

التيم مطابق تماما لهذه الملفات
 هذه الملفات تحوي ترجمه وشرح
 بالعربي فقط

ENDOCRINE PHYSIOLOGY

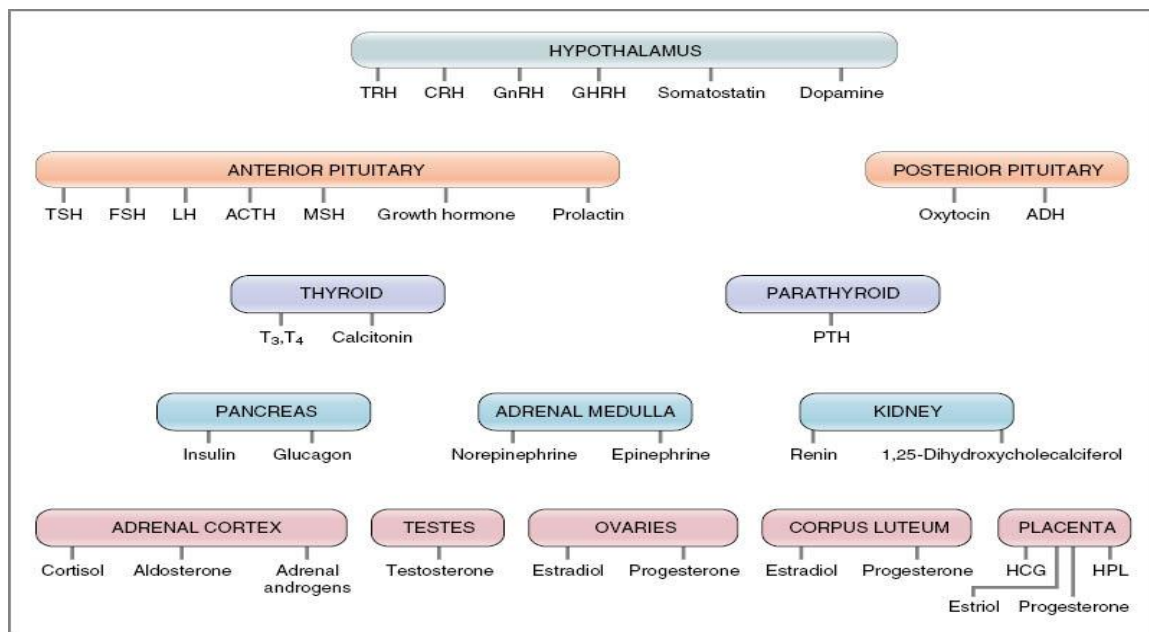
DR. ABDULMAJEED AL-DREES

😊 بالعربي كلو سيم سيم

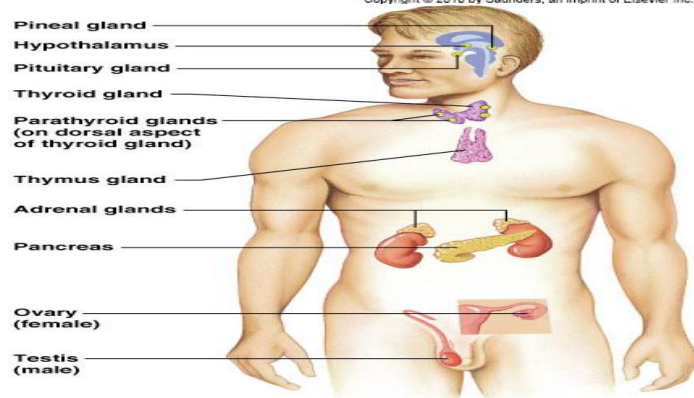
GLANDS : there are 2 types of glands :

- **Exocrine gland.** (which are ductal glands → have ducts)
- **Endocrine gland.** (which are ductless glands → no ducts) وهي موضوع الدراسه في هذا البلوك

ENDOCRINE GLANDS



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• **Objectives :**

- Definition of hormone.
- Local secretion.
- General secretion.
- Target tissue

- What is hormone?.
- Chemical substance secreted in a small amount from **endocrine gland** directly to the blood stream in response to stimulus to cause physiological responses at the target tissues. , الدرس سيناقش جزئيات هذا التعريف بالتفصيل

الجدول يعرض الهرمونات التي سوف تدرس مستقبلا - فقط اطلاع

Table 9-1 Commonly Used Abbreviations in Endocrine Physiology

Abbreviation	Hormone	Abbreviation	Hormone
ACTH	Adrenocorticotrophic hormone	LH	Luteinizing hormone
ADH	Antidiuretic hormone	MIT	Monoiodotyrosine
CRH	Corticotropin-releasing hormone	MSH	Melanocyte-stimulating hormone
DHEA	Dehydroepiandrosterone	PIF	Prolactin-inhibiting factor
DIT	Diiodotyrosine	POMC	Pro-opiomelanocortin
DOC	11-Deoxycorticosterone	PTH	Parathyroid hormone
FSH	Follicle-stimulating hormone	PTU	Propylthiouracil
GHRH	Growth hormone-releasing hormone	SRIF	Somatotropin release-inhibiting factor
GnRH	Gonadotropin-releasing hormone	T ₃	Triiodothyronine
HCG	Human chorionic gonadotropin	T ₄	Thyroxine
HGH	Human growth hormone	TBG	Thyroxine-binding globulin
HPL	Human placental lactogen	TRH	Thyrotropin-releasing hormone
IGF	Insulin-like growth factor	TSH	Thyroid-stimulating hormone

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Endocrine glands are ductless glands that produce and release hormones to the blood through diffusion.

