تفريغ علم وظائف الأعضاء المرضي

اسم الموضوع: Introduction

إعداد الصيدلاني/ة: Malak

Soul Academy

لجان الدُّفعات

Pathophysiology-Introduction

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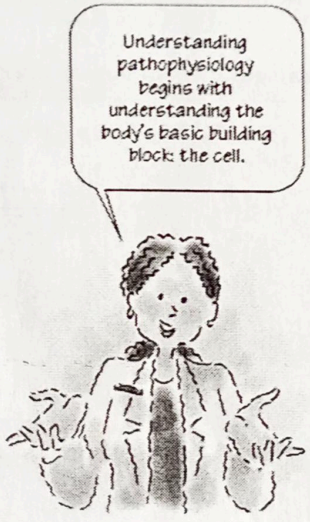
بسم الله الرحمن الرحيم



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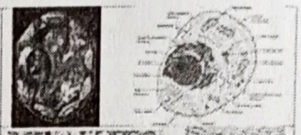
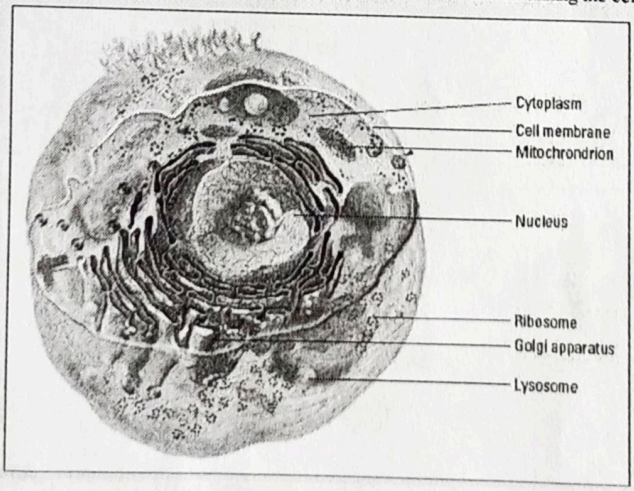
Cell	Basic structural and functional unit of a living organism	
Tissue	Group of cells with similar structures, working together to perform a shared function	
Organ	Structure made up of a group of tissues, working together to perform specific functions	
Organ System	Group of organs with related functions, working together to perform body functions	
Organism	Living thing performing all seven life processes	

Cells, Organs, Tissues Card Sort | Teaching Resources (tes.com)

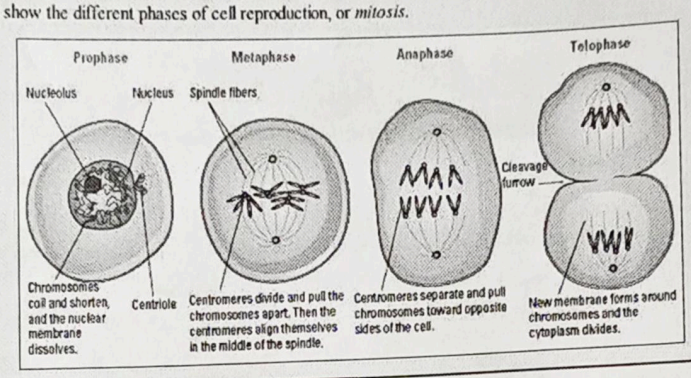
Just your average cell

The illustration below shows cell components and structures. Each part has a function in maintaining the cell's life and homeostasis.



Replicate and divide

These illustrations show the different phases of cell reproduction, or *mitosis*.



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هاي المشاكل يلي تصير نتيجة خلل في انقسام الخلية:-

خلك يا الجسم تتجدد و إلها القدرة على الانقسام

و العملية تكون Control

١ تنتج وحدة أكثر من اللازم

٢ تنتج وحدة أقل من اللازم

٣ تموت قبل بوقت

٤ تتجدد قبل بوقت

وإذا صار عندنا مشكلة

Pathophysiologic concepts

Stressors, changes in the body's health, disease, and other extrinsic and intrinsic factors can alter the cells' (normal functioning.)

