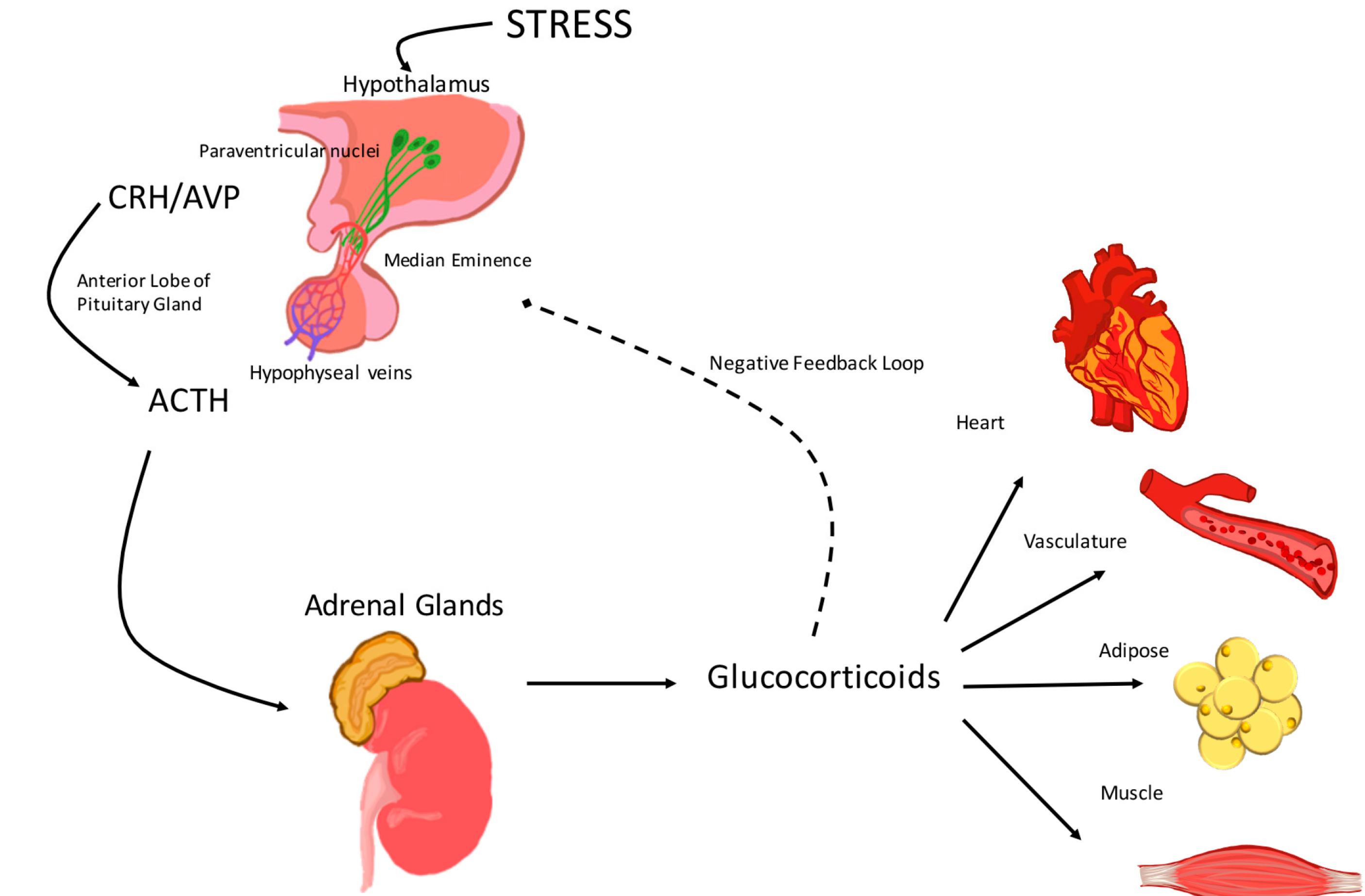


Stress , Motivation and Emotion

马婧婷Neveah

Stress response (应激反应)

- Fight or escape & dissociation
- ACTH (促肾上腺皮质激素)
- Glucocorticoid (糖皮质激素)
- Non-specific response