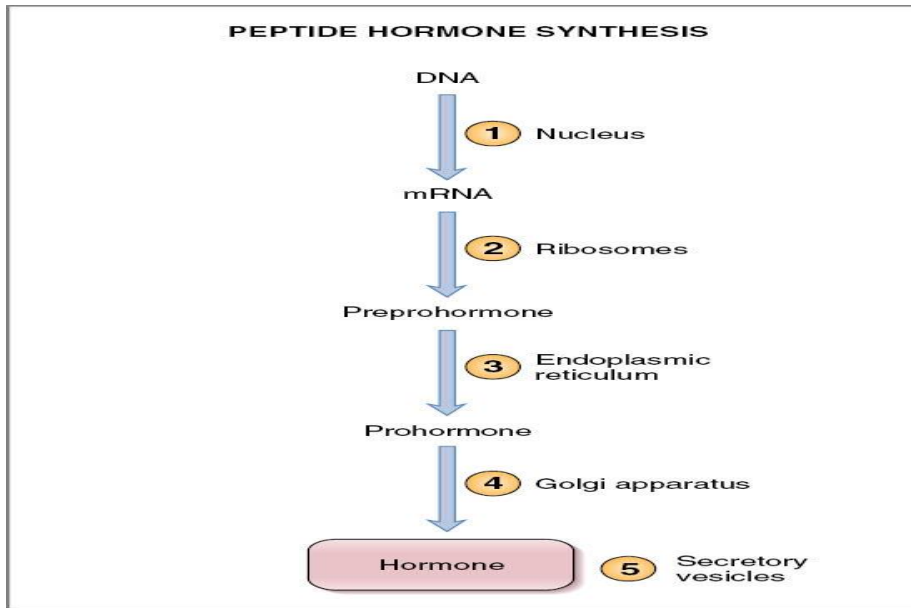
Endocrine glands may be strictly endocrine, such as the pituitary, thyroid, parathyroid, adrenal, pineal and thymus; or they may be organs that have hormone production as one of many functions, such as the pancreas, gonads, hypothalamus, and others.

اولا : CHEMICAL CLASSIFICATION OF HORMONES : 3 types :

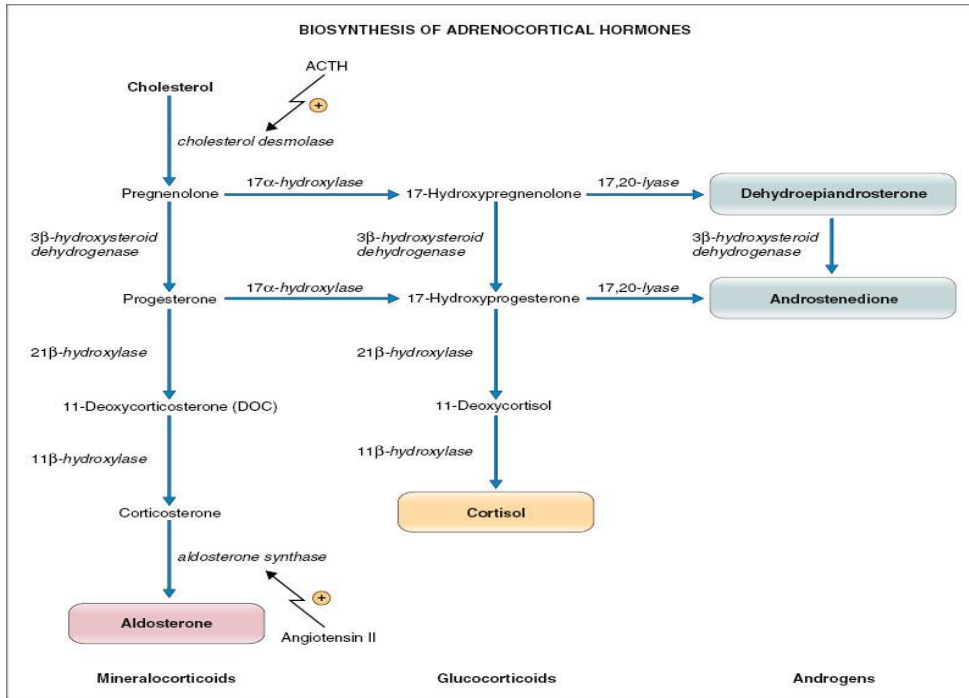
- **Peptides or proteins hormones.** (made from proteins " many types of amino acids ")
- **Steroid hormones.** (made from cholesterol)
- **Amine hormones.** (made from one type of amino acid → **tyrosin**)

ثانيا : HORMONES SYNTHESIS : على حسب النوع الكميائي كما يلي :

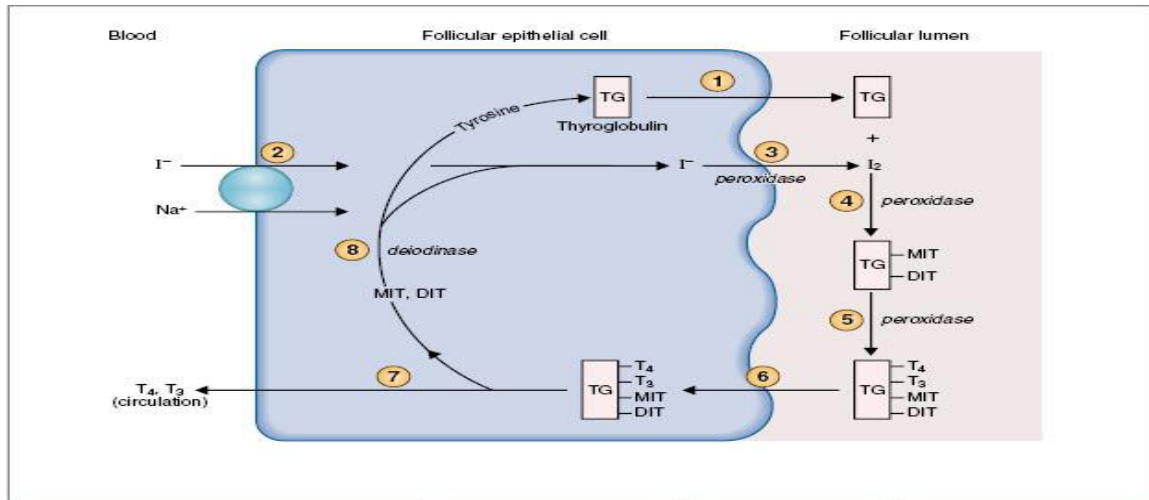
1- Peptides hormones :



2- STEROIDS HORMONES



3- AMINE HORMONE



العامل المؤثر على الغده لكي تفرز الهرمون :CLASSIFICATION OF STIMULI :ثالثا

3 types :

- Humoral Stimuli.
- Neural Stimuli.
- Hormonal Stimuli.

