

# ENDOCRINE SYSTEM- PITUITARY GLAND

Dr. SHEETAL JAIN

# The Pituitary

Sits in hypophyseal fossa: depression in sella turcica of sphenoid bone

Pituitary secretes 9 hormones

## Two divisions:

- **Anterior pituitary**  
(adenohypophysis)

1. TSH
2. ACTH
3. FSH
4. LH
5. GH
6. PRL
7. MSH

*The first four are "tropic" hormones, they regulate the function of other hormones*

---

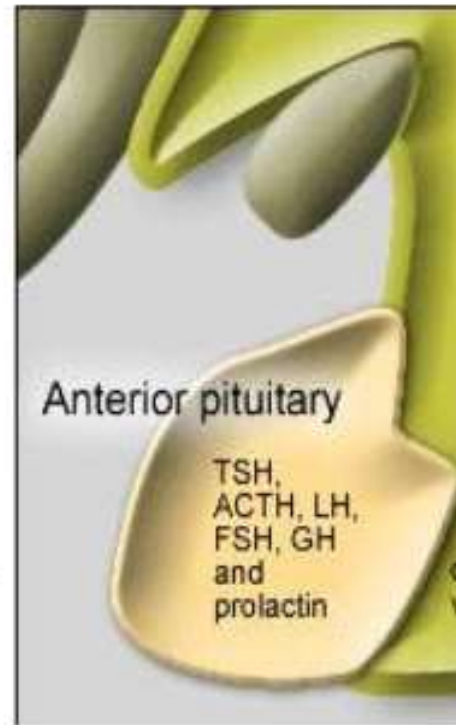
- **Posterior pituitary**  
(neurohypophysis)

8. ADH (antidiuretic hormone), or vasopressin
9. Oxytocin

# ANTERIOR PITUITARY GLAND

1. Size of a pea

2. The anterior pituitary gland is the front lobe of the pituitary gland, which is found at the floor of the [brain](#), called the *sellaturcica*



## ***What the letters stand for...***

- TSH: thyroid-stimulating hormone
  - ACTH: adrenocorticotrophic hormone
  - FSH: follicle-stimulating hormone
  - LH: luteinizing hormone
  - GH: growth hormone
  - PRL: prolactin
  - MSH: melanocyte-stimulating hormone
- 
- ADH: antidiuretic hormone
  - Oxytocin

## So what do the pituitary hormones do?

The four tropic ones regulate the function of other hormones:

- TSH stimulates the thyroid to produce thyroid hormone
- ACTH stimulates the adrenal cortex to produce corticosteroids: aldosterone and cortisol
- FSH stimulates follicle growth and ovarian estrogen production; stimulates sperm production and androgen-binding protein
- LH has a role in ovulation and the growth of the corpus luteum; stimulates androgen secretion by interstitial cells in testes

## The others from the anterior pituitary...

- GH (aka somatotrophic hormone) stimulates growth of skeletal epiphyseal plates and body to synthesize protein
- PRL stimulates mammary glands in breast to make milk
- MSH stimulates melanocytes; may increase mental alertness

# Growth hormone

- Stimulates the growth of bones, muscle, and other organ by increasing protein synthesis.
- affects protein, fat and carbohydrate metabolism.
- Too little growth hormone secretion can be the result of abnormal development of the pituitary gland.
- Release is stimulated by GHRH
- Suppression is by GHRIH



## Thyroid stimulating hormone (TSH)

- Stimulated by Thyroidtropin-releasing hormone (TRH )from hypothalamus
- Inhibit by Somatostatin from hypothalamus
- Stimulate the thyroid gland to secrete hormone thyroxin
- Stimulates growth and activity of the thyroid gland
- When too much TSH is secreted,it cause the thyroid gland to enlarge and secrete too much thyroxin

## Adrenocorticotrophic hormone (corticotrophin, ACTH)

- Stimulated by Corticotropin-releasing hormone(CRH) from the hypothalamus
- ACTH stimulate the adrenal gland(cortex) to secrete a hormone called glucocorticoids.
- Secretion is regulated by negative feedback  
(Suppressed when blood level ACTH rises )

# Prolactin

- Also known as lactogenic hormone
- Stimulated by Prolactin-releasing hormone (PRH) from hypothalamus
- Inhibit by Dopamin from hypothalamus
- Target cell is mammary gland
- Stimulates the production of milk in the breast following pregnancy.
- Negative feedback when blood level prolactin increase
- Prolactin hypersecretion in males cause erectile dysfunction.

