UNDERSTANDING MEDICATIONS IN PSYCHIATRY

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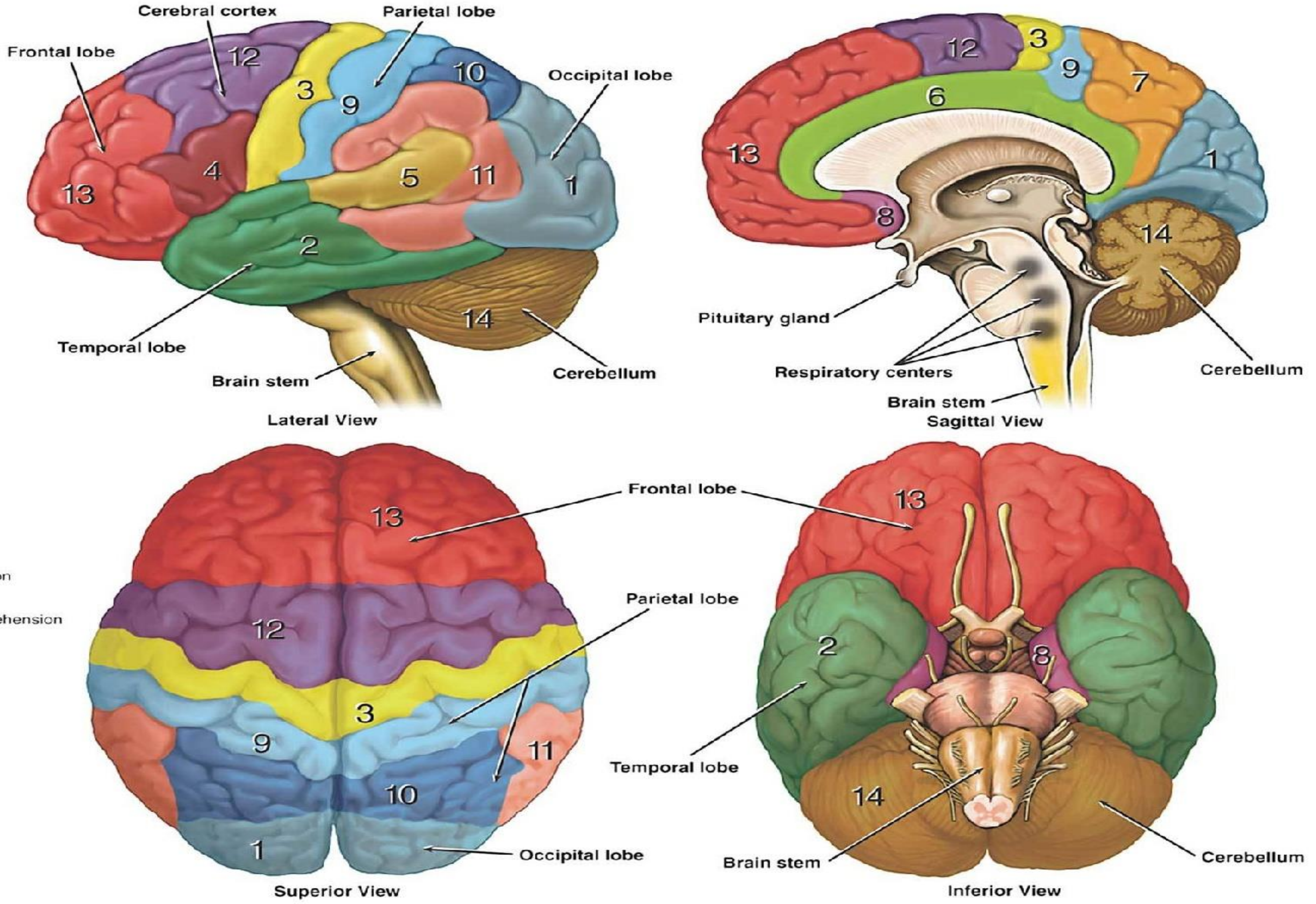
Functional Areas of the Cerebral Cortex

