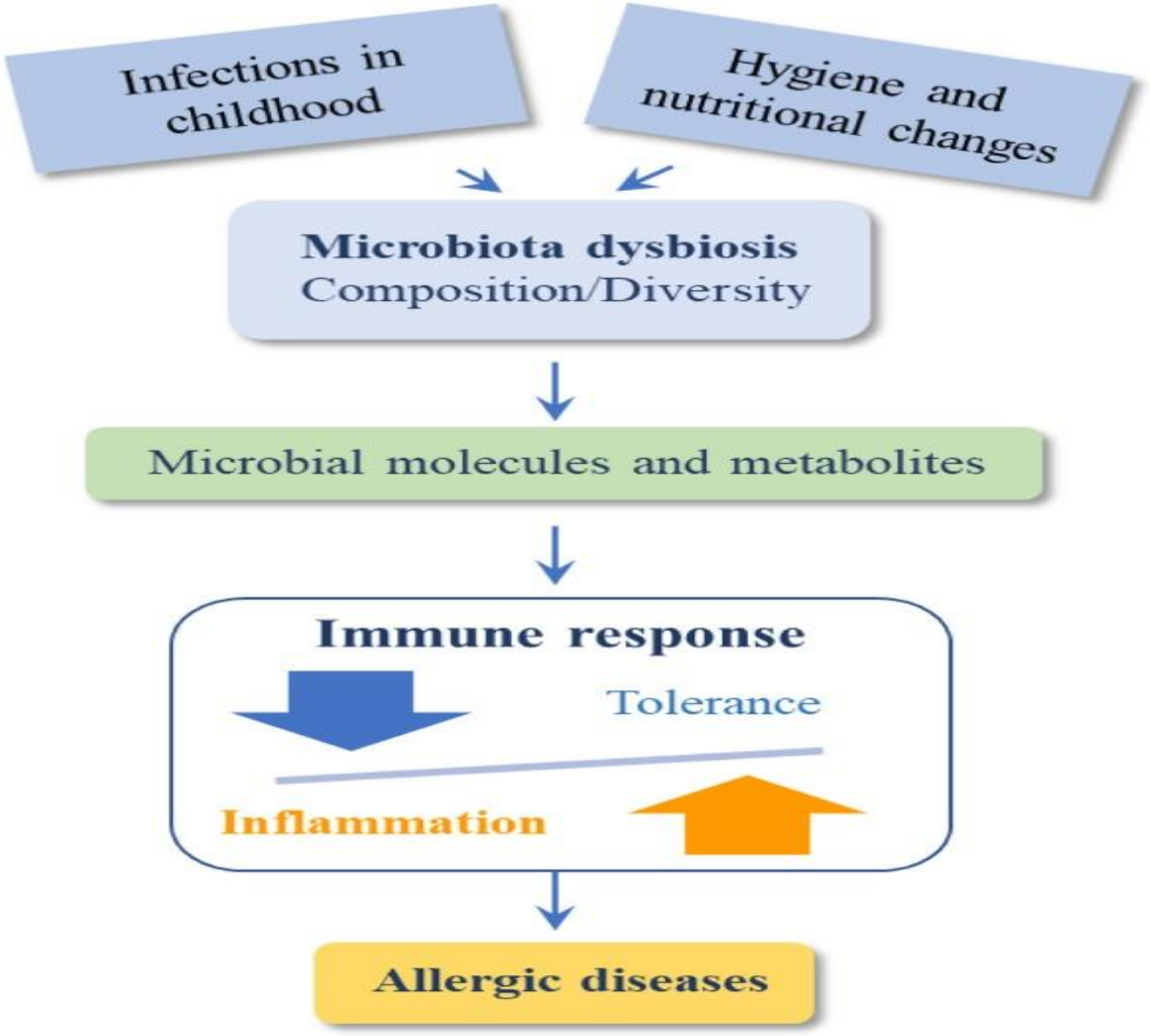
  …if in a case of **urticarial we look to the intestinal track,**

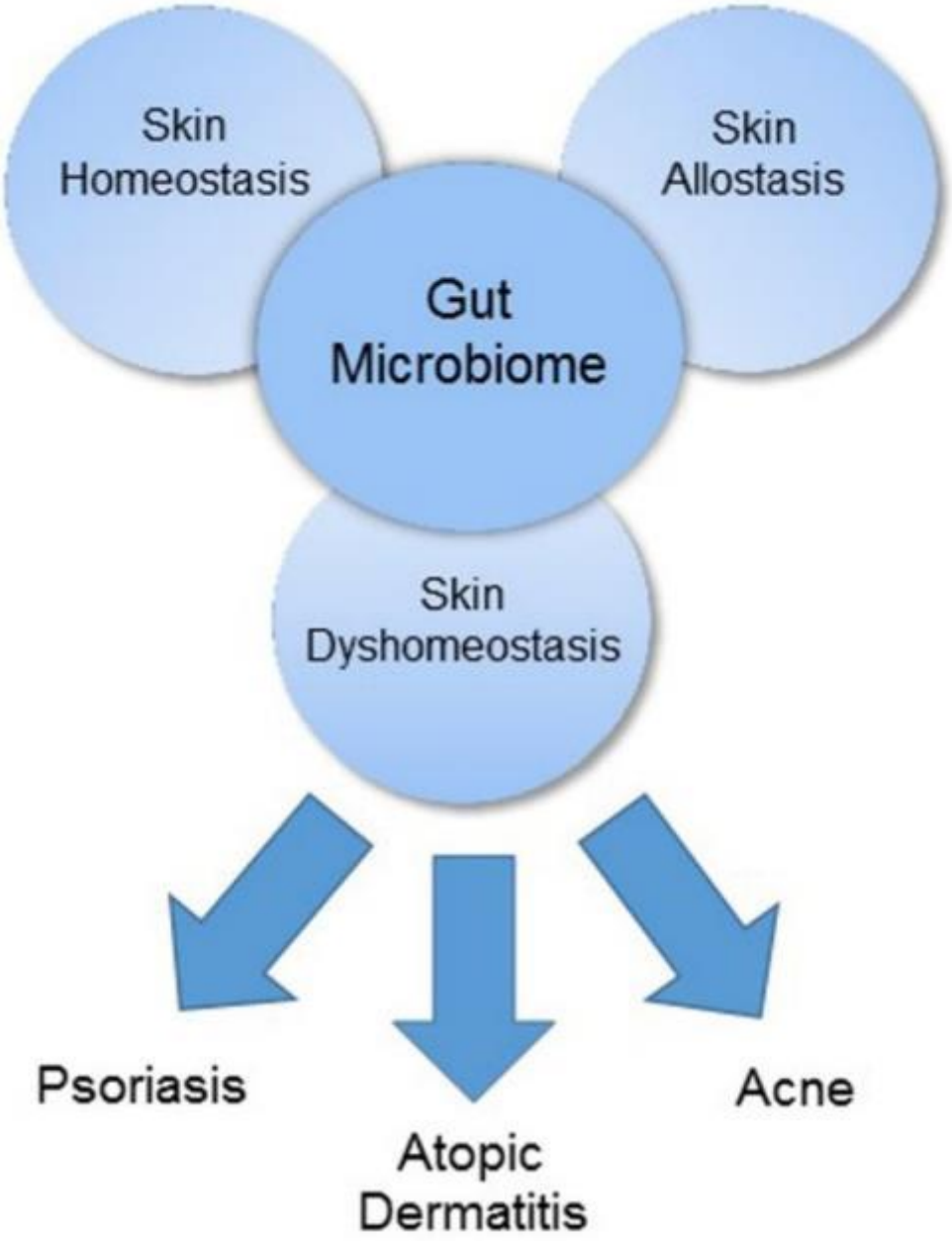
  why not in eczema and acne?"

  *(Mack M. Intestinal toxemia. Illinois Med J. **1911**;311-316)*
- **Auto-Immune Disease: SLE, Multiple Sclerosis, Fibromyalgia, CFS**
- **Autism, Schizophrenia**
- **Asthma, Arthritis, AIDS, Endotoxemia, Alcoholism**

Skin-Gut Axis:

- Both **Skin & Gut** contain **rich vascular supply, diverse microbial communities**, and act as **vital interfaces between the internal human body and the external environment**.
- **Both** operate as **neuro-immuno-endocrine organs**, essential communication with the nervous system, immune system, and endocrine system. **The harmonial balance in these microflora** is important in **maintaining homeostasis**.
- **ALTERATIONS IN MICROBIOTA COMPOSITION** have been related to different **intestinal & extra-intestinal diseases** such as **PSORIASIS** and **ROSACEA.**
- Modulation through **Prebiotics** and **Probiotics** may **prevent** or **resolve** such diseases. *(Alexandra R Vaughn, et al., **Skin-gut axis: The relationship between intestinal bacteria and skin health.** World J Dermatol. Nov 2, 2017; 6(4): 52-58)*





Dysbiosis induce qualitative and quantitative **changes in the microbiota** that **directly affect immunological mechanisms** leading to **allergic diseases.** (Mariona Pascal et. al., Front Immunol. 2018; 9: 1584)

Skin-Gut Axis:

Diet & Acne

- It is generally accepted that **high fat diets** lead to **gut dysbiosis**, reflected by a ↓ ***Bacteroidetes*** **species** and ↑ **in** ***Firmicutes*** **species**.
- "**Western Diet**" induced **gut dysbiosis** may be associated with **cancer**, **atherosclerosis** and **heart disease**, **insulin resistance** and even **disorders of the CNS.**
- **There is growing evidence regarding the link between Diet and Skin conditions.**
- **Diet** plays an important role in the **pathogenesis of skin diseases.** For example, the **western diet** consisting of large amounts of **saturated fats** and **high glycemic load** has been **strongly associated with ACNE.**

(Cordain L, Acne vulgaris: a disease of Western civilization. Arch Dermatol. 2002;138:1584-1590),

(Grossi E, The constellation of dietary factors in adolescent acne: a semantic connectivity map approach. J Eur Acad Dermatol Venereol. 2016;30:96-100)

Gut Health and Skin

- **Alteration of intestinal flora compromised intestinal lining ➔ bacteria and endotoxins in blood.**
- **66% of 57 pts. with Acne showed positive reaction to stool-isolated Coliforms vs. none** of control gr. **without active skin disease**.
  *(Strickler A, et al. J Cutaneous Dis. **1916**,34:166-78)*

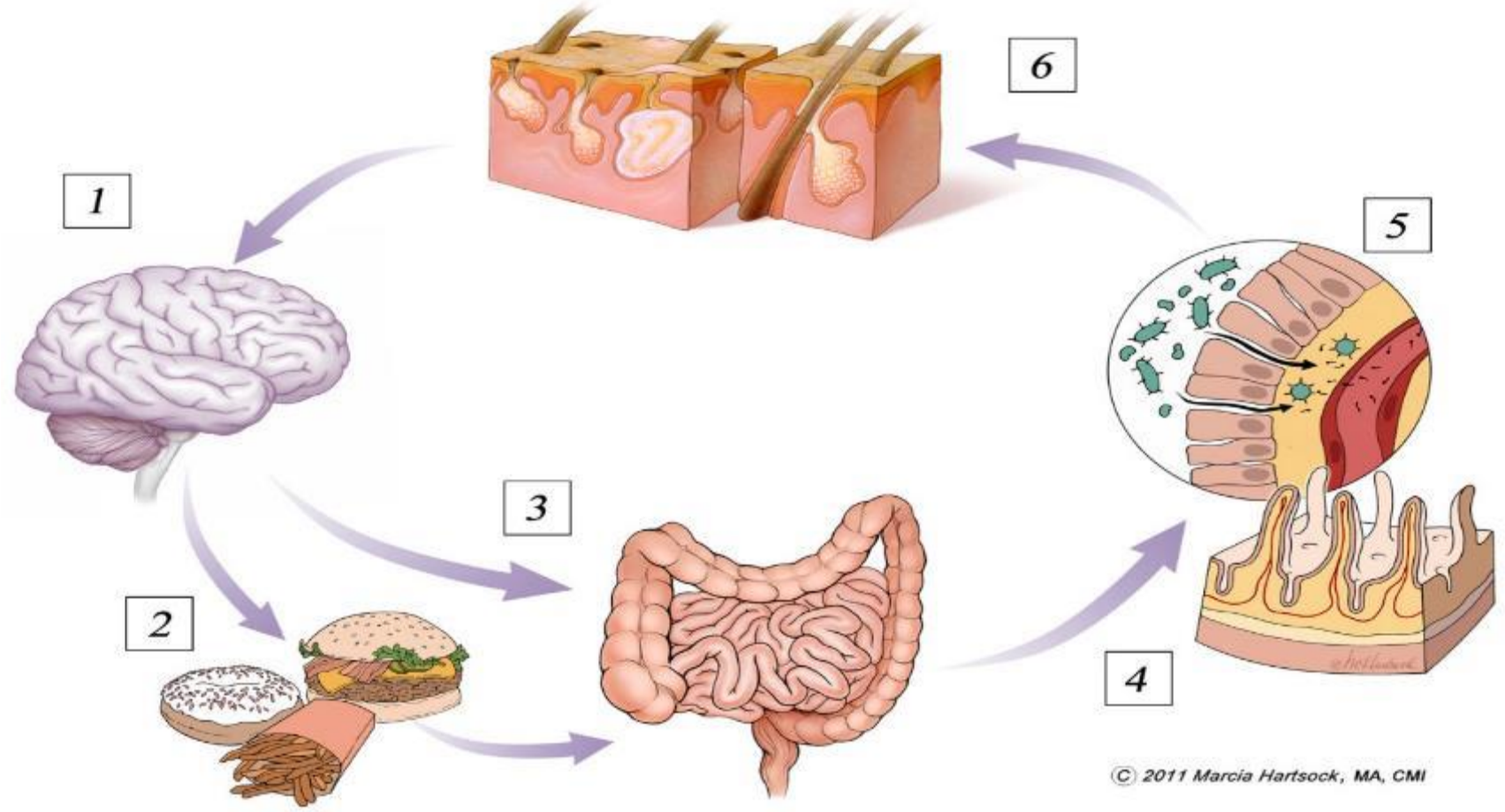
- **40 acne pts. showed the presence of and high reactivity (65%) to *E. Coli* LPS** (lipopolysaccharide) **endotoxin** in the blood VS. **none** of the matched controls.
  (Juhlin L, et al. Acta Derm Venereol 1983, 63:538-40)

The Gut-Brain-Skin Axis

- **In 1930,** 2 dermatologist John H. **Stokes** and Donald M. **Pillsbury** first proposed '**an important linkage of emotion with cutaneous outbreaks (erythema, urticaria, dermatitis, etc.) and bacteriology of the GI tract'.** ➔ **"The Stokes-Pillsbury theory"**
- **Skin** is influenced by **Emotional** and **Nervous states** (depression, worry, anxiety) which **altered** GI tract functions and **microbial flora** ➔ **↑intestinal permeability** ➔ **promotes inflammation.**
- ***"Stress*** ➔ **alterations of *intestinal microflora*** ➔ **systemic and local *skin inflammation*."**

*(Stokes JH, Pillsbury DH: Arch Dermatol Syphilol **1930**,22:962-93)*

Potential Pathways of the Gut-Brain-Skin Axis in Acne Vulgaris

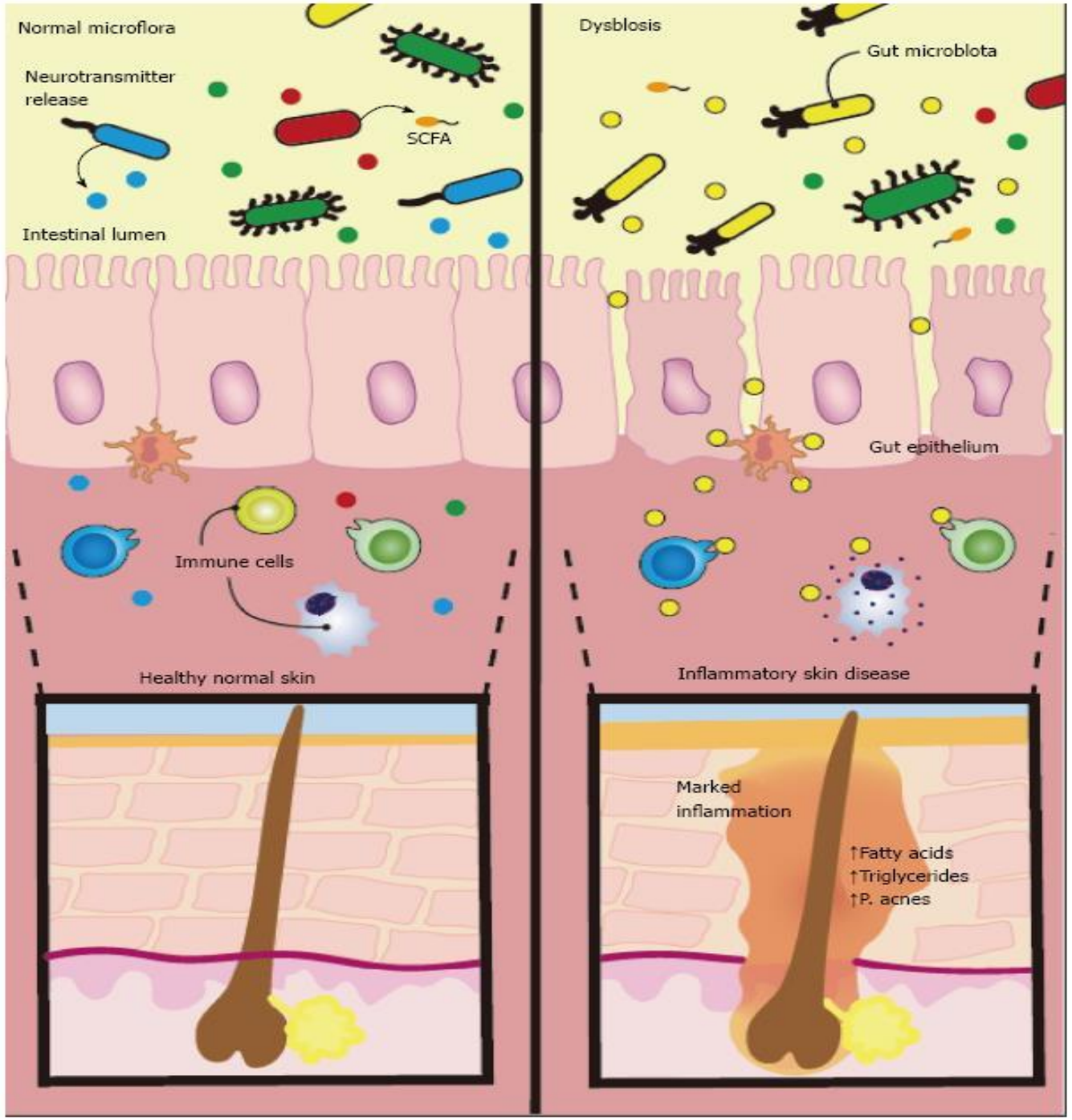


Psychological distress(1) +/- high fat diet, processed foods devoid of fiber (2) ➔ alterations of gut motility (3) and microbiota profile (4). Loss of normal microbial biofilm (*Bifidobacterium* in particular) ➔ intestinal permeability and endotoxins gain systemic access (5) ➔ ↑inflammation & oxidative stress ➔ excess sebum production, exacerbations in acne & additional psychological distress.