# Gonadotrophins

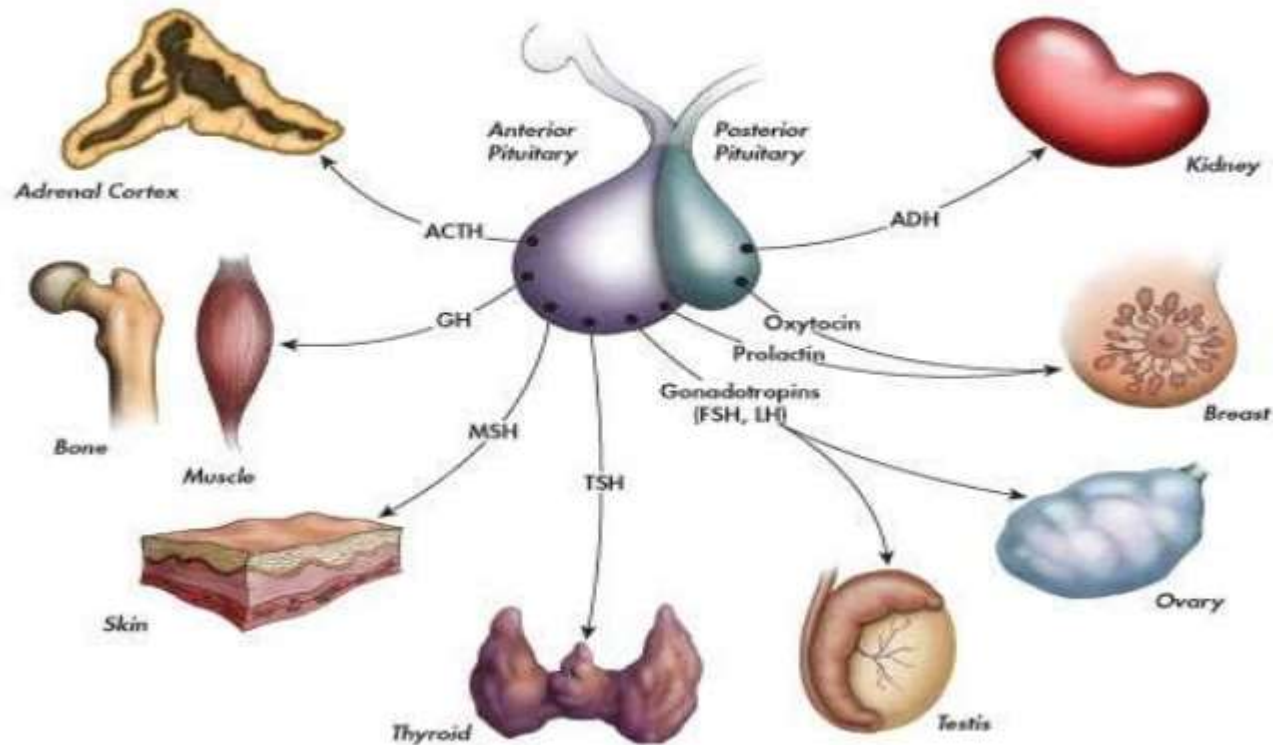
- LUTENIZING HORMONE (LH) –
  - ~>stimulated by gonadotropin-releasing hormone(GnRH) from hypothalamus
  - ~> In males, stimulates the testes to secrete testosterone
  - ~>In females, stimulates release of ovum by ovary.
  - ~>After ovulation,it stimulate the formation of corpus luteum in ovary and secret hormone progesterone .

- FOLLICLE-STIMULATING HORMONE (FSH)

~>in **male**,stimulate **production of sperm cells** in the testes.