• 1- Humoral Stimuli:

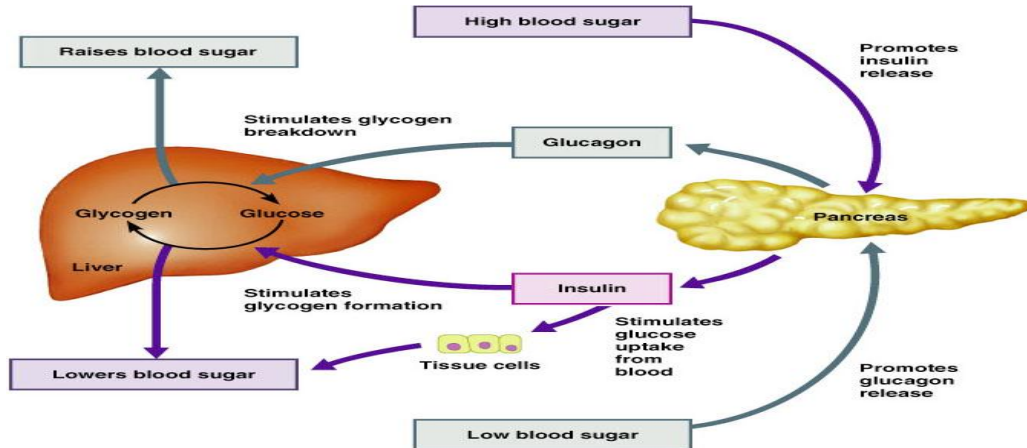
- Secretion of hormones in direct response to **changing in blood levels of ions and nutrients** يعني الغده لها حساسات لمواد معينه بالدم اذا تغيرت نسب هذه المواد الى غير الطبيعي تتحفز الغده وتفرز الهرمون لكي يعدل الوضع

مثال ذلك : على الايونات : الكالسيوم : كما في الصورة الثانيه --- وعلى المواد الغذائيه : الجلوكوز : كما في الصورة الاولى

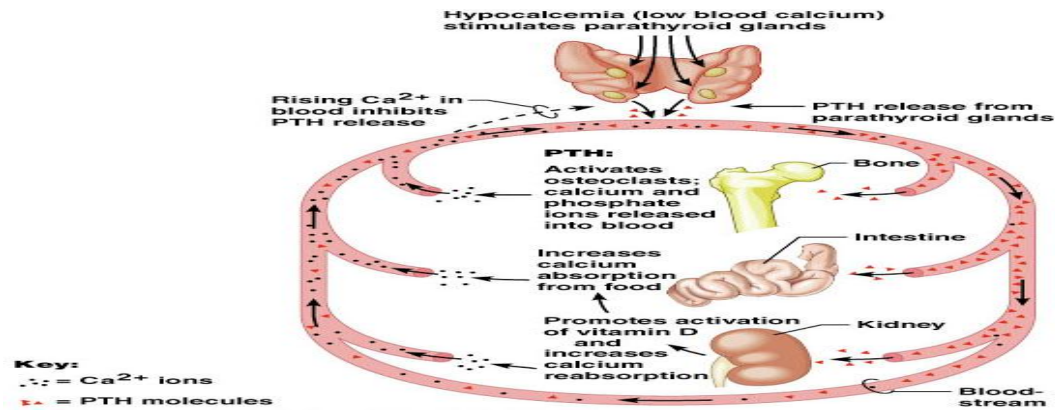
شرح الصورة الاولى :

If the Glucose level increase : it stimulate Insuline secretion

If the Glucose level decrease : it stimulate Glucagon secretion

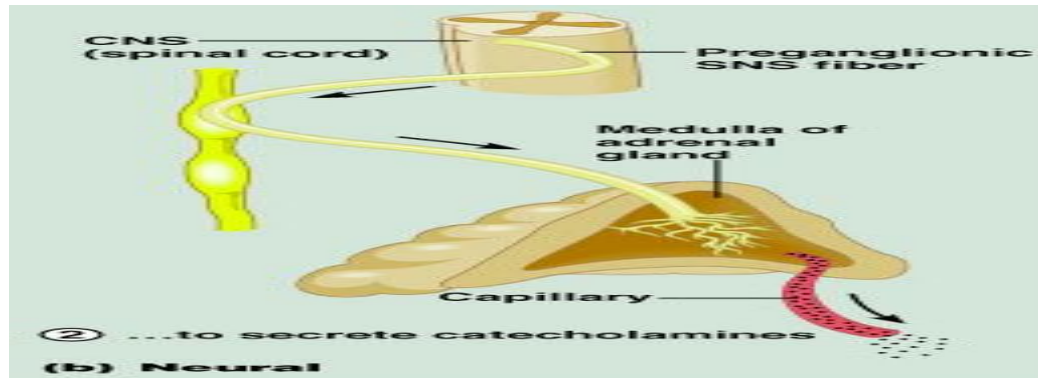


الصورة الثانية : مثال على تحكم نسبة الكالسيوم بالدم بإفراز بعض الغدد



• 2- Neural Stimuli:

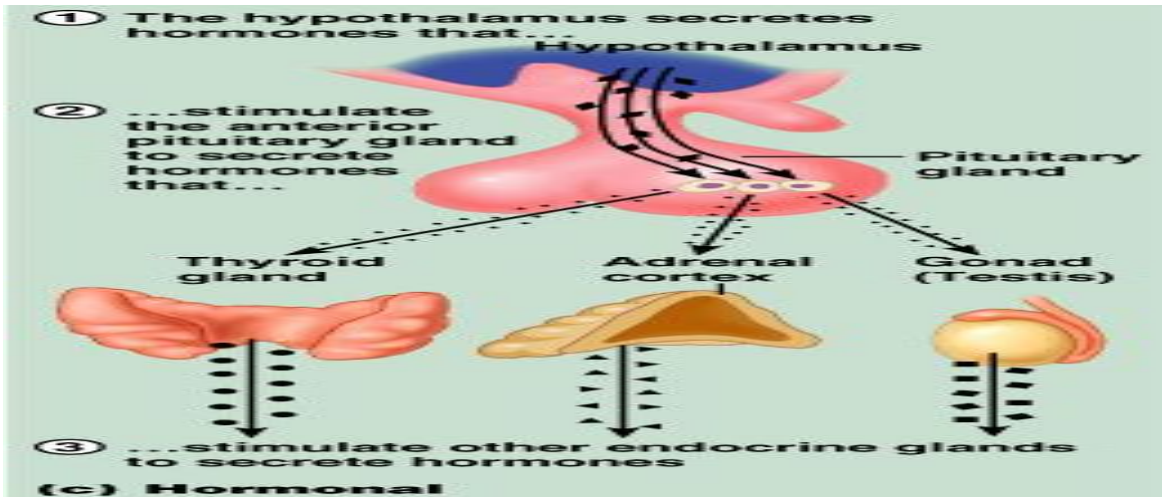
- Nerve fibers stimulate hormone release.
- Ex : sympathetic system in our body stimulate secretion of adrenalin hormon



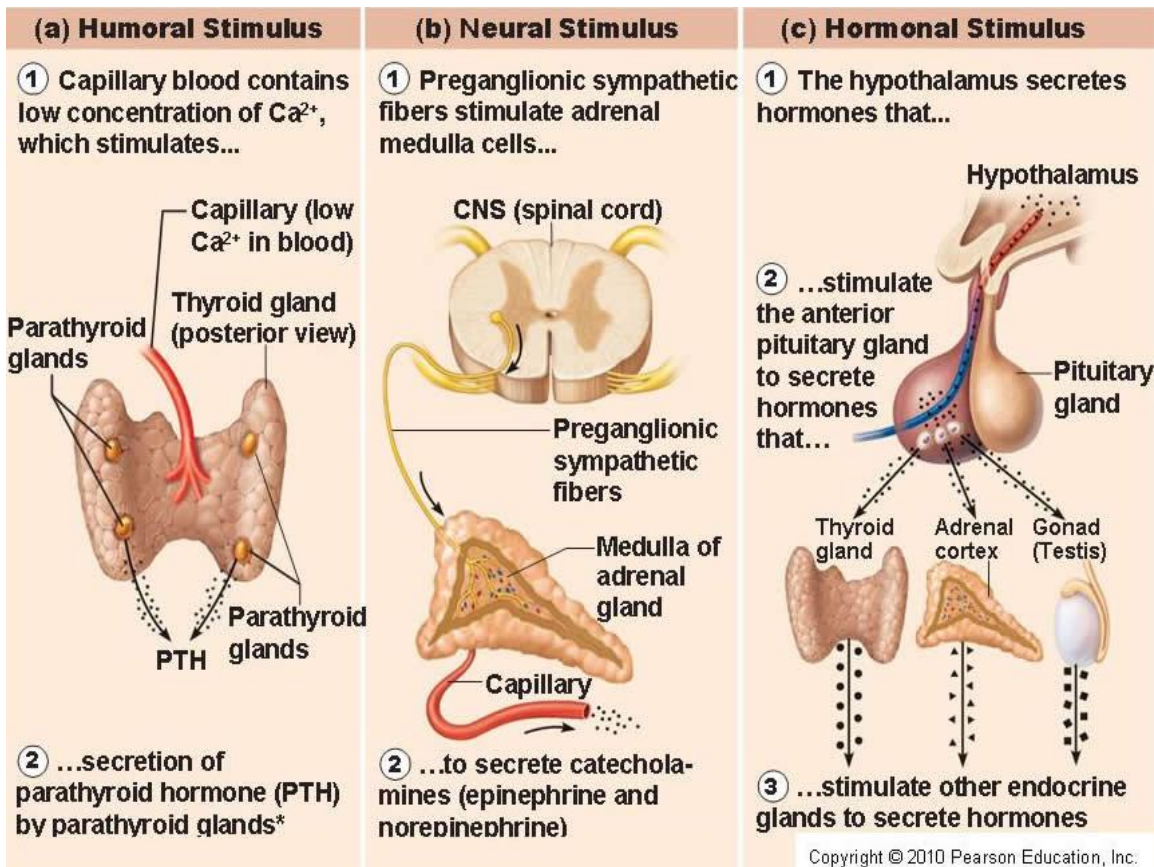
• 3- Hormonal Stimuli:

- Release of hormones in response to hormones produced by other endocrine gland.

Ex : pituitary gland control the other glands secretion in our body by releasing hormones انظر الصورة الصفحه التاليه



In summary :

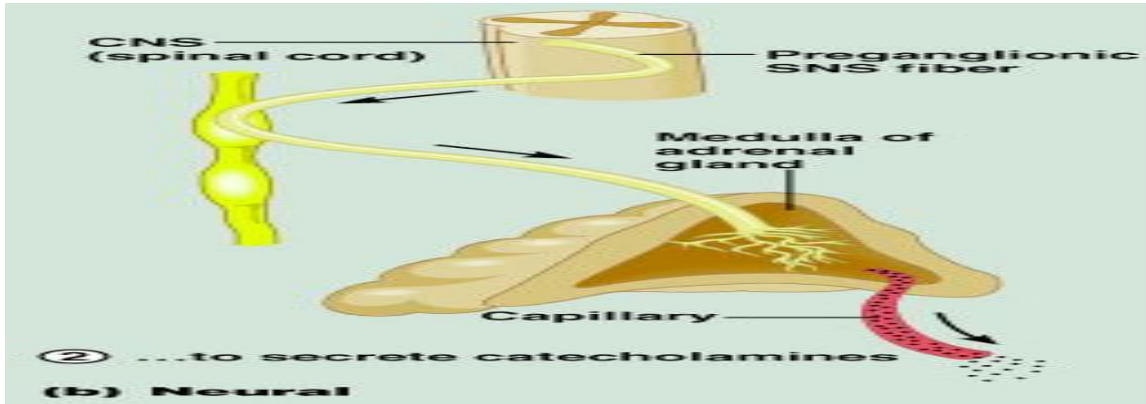


رابعاً: REGULATION OF HORMONE SECRETION: by 2 mechanisms :

Neural mechanism.

