Immunology

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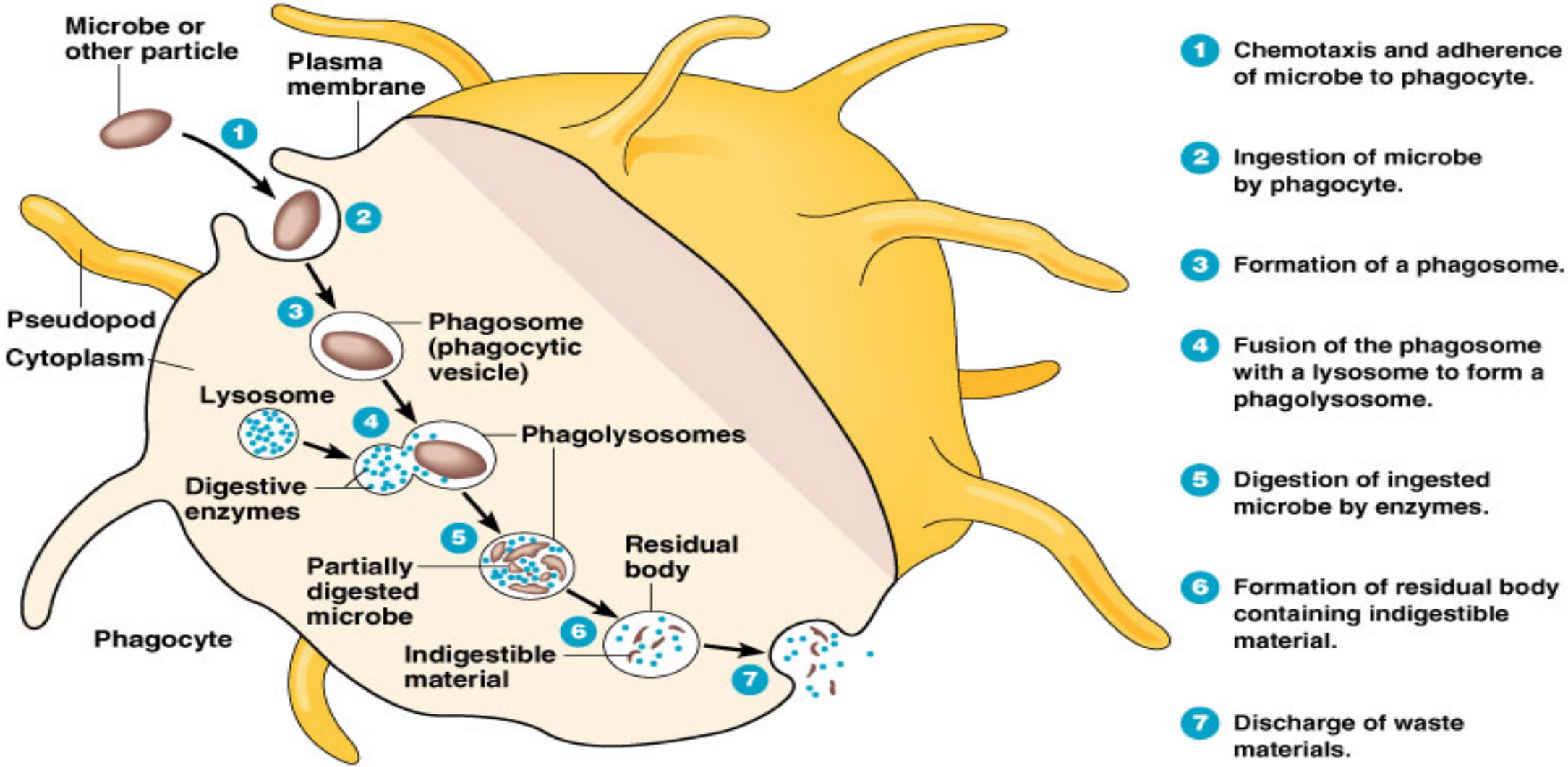
Immunology

Immunology: The science which deals with studying the defense mechanism which is characterized by the body against invasion by microorganisms