Both probiotics and antimicrobials may play a role in cutting off this cycle at the gut level.

Gut Health & Acne

- **Intestinal stagnation** was reported in 47% of acne pts. (n=30). **Constipation** was a **clinical complaint in 40% of acne pts**.
  *(Ketron LH, JAMA **1916,** 60:671-75)*
- **Constipation** is more prevalent in **acne pts**., an '**important factor**'.
  *(Cleveland DEH, Can Med Assoc J **1928**.18:261-66)*
- 57 pts. with **functional constipation**: fecal concentrations of **Lactobacillus** and **Bifidobacterium** were significantly **lower** with significantly **higher intestinal permeability** VS healthy adults without constipation.
  (Khalif IL, et al. Dig Liver Dis 2005, 7:838-49)



The Gut flora produce **neurotransmitters** in **response to stress** that can **modulate skin function**.

These **neurotransmitters cross the intestinal epithelium enter the bloodstream and induce systemic effects.**

The gut microflora also releases **short chain fatty acids (SCFAs),** which can also **enter systemic circulation and affect the skin**.

Additionally, **diet** may **influence inflammation in the skin** via **nutrient signaling** and **release of long chain fatty acids**, leading to **excessive stimulation** of **sterol regulatory element-binding protein 1** (**SREBP-1**) and **increased synthesis of fatty acids** (ex. Free oleic acid) and **triglycerides** promoting

***Propionibacterium acnes* overgrowth**. *(Alexandra R Vaughn, et al., Skin-gut axis: The relationship between intestinal bacteria and skin health. World J Dermatol. Nov 2, 2017; 6(4): 52-58)*

Gut Health & Sebaceous gland diseases

- A Russian study: **54% of acne pts**. have **marked alterations to the intestinal microflora**. *(Volkova LA, et al,: **Impact of the impaired intestinal microflora on the course of acne vulgaris**. Klin Med (Mosk) 2001, 79:39-41, Russian)*
- A study of 13,000 adolescents:➔ those with **Acne** were more likely to have **GI symptoms: constipation, halitosis, gastric reflux,** etc.
- Those with **abdominal bloating** were more likely to be associated with **Acne & Seborrheic diseases.** *(Zhang H., et al: J Dermatol 2008, 35:555-61)*

Probiotics-Diet-Acne

- **Probiotics might influence acne via regulation of glycemic control.**
- A Connection between dietary component (**low-fiber carbohydrates**) and the **increase risk of Acne.**
  (Bowe WP, et al., Diet and Acne. J Am Acad Dermatol 2010, 63:124-41)
- **Regional diets low in processed foods and sugars (overall low glycemic load) ➔ decrease acne risk.**
  Low GI meals ➔ improved acne.
  *(Smith RN, et al., Am J Clin Nutr **2007**, 86:107-15), (Rouhani P, et al., J Am Acad Dermatol 2009, 60(suppl):p706)*

Probiotics in Seborrheic Dermatitis

- **Seborrheic dermatitis**: a subacute or chronic disease of the skin, affecting the seborrhea afflicted areas and presenting with erythema and desquamation.
- → **fungi Malassezia spp**. Scalp seborrhea varies from mild **dandruff** to dense, diffuse, adherent scale.
- A Chinese study: **disruptions of the normal GI microflora in pts. with seborrheic dermatitis.**
  *(Zhang H, et al.: **Quantitative studies on normal flora of seborrheic dermatitis**. Clin J Dermatol **1999**, 32:399-400, Chinese)*
- **Inflammation → Steroid**? → Off & On, ***Not Cure***
- **Yeast → Anti-fungal drugs**?
- **Dry & Scaly skin →** Moisturizer?

Seborrheic Dermatitis

- **Dysbiosis/Auto-Intoxication – Rx. Yeast Overgrowth/ Unbalance of Bowel Flora**
- **Rx. by Balancing Nutrition,**

  ↓ sugar, diary, yeast fermented, **alcohol, processed food**
  + ↑ Probiotics
  ➔ ↓ Inflammation ➔ REVERSE & CURE

Probiotics have been **extremely useful** in the **healing of seborrheic dermatitis**. Probiotics may also **reduce dandruff**.
In one study, 57 men took probiotics or a placebo. Of those who took the probiotics, **72 percent experienced less dandruff.**
Consumption of the **healthy bacteria** also showed to **reduce scalp erythema, itching, greasiness, and scalp Malassezia yeast counts.**
(Dermatology News).

Skin-Gut Axis:

ROSACEA

- **SIBO (S**mall **I**ntestinal **B**acterial **O**vergrowth) **is 10 times more** prevalent in **Acne rosacea VS. healthy controls.**
- **Normalization of the intestinal flora led to improvement of rosacea symptoms.**
- A study of 113 rosacea patients: those with **rosacea** have a higher incidence of small intestinal bacterial overgrowth (**SIBO**) when compared to controls. SIBO pts. were treated with either rifaximin therapy for 10 d or placebo ➔ with **antibiotic therapy** experienced an **improvement** in their symptoms for at least nine months.
  (Parodi A, Small intestinal bacterial overgrowth in rosacea: clinical effectiveness of its eradication. Clin Gastroenterol Hepatol. 2008;6:759-764)
- **Oral Probiotics supplement** has proven beneficial in the **reduction of SIBO**. *(Barrett JS, et al. World J Gastroenterol **2008**, 14:5020-4)*

Probiotics & Rosacea

- **Rosacea** has been linked to ***Helicobacter pylori*** **(*H. pylori*) infection.**
- ***Helicobacter pylori*** infection is believed to play a role in **pathogenesis of rosacea**.
- **Reduction of *H. pylori* and bacterial colonization → improved rosacea.**
  *(Holmes AD. Potential role of microorganisms in the pathogenesis of rosacea. J Am Acad Dermatol. **2013**; **69**:1025-1032)*

Probiotics & Psoriasis

- Several studies found that **Dysbiosis** (shifts or imbalance of the gut microbiome, perturbed ratio of (↑) **Firmicutes** and (↓) **Bacteroidetes**) ➔ **uncomfortable digestive issues** (including slow intestinal transit time ➔ **Constipation) occurred before the psoriatic complications** became evident.
- **Gut microbiome** studies in **Psoriasis ➔ a decrease** in **Actinobacteria** (a phylum which includes **Bifidobacterium** species that have been shown to **reduce intestinal inflammation, suppress autoimmunity,** and **induce Tregs**.)
- **Microbiome** may play a **pathogenic role in psoriatic disease:** ➔ **Dysbiosis of the skin microbiome** in areas of **skin lesions** or patches (**lesional psoriatic microbiome)** ➔ ↑ abundance of **Streptococcus** and ↓ **Propionibacterium** compared to healthy skin.

Skin-Gut Axis: Psoriasis

- A mouse study: **mice treated with antibiotics neonatally** had **exacerbated** imiquimod-induced **psoriasis** as an adult ➔ **Neonatal gut dysbiosis** can affect **skin inflammation, potentially triggering or exacerbating inflammatory skin diseases** such as **psoriasis** later in adulthood.
- Animal models have shown that **probiotic supplementation up regulates IL-10** (↓ **pro-inflammatory molecules** such as **IL-17**) and provides **beneficial skin effects**.
  (Levkovich T, Probiotic bacteria induce a 'glow of health'. PLoS One. 2013;8: e53867)
- Certain beneficial intestinal bacteria (e.g. **lactobacilli**,) are able to **suppress the IL-23/Th17 axis** (an important role in inflammation involved in **psoriasis**).
- This suppression may occur through certain gut commensal organisms' ability to **down regulate IL-23** and **transforming growth factor-beta (TGF-β) expression,** and **preventing Th17 cell-mediated release of proinflammatory IL-17.**
  (Chen L, Lactobacillus acidophilus suppresses colitis-associated activation of the IL-23/Th17 axis. J Immunol Res. 2015)
- **The intestinal microbiome** is responsible for **regulating the expansion of T regulatory cells, Th1 and Th2 type cells** to provide **immune system homeostasis**.
  Deficiency in T regulatory cells (some autoimmune diseases) ➔ **inflammation and severe dermatitis.**

Skin-Gut Axis:

PSORIASIS

- Patients with **psoriatic arthritis** → ↑ **risk of IBD** and have **subclinical evidence** of **gut inflammation**. *(Scher JU, Microbiome in Inflammatory Arthritis and Human Rheumatic Diseases. Arthritis Rheumatol. 2016;68:35-45)*
- A clinical study: **16** patients with **psoriatic arthritis**, **15** with **psoriasis** & **17** healthy controls: The **gut microbiome** was **less diverse** in the **psoriasis and psoriatic arthritis** groups; ↓ **the *Coprococcus* spp**.
- **Psoriatic arthritis pts**. → ↓ **important bacterial enterotypes** (*Akkermansia, Ruminococcus, and Pseudobutyrivibrio)* → **↓ the ability of the gut to regulate immune responses → systemic or localized inflammation.**

  *(Scher JU, **Decreased bacterial diversity** characterizes **the altered gut microbiota** in patients with **psoriatic arthritis, resembling dysbiosis in inflammatory bowel disease**. Arthritis Rheumatol. **2015;67**:128-139)*

Psoriasis & Probiotics

- The **gut microbiota** has an **influence** on the development and maintenance, **not only of the mucosal**, (Garrett WS, et al., Homeostasis and inflammation in the intestine. Cell. 2010;140:859–70.), but also the **systemic immune response.** ➔ **the therapeutic vista** of **modifying the systemic immune response by enteric microbes**. (Wu HJ, et al. Gut-residing segmented filamentous bacteria drive autoimmune arthritis via T helper 17 cells. Immunity. 2010; 32:815–27.)
- "These first studies reveal interesting **differences in microbiome composition** that **may be associated with the development of psoriatic comorbidities** and serve as **novel therapeutic targets**." (Current Dermatology Reports)

Skin-Gut Axis:

PSORIASIS

- A clinical trial: **treating psoriasis patients** with **Probiotic *Bifidobacterium infantis* 35624** for 8 weeks **improved C-reactive protein (CRP), TNF-alpha & IL-6 levels**.
  These results suggest that **probiotic supplementation could modulate inflammation in this disorder.**
  *(Groeger D, et.al., **Bifidobacterium infantis 35624 modulates host inflammatory processes beyond the gut**. Gut Microbes. **2013**;4:325-339)*

Eczema: Allergy/Atopic Dermatitis

- ✓Chronic, relapsing and very itchy rash
- ✓Often based on an allergic response **(atopic dermatitis)**
- ✓Approximately 10-20 % of the world's population affected by eczema during childhood
- ✓Variety of treatments…
- ✓(Steroid)… but how effective?

Skin-Gut Axis: The relationship between intestinal bacteria and skin health

Atopic dermatitis

(www.Medicinenet.com)

- There is a well-documented association between **gut microbiome dysbiosis** and **low diversity within the gut microbiota** with the development of **allergic diseases.** *(Melli, 2016)*
- Conversely, **increased microbial diversity within the gut** has been associated with **reduced flares in inflammatory skin diseases**, such as **atopic dermatitis**. *(Marrs, 2016)*

Probiotics & Atopic Dermatitis (AD)

AD: Atopic Dermatitis:

- **Composition of the intestinal microflora** was reported to be **different** in patients with **AD** and infants with **eczema**,
  ↓ Bifidobacteria species and **lower microflora diversity ➔ ↓intestinal mucosa barrier ➔ ↑exogenous antigen in circulation ➔ symptomatic AD.**
- **Decrease in regulatory T cells (Tregs)** which are crucial for immune response
  ➔ Probiotics upregulate T cells which **migrate to inflammation** sites and **suppressed disease progression**.
  (Kwon HK, et al., Proc Natl Acad Sci USA 2010: 107:2159-64)

Probiotics & Atopic Dermatitis (AD)

AD: Atopic dermatitis:

- **Dysfunction in the skin barrier ➔ Probiotics *Lactobacillus paracasei*** was found to **speed up barrier function recovery**.
  (Gueniche A, et al., Eur J Dermatol 2010; 20:731-7)

- **Imbalance in T-helper (TH1/TH2) cytokine activation ➔ Probiotics** can **inhibit TH2 response and stimulate TH1 cytokines** (such as interferon gamma IFN-y) production.
  (Isolauri E, et al., Am J Clin Nutr 2001;73(2suppl):445-505)
- **Probiotics (yogurt consumption) improve intestinal microflora, T-helper 1 cytokine and AD symptoms.**
  (Matsumoto M, et al., Clin Exp Allergy 2007;37:358-70)

Probiotics & Atopic Dermatitis (AD)

Possible mechanisms of action of probiotics in AD:

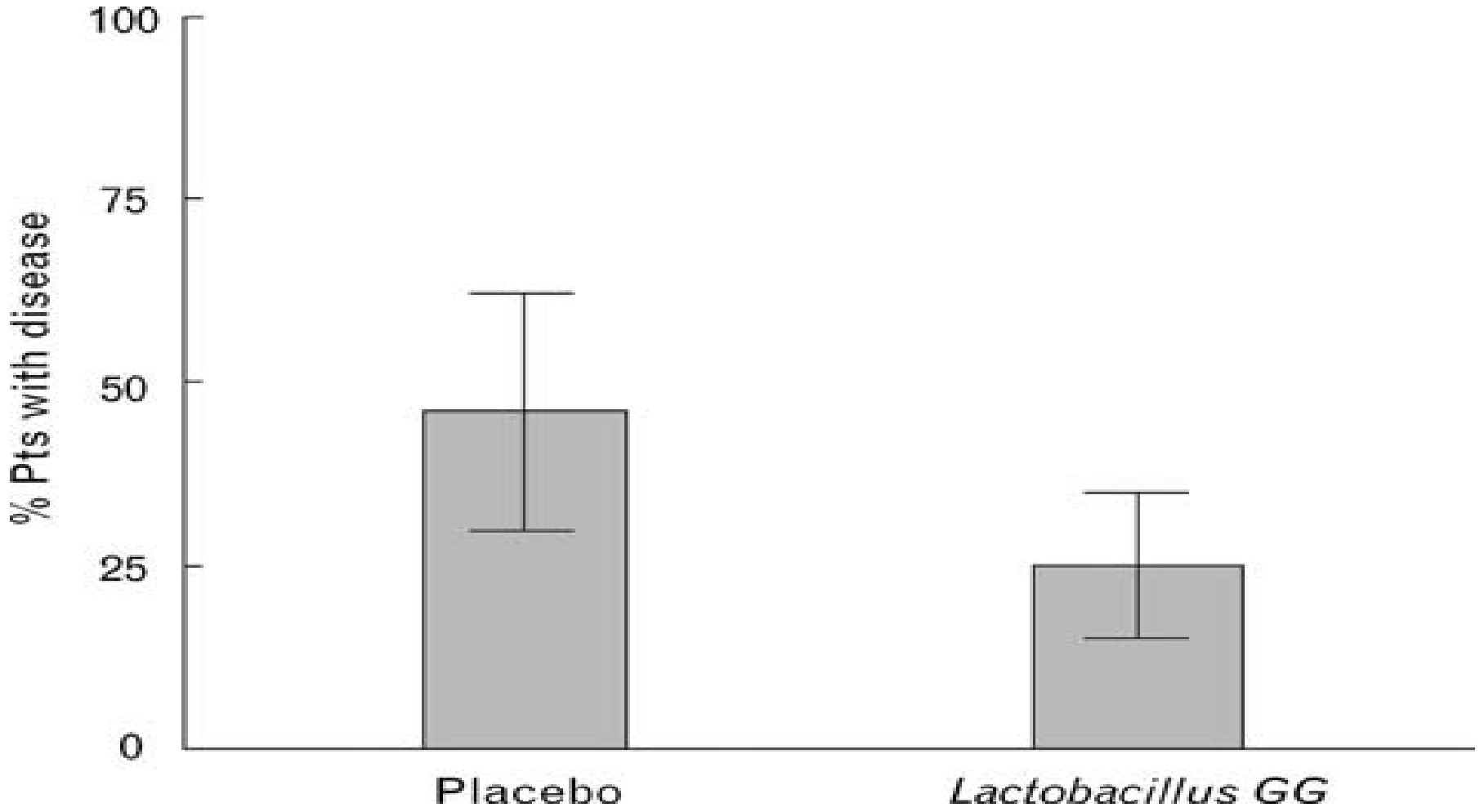
- **Inhibition of T-helper 2 response.**
- **Stimulation of T-helper 1 response.**
- **Upregulation of regulatory T cells (Treg).**
- **Acceleration of skin and mucosa barrier function.**
- **Increase in intestinal microflora diversity.**
- **Reduction of fermentation products.**
- **Inhibition of Staphylococcus aureus attachment.**

(Katherine L, et al.: Probiotics and Prebiotics in dermatology. J Am Acad Dermatol 2014;71:814-21)

Probiotics vs. AD & Allergy

- **LGG (*Lactobacillus rhamnosus* GG (ATCC53103)) has demonstrated beneficial effects in atopic dermatitis in allergic infants.**
- A randomized, double-blind, placebo-controlled trial in Finland➔ **↓the frequency and severity of atopic eczema** in infants receiving **LGG**. (LGG was administered to pregnant women with a first-degree relative with atopic eczema & the newborn infants continued taking LGG and were evaluated at the age of **2 years** old.)
  *(Kalliomaki M. Lancet **2001**;357:1076-9)*

Probiotics and Allergy



Efficacy of LGG in 2-year-old children with atopic eczema; adapted from *Kalliomaki M,et al (Lancet **2001**;357:1076-9).*