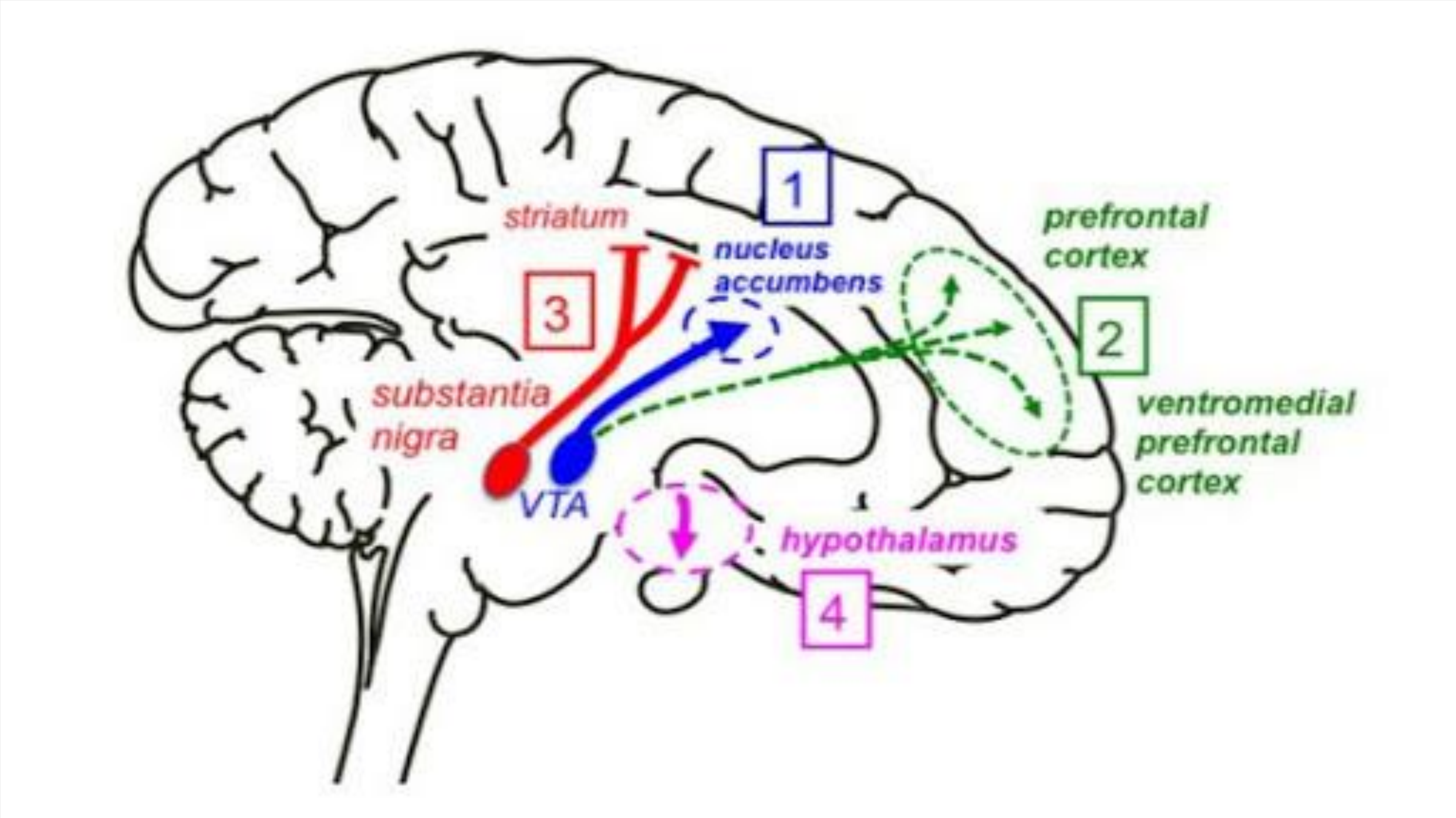
1. **Visual Area:**
   Sight
   Image recognition
   Image perception
2. **Association Area**
   Short-term memory
   Equilibrium
   Emotion
3. **Motor Function Area**
   Initiation of voluntary muscles
4. **Broca's Area**
   Muscles of speech
5. **Auditory Area**
   Hearing
6. **Emotional Area**
   Pain
   Hunger
   "Fight or flight" response
7. **Sensory Association Area**
8. **Olfactory Area**
   Smelling
9. **Sensory Area**
   Sensation from muscles and skin
10. **Somatosensory Association Area**
    Evaluation of weight, texture, temperature, etc. for object recognition
11. **Wernicke's Area**
    Written and spoken language comprehension
12. **Motor Function Area**
    Eye movement and orientation
13. **Higher Mental Functions**
    Concentration
    Planning
    Judgment
    Emotional expression
    Creativity
    Inhibition