Adrenal hormones: Response to stress

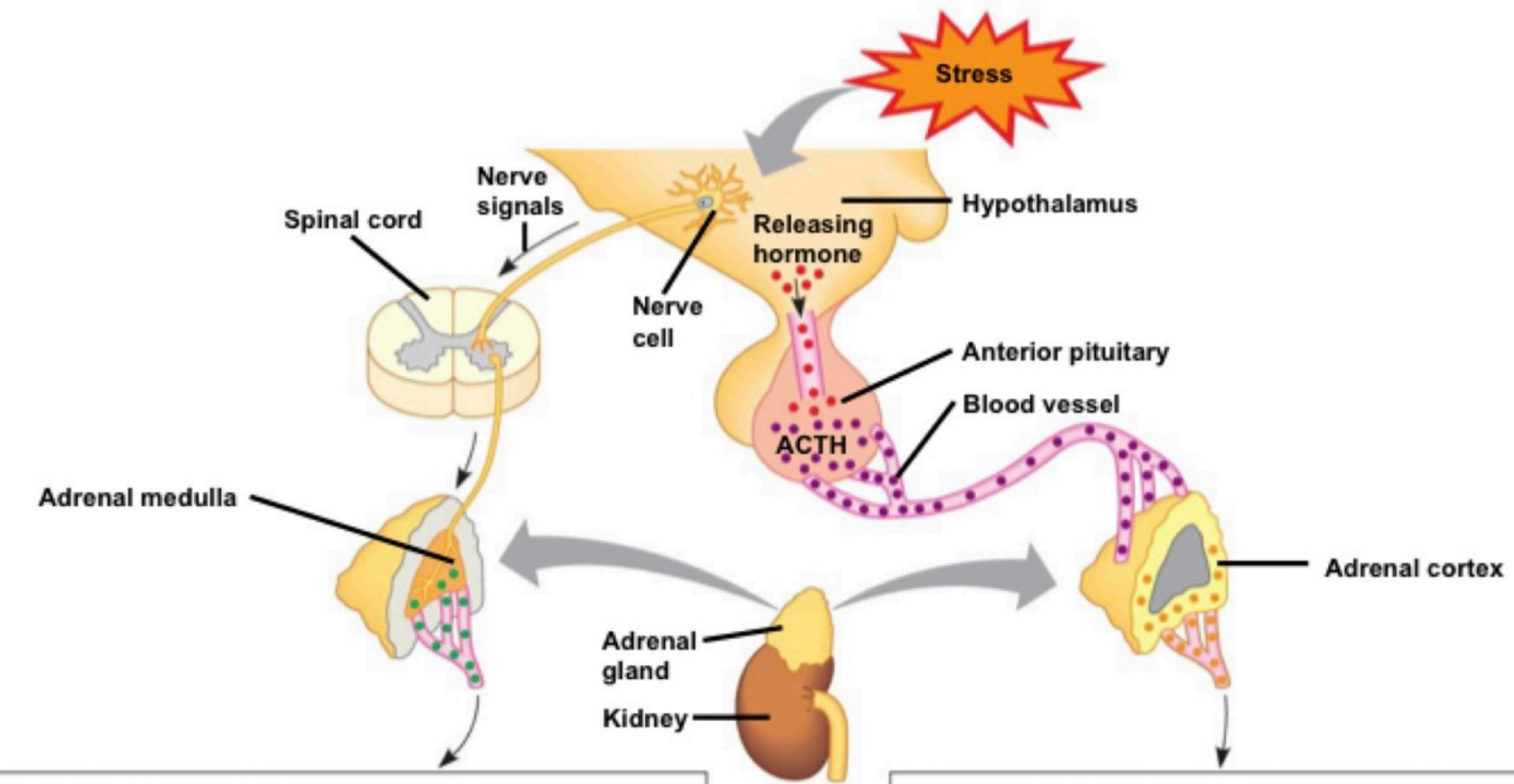
- The adrenal glands are adjacent to the kidneys
- Each adrenal gland consists of two glands: the adrenal medulla (inner portion) and adrenal cortex (outer portion)

Catecholamines from the Adrenal Medulla

- The adrenal medulla secretes epinephrine (adrenaline) and norepinephrine (noradrenaline)
- They are secreted in response to stress-activated impulses from the nervous system
- They mediate various fight-or-flight responses

