

STRESS



NEUROTRANSMITTER



binds to membrane receptors

**Hypothalamus
CRH secretion**



↑ CRH

(in hypothalamic-pituitary portal vessels)



binds to membrane receptors

**Anterior pituitary
ACTH secretion**



↑ PLASMA ACTH



binds to membrane receptors

**Adrenal cortex
Cortisol secretion**

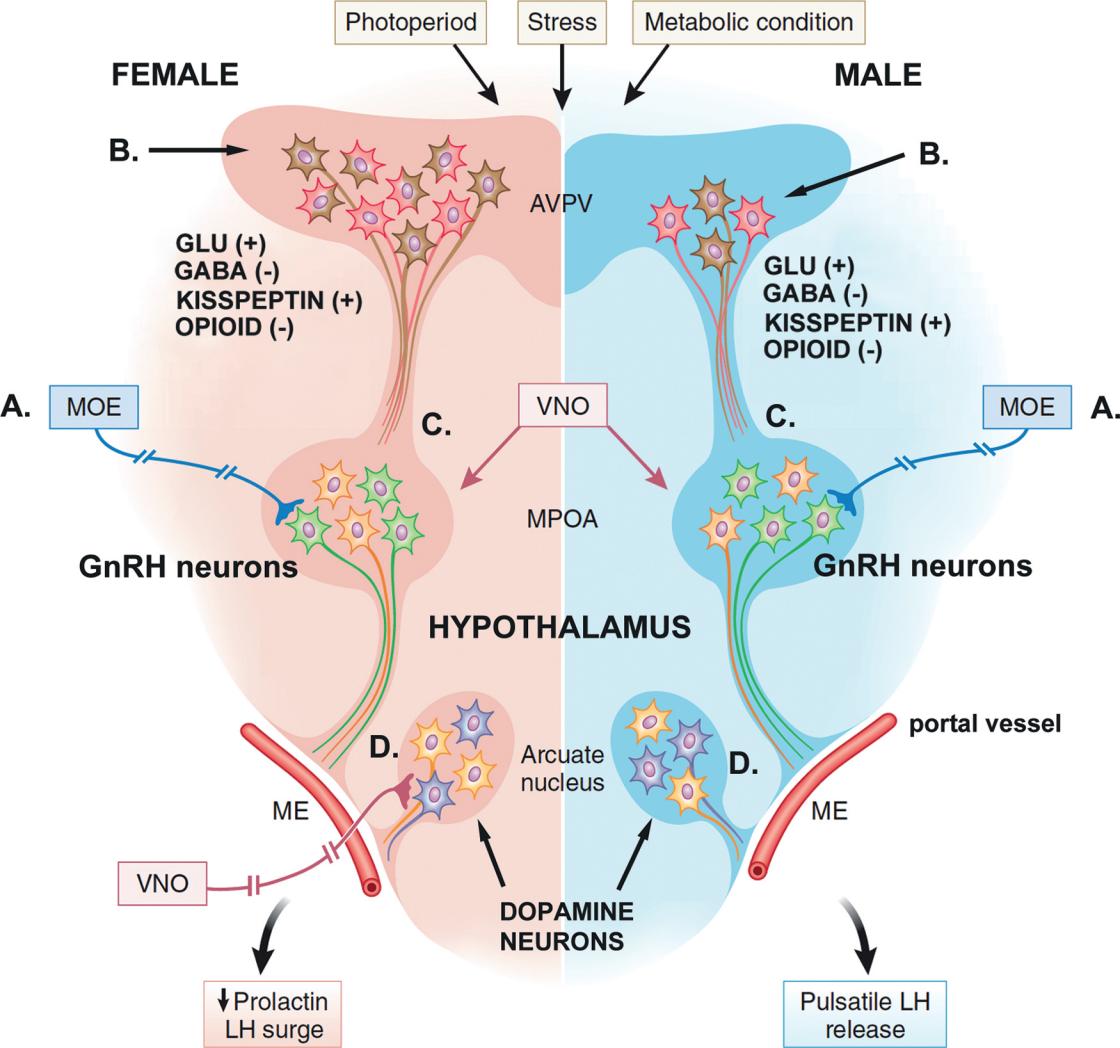


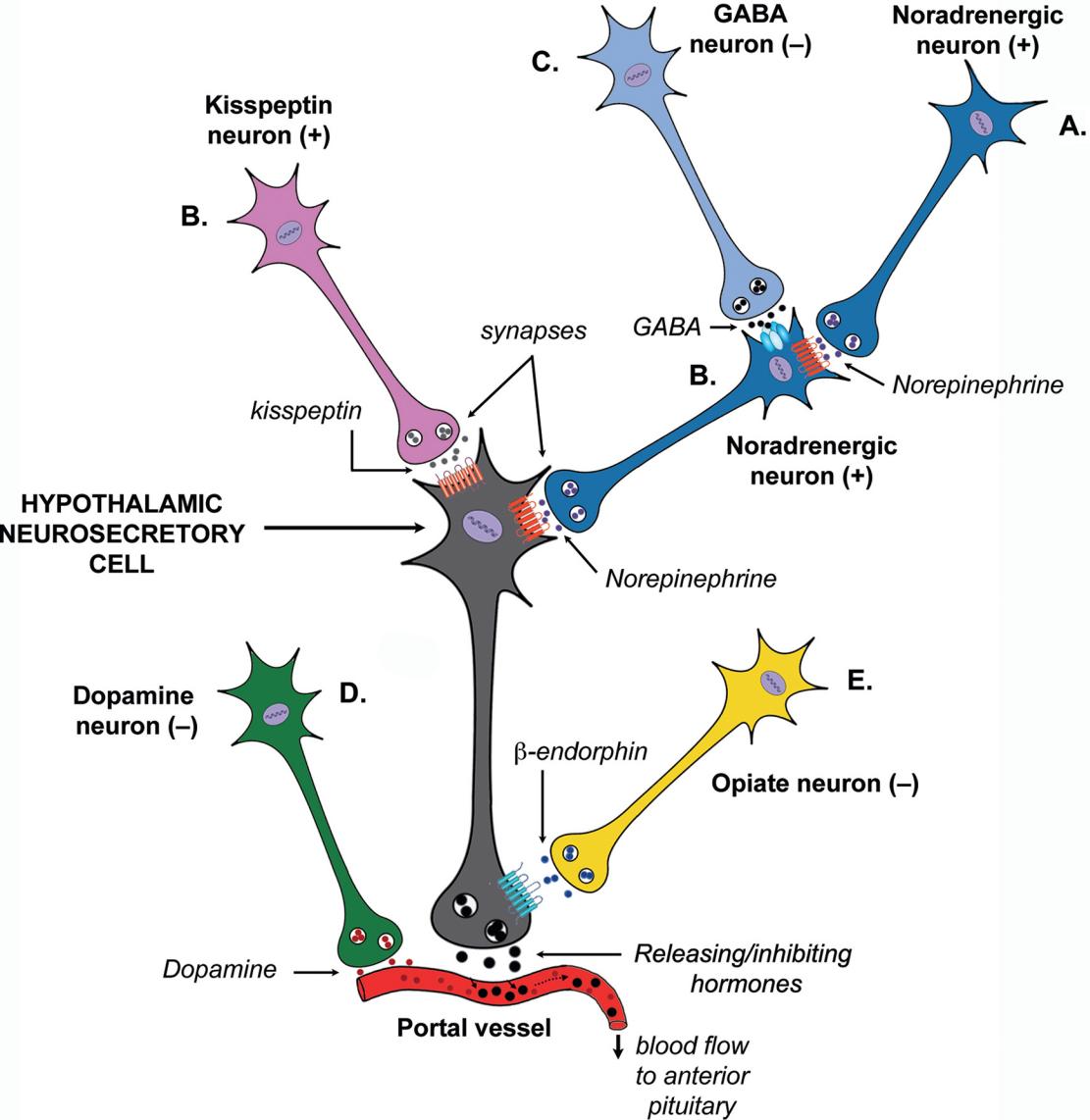