Cells generally continue functioning despite challenging conditions or stressors. However, severe or prolonged stress or changes may injure or destroy cells. When cell integrity is threatened, the cell reacts by drawing in its reserves to keep functioning, by adaptive changes or by cellular dysfunction. If the cellular reserve is insufficient, the cell dies (cell death (necrosis, is usually localized and easily identifiable, occurs). If enough reserve is available and the body doesn't detect abnormalities, the cell adapts by atrophy, hypertrophy, hyperplasia, metaplasia, or dysplasia.

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عوامل تؤثر على الخلية: ضغوطات Stressors

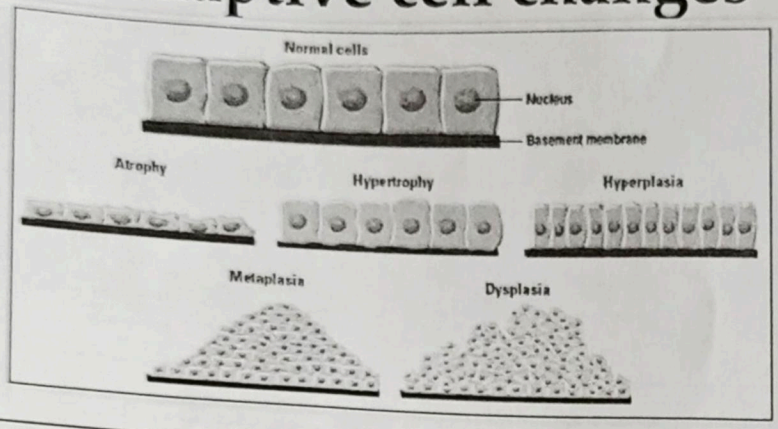
يؤدي لموت الخلية

جسم الانسان يتكيف مع المؤثرات الخارجية والداخلية ويقدر يصحح مسار العمليات تلقائي

* إذا صار عدم توازن لفترات طويلة

تكيف الخلية مع التغيرات

Adaptive cell changes



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أمثلة ① الرتجاع المريء ← يموت خلايا المريء ومع تكرار الارتجاع تتجدد خلايا تتحمل الحمض المعدي

على خلايا إذا مائت تتغير نوعها:

② الأعصاب لما تموت تبدل للألياف / ③ تشمع الكبد: خلايا الكبد تتجدد لخلايا كولاجين

الأسبرين ← مع تكرار هتن المعدة يصير فيه تقوس للخلايا وكمان البطن

Atrophy حجم الخلية يصير أقل من الطبيعي

Atrophy is a reversible reduction in the size of the cell. It results from disuse, insufficient blood flow, malnutrition, denervation, or reduced endocrine stimulation.

Hypertrophy (تضخم حجم القلب) زيادة في حجم الخلايا

Hypertrophy is an increase in the size of a cell due to an increased workload. It can result from normal physiologic conditions or abnormal pathologic conditions.

زيادة عبء العمل

Hyperplasia زيادة عدد الخلايا لداء القلب أقل

Hyperplasia, an increase in the number of cells, is caused by increased workload, hormonal stimulation, or decreased tissue.

زيادة في حجم الخلايا

Metaplasia تستبدل

Metaplasia is the replacement of one adult cell with another adult cell that can better endure the change or stress. It's usually a response to chronic inflammation or irritation.

تتحمل تهيج مزمن

Dysplasia غير منتظم

In dysplasia, deranged cell growth of specific tissue results in abnormal size, shape, and appearance. Although dysplastic cell changes are adaptive and potentially reversible, they can precede cancerous changes.

تغير نوع الخلايا شكل حجم غير طبيعي يحتمل عكسها

تسبق التغيرات السرطانية

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تشكل الخلية غير منتظم

Lethal : وشوهة للخلقة

Memory jogger عداء الذاكرة

To remember the four causes of cell injury, think of how the injury tipped (or **TIPD**) the scale of homeostasis:

جرح — يميل — هياس التوازن — قسم

Toxin or other lethal (cytotoxic) substance مواد مسممة / قاتلة

Infection الإصابة بـ

Physical insult or injury أذى / جرح — صدمة / حادثة

Deficit, or lack of water, oxygen, or nutrients. عجز / نقص — ماء — أوكسجين — مواد — (نقص التغذية)

* تحدث في السيتو بلازم للخلية
الجزء من النواة RNA/DNA تبقى
غير متأثرة

غير مشوه للخلقة

A type of nonlethal cell damage known as degeneration

موت خلايا في جسم الأنسان
دون التسبب بالوفاة

"ومن يتقِ الله يجعل له مخرجاً"

Degeneration

When changes within cells are identified, degeneration may be slowed or cell death prevented through prompt treatment. An electron microscope makes the identification of changes within cells easier.