Functional Areas of the Cerebellum

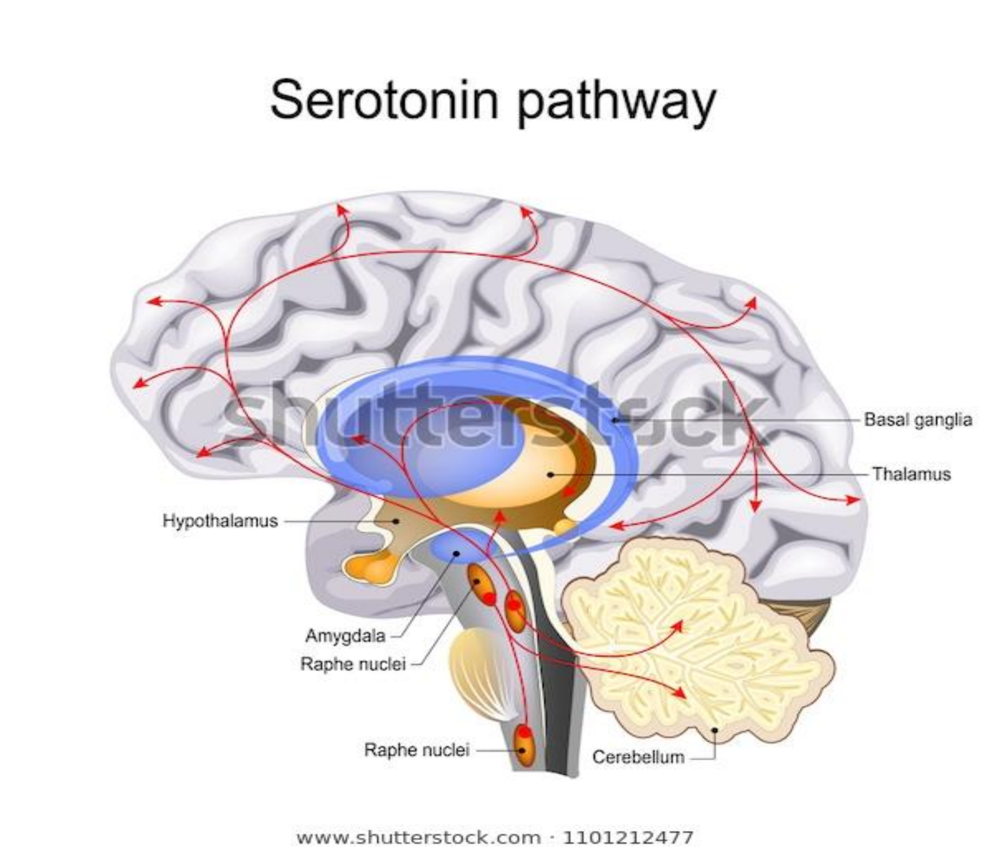
14. **Motor Functions**
    Coordination of movement
    Balance and equilibrium
    Posture