Probiotics & Atopic Dermatitis (AD)

- **Probiotics** have a role in **prevention of pediatric AD** but the use of probiotics in the treatment has been evaluated in small trials.
- ***Lactobacilli* were found useful in ↓itch & burning scores in 10 adults AD**. *(Matsumoto: Clin Exp Allergy 2007)*
- ***L. paracasei K71*→ ↓skin severity scores** at weeks 8 &12 in 34 **adults AD.** *(Moroi M: J Dermatol 2011)*
- **Probiotic mixture→ ↓SCORAD** of 38 pts. with moderate to severe AD. *(Drago L; J. Clin Gastroenterol 2012)*, Similar results in 48 pts.*(Iemoli; J Clin Gastroen 2012)*
- A 12-week study of ***Lactobacillus plantarum*** in 83 children with PAD showed **reduction of 9.1 in SCORAD vs. 1.8 in placebo group**. *(Han Y:Pediatr Allergy Immunol 2012)*

Prebiotics & Atopic Dermatitis (AD)

- **Prebiotics**, like probiotics can significantly **decrease the generation of toxic fermentation products**.
  (De Preter V., et al., Br. J Nutr 2004;92:439-46)
- **Prebiotics** can **modulate immune parameters** including **TH1/TH2 balance**. *(Schley PD, et al., The immune-enhancing effects of dietary fibers and prebiotics. Br. J Nutr 2002;87(suppl2):S221-30)*
- **Prebiotics could be beneficial to AD patients.**
  *(Passeron T, et al., **Prebiotics** and **Synbiotics:** two promising approaches for the **treatment of atopic dermatitis** in children above 2 years. Allergy 2006;61:431-7)*

Prebiotics & Atopic Dermatitis

- Metaanalysis data show a **reduction of 32% in the incidence of pediatric atopic dermatitis** after using prebiotics.
- 4 studies (1,218 infants), using a combination of **galactooligosaccharide** and **fructooligosaccharide** ➔ **a significant reduction in eczema**.
  (Osborn DA, et al., Cochrane Database Syst Rev 2013;3:CD006474)
- **Infants** with **risk of atopy**, fed with a **prebiotic (oligosaccharide)** -supplemented **formula** during the first 6 months of life ➔ **significantly lower 5-year cumulative incidence of pediatric AD**.
  (Aslanoglu S,et al., J Biol Regul Homeost Agents 2012;26:49-59.)

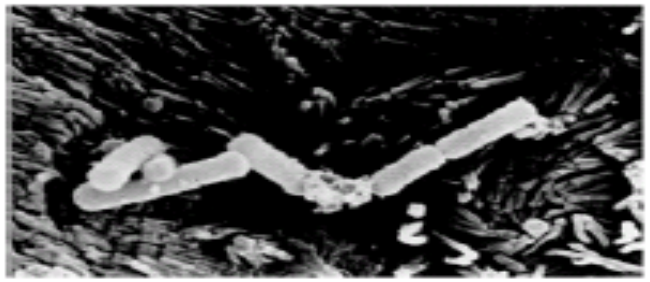
Probiotics & Prebiotics
➔ Synbiotic

Definition of Probiotics

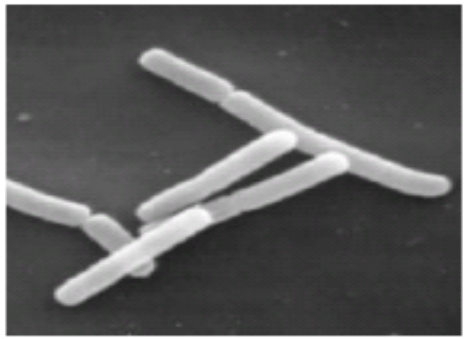
Probiotics are live micro-organisms which, when administrated in adequate amounts, confer a health benefit on the host.

FAO/WHO Report** on Expert Consultation on Evaluation of Health and Nutritional Properties of Probiotics in Food Including Powder Milk with Live Lactic Acid Bacteria. Córdoba, Argentina, **October 2001.

Lactobacillus



Lactobacillus



Streptococcus

Bifidobacterium

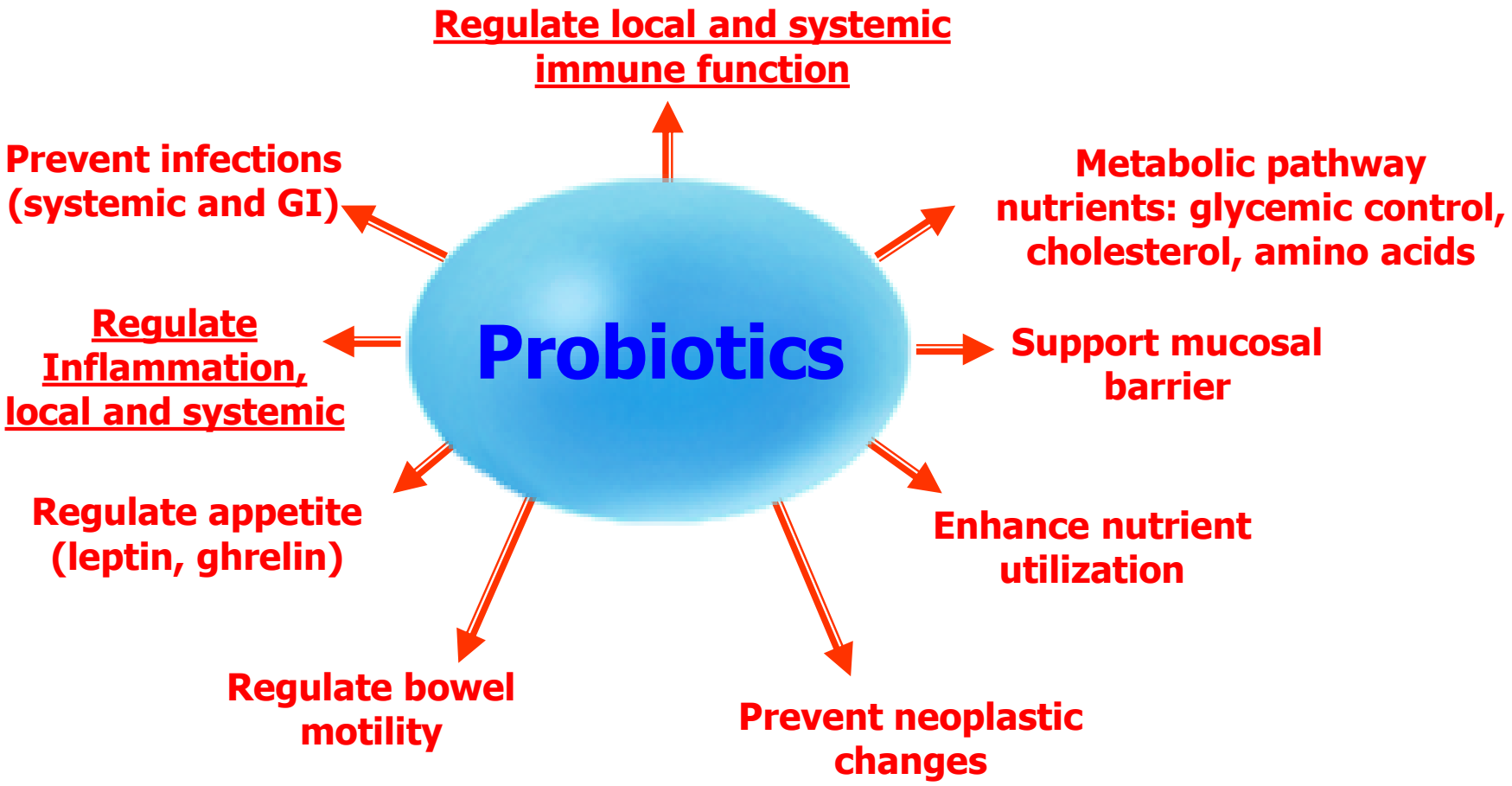
Guidelines for the Assessment of Probiotic Microorganisms

Probiotic microorganisms should not only be capable of **surviving passage through the digestive tract** but also have the **capability to proliferate in the gut**. This means they must be **resistant to gastric juices** and be **able to grow in the presence of bile** under conditions in the intestines, or be consumed in a food vehicle that allows them to survive passage through the stomach and exposure to bile.

They are Gram positive bacteria and are included primarily in two genera, ***Lactobacillus*** **and** ***Bifidobacterium*** *(Holzapel et al., 1998; Klein et al., 1998).*

Report of a Joint FAO/WHO Expert Consultation on Evaluation of Health and Nutritional Properties of Probiotics in Food Including Powder Milk with Live Lactic Acid Bacteria 2001

Probiotics: The Mutually Beneficial Effects of Bacteria and their Substrates in the Human Host



Probiotics can REVERSE Skin Inflammation

- Seborrheic Dermatitis, Dandruff
- Skin Rash, Eczema, Psoriasis
- Adult Acne and Rosacea
- Dilation of cheek and nose capillaries
- Easily bruised skin
- Weak and cracking fingernails
- Recurring yeast infections, Candida, or vaginitis

(https://www.pharmacy.mahidol.ac.th/th/knowledge/article/294/probiotics-drugs/)

Dosage

Recommendations tend toward 1 to 10 billion CFU for infants, and 10 to 20 billion CFU or more for older children and adults.