When a disease is diagnosed before the patient complains of any symptoms, it's termed **subclinical identification**. Unfortunately, many cell changes remain unidentifiable even under a microscope, making early detection impossible.

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Cell aging

• During the normal process of cell aging, cells lose structure and function. Lost cell structure may cause a decrease in size or wasting away, a process called **atrophy.**

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In's and out's of cell aging

Factors that affect cell aging may be intrinsic or extrinsic, as outlined here.

Intrinsic factors

- Psychogenic
- Inherited
- Congenital
- Metabolic
- Degenerative
- Neoplastic
- Immunologic
- Nutritional

Extrinsic factors *Physical agents*

- Force
- Temperature
- Humidity
- Radiation
- Electricity
- Chemicals

Infectious agents

- Viruses
- Bacteria
- Fungi
- Protozoa
- Insects
- Worms

Intrinsic factors : أسباب داخلية

1. Psychogenic النفسية
2. Inherited وراثي
3. Congenital خُلقي
4. Metabolic أيض
5. Degenerative التكاسة
6. Neo Plastic الأورام
7. Immunologic مناعي
8. Nutritional تغذية

* الجسم يعمل تكيف عشان يحافظ على التوازن

HOMEOSTASIS (التوازن)

Control = regulation

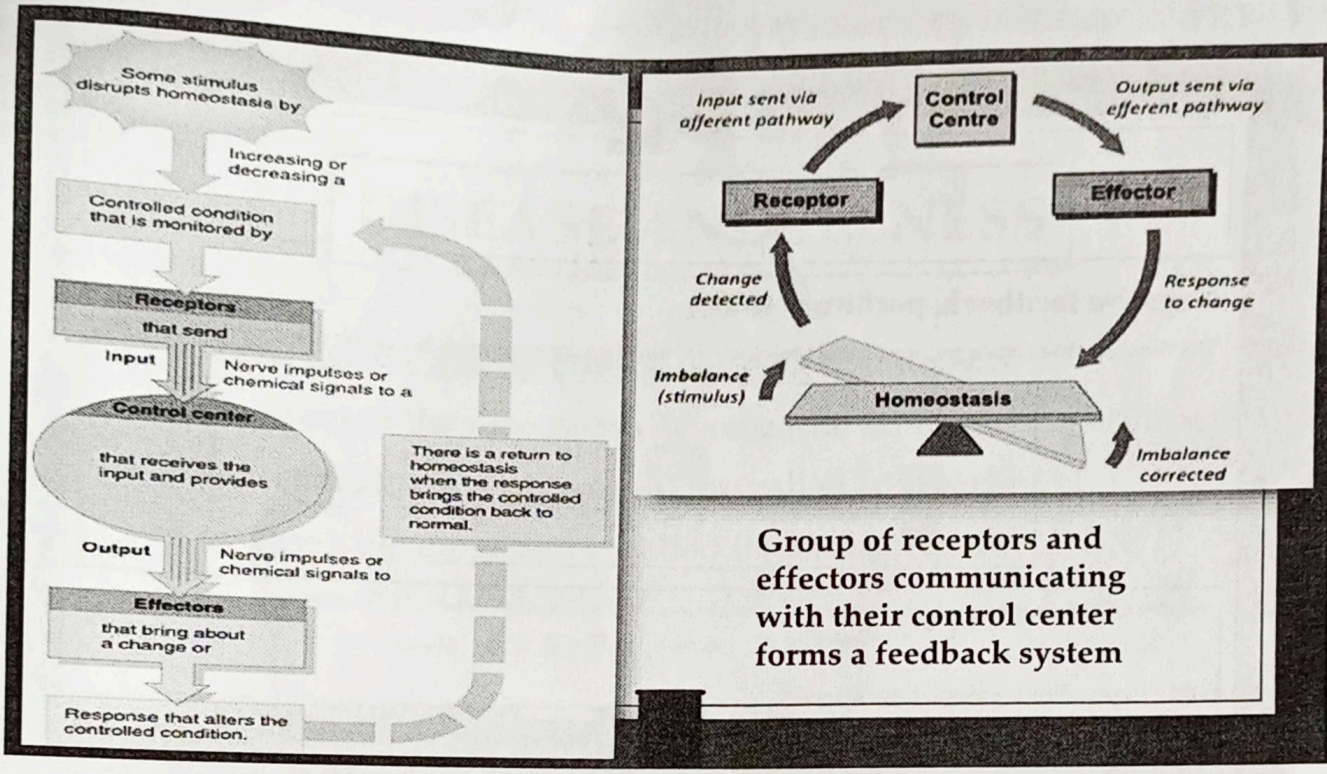
- The body is constantly striving (يسعى) to maintain a dynamic (حركية), steady-state (ثابتة) of internal balance called homeostasis. Every cell in the body is involved (متشاركين) in maintaining homeostasis, both on the cellular level and as part of an organism.
- Any change or damage at the cellular level can affect the entire body. When an external stressor (ضغط) disrupts (يعطل) homeostasis, illness (مرض) may occur. A few examples of external stressors include injury (جرح), lack of nutrients (كائنات دقيقة), and invasion (هجوم) by parasites (طفيليات) or other organisms. Throughout the course of a person's life, many external stressors affect the body's internal equilibrium.