Steroid Hormones from the Adrenal Cortex

- The adrenal cortex releases a family of steroids called corticosteroids in response to stress
- Humans produce two types of corticosteroids: glucocorticoids and mineralocorticoids

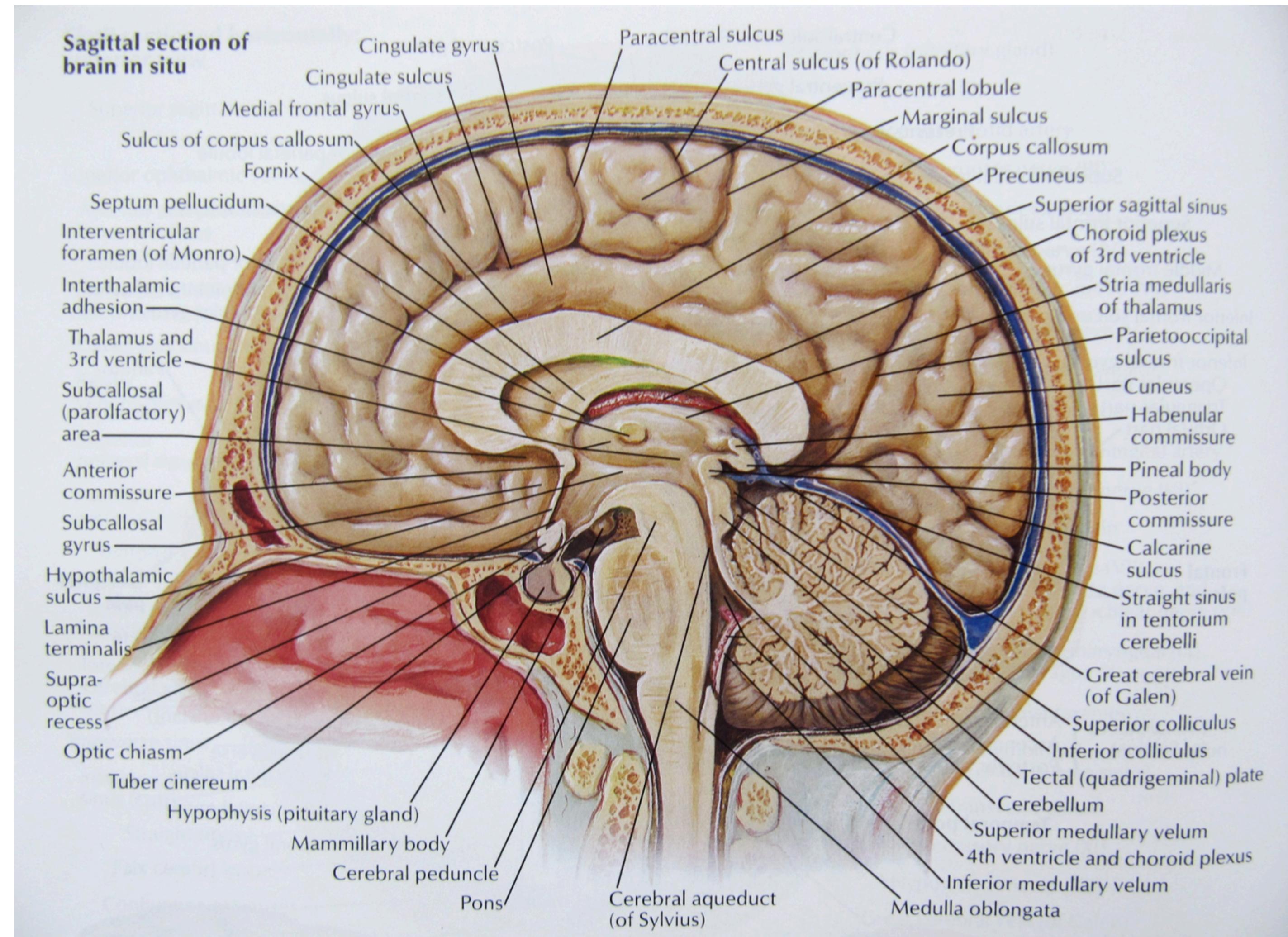


(a) Short-term stress response
Effects of epinephrine and norepinephrine:
1. Glycogen broken down to glucose; increased blood glucose
2. Increased blood pressure
3. Increased breathing rate
4. Increased metabolic rate
5. Change in blood flow patterns, leading to increased alertness and decreased digestive, excretory, and reproductive system activity