Immunity: The body's resistance to microbes, or in other words, is the body's ability to recognize foreign body within it and destroy it.
Antigen: Any foreign body enters the body and works to stimulate the immune system, can be a proteins , Polysaccharide or however Lipid or may be a combination of two or more of these substances, usually protein antigen stimulates the immune system strongly, while lipids as a weak antigens.
Foreign body: is the same antigen will be mentioned later.
Immune divided in terms of the nature of its business into two main sections are:
1 - natural immunity (non-specific) Innate Immunity: It is the body's resistance to any pathogen has a first line of defense for the body and is found in vertebrates and invertebrates and represents the skin and mucous membranes, while the second line defense contains phagocytosis , Inflammation, Fever and antimicrobial agents such as Interferon and complement factor

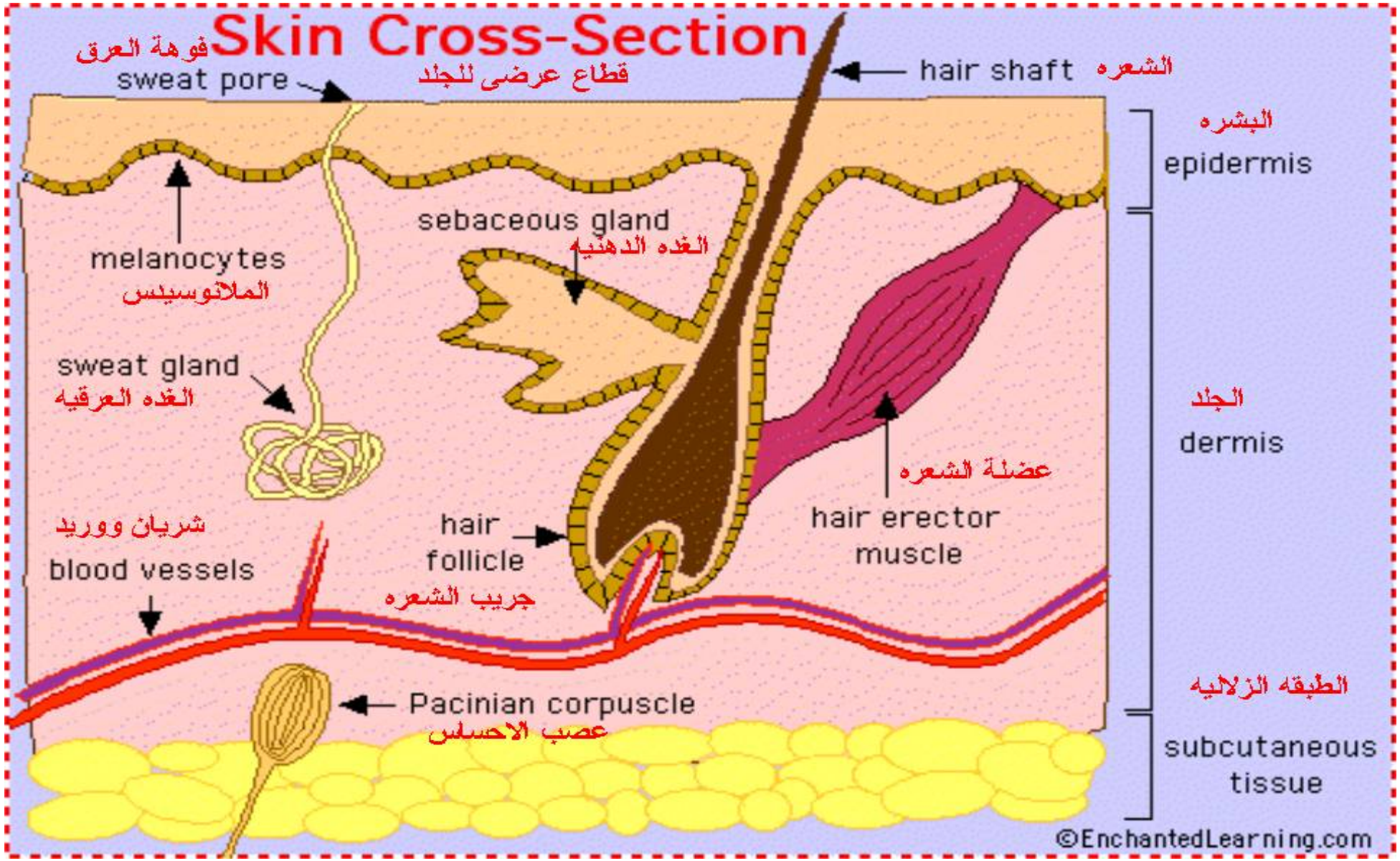


(a) Phases of phagocytosis

Non-specific immune divided into two factors:

1-Mechanical Factors:

A - Skin: where consists of several thick layers prevent the entry of microbes into the body also contains the hair follicles, which contain oil glands as well as raises the skin sweat, which is considered a means of body's defense chemicals, which will be mentioned later.


Skin Cross-Section
فوهة العرق
sweat pore
قطاع عرضى للجلد
hair shaft
الشعره
البشره
epidermis
sebaceous gland
الغده الدهنيه
melanocytes
الملانوسيلس
sweat gland
الغده العرقيه
الجلد
dermis
عضلة الشعره
hair erector muscle
شريان ووريد
blood vessels
hair follicle
جريب الشعره
الطبقه الزلاليه
Pacinian corpuscle
عصب الاحساس
subcutaneous tissue
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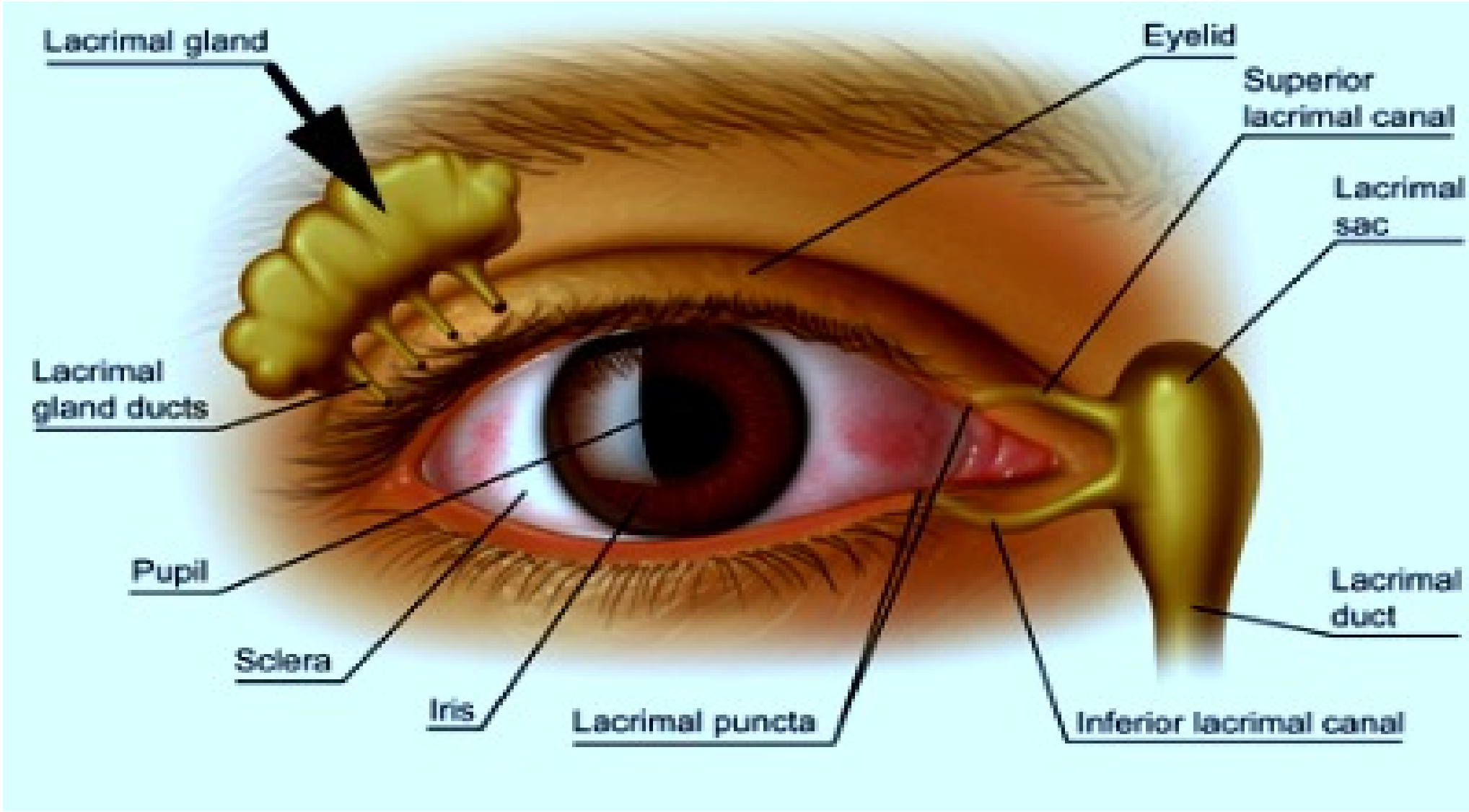
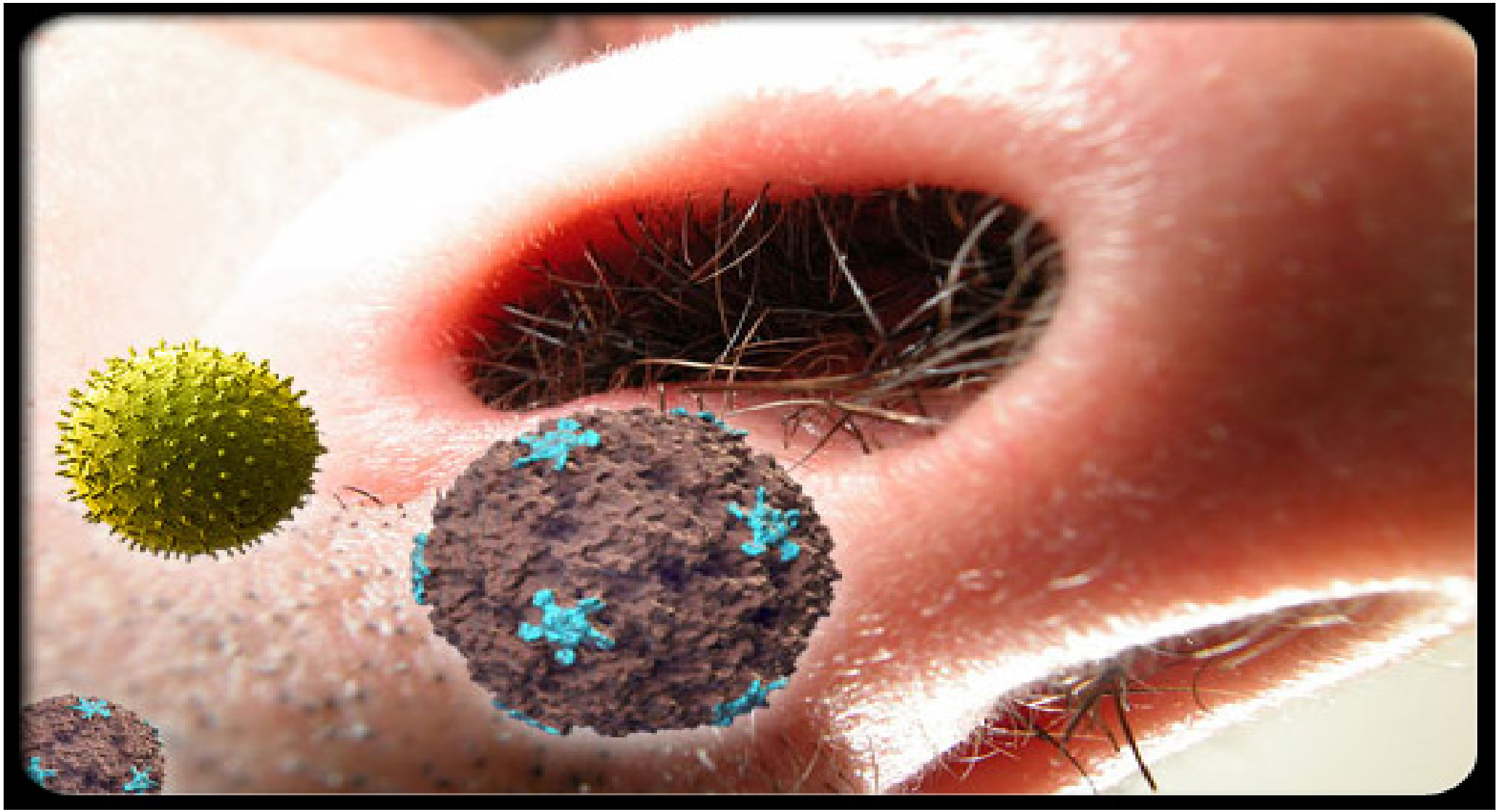
B - Mucous Membrane: which are found in many areas of the body such as the gastrointestinal tract and respiratory tract and urogenital system which produces a mucous which prevents dryness of these channels and also works to capture microbes .