Every cell in the body is involved in maintaining *homeostasis*, a dynamic, steady state of internal balance.

Maintaining the balance

Three structures in the brain are responsible for maintaining homeostasis:

- the medulla oblongata, the part of the brain stem that's associated with vital functions, such as respiration and circulation
- the pituitary gland, which regulates the function of other glands and thereby a person's growth, maturation, and reproduction
- the reticular formation, a group of nerve cells or nuclei that form a large network of connected tissues that help control vital reflexes, such as cardiovascular function and respiration.

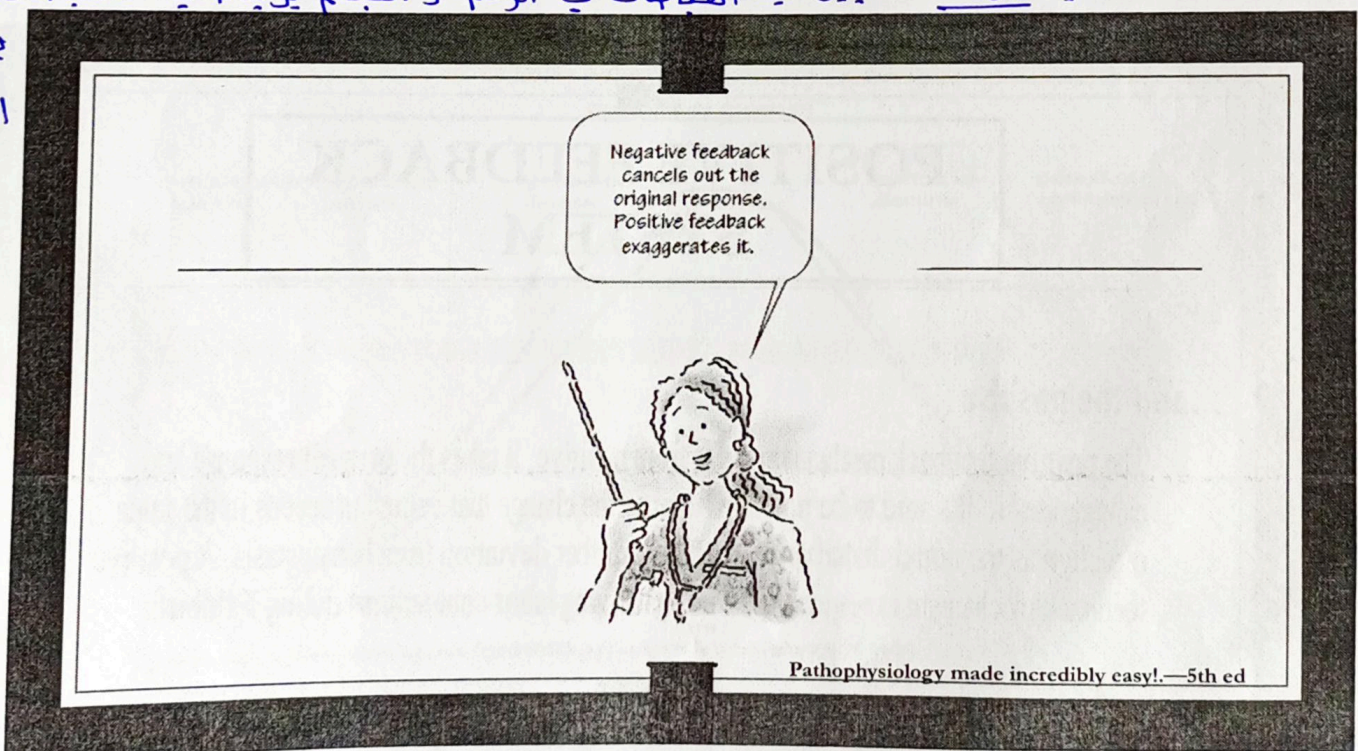


* Negative feedback (لما يصير في فعل بالجسم الجسم يعمل عكس ردة الفعل)

مثال : لما ضغط الدم يرتفع الجسم يقلل ضغط الدم يرجع لو ضغطه الطبيعي

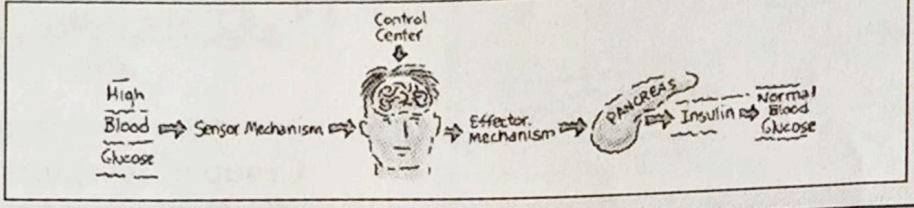
* Positive feedback (لما يصير في فعل بالجسم الجسم يعمل مع ردة الفعل)

مثال : عملية الولادة يصير فيه انقباضات في الرحم و الجسم يزيدهاي للأنقباضات عشان يخرج الطفل