Effects of mineralocorticoids:	Effects of glucocorticoids:
1. Retention of sodium ions and water by kidneys	1. Proteins and fats broken down and converted to glucose, leading to increased blood glucose
2. Increased blood volume and blood pressure	2. Possible suppression of immune system

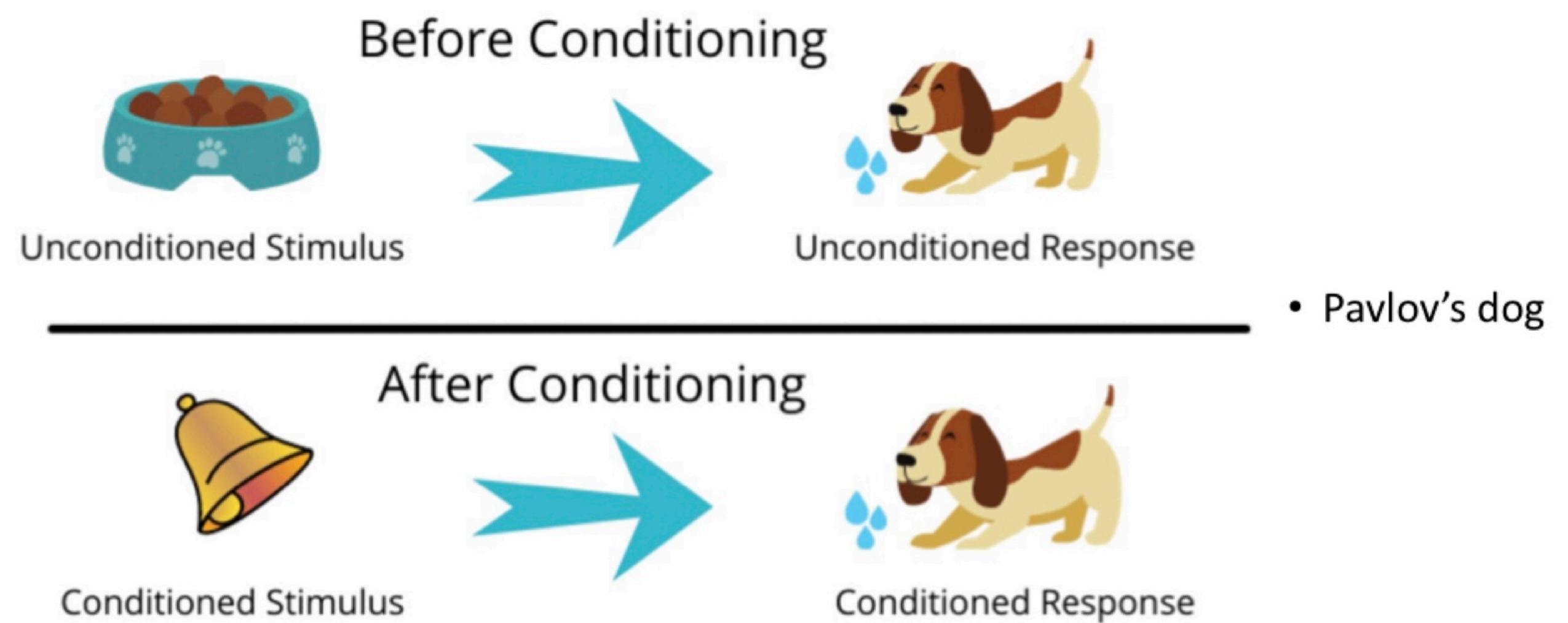
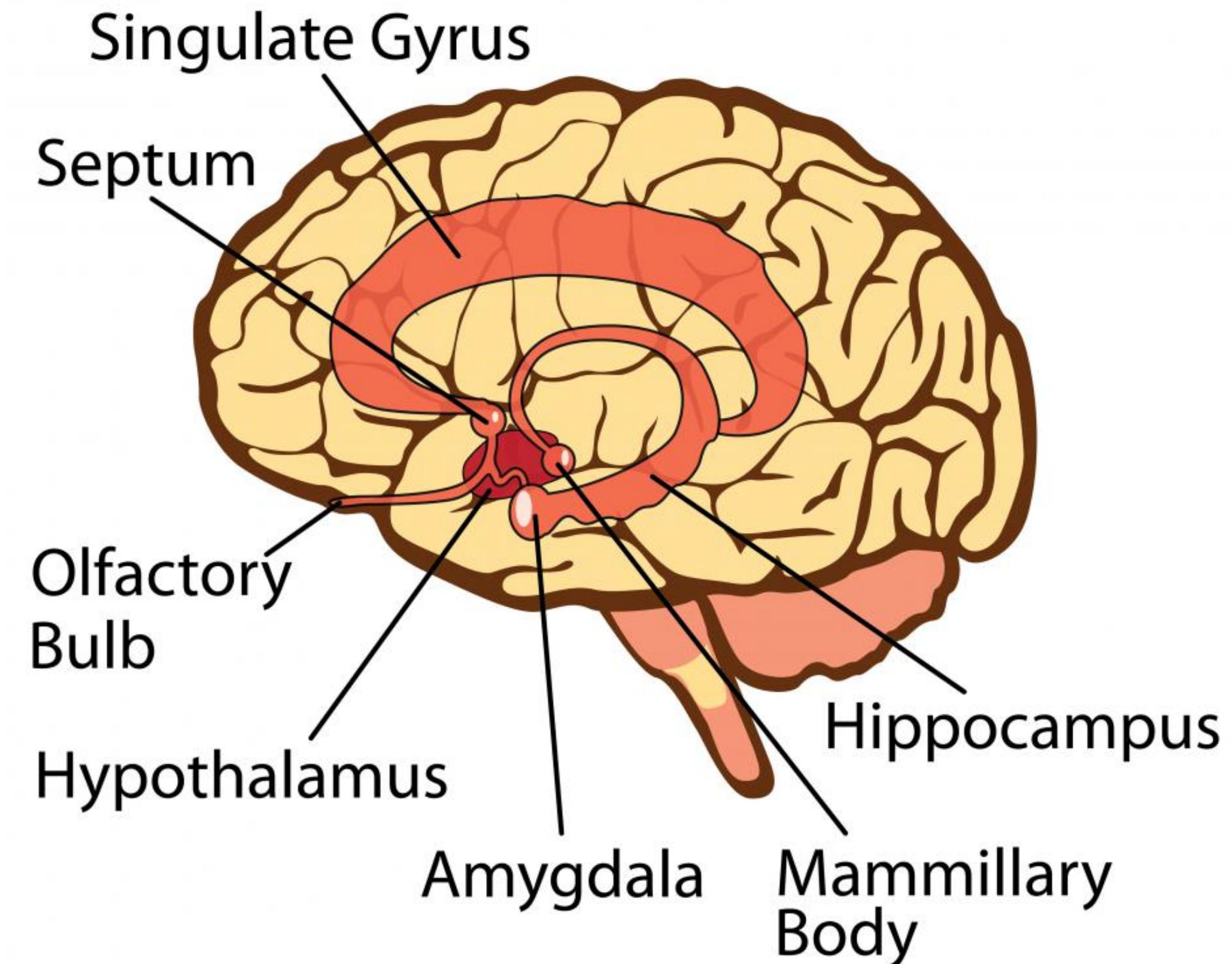
Emotion