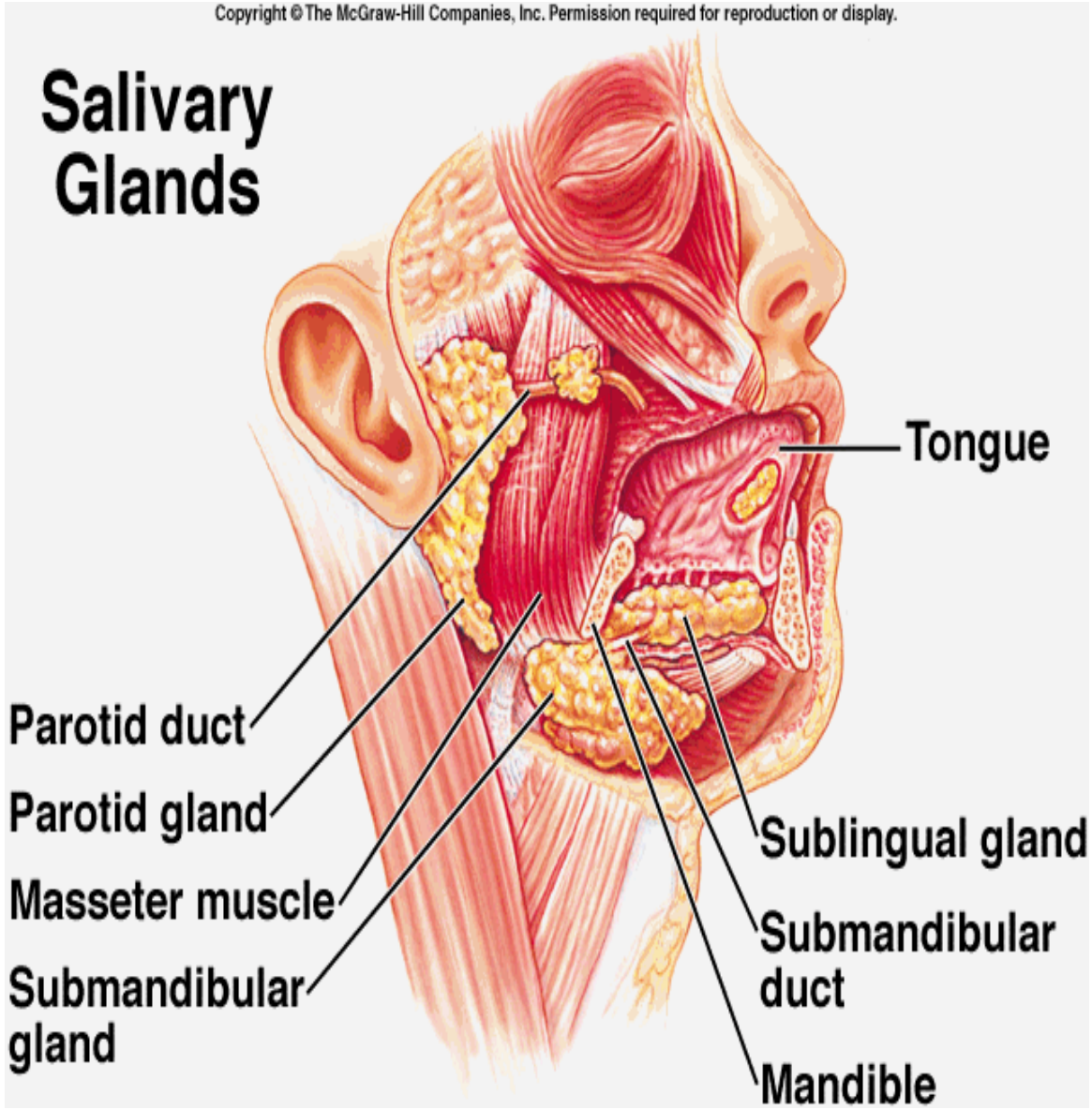
C - Lacrinal Glands and Salivary Glands: working on the washing of the eye and microbes on the surface of the teeth and the mucous membranes in the mouth and thus prevent the formation of microbial colonies in the mouth.