Negative feedback, positive result

This flowchart shows how a negative feedback mechanism works to restore homeostasis in a patient with a high blood glucose level.



POSITIVE FEEDBACK SYSTEM

...and the positive

The positive feedback mechanism is far from positive. It takes the original response and exaggerates it. It's said to be positive because the change that occurs proceeds in the same direction as the initial disturbance, causing a further deviation from homeostasis. A positive feedback mechanism is responsible for intensifying labor contractions during childbirth.

DISEASE AND ILLNESS

- Disease occurs when homeostasis isn't maintained.
- One aspect of the disease is its cause (the fancy term is **etiology**).
- Diseases with no known cause are called **idiopathic.**
- A disease's development is called its **pathogenesis.**

سبب المرض ← مرض موجود مش معروف سببه

تطور المرض في الجسم ←

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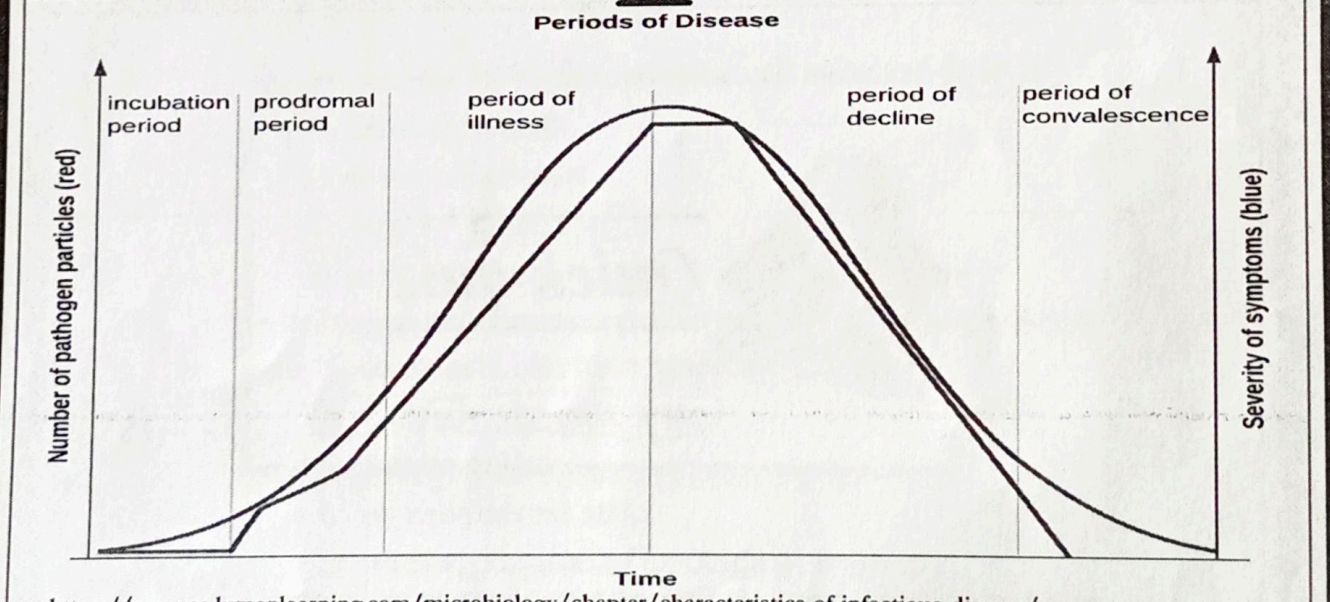
أعراض ذروة خفيفة