- In 1970, Paul Ekman: six basic emotions: anger, fear, surprise, disgust, joy and sadness
- Brain structure related :amygdala, the insula or insular cortex, and the periaqueductal gray



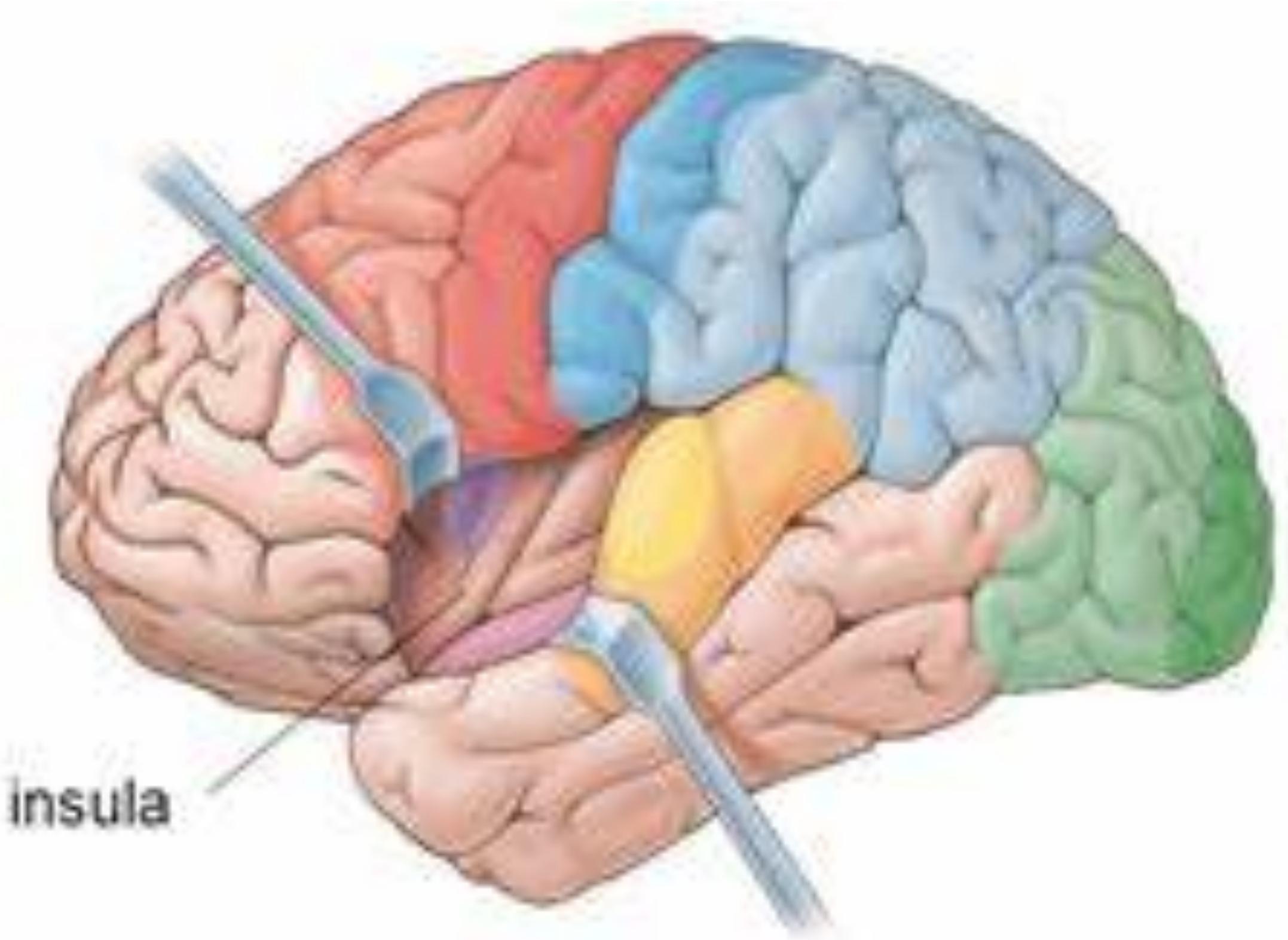
Amygdala(杏仁体)

- Integrate emotions, emotional behaviors and motivation
- responsible for strong affective reactions as fear, anger or emotions associated with sexual behavior
- Learning dependent on Amygdala: classical conditioning (a type of associative learning in which an animal learns to associate one of its behaviors with a reward or punishment)



Insula (脑岛)