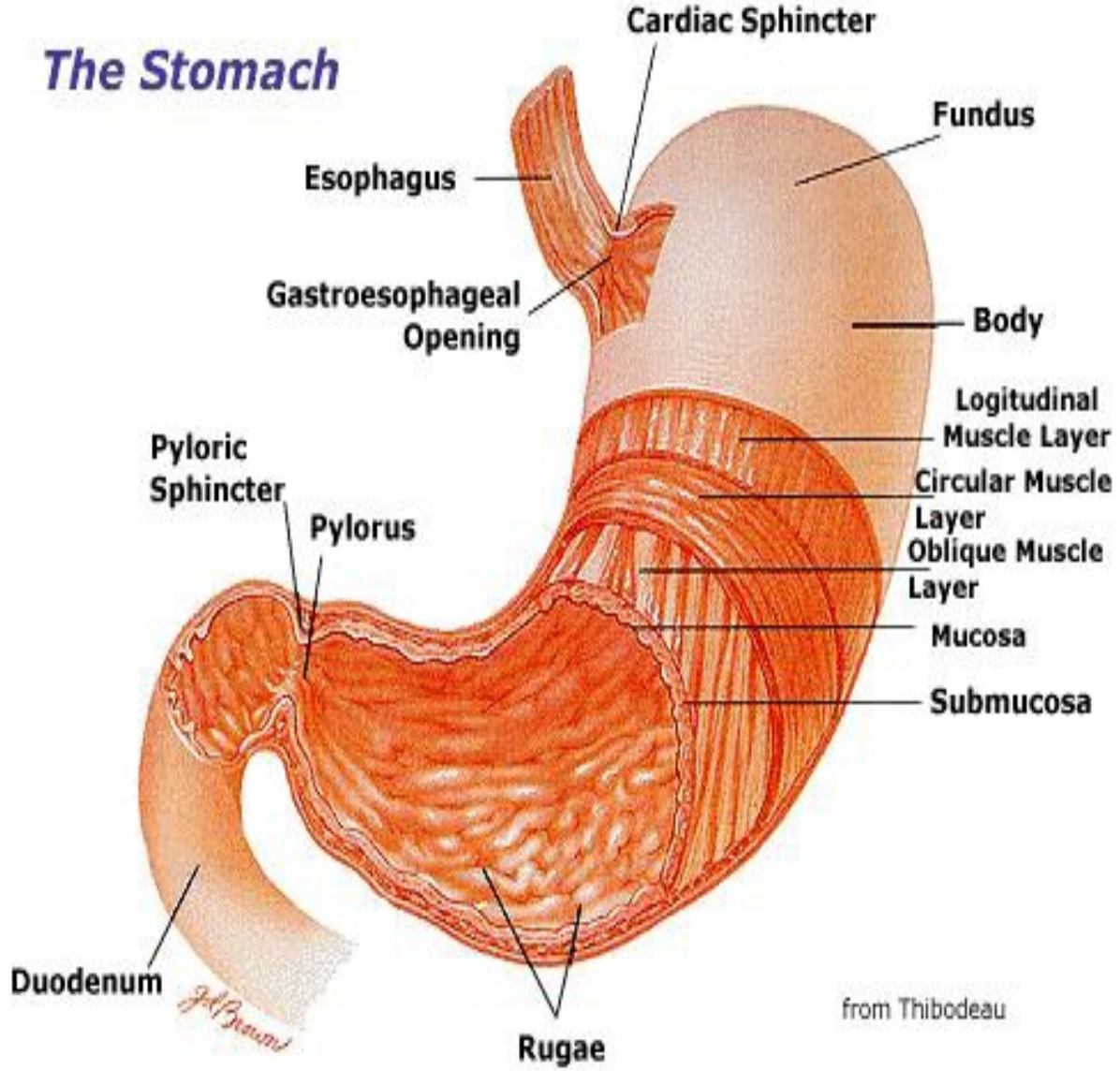

Lacrimal gland
Eyelid
Superior lacrimal canal
Lacrimal sac
Lacrimal gland ducts
Pupil
Sclera
Iris
Lacrimal puncta
Inferior lacrimal canal
Lacrimal duct

- D - Hairs in Nose: which act as filters air filtration working on the inside of the nose. The lower respiratory contain Cilia which movement up and down working on the transfer of foreign body into the upper part of the respiratory tract and then to the outside (Smoking is the direct cause of the effect on these cilia) as well as vaginal secretion working to wash the vaginal canal of microbes in addition to the impact of chemotherapy where the acidic nature works to reduce the pH which prevents the formation of microbial colonies in the region.



2 - Chemical Factors: play an important role in defending the body and includes several factors:
A - Sebaceous Glands: which secrete an oily substance called Sebum which prevents the hair from drying ,They also contain these oily Fatty Acid which inhibit the growth of some types of pathogenic bacteria, as well as some types of fungi. As the fatty acid and lactic acid are working to reduce the pH of the skin between 3-5 and thus inhibits the growth of many pathogenic microbes.
B - Sweat Glands: which keeps the body temperature in addition to containing the Lysozyme enzyme, which can affect the cell wall of bacteria, especially bacteria Cr+ also affects Cr- Bacteria, but to a lesser extent. As noted there an enzyme in each of all body secretions(like Saliva, nasal and In other tissue fluid), which is as a Antimicrobial Activity.
C - Gastric Juice: which is excreted by the glands of infectious and which are a combination of hydrochloric acid HCL and other enzymes which is very high acidic ranging between 1.7 - 3 as it works to sterilize the stomach and destroy the cells of bacteria and their toxins, as there is in the small intestine secretions Bile Secretion and which have a significant effect on the pathogens as well as Vaginal Secretion working to reduce the pH of the vaginal canal and thus inhibit the growth of pathogenic microbes.