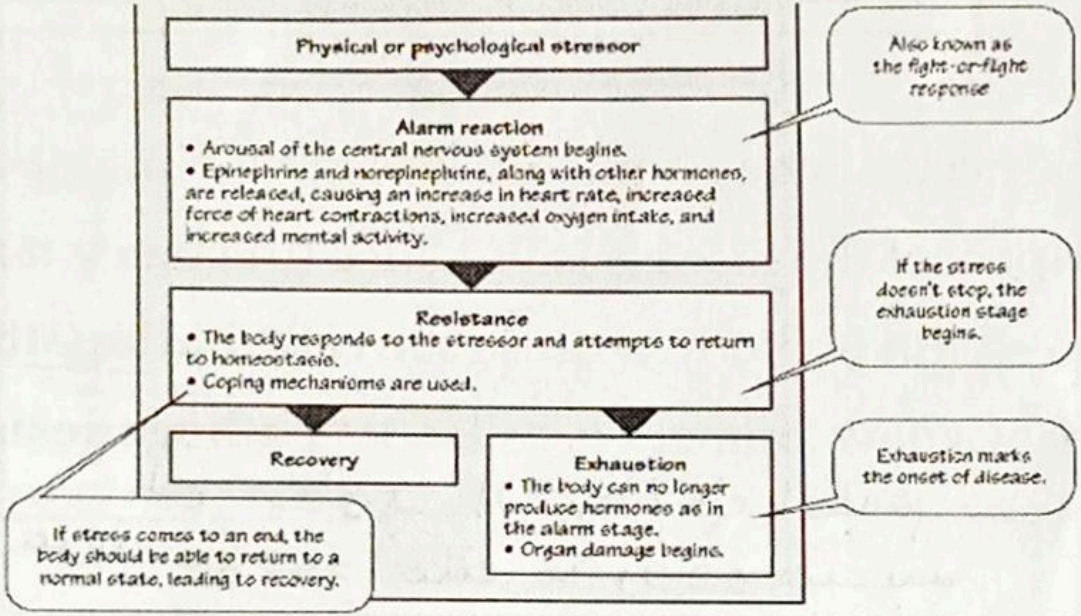
مدخل تطور المرض



https://courses.lumenlearning.com/microbiology/chapter/characteristics-of-infectious-disease/

When stress strikes

According to Hans Selye's General Adaptation Model, the body reacts to stress in the stages depicted below.



1. The organelle that contains the cell's DNA is the:
   A. mitochondria.
   B. Golgi apparatus.
   C. ribosome.
   D. nucleus.

2. When a cell gets injured, the first sign is:
   A. a biochemical lesion.
   B. an area of hyperplasia.
   C. a chromatid.
   D. cellular necrosis.

3. An extrinsic factor that can cause cell aging and death is:
   A. Down syndrome.
   B. sickle cell anemia.
   C. ultraviolet radiation.
   D. person's advanced age.

4. Homeostasis can be defined as:
   A. a steady, dynamic state.
   B. a state of flux.
   C. an unbalanced state.
   D. an exaggeration of an original response.