(CFU = Colony Forming Unit)

Probiotics Contraindications

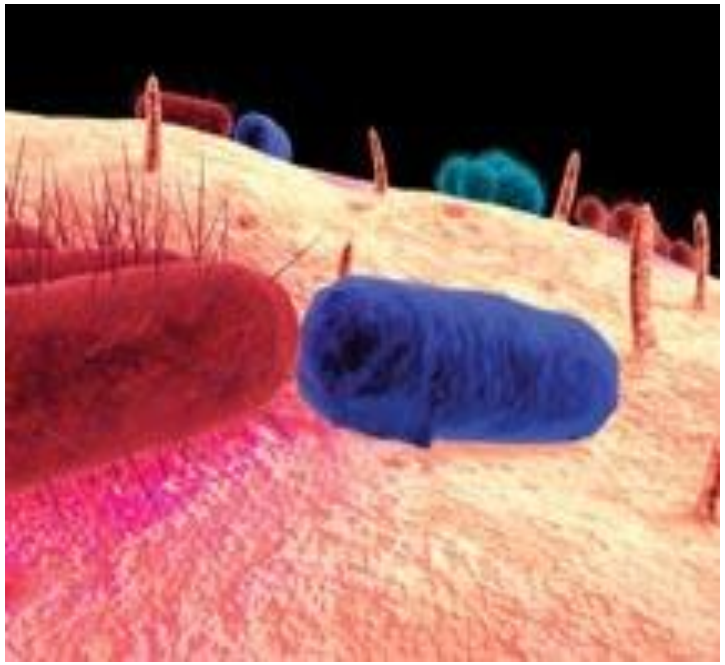
Serious medical conditions e.g.:

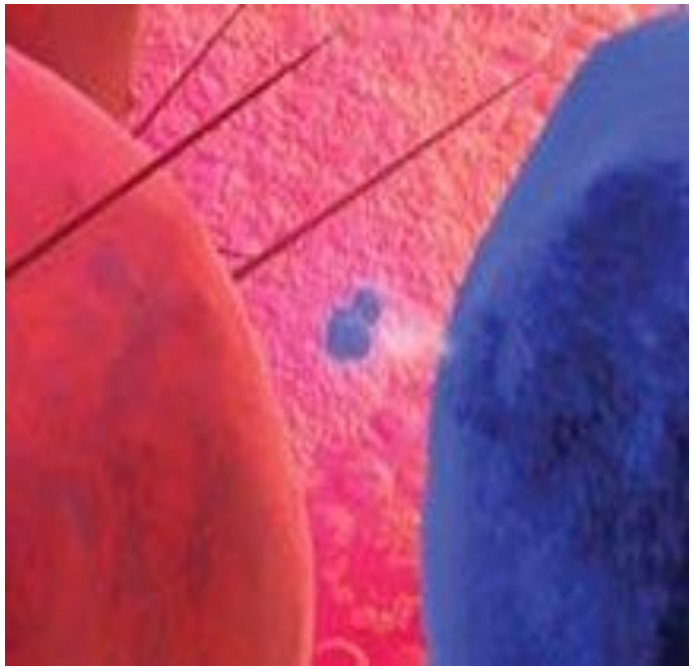
- Severely immunosuppressed
- Patients with pancreatitis
- Patients in ICU
- Patients who have central venous catheter
- Infants with short bowel syndrome
- Patients with open wounds following major surgery
- Pregnant or breastfeeding women should consult their doctors before taking *Saccharomyces boulardii*

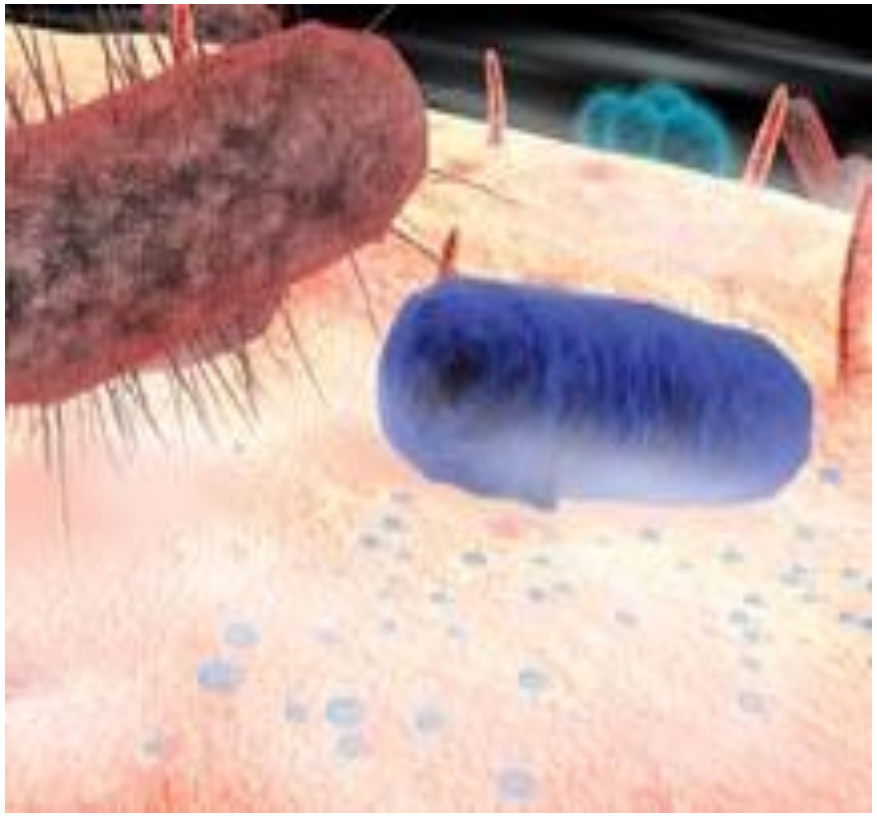
Bacteria might someday…

… keep the Doctor away

(Science News. Feb 2,2002)



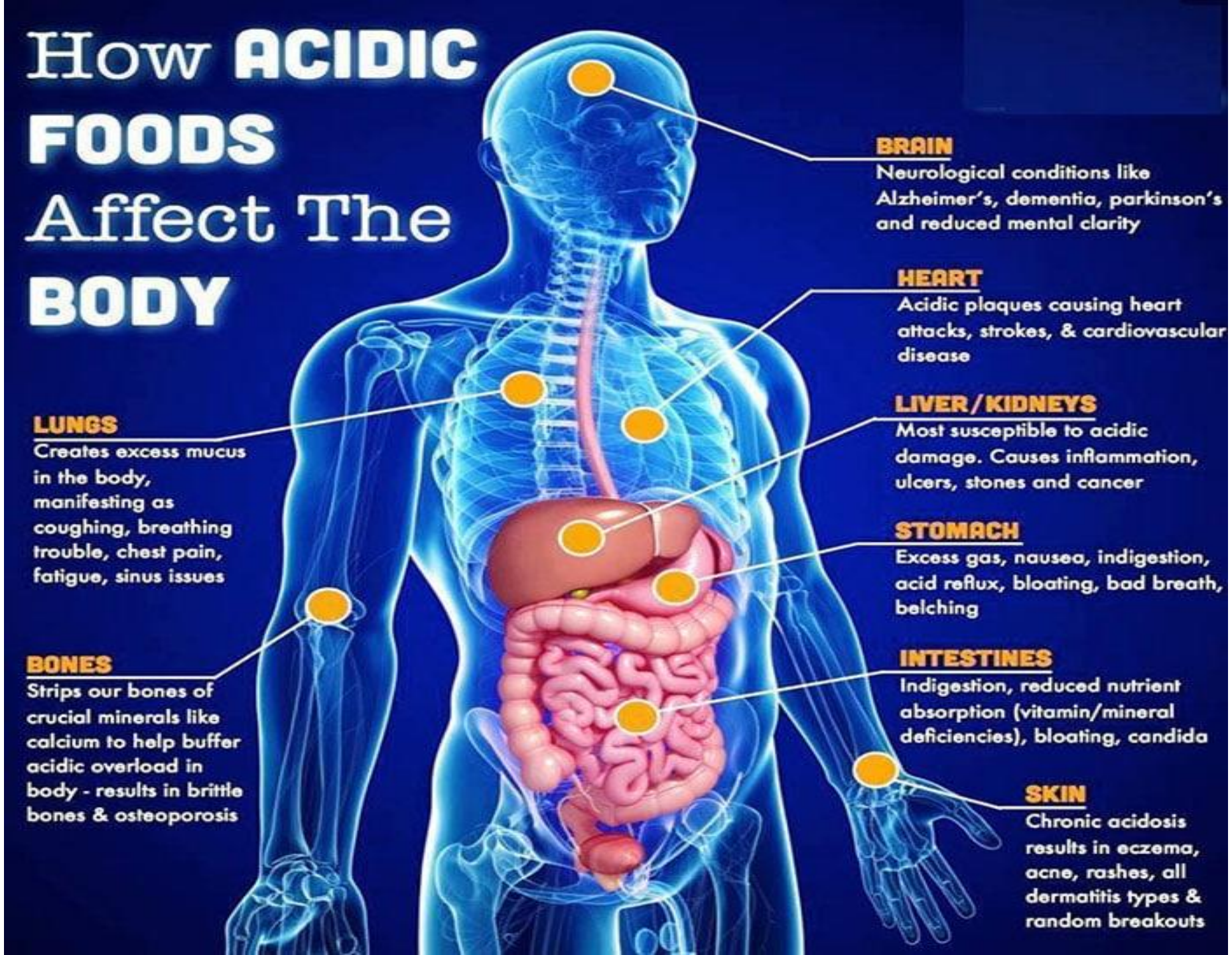




Blue = Lactobacilli , Red = E. coli

Bacteria battleground

Acid-Alkaline Balance
&
Common Skin Disorders



How Acidic Foods Affect the Body.