~> in **females**, stimulates **maturation of ovarian follicle** and **secrete estrogen** by ovaries

# SUMMARY

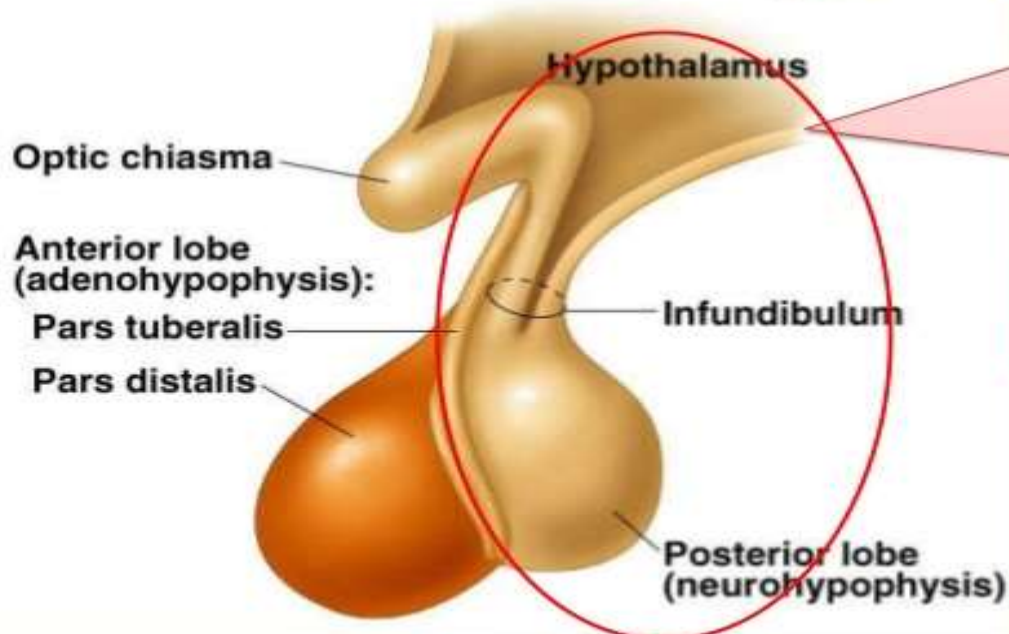


# PITUITARY

## Posterior pituitary gland



Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.