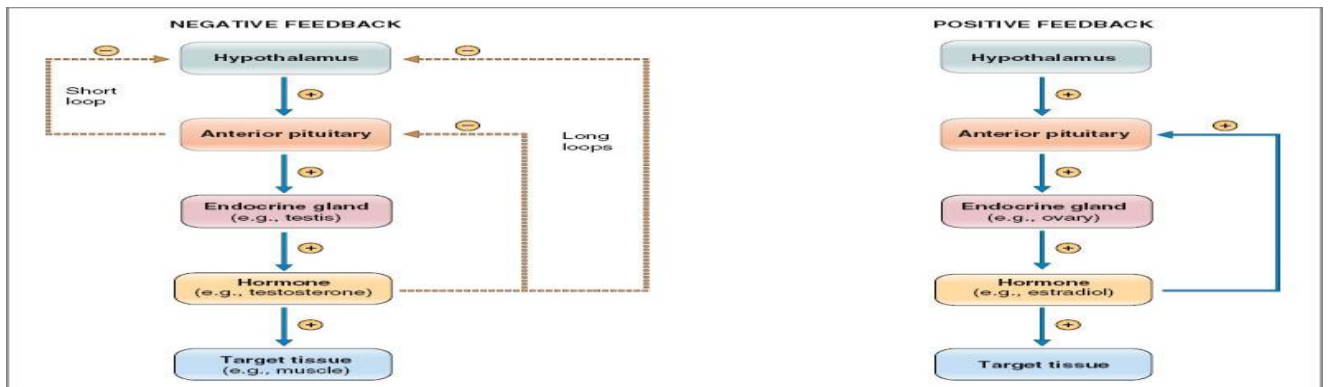
Feedback mechanism.

1- NEURAL MECHANISM: مثل مثال السمباثاتيك السابق

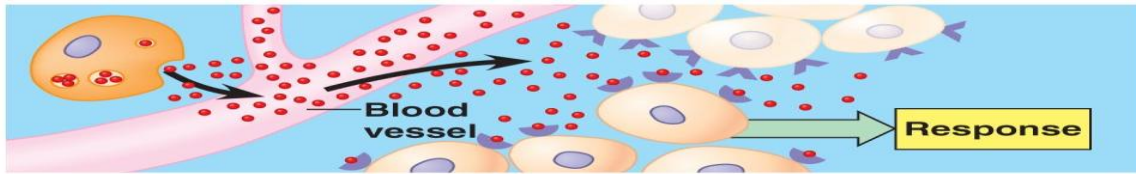


2- FEEDBACK MECHANISM: 2 types :

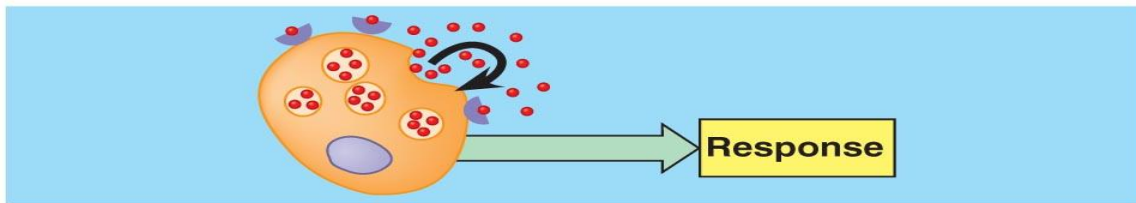
- Negative feedback “ more common “ (has 3 types) :
 - 1- Long lobe (اذا كان العامل المثبط يفرز من مكان بعيد جدا عن الغده وينتقل اليها عبر الدم)
 - 2- Short lobe (called paracrine) (اذا كان العامل المثبط يفرز من غده مجاوره)
 - 3- Ultra short lobe (called autocrine) (اذا كان العامل المثبط يفرز من نفس الغده المفرزه) (للهرمون)



- In other words :
- **Autocrines** – chemicals that exert their effects on the same cells that secrete them.
- **Paracrines** – locally acting chemicals that affect cells other than those that secrete them.

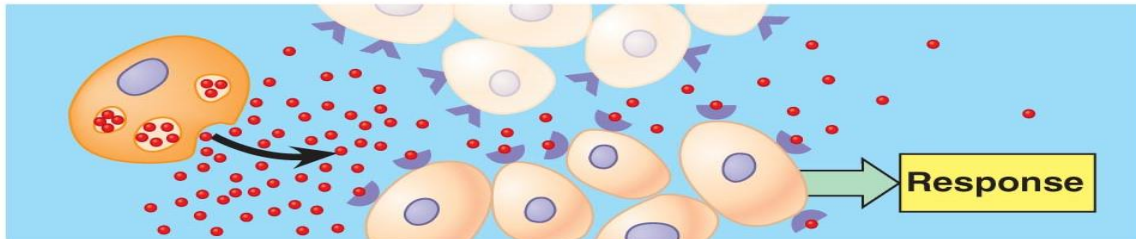


(a) Endocrine signaling



(c) Autocrine signaling

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(b) Paracrine signaling

- **Positive feedback**

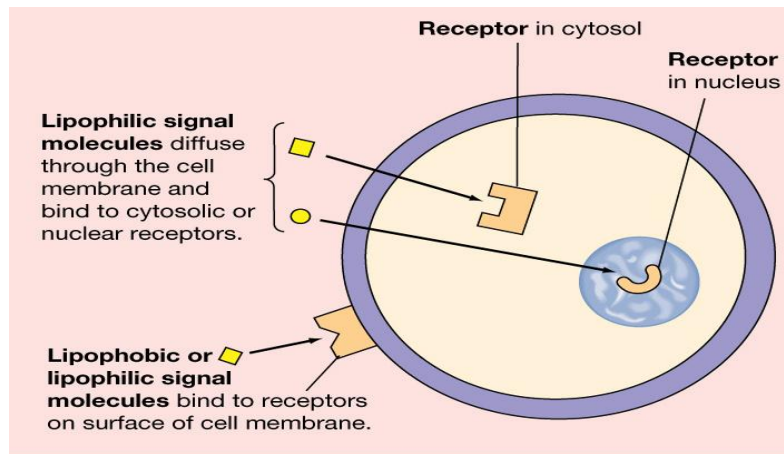
خامسا: TARGET TISSUE: specific tissues that have specific receptors to some hormones