SKIN: eczema, acne, all dermatitis

LUNG: excess mucus, coughing, chest pain, sinus

BONE: brittle & thin bone

BRAIN: dementia, Alzheimer's, cloudy mental

HEART: CVD, stroke

LIVER/KIDNEY: stone, cancer, inflammation

STOMACH: indigestion, acid reflux, bloating

INTESTINES: indigestion, nutrients deficiency, candida

https://nimarsti.com/2019/03/06/link-between-psoriasis-and-acid-waste-build-up-in-the-body/

Eliminating Acid Waste ➔ Skin Disorders?

- **The body excretory processes** via the **respiratory system, urinary system, intestinal tract and skin.** If the other systems aren't sufficient and/or are damaged ➔ **↑excretory process via skin, the body's largest eliminatory organ ➔ SKIN DISORDERS**.
- **The toxins** and **the overly acidic environment cause inflammation** and **overdriven immune system ➔ health problems** including **skin disorders.**
- **pH imbalance ➔ ↑ Inflammation** such as **joint pain** and **arthritis** as well as **skin problems**.
- **Psoriasis symptoms** arise when **the body attempts** to **detoxify by excreting acidic waste/toxins** through **the skin,** to reclaim its balance and **cleanse away harmful toxins** (**acids**).

Acid-Alkaline & Skin Problems

How Acidity Affects Skin Conditions ?

- "How the **foods** you eat **affect the pH balance** in your body."
- **Acidic toxins** (normally expelled by the kidneys) **build up on the surface** and **within the skin**.
- **This building up of the acidity** is one of the **primary reasons** of **eczema, dermatitis** or **psoriasis**.
- **pH imbalance → negative impact** on **psoriasis**.
- By working **to eliminate acid waste** build-up in the body, you're **targeting a root cause** of **inflammatory skin disorders** such as **atopic dermatitis**, **seborrheic dermatitis** and **psoriasis.**

Acidosis and Skin Diseases

- The first report on **'Acidity & Skin problems'** was published in **1918** by Barber and Semon….. In a series of observations on soldiers in the British army, who had **seborrheic eruptions**, they found **lowered alkalinity in seborrheic eruptions** and a **pronounced and remarkably constant hyperacidity of the urine.**
  ➔ the assumption that the **seborrheic state** is really **a manifestation of relative acidosis**.
  ➔ the therapeutic effects of giving **alkali mixtures** and local applications
  ➔ **Beneficial results were immediately apparent**.
- **Two fundamental facts:** nearly all cases of **all active inflammatory processes were acidosis** and the majority of **patients with seborrheic manifestations** show a **markedly increased alkaline tolerance**.

(S.E. Sweitzer, H.E. Michelson. Arch Derm Syphilol. 1920;2(1):61-66)

Acid-Alkaline & Skin Problems

- **ALL skin problems** (**acne, rosacea, eczema, psoriasis**, or **wrinkled skin**, etc.) are **ACID** problems (from food (sugar, dairy products, grains, animal meat, processed food), allopathic drugs, heavy metals, stress, low oxygenation, etc.)
- **Skin** is the '3rd kidney' and is the largest organ of the body, and is an important organ for your body to detoxify itself.
- **Eating poorly**, **not sleeping well**, not exercising, and **feeling stressed → an acidic state**.
- **Skin problems: a sign that the body is acidic.** The body is fighting to get these acids out → **Skin Inflammation/Break out**
- (http://www.thenewpotato.com/2017/01/27/alkaline-diet-before-and-after/)

Anti-inflammatory = Alkaline Diet

- **Slightly alkaline pH → your body functions its best.**
- The body requires **70-80% alkaline diet (vegetables & fruits)** and **< 20-30% acidic diet: → reduce the acidity** in your skin **→ repair skin → ↓ or eliminate/ cure eczema** and **psoriasis.**

(http://www.livingphit.com/alkaline-diet-eczema-and-psoriasis-skin/)

- **Acid-forming foods**: **alcoholic drinks**, **breads,** cake, coffee, cereals, crackers, **grains** (except millet and quinoa), **dairy**-milk-cheese, vinegar, eggs, oils or foods cooked in oils, **trans fat**, meat, seafood and fish, nuts, seeds, pastas, salt, **sugar**, tofu, fried-baked-barbecue-burned food, **processed food**, **allopathic drugs,** etc.
- **Alkaline-forming foods**: **fresh fruit, vegetable**, salad green, sprouts, **citrus fruits**, tomato, garlic, millet, quinoa, etc.
- Drink 3-4L/day of filtered/**mineral water** with a **pH of 8-9.5**.
- To make your water more alkaline forming, **add an organic lemon or lime slice or a pinch of baking soda (sodium bicarbonate).**

Acidic / Alkaline Food Comparison Chart

Eat Less- X More Acidic | Neutral | More Alkaline ✓ Eat More+

Soft Drinks

Energy Drinks

Carbonated Drinks

Sugar

Juice

Alcohol

** Processed & Refined Food*

Popcorn
Cream Cheese
Buttermilk
Pastries
Pasta
Yellow Cheese
Pork
Beef
Black Tea
Pickles
Roasted Nuts
Vinegar
Artificial Sweeteners
Bread
Canned Food
Meat
Ice-Cream

Pasteurised Fruit Juices
Most Grains
Eggs
Fish
Tea
Soya Milk
Lima Beans
Rice
Cocoa
Oats
Oysters
Salmon
Dairy
Coffee

Coffee
Dark Chocolate
Pistachiaos
Peanuts
Nuts

Most Tap Water

Most Spring Water

River Water

Apples
Almonds
Tomatoes
Grapefruit
Mushrooms
Turnip
Olives
Peaches
Bell Pepper
Radish
Pineapple
Cherries
Wild Rice
Apricot
Strawberries
Bananas

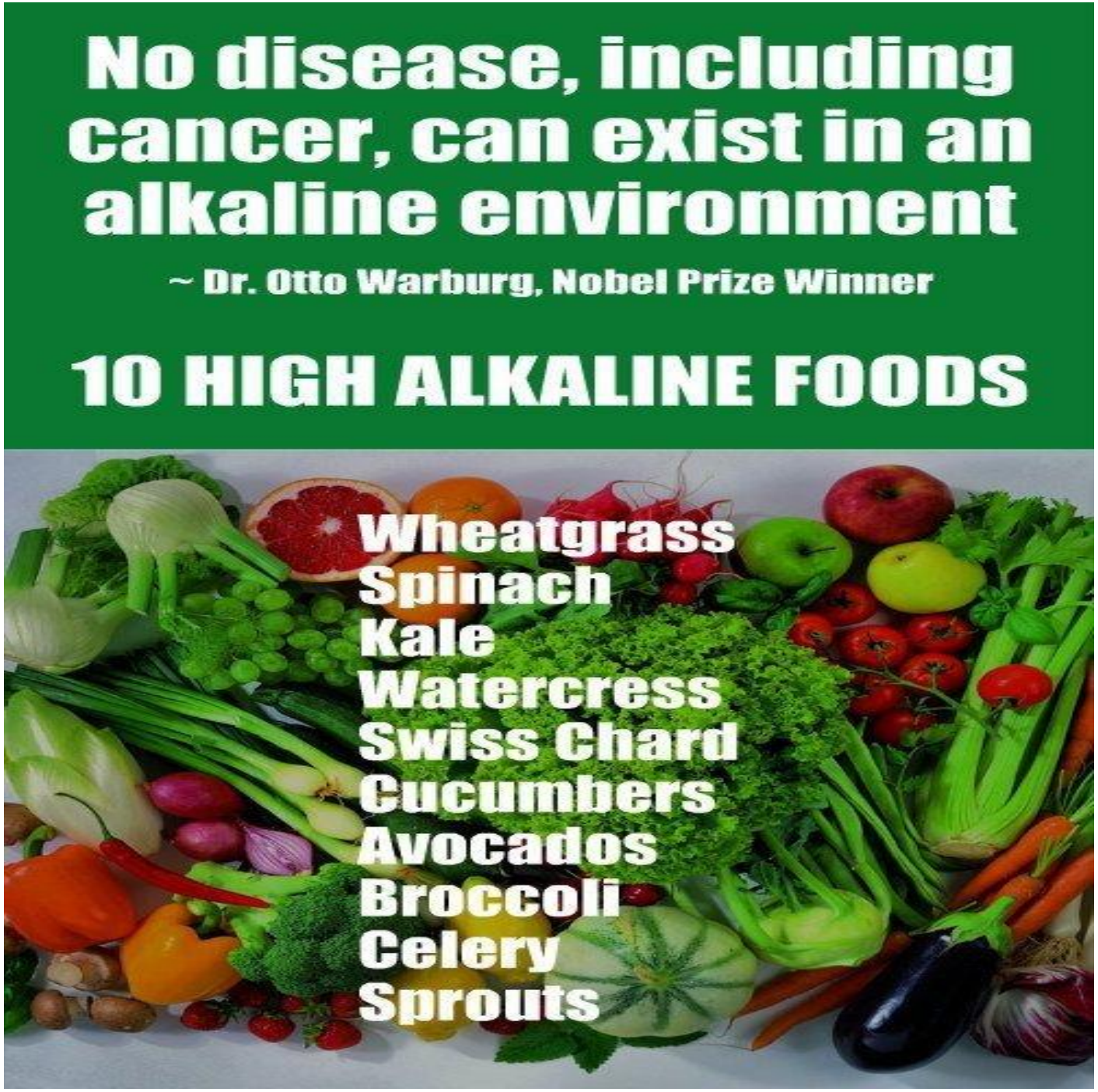
Avocados
Green Tea
Lettuce
Celery
Peas
Sweet Potatoes
Egg Plant
Green Beans
Beets
Blueberries
Pears
Grapes
Kiwi
Melons
Tangerines
Figs
Dates
Mangoes
Papayas
Coconut
Tofu