Schizophrenia Dopamine Pathways



Depression and Anxiety and Serotonin

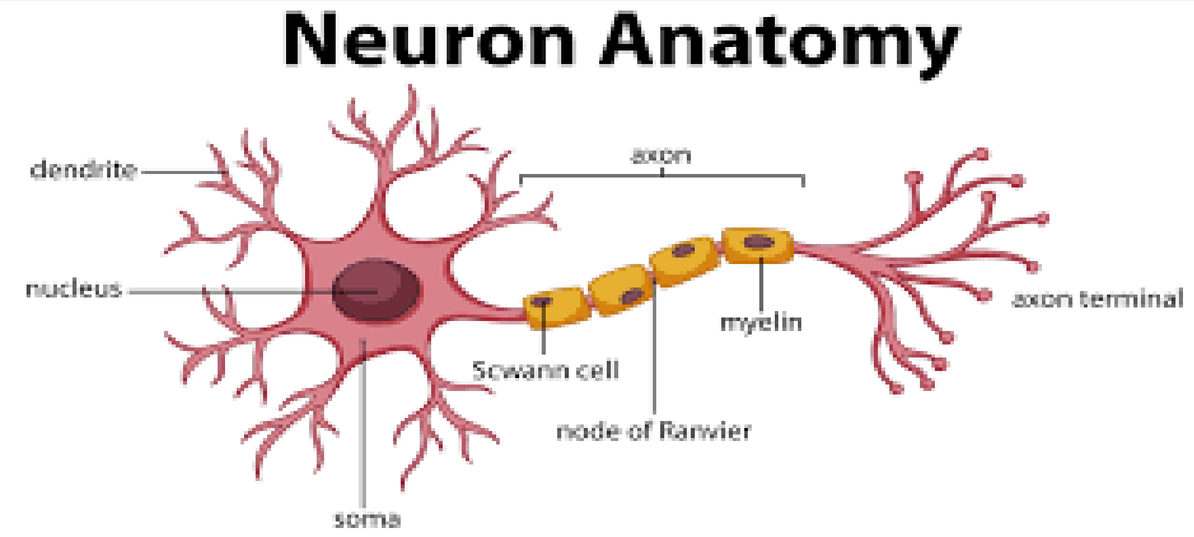


NEURON (Basic functional unit of the brain)

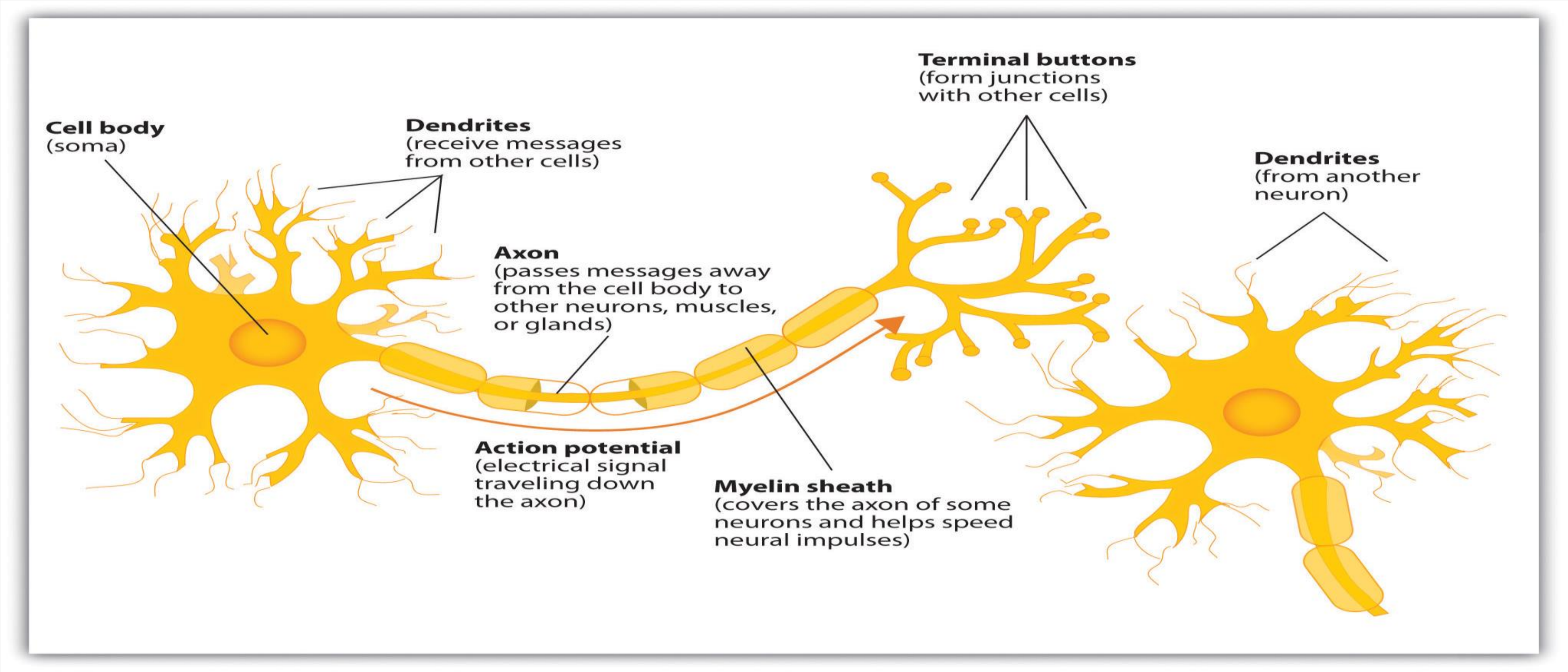
Soma: Where the nucleus resides (genetic material)