MECHANISM OF ACTION (they mainly follow the key and lock theory)

- **Receptors + hormone** → conformational changes **مهمة** → ?????? → **action**

RECEPTOR LOCATIONS IN THE TARGET TISSUE: سادسا

- **1- Cytosolic or Nuclear** على النواه
 - **Lipophilic ligand** الهرمونات القابلة للذوبان بالدهن هي التي ترتبط بها **enters cell**
 - **Often activates gene**
 - **Slower response**
- **2- Cell membrane**
 - **Lipophobic ligand can't enter cell**
 - **Outer surface receptor**
 - **Fast response**

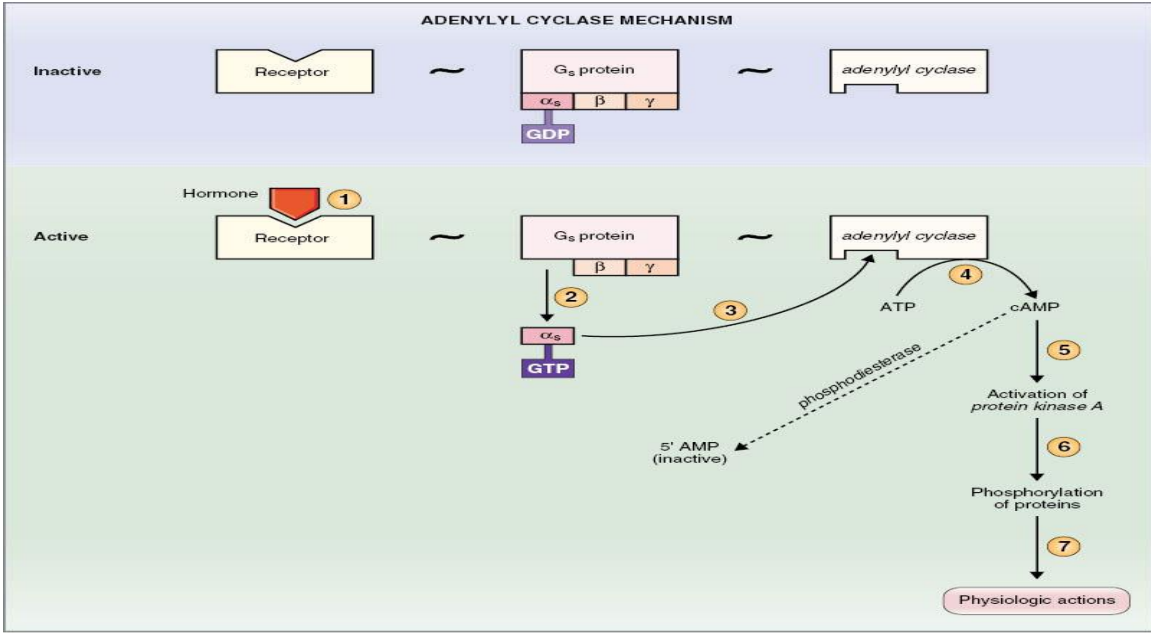


AFTER THE HORMONE BIND TO A RECEPTOR IT DO ITS EFFECT BY EITHER :

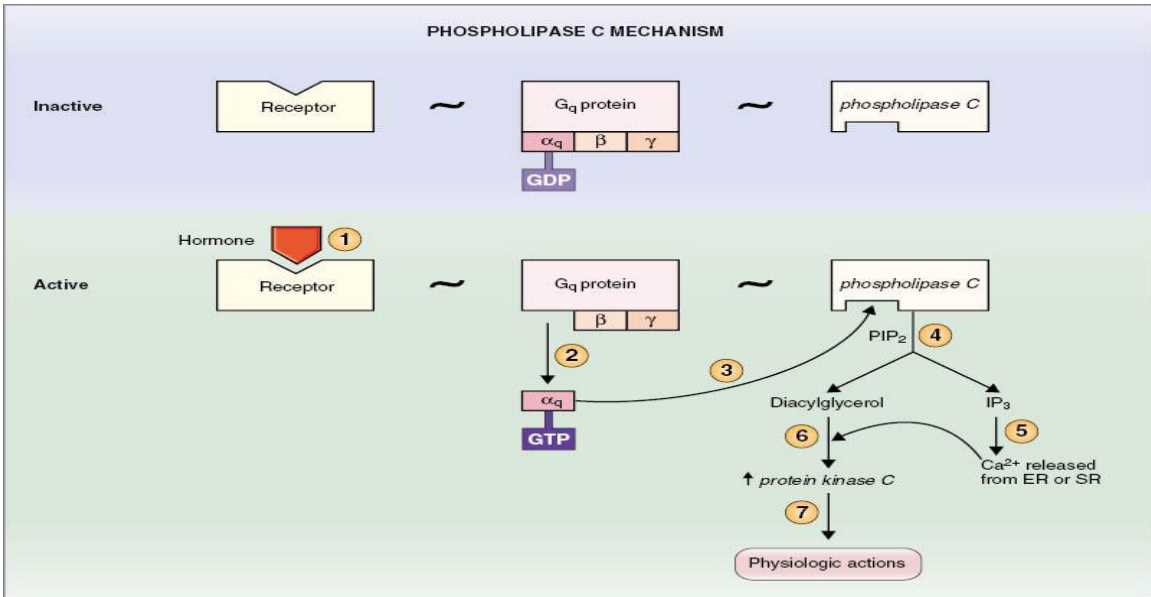
- 1- DIRECTLY**
- 2- BY SECOND MESSENGER**