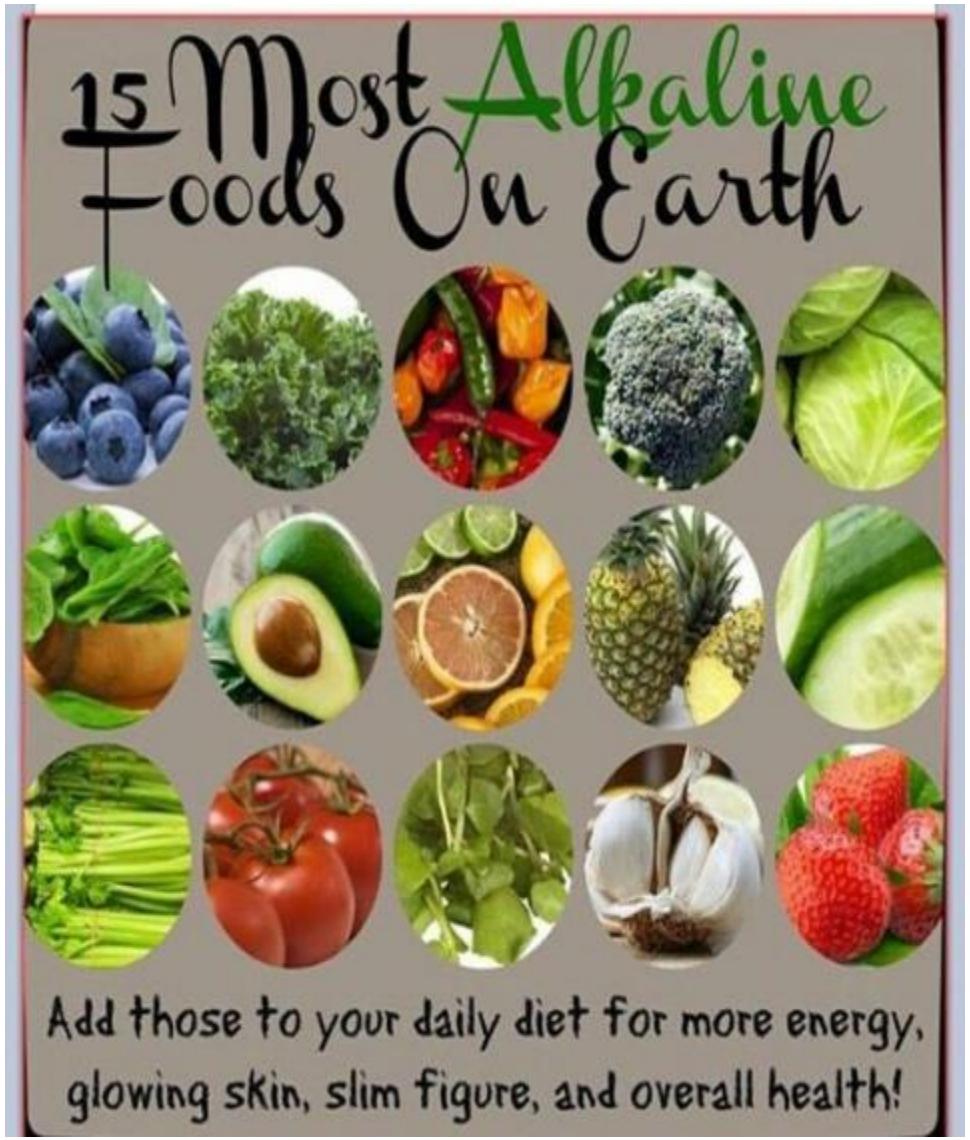
Spinach
Broccoli
Artichoke
Brussel Sprouts
Cabbage
Cauliflower
Carrots
Cucumbers
Lemons
Limes
Seaweed
Asaparagus
Kale
Radish
Collard Greens
Onion
Apple Cider Vinegar

** Raw/ Uncooked*

Eat less processed and refined foods and more raw and uncooked greens and fruits.

Note that a food's acid or alka-line forming tendency in the body has nothing to do with the actual pH of the food itself .eg: lemons are very acidic, however the end - products they produce after digestion and assimilation are very alkaline so lemons are alkaline-forming in the body. Likewise, meat will test alkaline before digestion but it leaves very acidic residue in the body so, like nearly all animal products, meat is very acid-forming.


No disease, including cancer, can exist in an alkaline environment
~ Dr. Otto Warburg, Nobel Prize Winner
10 HIGH ALKALINE FOODS
Wheatgrass
Spinach
Kale
Watercress
Swiss Chard
Cucumbers
Avocados
Broccoli
Celery
Sprouts


15 Most Alkaline Foods On Earth
Add those to your daily diet for more energy, glowing skin, slim figure, and overall health!

Rosacea & Alkaline diet

- **A vegetarian alkaline diet ➔ dramatically reduce the symptoms of rosacea** over **two months**. An **alkaline diet** also **reduced body-wide inflammation** in the participants.
- Eating an **alkaline diet** for a few weeks, your skin should start **looking better** and you will **feel much better**.
- (The Alkaline Diet & Rosacea by *Dr. Scott Olson, Naturopathic Doctor* (ND)) (https://www.dermaharmony.com/skinnutrition/alkalinedietandrosacea.aspx)

Acid-Alkaline balance with Sodium Bicarbonate

Studies of Sodium Bicarbonate (Baking Soda) drink:

➔ **shifted from Macrophage 1 (M1: promote inflammation) to M2 (reduce inflammation). M2:** early arrivers to a call for an **immune response,** ability to consume debris from injured or dead cells.

- Fed **sodium bicarbonate drink** to **lab animals** with **kidney disease** (impaired kidney functions ➔ ↑ acidic blood ➔ ↑CVD & osteoporosis risk) ➔ **↓ acidity and slow progression of kidney disease.**
- A rat model without actual kidney damage ➔ **↓M1 & ↑M2 (Anti-inflammation)**
- In healthy medical students ➔ **↓M1 & ↑M2 (Anti-inflammation)**

(ScienceDaily, 25 April 2018. Source: Medical College of Georgia at Augusta University)

Acid-Alkaline balance with Sodium Bicarbonate

Studies of Sodium Bicarbonate (Baking Soda) drink:

➔ **"The shift from inflammatory to an anti-inflammatory profile is happening everywhere** (in kidneys, spleen and peripheral blood)."

➔ **↑ conversion of some of the proinflammatory cells to anti-inflammatory ones** with **actual production of more anti-inflammatory macrophages**.

➔also a shift in other immune cell types (↑ **regulatory T cells)**

➔ **↓ immune response** and keep the immune system from attacking our own tissues.

➔The **anti-inflammatory shift** was sustained for at least 4 hrs, in humans and 3 days in rats.

(ScienceDaily, 25 April 2018. Source: Medical College of Georgia at Augusta University)

Acid-Alkaline & Skin Problems

Severe Plaque Psoriasis

Before and After 2 months of Alkaline Diet.

(https://www.livingphit.com/alkaline-diet-eczema-and-psoriasis-skin/

Acid-Alkaline & Skin Problems

Severe Allergies & Eczema:

A 2 yrs. old boy, Before & After 1 week of Alkaline Diet.

(https://www.livingphit.com/alkaline-diet-eczema-and-psoriasis-skin/

Acid-Alkaline Balance

- **Balance your blood pH to alkaline (pH> 7.40) can cure or at least improve almost all diseases; inflammation, degeneration, infection, toxicity and cancer.**
- Alkalinize blood pH by eat 1-2 big bowls of **green vegetables/day** + 7 colors fruits and vegetable 5-8 servings/day.,
- Drink **mineral water pH > 7.5**, preferable pH > 8.
- **Alkaline minerals** supplements (Ca, K, Mg)
- **Sodium Bicarbonate (NaHCO3)**:
  - Baking Soda ¼ tsp. (1,300 mg of sodium bicarbonate) in a glass of water, 2-4 times/day.
  - Soda Mint (300 mg, used in gastritis & peptic ulcer Rx.)
    4-6 tablets/time, 2-4 times/day

Relax

Enjoy Life

Think Positive

Be Happy

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…can heal.

www.smedicalclinic.com