

## **TABLE 1 - Essential neurotransmitters & emotions-motory functions**

### 1. Acetylcholine

- arousal and orgasm
- voluntary muscular energy and stamina
- memory
- long-term planning
- mental focus

### 2. Dopamine

- alertness
- motivation
- motor control
- immune function
- ego hardening, optimism, confidence
- sexual desire
- fat gain and fat loss
- lean muscle gain
- bone density
- ability to sleep soundly
- inhibits prolactin
- thinking, planning and problem solving
- aggression
- increase psychiatric and creative ability
- reduction of compulsivity
- salience and paranoia
- processing of pain
- increase sociability

### 3. Serotonin (S-HT), Nicotin (B3), 5-hydroxytryptophan (S-HTP)

- decrease thought
- anesthetize emotions
- decrease aggression and anger
- decrease anxiety
- promote satiety and decrease appetite
- elevates pain threshold
- reduces compulsivity/impulsivity
- decrease sexual desire
- orgasm
- thermoregulation (S-HT1A)
- Stimulates Emesis (S-HT3)
- Cerebrospinal fluid secretion (S-HT2C)
- Platelet Aggregation (S-HT2A)

- Smooth muscle contraction, vasoconstriction, and vasodilation (S-HT2A)
- release Oxytocin (S-HT1A)
- learning (S-HT2A & S-HT4)
- memory (S-HT4)
- neuronal excitation (S-HT2A, S-HT3 & S-HT4)
- neuronal inhibition (S-HT1A)
- cerebral vasoconstriction (S-HT1B)
- Pulmonary Vasoconstriction
- Presynaptic inhibition (S-HT1B)

#### 4. Norepinephrine DOPAC

- increase physical energy
- reduce compulsivity
- increase heart rate
- increase BP
- aggression
- alertness
- wakefulness/sleep cycle
- memory and learning
- orgasm
- decrease blood flow extremities
- increase heart rate
- maintenance of attention
- orgasm
- cerebral plasticity

#### 5. Epinephrine, adrenochrome (after oxydation)

- increases supply of oxygen and glucose to brain and muscles
- suppression digestion
- increase heart rate and stroke volume
- pupil dilation
- constricts arterioles in skeletal muscles
- elevates blood sugar levels

#### 6. GABA - synthesized from glutamate

- reduce physical tension
- reduce anxiety
- reduce insomnia
- elevates pain threshold
- reduces blood pressure
- decrease heart rate
- reduce compulsivity

## 7. Prolactin

- inhibition of Dopamine
- decreases sex hormones
- stimulates proliferation of oligodendrocyte precursor cells (myelin coating on axons in Central Nervous System, CNS)

## 8. Nitric Oxide

- vasodilation, thins blood
- reduces platelet stickiness, blood coagulation, wound healing
- vasopressin release
- stimulation of guanyl cyclase  $\rightarrow$  GTP  $\rightarrow$  cGMP (relaxation of smooth muscle)

## 9. Histamine

H1: vasodilation, bronchoconstriction, smooth muscle activation, separation of endothelial cells, pain and itching insect stings, allergic rhinitis, motion sickness

H2: stimulates gastric and secretion, potent stimulant of cAMP production, increase of intracellular  $\text{Ca}^{2+}$  concentrations and release  $\text{Ca}^{2+}$  from intracellular stores

H3: presynaptically inhibits release of other neurotransmitters

H4: mediates receptors chemotaxis and calcium mobilisation of mast cells

## 10. Vasopressin

Water retention, raises blood pressure, involved in aggression, memory formation, adrenocorticotrophic hormone secretion, gluconeogenesis, social recognition, increases mental clarity and memory

## 11. Oxytocin

Spontaneous erections and orgasm, water retention, bonding, decreased repetitive behaviors & improved interpretation of emotions, maternal behavior, increased trust and reduced fear, increase of generosity, inhibition of tolerance to drugs, impair learning and memory retrieval

12. Endocannabinoids

less relevant here

13. Endogenous opioids, sigma receptors, glycine,

less relevant here