اولا : **Second messenger** : there are 4 different mechanisms of second messenger : الصور تحت تجدها مشروحه بالتفصيل في محاضره البايو الاولى

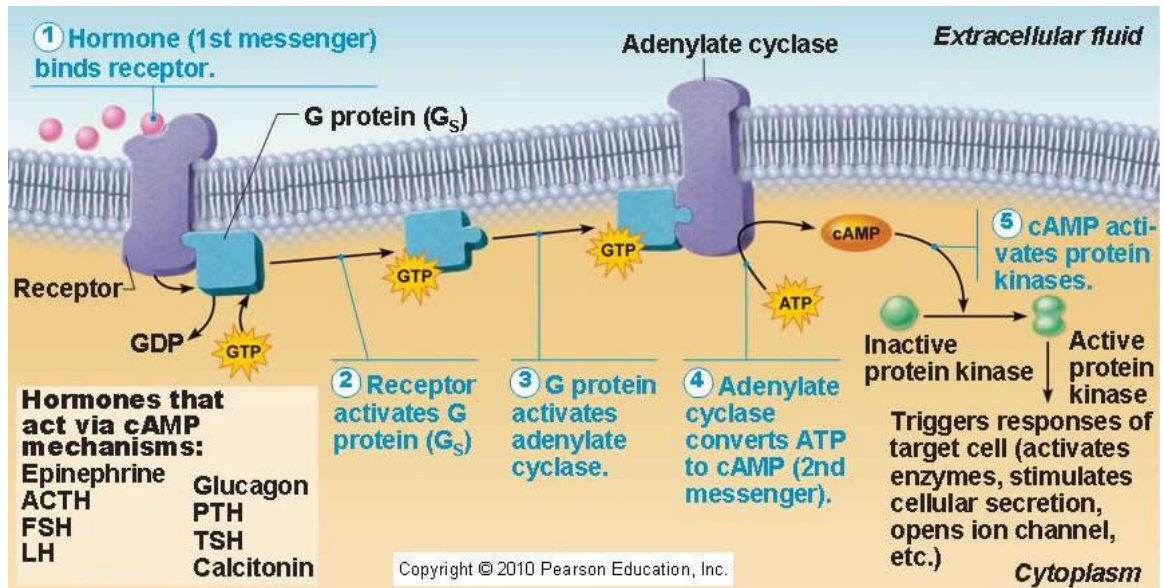
- 1- Adenylyl Cyclase mechanism**
- 2- Phospholipase C mechanism**
- 3- Tyrosine kinase system (mainly used by Insulin)**
- 4- c GMP**



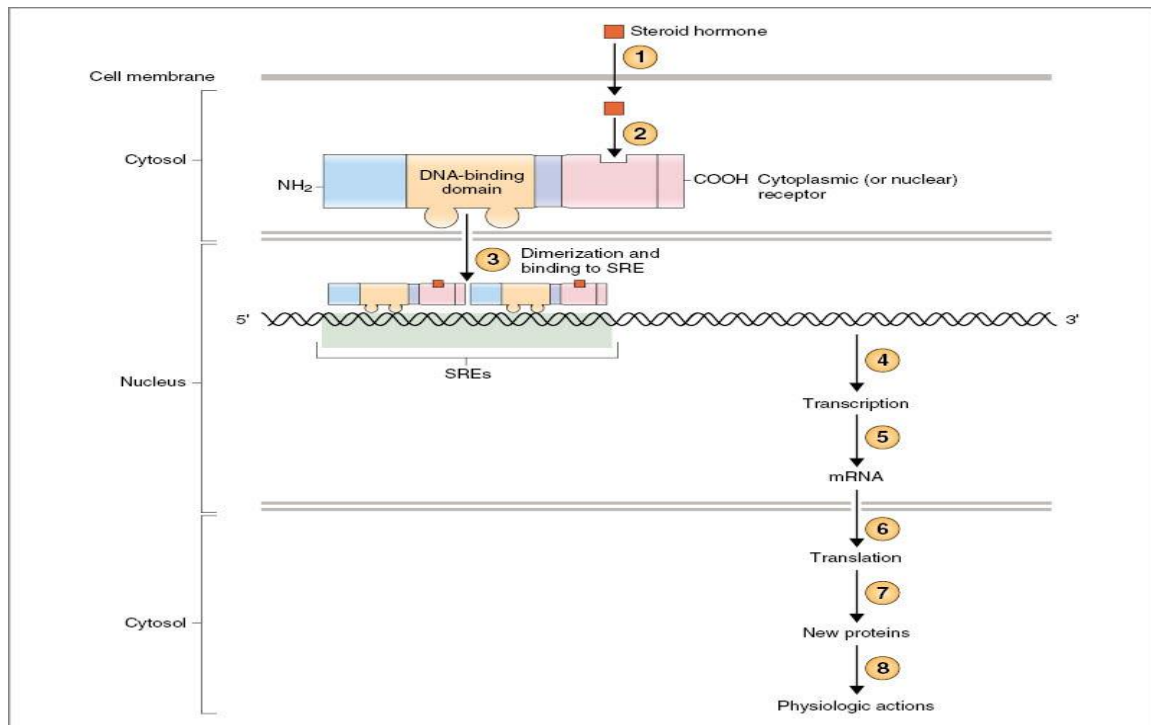
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ثانياً: Direct effect (called steroid hormone mechanism) (main example is : steroid hormones) انظر الصور تشرح العملية بشكل جميل خصوصا الصورة الثانية – مطلوبه ومهمه