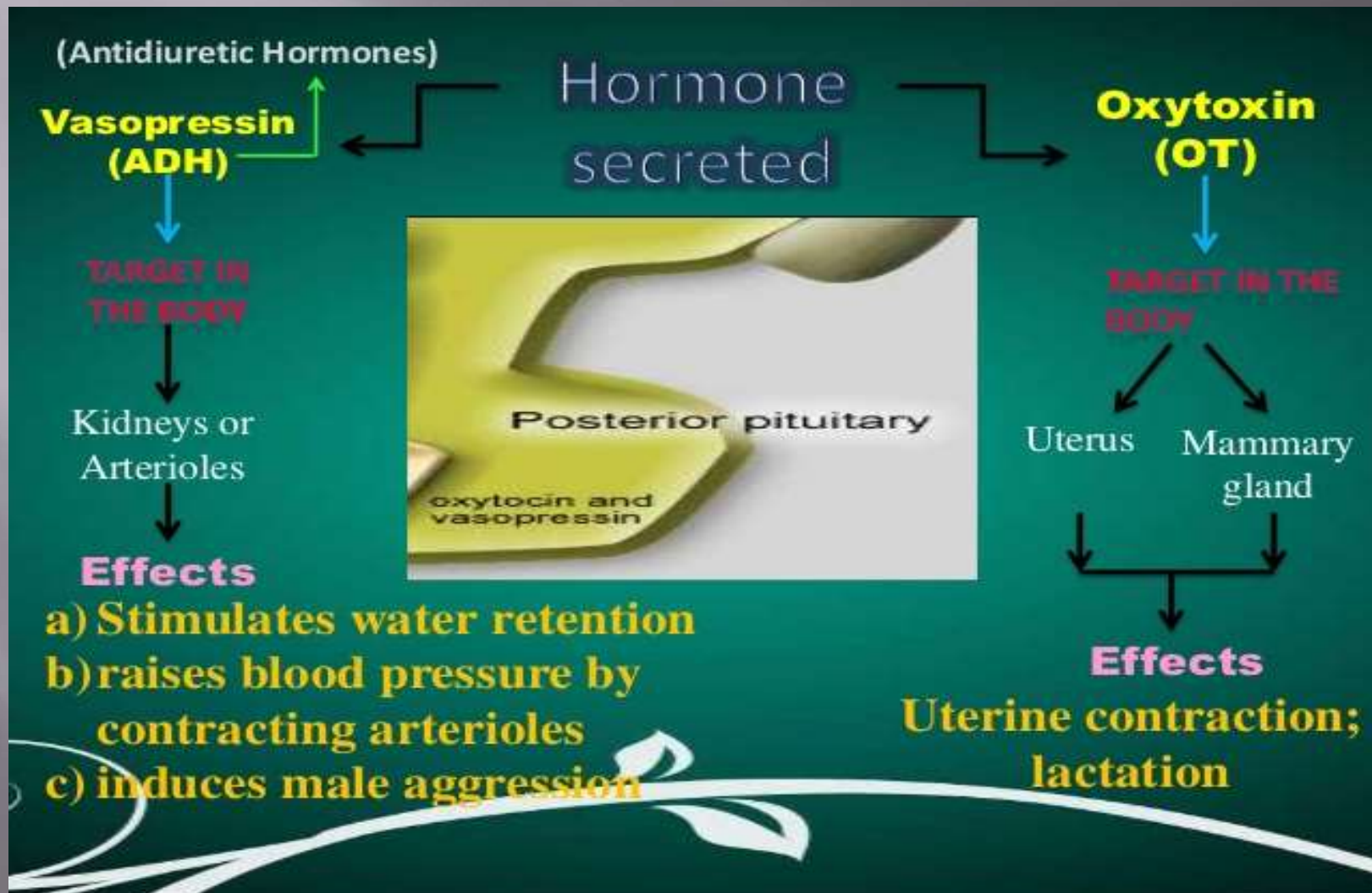
## STRUCTURE

Its is very small – only the size of a pea, 500mg

## LOCATION

Sits just beneath the base of the brain, behind the bridge of the nose or, *lies in the hypophyseal fossa of the sphenoid bone below the hypothalamus.*

# HORMONE OF POST.PITUITARY



From the posterior pituitary (neurohypophysis)  
*structurally part of the brain*

- ADH (antidiuretic hormone AKA vasopressin) stimulates the kidneys to reclaim more water from the urine, raises blood pressure
- Oxytocin prompts contraction of smooth muscle in reproductive tracts, in females initiating labor and ejection of milk from breasts

# Can we put it all together?

Blue is from hypothalamus

Black is from pituitary

TRH (thyroid releasing hormone)

turns on TSH

CRH (corticotropin releasing hormone)

turns on ACTH

GnRH (gonadotropin releasing hormone)

turns on FSH and LH

PRF (prolactin releasing hormone)

turns on PRL

GHRH (growth hormone releasing hm)

turns on GH

TSH: thyroid-stimulating hormone

ACTH: adrenocorticotrophic hormone

FSH: follicle-stimulating hormone

LH: luteinizing hormone

GH: growth hormone

PRL: prolactin

MSH: melanocyte-stimulating hormone

ADH: antidiuretic hormone

Oxytocin

TSH stimulates the thyroid to produce thyroid hormone

ACTH stimulates the adrenal cortex to produce corticosteroids: aldosterone and cortisol

FSH stimulates follicle growth and ovarian estrogen production; stimulates sperm

production and androgen-binding protein

LH has a role in ovulation and the growth of the corpus luteum; stimulates androgen secretion by interstitial cells in testes

GH (aka somatotrophic hormone)

stimulates growth of skeletal epiphyseal plates and body to synthesize protein

PRL stimulates mammary glands in breast to make milk

MSH stimulates melanocytes; may increase mental alertness

ADH (antidiuretic hormone or vasopressin) stimulates the kidneys to reclaim more water from the urine, raises blood pressure

Oxytocin prompts contraction of smooth muscle in reproductive tracts, in females

initiating labor and ejection of milk from breasts

THANKS