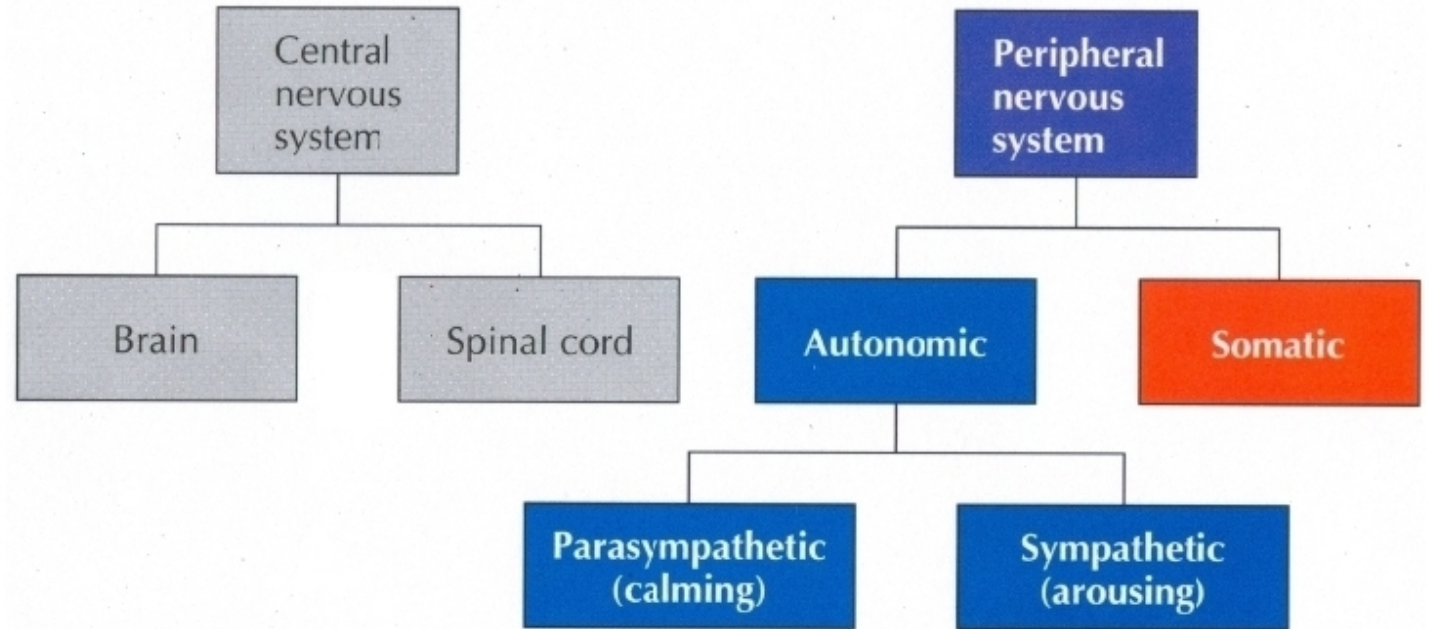


# Divisions of the Nervous System



PERIPHERAL NERVOUS SYSTEM  
(All nerves going to and from the CNS)

Somatic Nervous System  
(All nerves carrying sensory  
and motor information  
– voluntary)

Autonomic Nervous System  
(Regulates  
bodily functions  
– automatic)

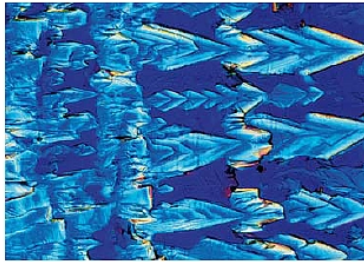
Parasympathetic  
Nervous System  
(Maintains basic  
bodily functions)

Sympathetic  
Nervous System  
(Activates body  
to deal with stress)