↑ PLASMA CORTISOL



binds to intracellular receptors

**TARGET CELLS for cortisol
Respond to increased cortisol**

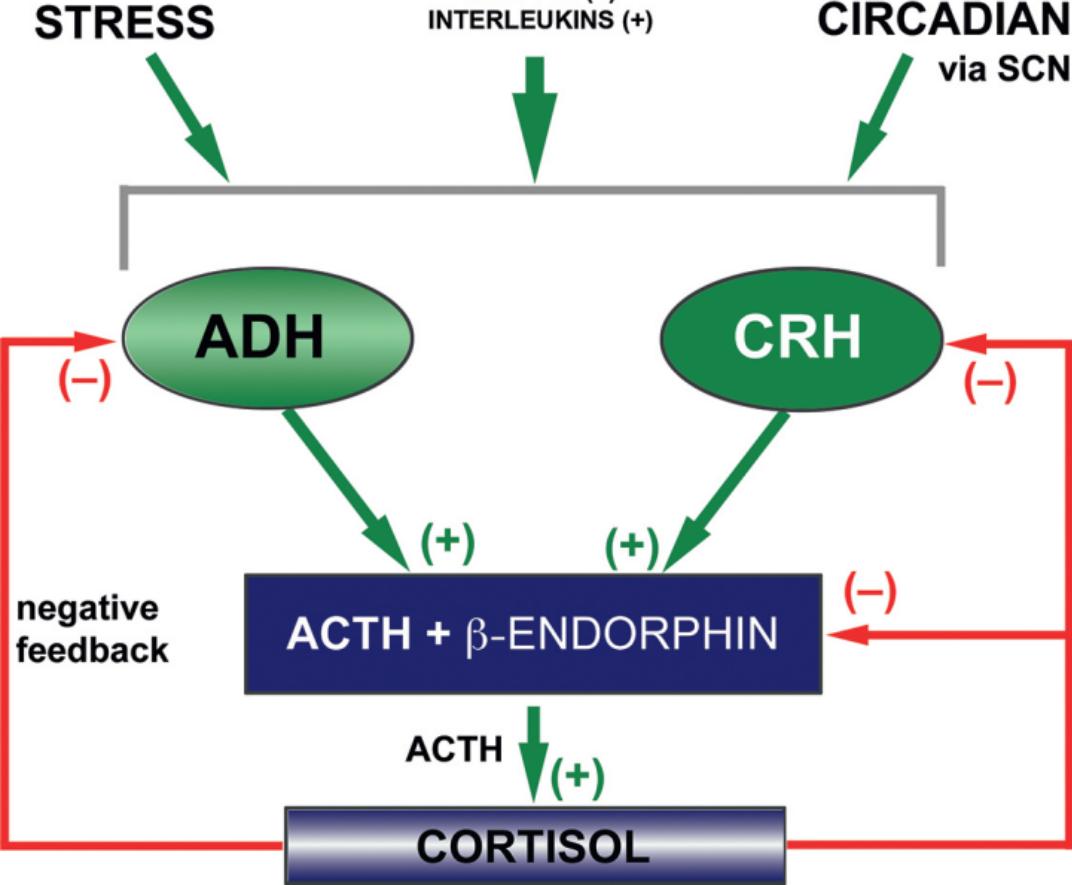


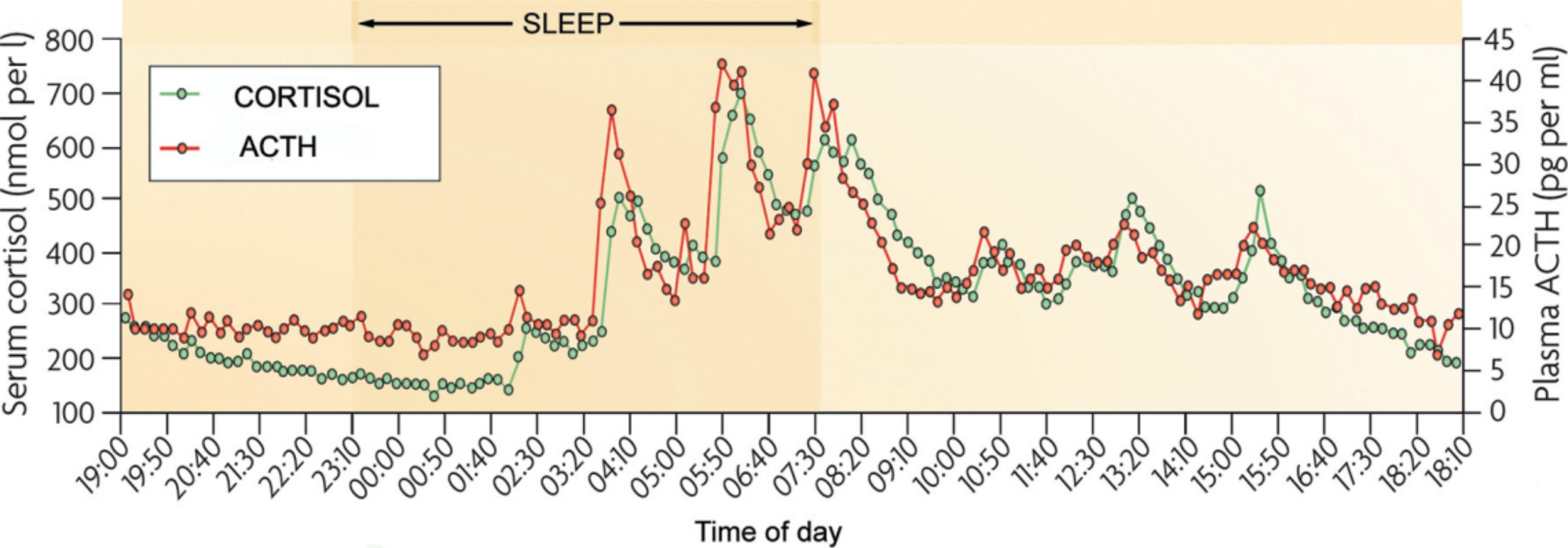