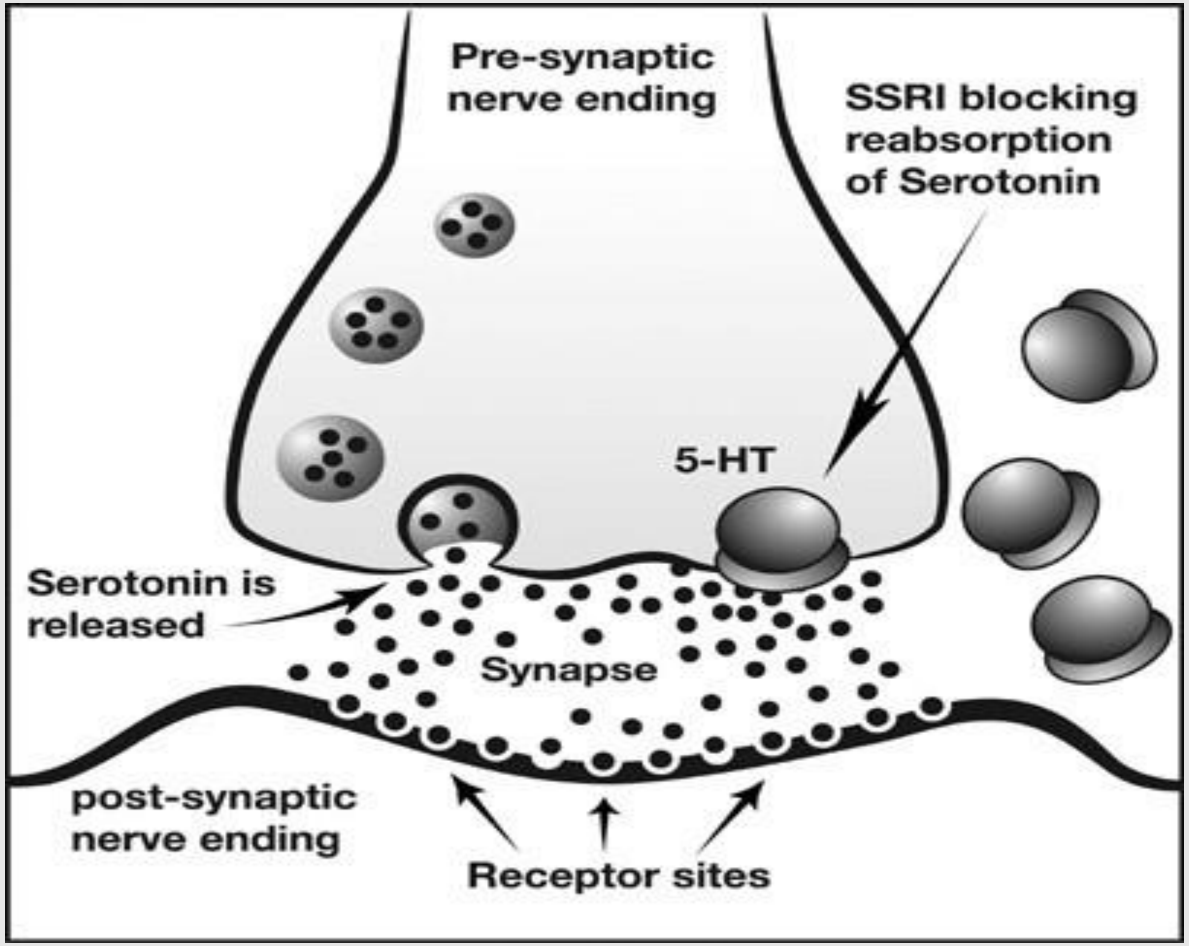
Dendrite: Site where neurotransmitters attach.

