

Endocrine system. **Hypothalamus - Pituitary- Target organ Axes**

Hypothalamus	<b>GnRH</b> (gonadotropin releasing hormone)		<b>CRH</b> (corticotropin releasing hormone)	<b>TRH</b> (thyrotropin releasing hormone)	<b>Dopamine</b>	<b>Somatostatin</b>	<b>GHRH</b> (Growth hormone releasing hormone)
Action	stimulates release of:		stimulates release of:	stimulates release of:	inhibits release of:	inhibits release of:	stimulates release of:
Anterior pituitary	<b>gonadotropins</b>		<b>ACTH</b> (adrenocorticotrophic hormone)	<b>TSH</b> (thyroid stimulating hormone)	<b>prolactin (PRL)</b>	<b>growth hormone (GH)</b>	
	<b>LH</b> (luteinizing hormone)	<b>FSH</b> (follicle stimulating hormone)					
Target	gonads		adrenal cortex (zona fasciculata)	thyroid	mammary glands, other sex accessory tissues	muscle, fat tissue, liver	liver
Actions at target	stimulates release of <b>Estrogen (E2)</b> <b>Progesterone (P4)</b> <b>Testosterone</b>		stimulates release of glucocorticoids ( <b>cortisol</b> )	stimulates release of: <b>thyroid hormones:</b> thyroxine ( <b>T4</b> ) and triiodothyronine ( <b>T3</b> )**	promotes milk production in lactating females	lipolysis and increased blood glucose	stimulates release of <b>somatomedin</b> neg feedback to hypo.
	induces ovulation and formation of corpus luteum		stimulates growth of adrenal gland	stimulates growth of thyroid	diverse other actions		promotes protein synthesis and growth especially in muscle and bone tissue neg. feedback to ant. pit.
Actions of tertiary hormones	neg feedback to ant. pit. & hypo.		neg feedback to ant. pit. & hypo.	neg feedback to ant. pit. & hypo.	not applicable	not applicable	
	other actions covered in chapter 20		anti-inflammatory, immune suppression, increases blood glucose	increases GH increases metabolic rate support normal neural development			
Other Notes			Plasma levels of cortisol highest in early morning.				

\*\* 90% of thyroid hormone released is T4, T3 is 10 times more active than T4 due to higher binding affinity of receptor to T3. Conversion to T3 takes place at the target tissue.

posterior pituitary (cell bodies of neurons in hypothalamus, terminal bouton is in posterior pituitary)	<b>ADH</b> (anti-diuretic hormone) aka vasopressin	<b>oxytocin</b>
target	kidneys  smooth muscle of vascular system	uterus mammary gland erectile tissue
actions	water retention, vasoconstriction	stimulates contractions

**Calcium homeostasis:**

**calcitonin** from thyroid leads to a decrease in plasma calcium  
**parathyroid hormone (PTH)** from parathyroid and the active form of **vitamin D3** (made in kidney) lead to increase in plasma calcium.

**Blood sugar regulation:**

**insulin** (from beta cells of pancreas) released in response to elevated blood sugar

**glucagon** (from alpha cells of pancreas) released in response to low blood sugar or elevated amino acids.

Other hormones involved in blood sugar regulation: **cortisol** (a glucocorticoid), **epinephrine** and **growth hormone** are all released when blood sugar is low.