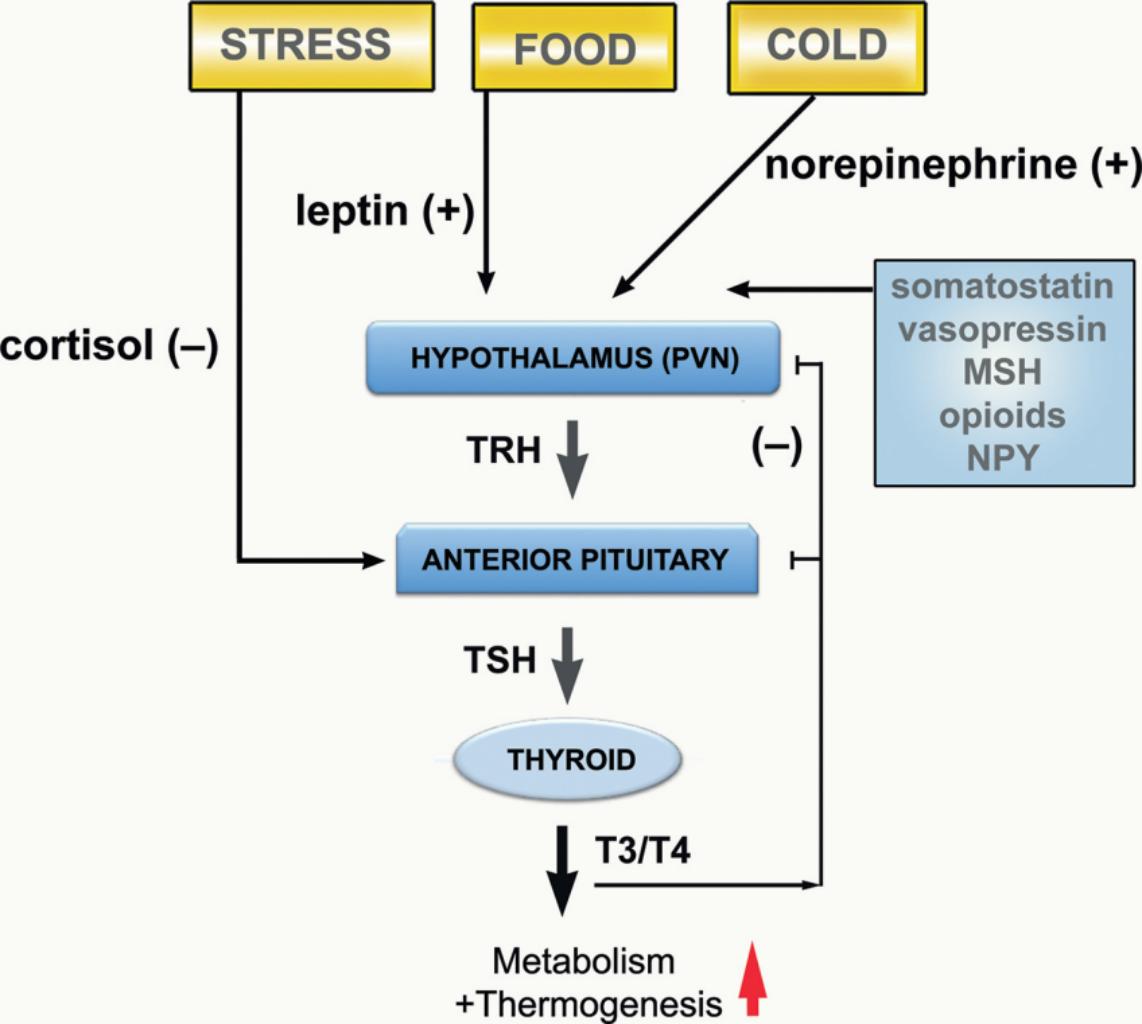
REGULATION

STRESS
CIRCADIAN via SCN

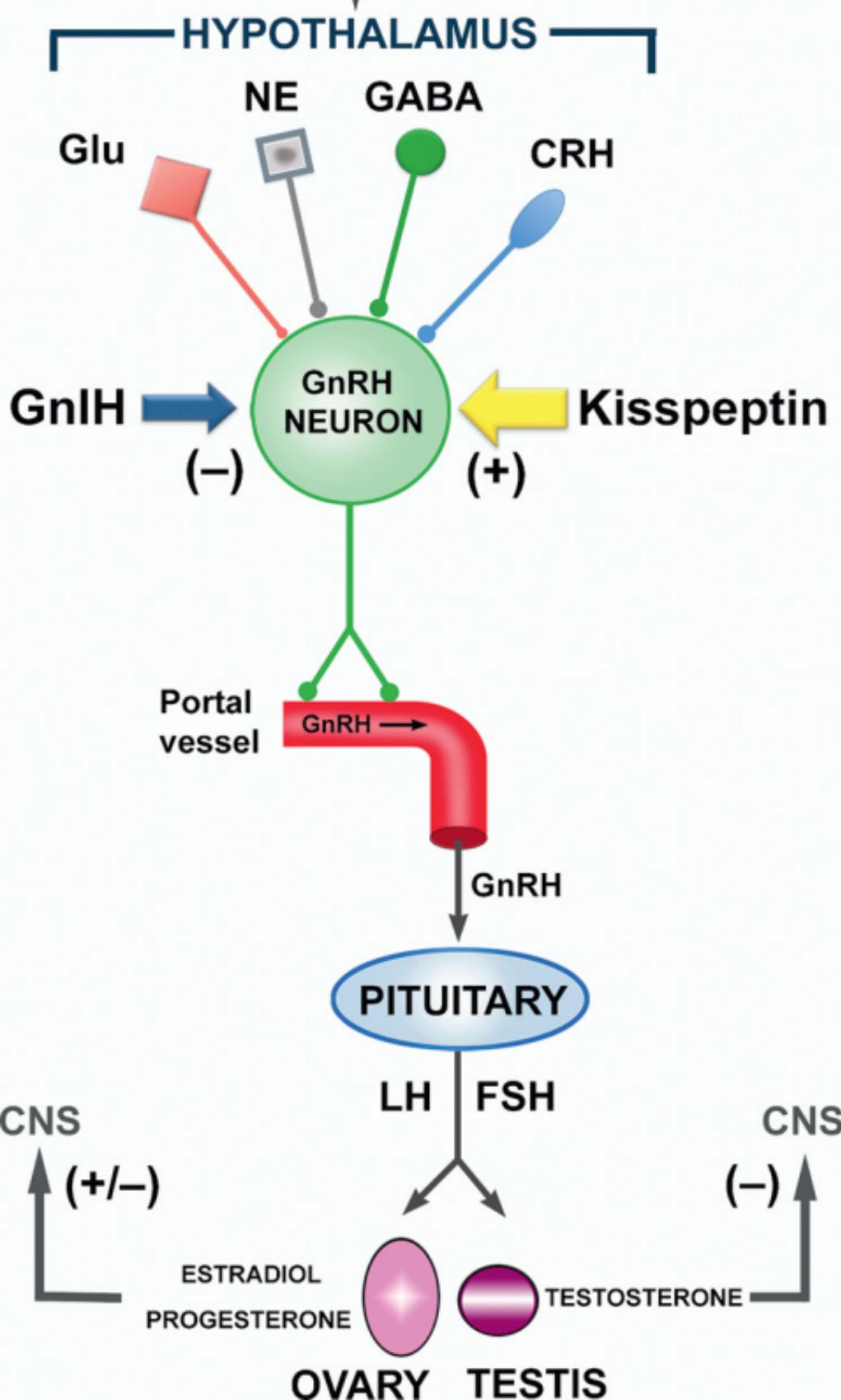
OPIOIDS (-)
ENDOCANNABINOID (-)
GHRELIN (+)
INTERLEUKINS (+)