Axon terminal: Site of Neurotransmitter release.



How do Neurons Communicate?




Pre-synaptic
nerve ending
SSRI blocking
reabsorption
of Serotonin
5-HT
Serotonin is
released
Synapse
post-synaptic
nerve ending
Receptor sites

Important Neurotransmitters in the Brain

- 1) Serotonin: Involved in Depression, Anxiety, Schizophrenia, OCD, Impulsivity.
- 2) Dopamine: Involved in Schizophrenia, Addiction, Tic disorders, Depression, Mania, ADHD, Aggression.
- 3) Norepinephrine: Involved Depression, ADHD, pain perception, Anxiety
- 4) GABA: Involved in Anxiety, Sleep.
- 5) Glutamate: Schizophrenia, Depression, Addiction (New Frontier)

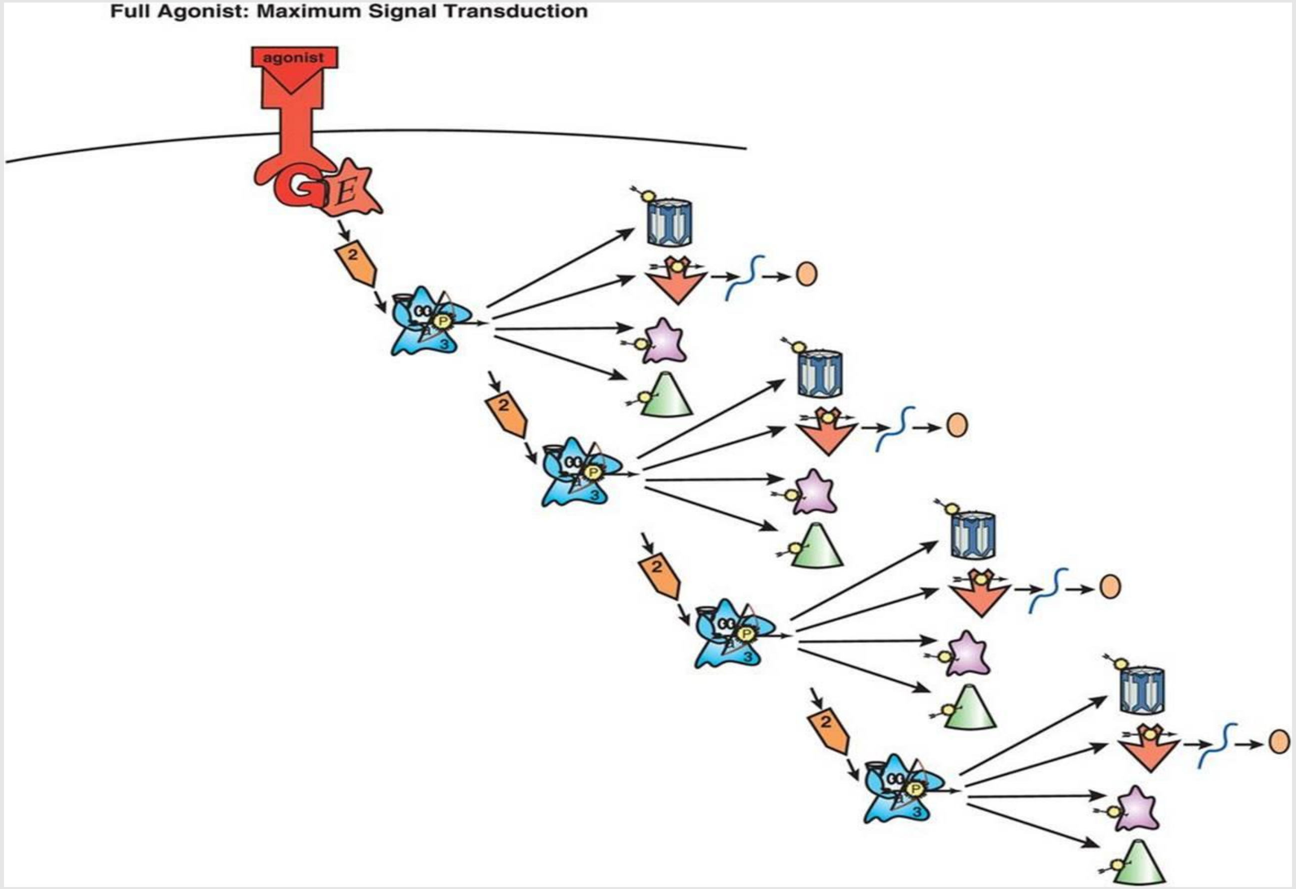
Mechanisms of Actions of Psychiatric Medications

- 1) Block the reuptake Pump (Slow)
- 2) Bind to G-Protein coupled receptors (Slow)
- 3) Bind to Ligand Gated Ion Channels (Fast)
- 4) Bind to Voltage Gated Ion Channels (Mod)
- 5) Inhibit Enzymes (Mod)

Important terms to remember

- 1)Agonist (mimics bodies natural neurontransmitter
- 2)Antagonist (blocks the binding of a neurotransmitter)
- 3)Partial agonist (partially stimulates the receptor)
- 4)Down regulation/upregulation and desensitization (Receptors adapt to medications)