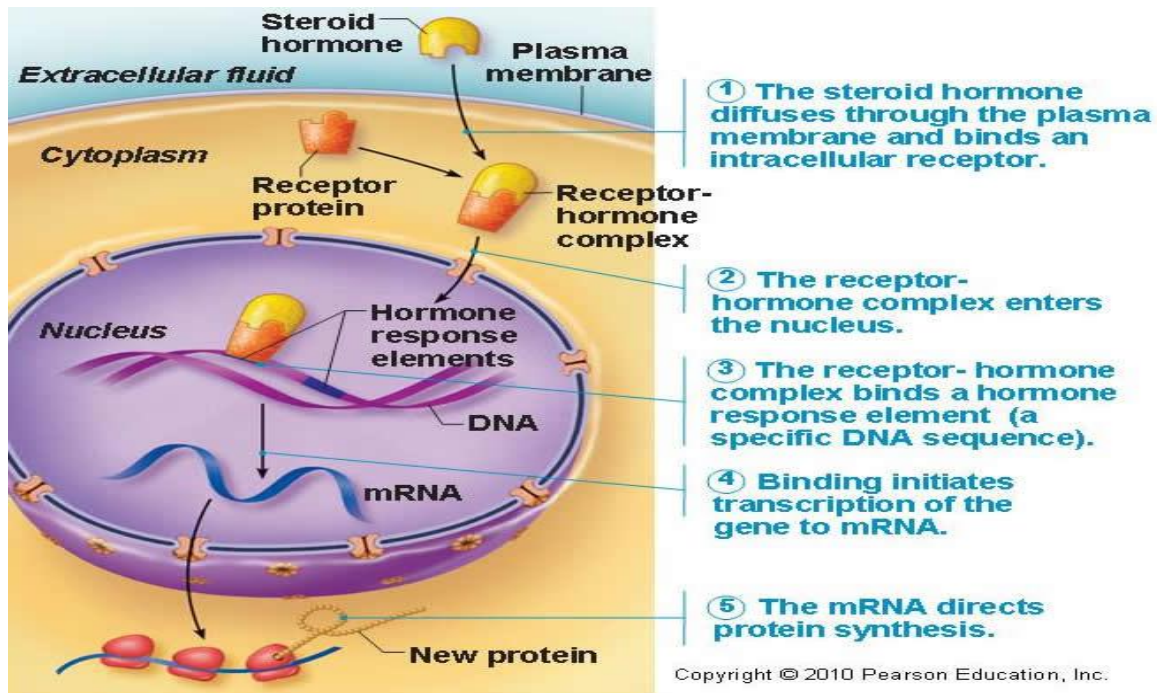


Table 9-3 Mechanisms of Hormone Action

ملخص لما سبق - مهم جدا

Adenylyl Cyclase Mechanism (cAMP)	Phospholipase C Mechanism (IP ₃ /Ca ²⁺)	Steroid Hormone Mechanism	Tyrosine Kinase Mechanism	Guanylate Cyclase Mechanism (cGMP)
ACTH	GnRH	Glucocorticoids	Insulin	Atrial natriuretic peptide (ANP)
LH	TRH	Estrogen	IGF-1	Endothelial-derived relaxing factor (EDRF)
FSH	GHRH	Progesterone		Nitric oxide (NO)
TSH	Angiotensin II	Testosterone		
ADH (V ₂ receptor)	ADH (V ₁ receptor)	Aldosterone		
HCG	Oxytocin	1,25-Dihydroxycholecalciferol		
MSH	α ₁ Receptors	Thyroid hormones		
CRH				
Calcitonin				
PTH				
Glucagon				
β ₁ and β ₂ receptors				

اسبابها :REGULATION OF HORMONE RECEPTORS by :

- 1- Dose-response relationship. اذا زادت الجرعه تزيد الاستجابه حتى تصل الى حد التشبع
- 2- Sensitivity. اللريسيبتور : وتتأثر بعاملين هما :
- A- Number.
- B- Affinity.
- عمل الجسم للتحكم بمستوى ونشاطيه الهرمونات يعمل كالتالي :

تنظيم الهرمون (عمله) وذلك بواسطه DOWN-REGULATION : اما

- Decrease synthesis.
- Increase degradation.
- Inactivation .
- T3, progesterone.

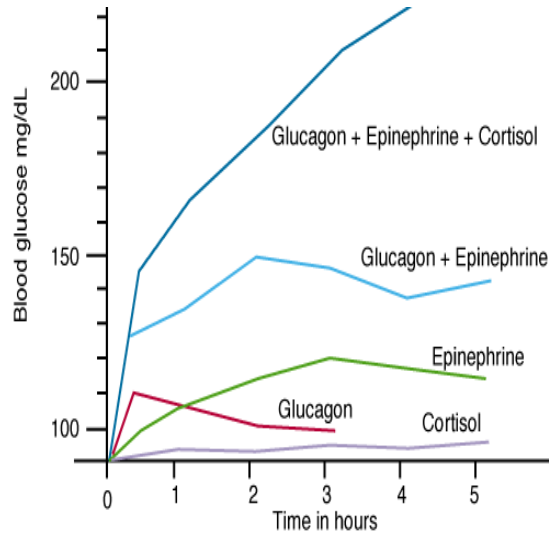
عكس ما سبق UP-REGULATION : او

- Increase synthesis.
- Decrease degradation.
- activation .
- Estrogen, GH, prolactin.

تأمننا :INTERACTION OF HORMONES AT TARGET CELLS: 3 types :

1- Permissiveness: Permissiveness occurs when one hormone cannot exert its full effect without another hormone being present (reproductive hormones need thyroxine to properly stimulate development of reproductive organs) example (Thyroid hormone have permissive effect on growth hormone action) احد الهرمونات يحفز عمل الاخر

- **2- Synergism :** occurs when more than one hormone produces the same effects in a target cell, and their combined effects are amplified (glucagon, cortisol and epinephrine) الهرمونات اذا عملت معا تؤدي نتيجه اعلى مما اذا عمل كل منها على حده – ي المخطط بالاسفل كما ف



- 3- Antagonism (Glucagon /insulin)

تاسعا: HORMONE CONCENTRATIONS IN THE BLOOD:

- Concentrations of circulating hormone reflect:
 - Rate of release
 - Speed of inactivation and removal from the body
- Hormones are removed from the blood by:
 - Degrading enzymes
 - The kidneys
 - Liver enzyme systems

قام بالتعديل و اضافته النوت من الكتاب المقرر

محمد المومي