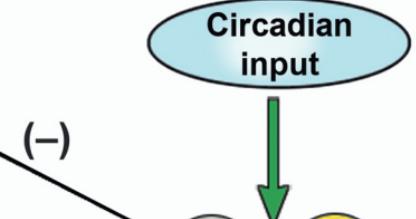


Light
Stress
Odorants/pheromones
Mating
Exercise
Nutrition



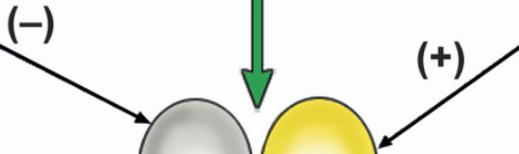
INHIBITION

light
odor
sound
stress



STIMULATION

sleep
mating/orgasm
suckling
estradiol
glucocorticoids



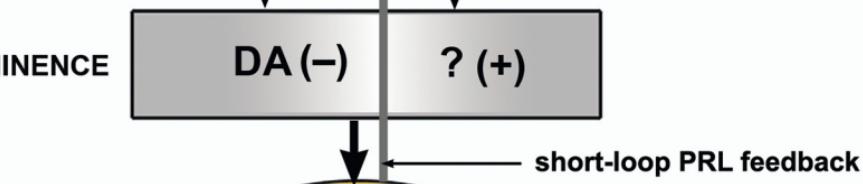
NO, GABA,
histamine,
CCK, opioids, SOM



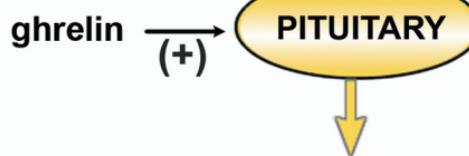
ACh, TRH, VIP,
Glu, 5-HT, NPY

MEDIAN EMINENCE

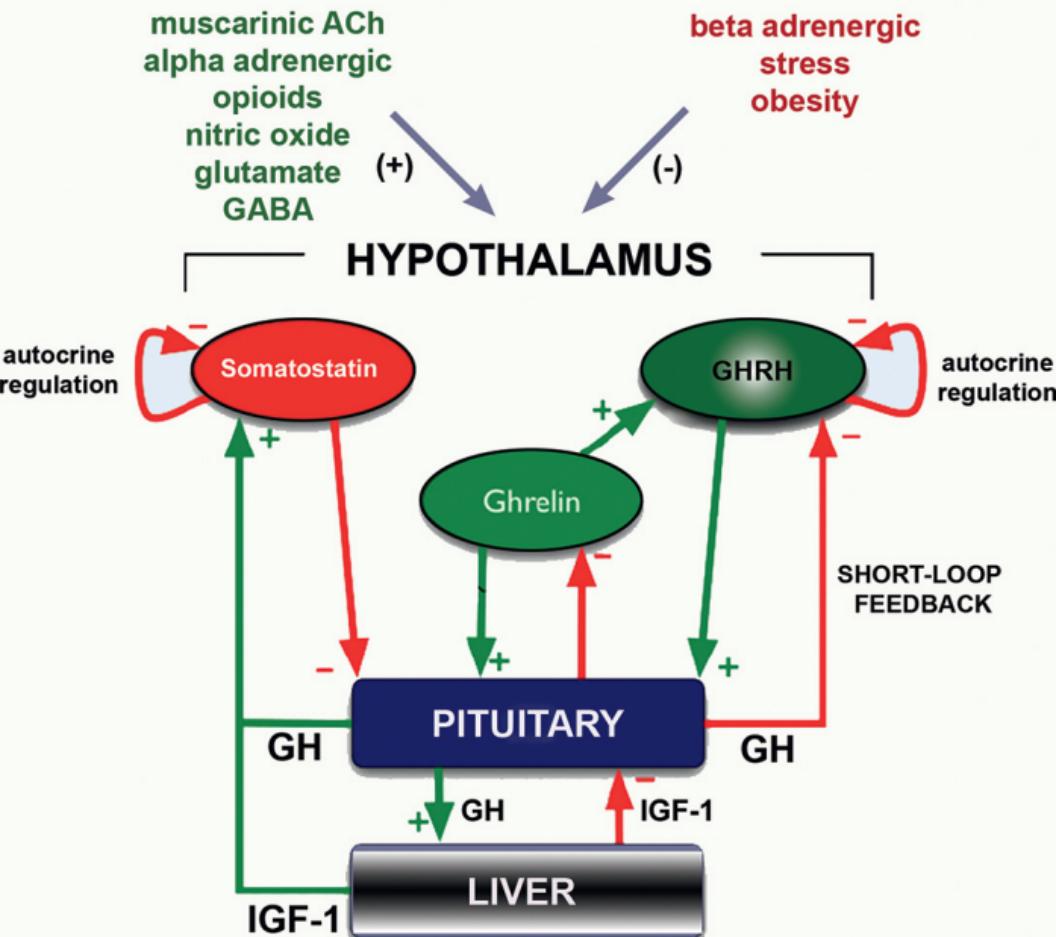
DA (-) ? (+)

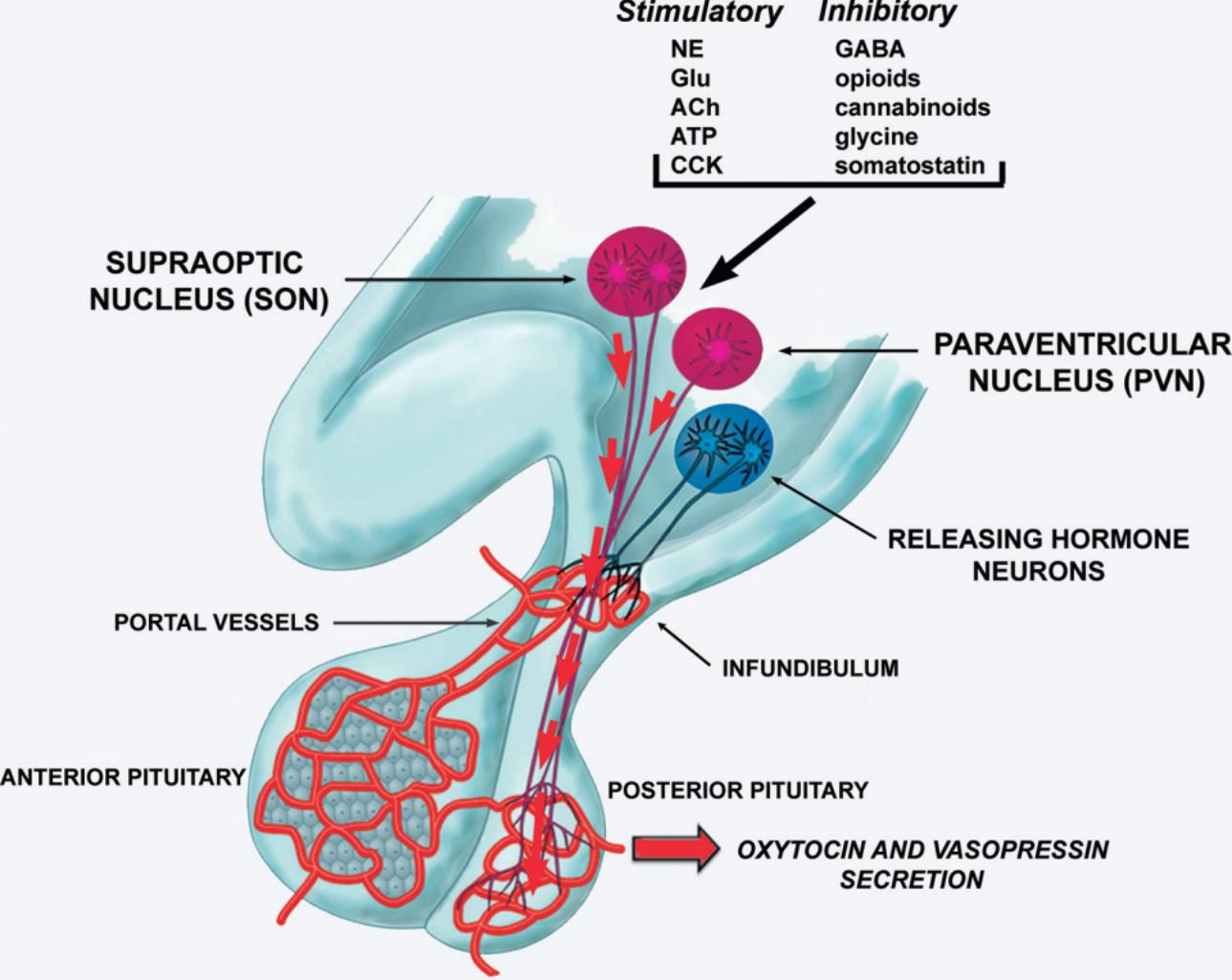


ghrelin



NEURAL CONTROL





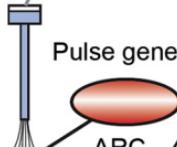
A.