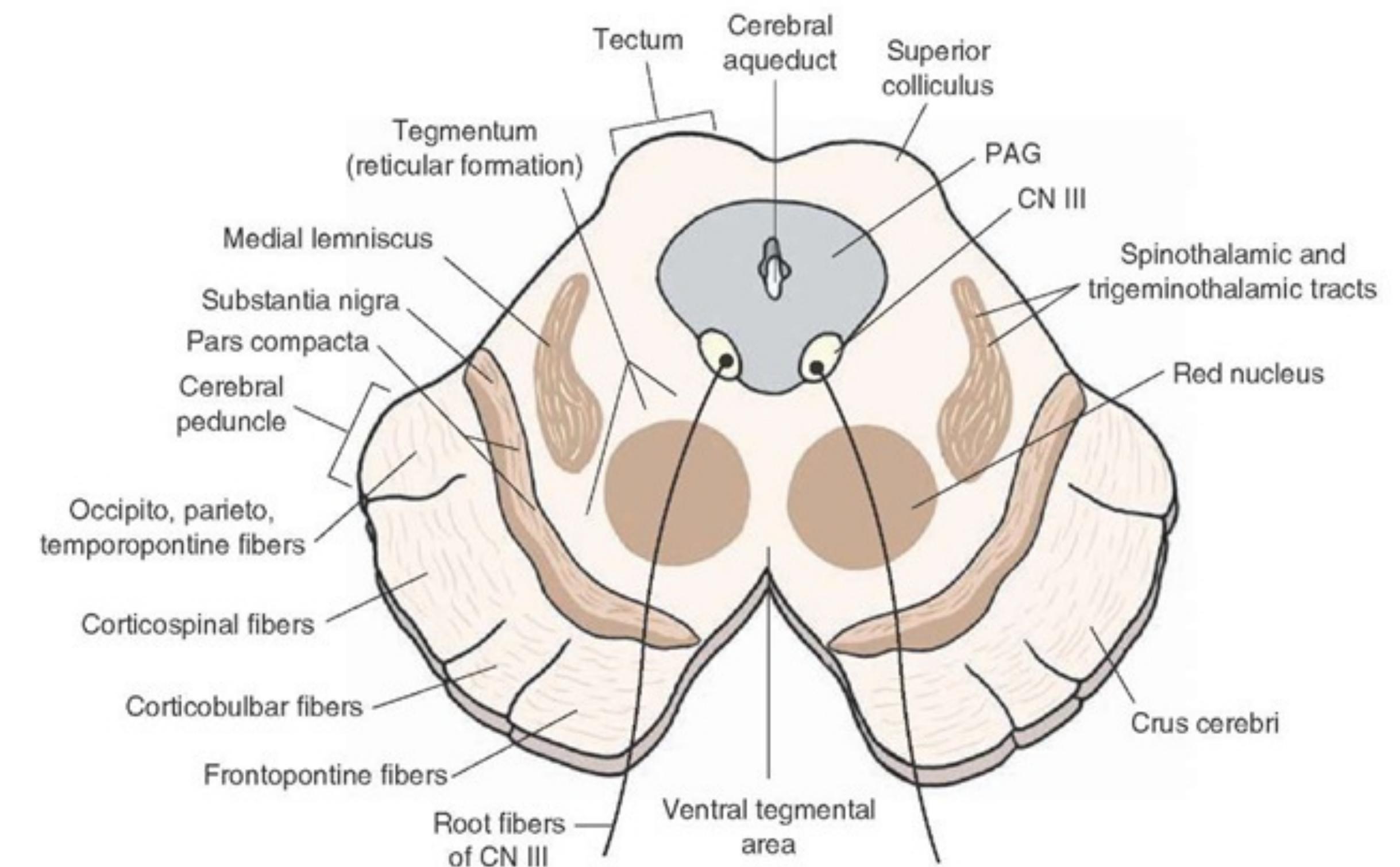
- Experience disgust: a strong negative reaction to an unpleasant odor—>protection
- take in system-wide inputs and generate subjective feelings
- Linking feelings, internal psychological state, social emotions and conscious actions