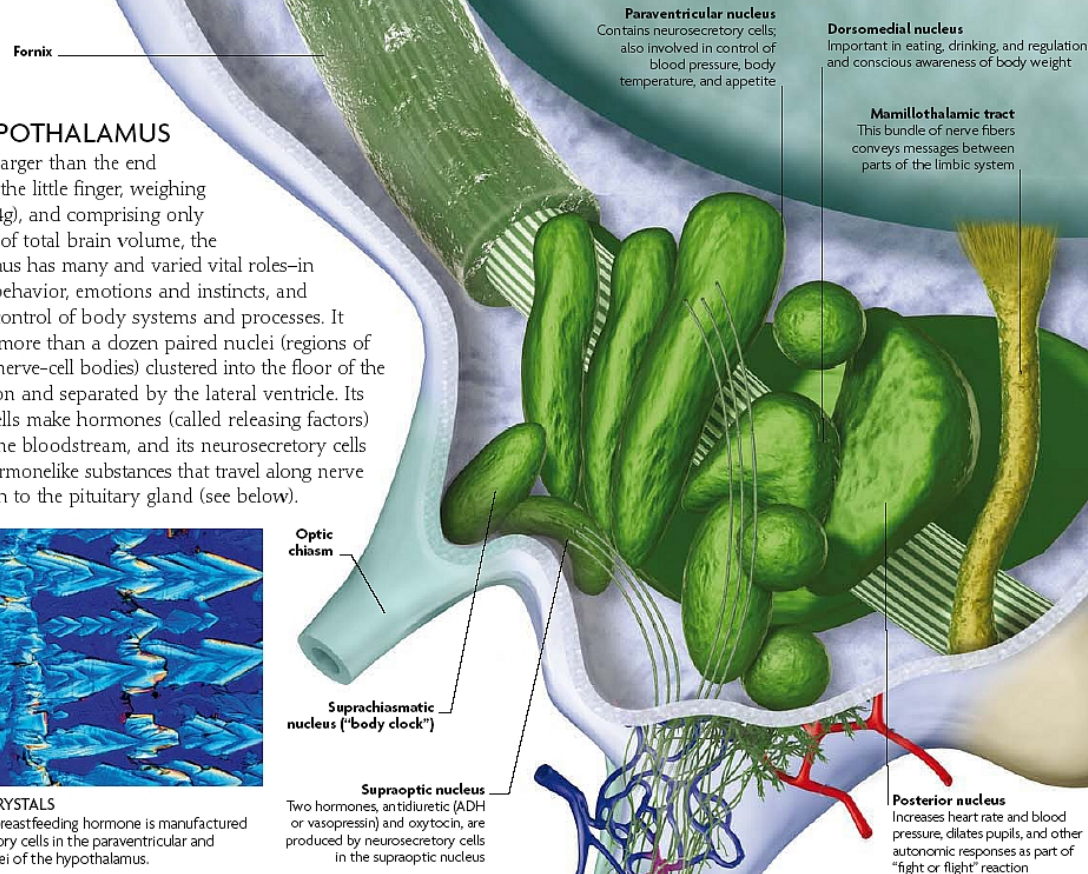
## THE HYPOTHALAMUS

Not much larger than the end segment of the little finger, weighing just  $\frac{1}{32}$  oz (4g), and comprising only 0.4 percent of total brain volume, the hypothalamus has many and varied vital roles—in conscious behavior, emotions and instincts, and automatic control of body systems and processes. It consists of more than a dozen paired nuclei (regions of interlinked nerve-cell bodies) clustered into the floor of the diencephalon and separated by the lateral ventricle. Its secretory cells make hormones (called releasing factors) that enter the bloodstream, and its neurosecretory cells produce hormonelike substances that travel along nerve axons down to the pituitary gland (see below).



### OXYTOCIN CRYSTALS

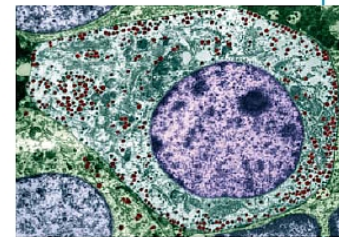
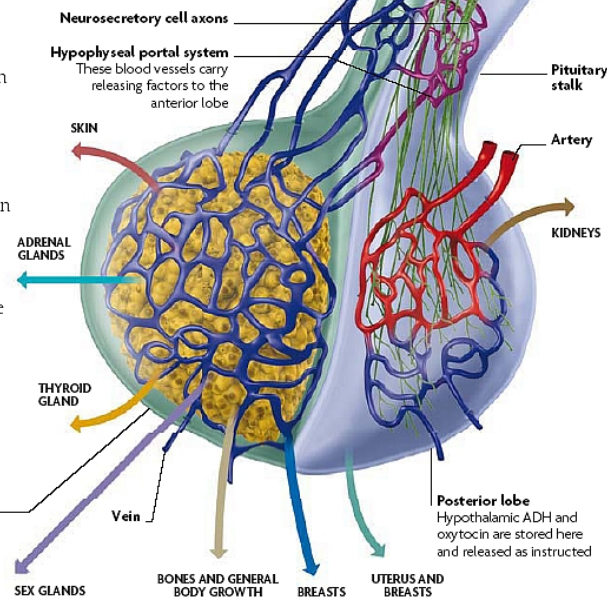
This birth and breastfeeding hormone is manufactured by neurosecretory cells in the paraventricular and supraoptic nuclei of the hypothalamus.