Recording electrodes

GnRH neuron



POA



Pulse generator

ARC

Arcuate nucleus/
median eminence

Anterior pituitary

Gonadotropes

Portal circulation

MUA volleys

Arcuate/
median
eminence

GnRH pulses

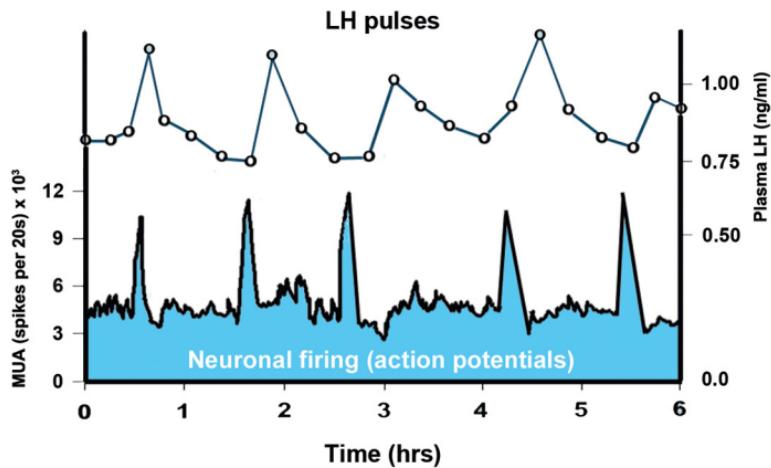
Portal
circulation

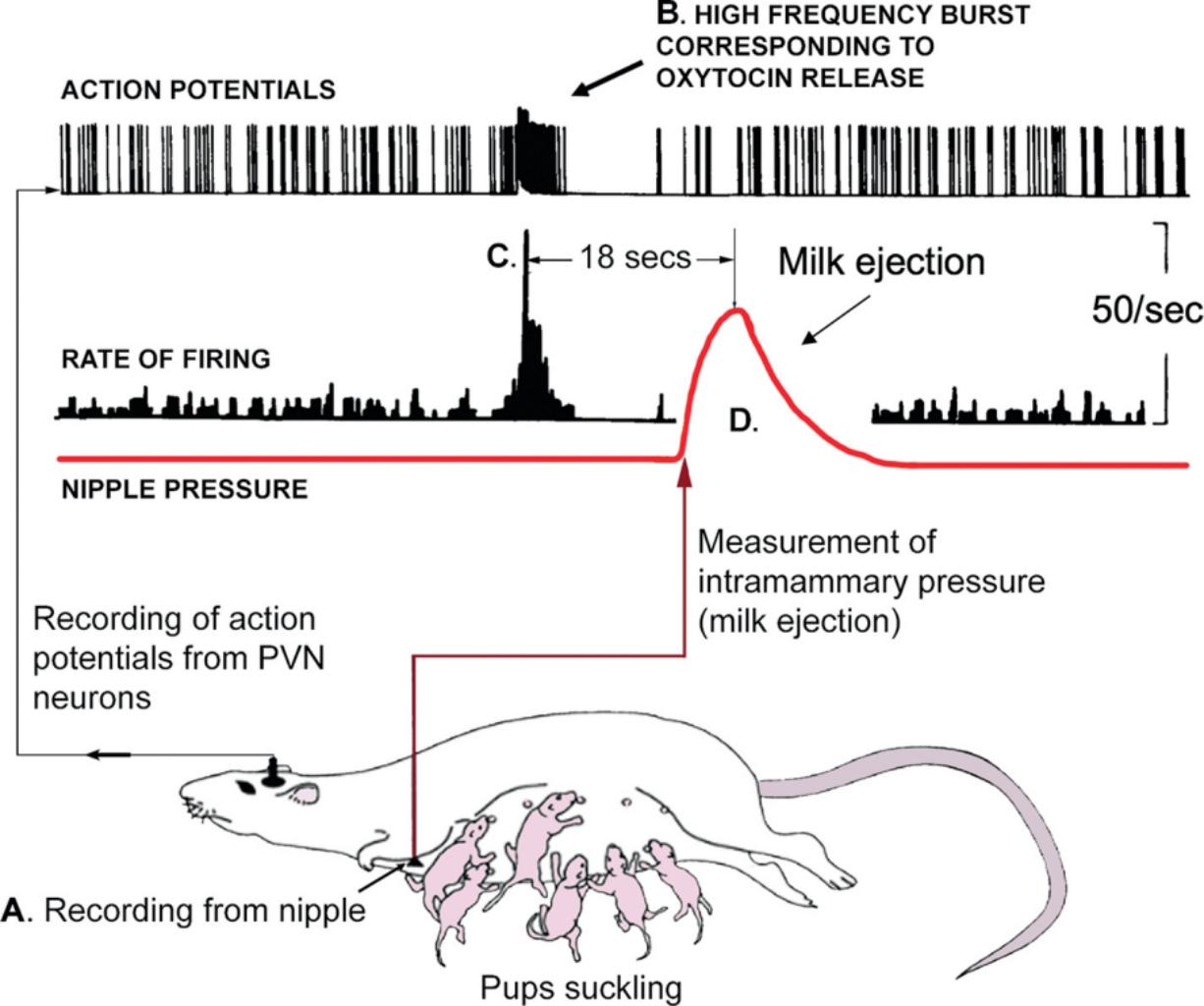
LH pulses

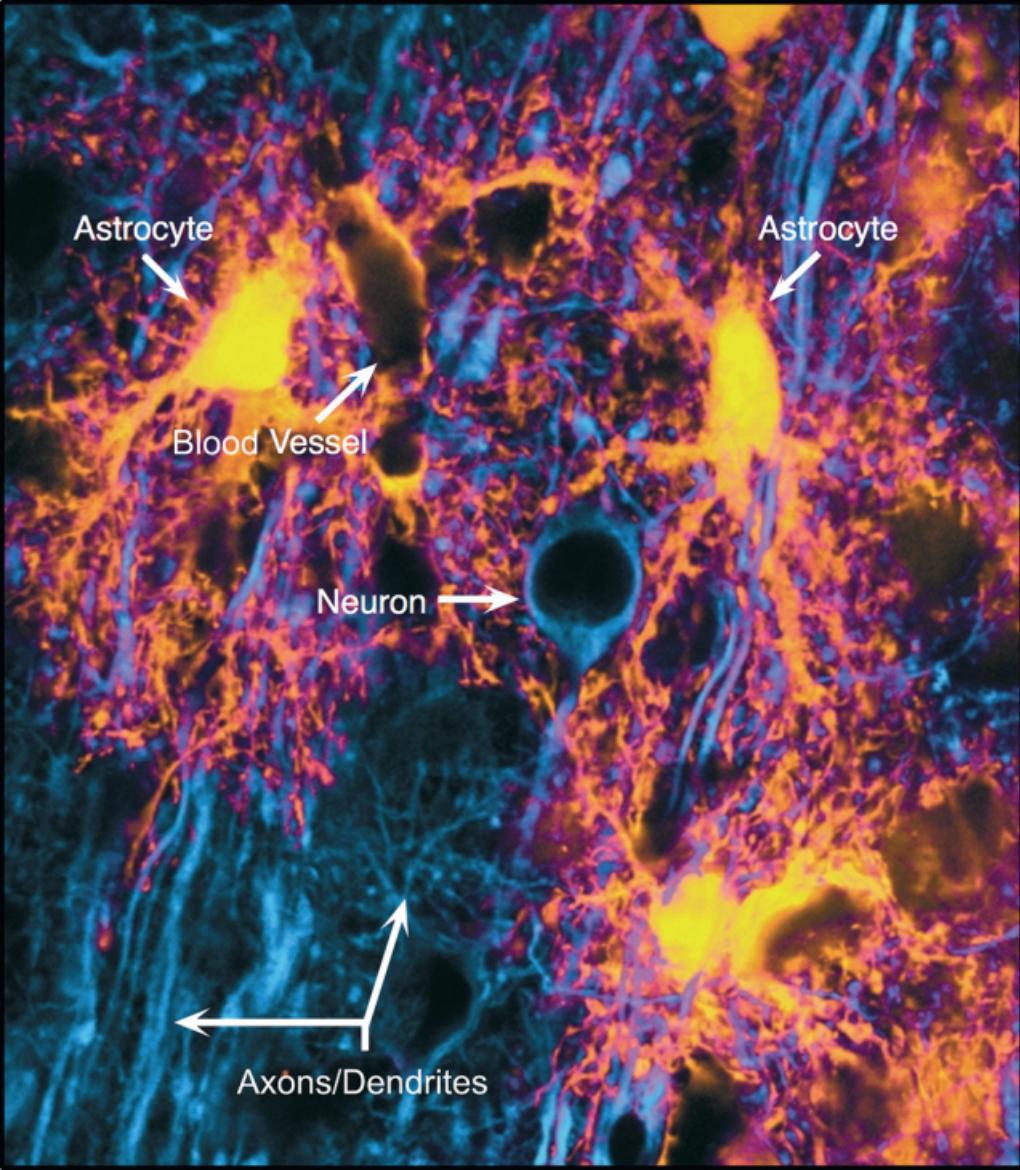
Peripheral
circulation

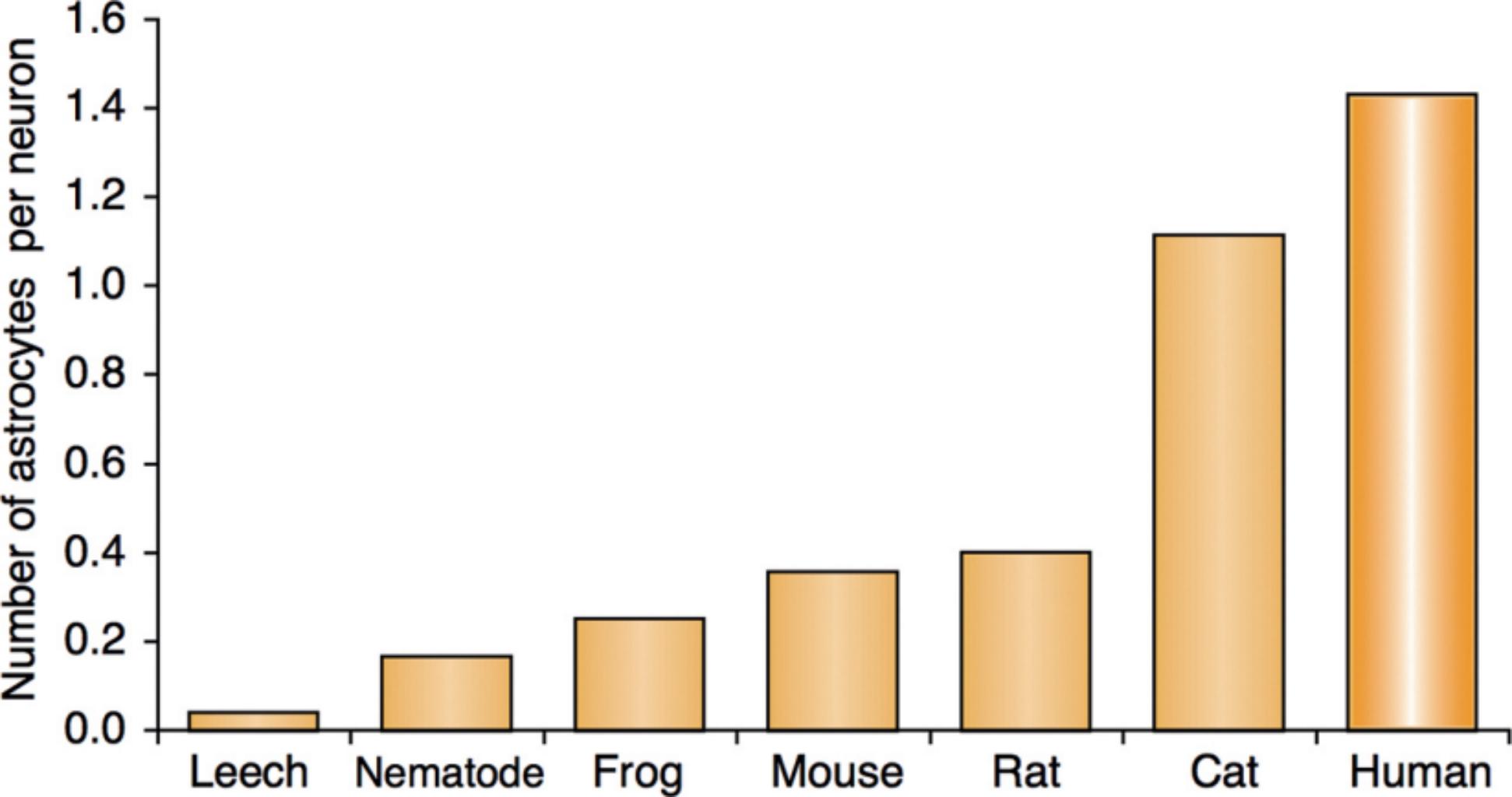
LH

B.