G-Protein Linked Receptor Drugs



Ligand Gated Ion Channel Drugs (Benzodiazepines)

Factors That Influence Drug Response

- 1) Genetics
- 2) Age
- 3) Diet
- 4) Other medications
- 5) Pharmacokinetics (CYP450 Enzymes)
- 6) "Person's belief that It will work" (Power of the placebo affect)

What are some proposed Etiologies of Mental illness?

How do Some of the Medications work?

- Antipsychotics: Block dopamine receptors in the brain.
- Antidepressants: Inhibit reuptake pumps, causing an increased in Cathecolamines (Serotonin, Dopamine, Norepinephrine)
- Anti-Anxiety medications: Inhibit reuptake pumps, or increase GABA
- Mood stabilizers: Block Sodium and Calcium channels, Increase GABA, decrease Glutamate

Common Side Effects of Medications

- Antidepressants: Sexual dysfunction, weight gain, sedation, worsen insomnia, apathetic syndrome, headache, stomach ache, increase in anxiety, worsen mania.

- Antipsychotics: Dystonia (muscle spasm), Dyskinesia (involuntary muscle movements), Akathisia (restlessness), Parkinsonian syndrome, Tardive Dyskinesia, Weight Gain.

Intercollaboration between Disciplines

Clinical Questions and Discussion