## THE PITUITARY GLAND

The hypothalamus integrates the body's two systems for coordination and control: the nervous system around and above it; and the endocrine system (see p.112-13) via the pituitary just below it. The pea-sized pituitary (hypophysis), often called the body's "master hormone gland," has two distinct lobes. The anterior lobe (adenohypophysis) makes several hormones that release into the bloodstream to regulate other endocrine glands around the body, such as the thyroid. The posterior lobe (neurohypophysis) receives two hormones along axons from the hypothalamus.

**Anterior lobe**  
Forming two-thirds of the pituitary bulk, the anterior lobe manufactures about eight major hormones; it is under the control of nerve messages and regulatory substances, called releasing factors, made in the hypothalamus



### ENDOCRINE CELL

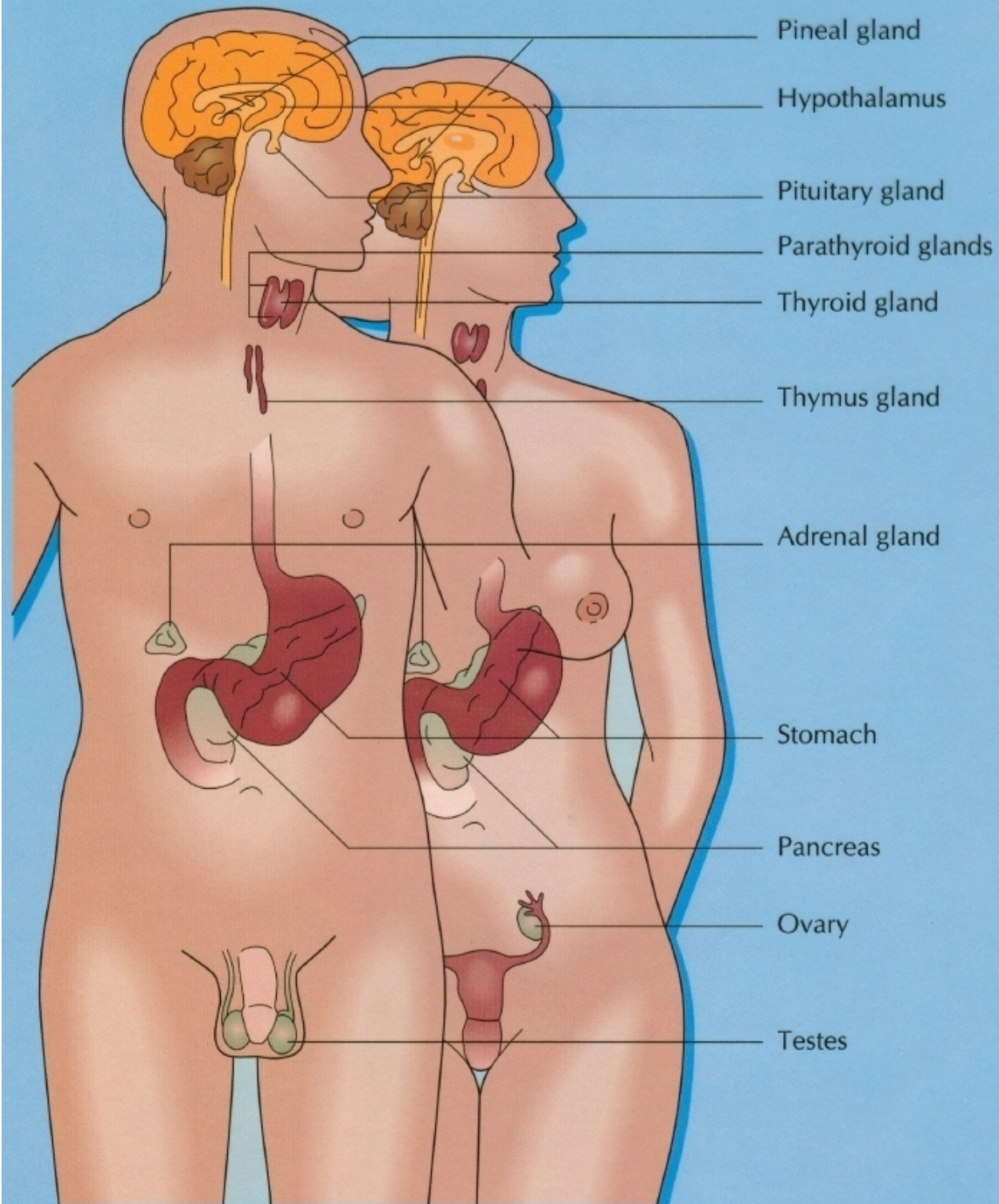
This micrograph shows somatotroph cells in the anterior pituitary. These cells store their growth hormone as granules (red dots) ready for export.