NEURAL THREESOME

- the Tripartite Synapse

1 Astrocytes have extensions that wrap around the synapse between neurons

2 Neurons release glutamate into the synapse

PRESYNAPTIC NEURON

Vesicles containing glutamate

4 In response to glutamate, intracellular calcium ions induce secretion of D-serine from astrocytes. D-serine enhances glutamate synaptic activity.

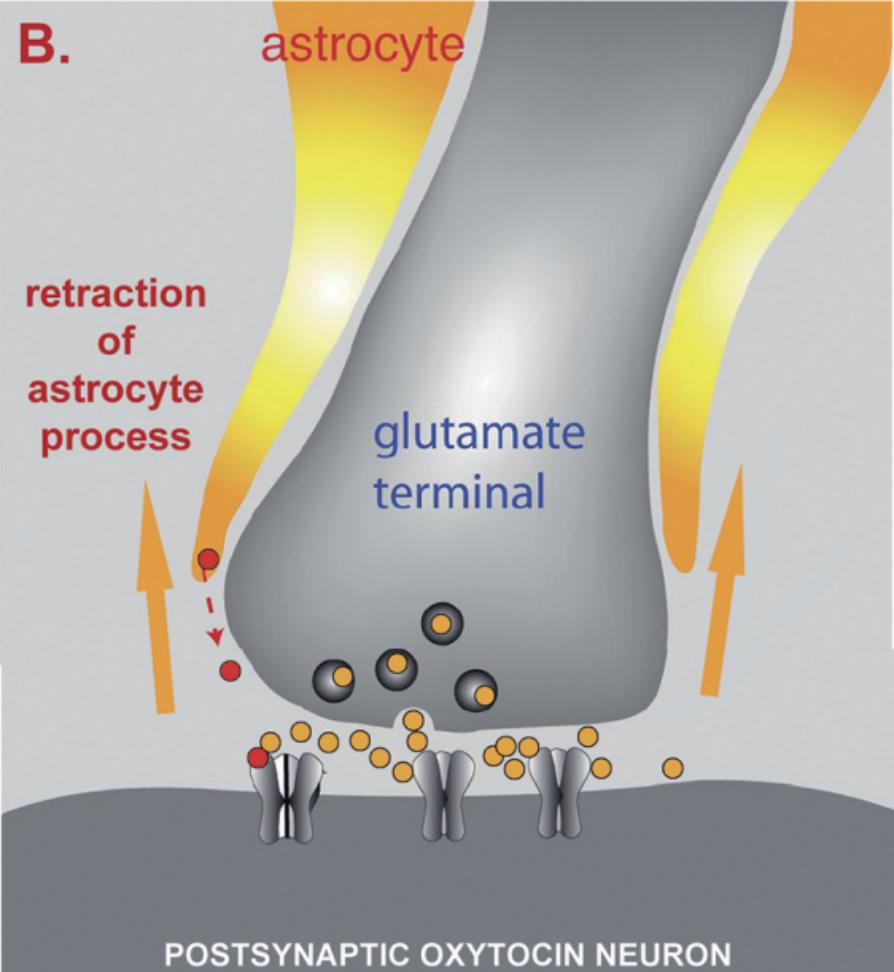
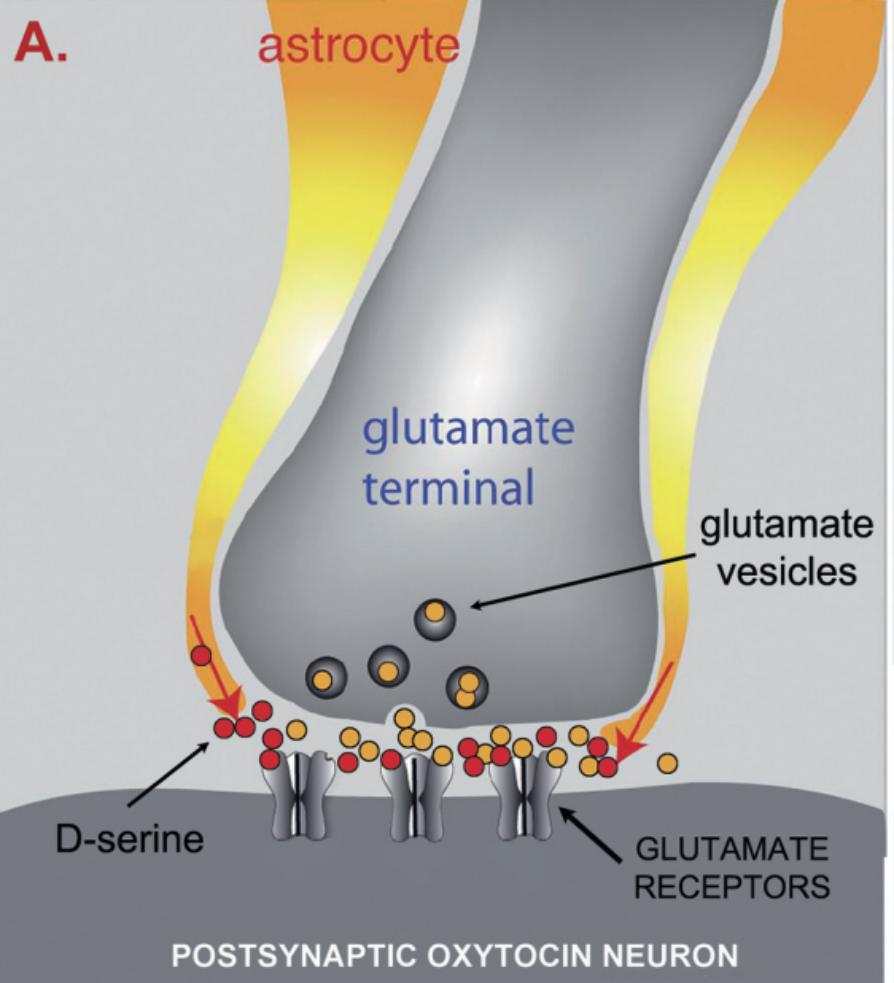
ASTROCYTE

POSTSYNAPTIC NEURON

Ionotropic glutamate receptors

3 Glutamate also binds to receptors on astrocytes

G-protein-coupled metabotropic glutamate receptor



MEDIAN EMINENCE