periaqueductal gray

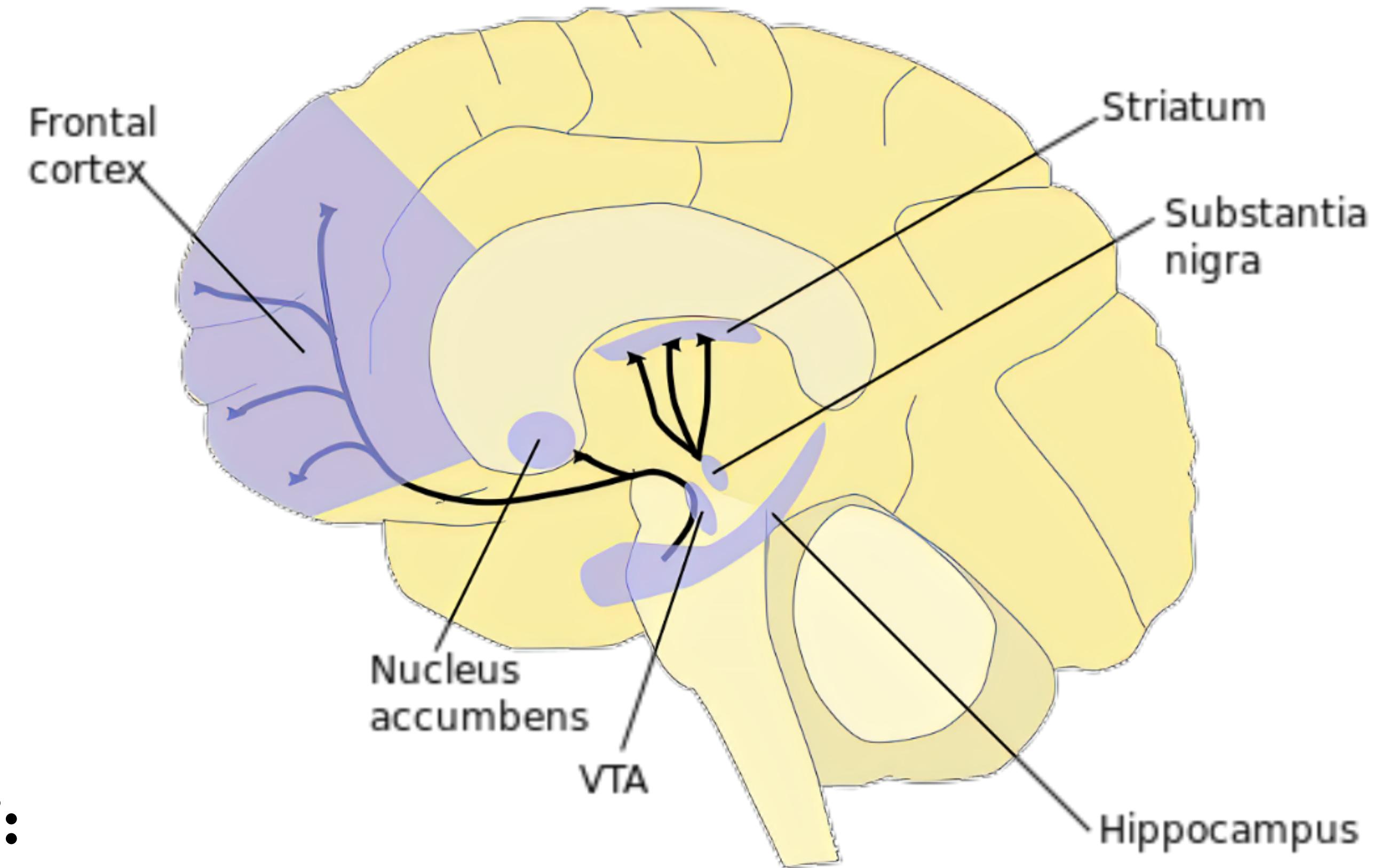
(中脑导水管周围灰质)

- Carries information about pain from spinal cord to the cortex
- Receptors for pain-reducing compounds eg: morphine (吗啡) and oxycodone(羟考酮)
- Stress response: defensive and reproductive behaviors, maternal attachment and anxiety



Motivation

- Affective decision-making: risky and uncertain conditions
- Emotionally centered decision-making: lateral prefrontal cortex—>self regulation
- dopaminergic neurons influence multiple brain functions: voluntary movement and behavioral processes
- Solimbic pathway/“Reward pathway”: connecting the mid-brain’s ventral segmental area to the nucleus accumbens(伏隔核)



Neuropsychiatric disorders

- The brain's reward system reinforces rewarding behaviors, trying to avoid behaviours leading to punishment
- Eg: The lateral habenula— encode punishment of inhibiting dopamine release. Dysfunction → inappropriate aggression
- Eg: the amygdala triggers rage and aggression