### KEY TO PITUITARY HORMONES

- Melanocyte-stimulating hormone (MSH)
- Adrenocorticotropic hormone (ACTH)
- Thyroid-stimulating hormone (TSH)
- Follicle-stimulating hormone (FSH), Luteinizing hormone (LH)
- Growth hormone (GH)
- Oxytocin
- Antidiuretic hormone (ADH)
- Prolactin



# The Endocrine System





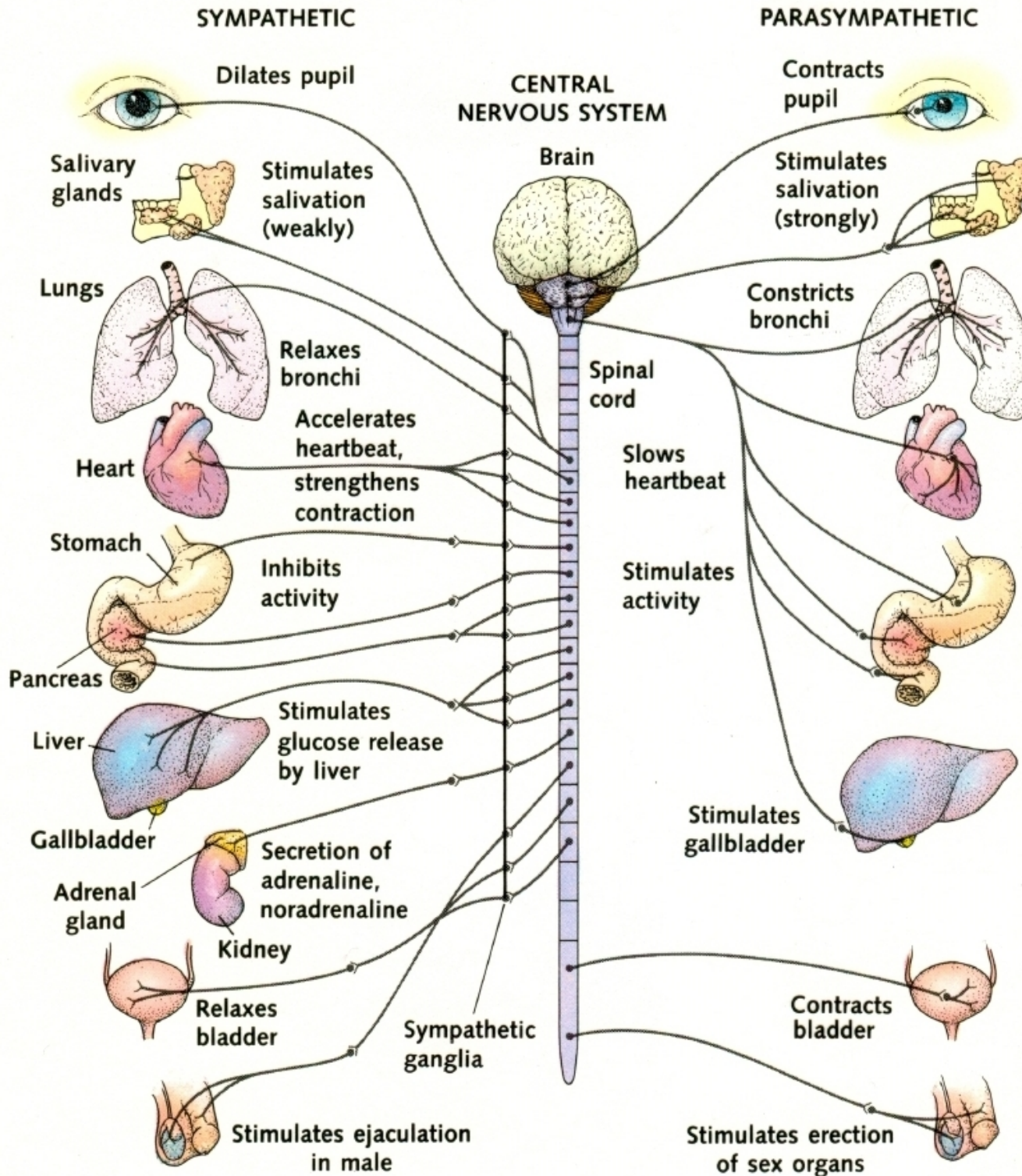
# The Autonomic Nervous System



Sympathetic		Parasympathetic
Pupils dilated	Eyes	Pupils constricted
Dry	Mouth	Salivating
Goose bumps, perspiration	Skin	No goose bumps
Respiration increased	Lungs	Respiration normal
Increased rate	Heart	Decreased rate
Increased epinephrine and norepinephrine	Adrenal glands	Decreased epinephrine and norepinephrine
Decreased motility	Digestion	Increased motility



# The Autonomic Nervous System





# The Autonomic Nervous System