2- **Acquired immunity** (specific): a third line of defense of the body which is made up by the body against the molecules nurse and be of special cells in the Immune system which lymphocyte (a type of white blood cells WBC), which produces proteins Private called antibodies and characterized only by vertebrates.

Acquired immunity is divided into two types:

1- **Naturally Acquired immunity**, which are of two types:

A – **Active**: which enters the antigen into the body naturally and the body produces antibodies against it, especially by lymphoid cells for example, in measles and chicken pox when the body is exposed to these germs once during his lifetime acquired immunity for long periods while other diseases such as digestive diseases, the body's immunity lasts for short periods

B **- passive** : transmitted antibodies from the mother to the fetus through the Placenta or to the baby through the milk, and this gives immunity for a weeks or months of the fetus or child until the maturity of his immune system.

2 **- Artificially Acquired immunity** be of two types:
A – **Active**: where it enters the antigen by vaccination and the body produces antibodies against him by lymphocytes, and have the vaccine either toxins bacterial ineffective called toxoids or germs dead or (weakened) Attenuated microorganism or part of germs such as Capsules and this possible materials that cause the disease for a short period but remained stimulate the immune response and the pathogen present in the body.
B – **Passive**: entered the antibodies directly through injections, and these antibodies come through the use of laboratory animals in preparation or taken by someone who is infected.

Immune Response

The immune system is developing various mechanisms for the prevent body from diseases

1 - remove foreign body from the body: usually carried out by phagocytic cells

2 - Analysis cells: by the complement factor and chemical factors.

3 - The equation of infectious microbes and biological materials effective: by the antibodies.

The immune response is also affected by many factors using special medicines and cytotoxic drugs as well as ,X-Rays, genetic factors and hormones, alcohol and smoking, and others.

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