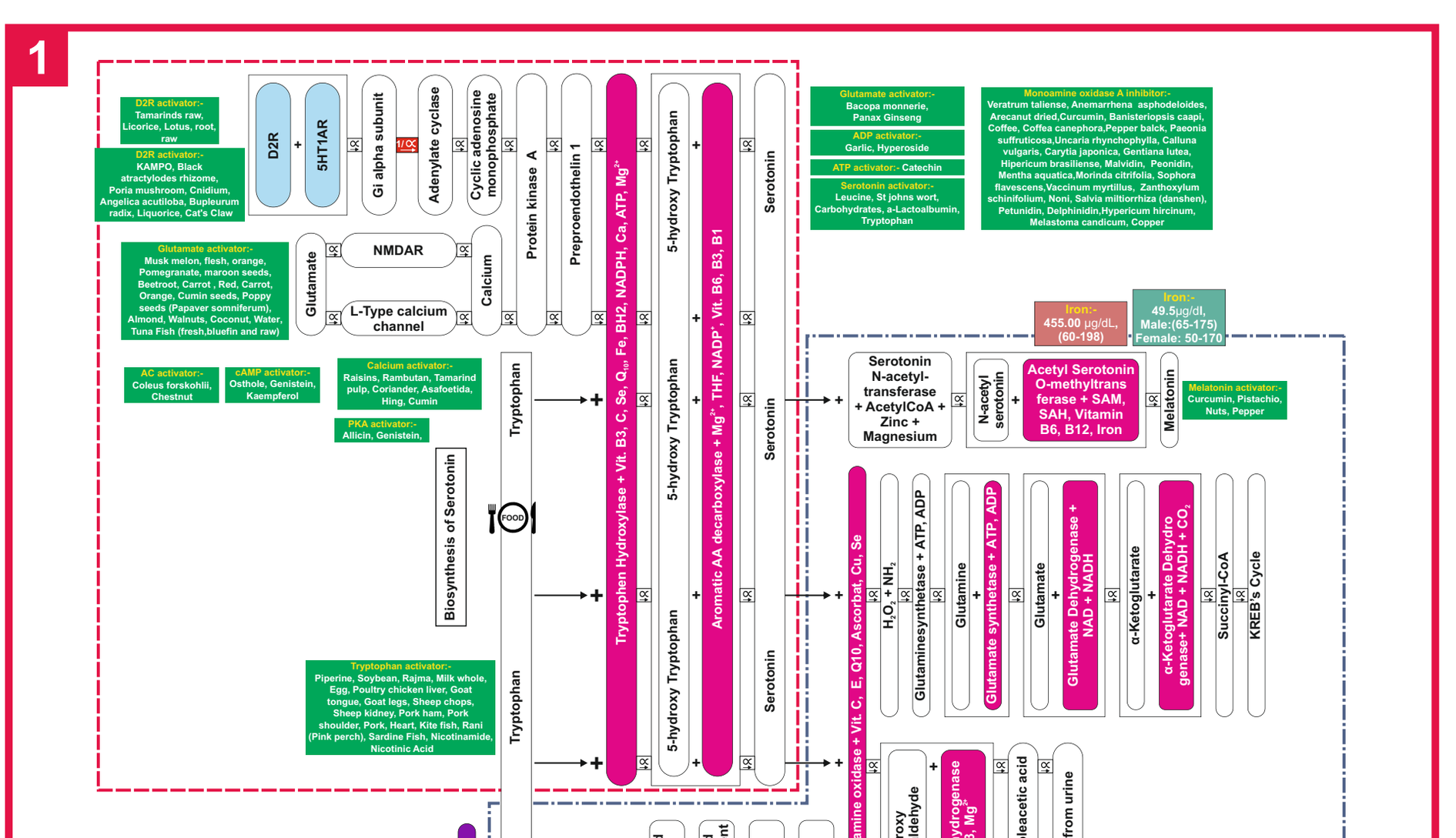
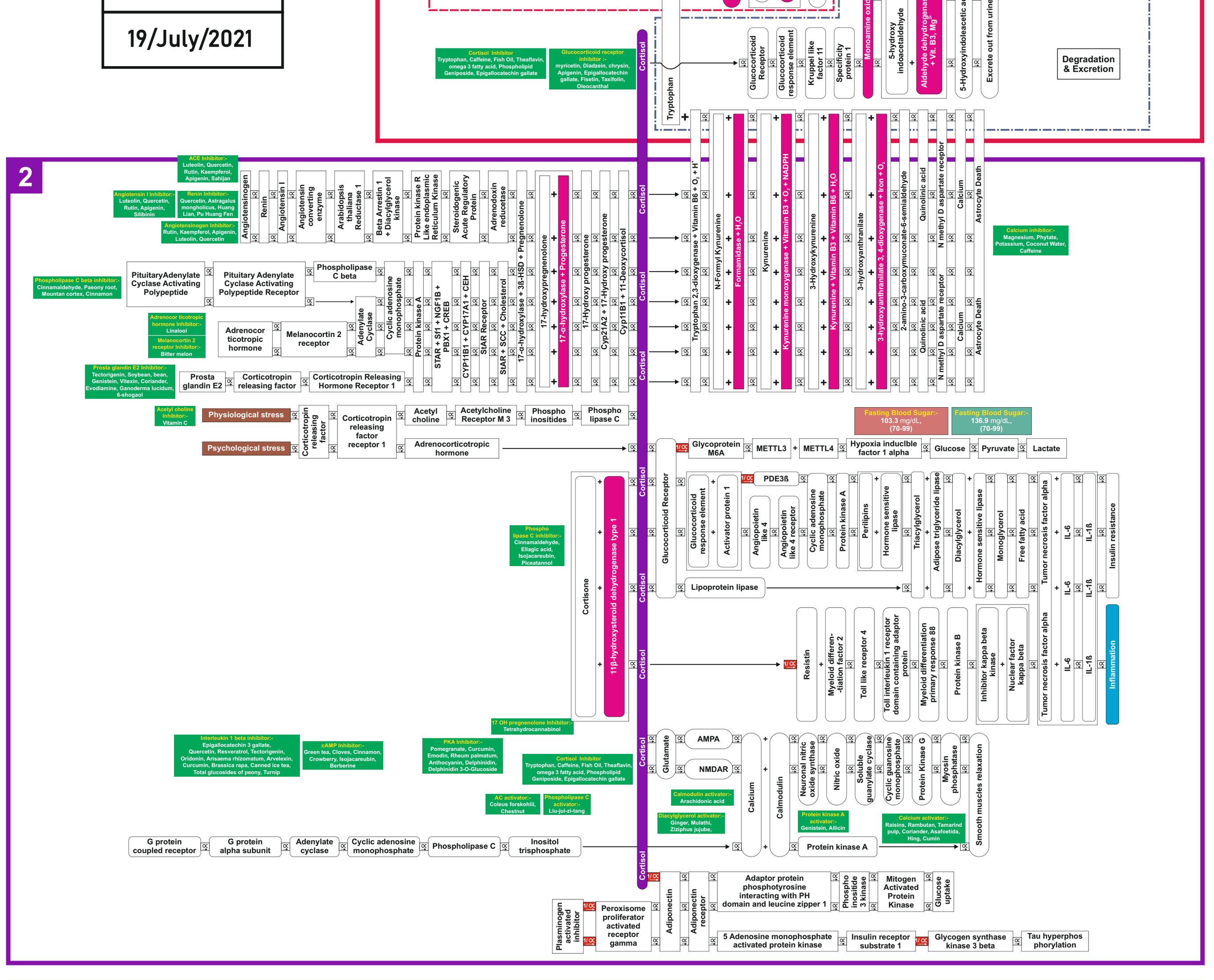
HYPEREXCITABILITY + OBESITY + DEPRESSION

19/July/2021

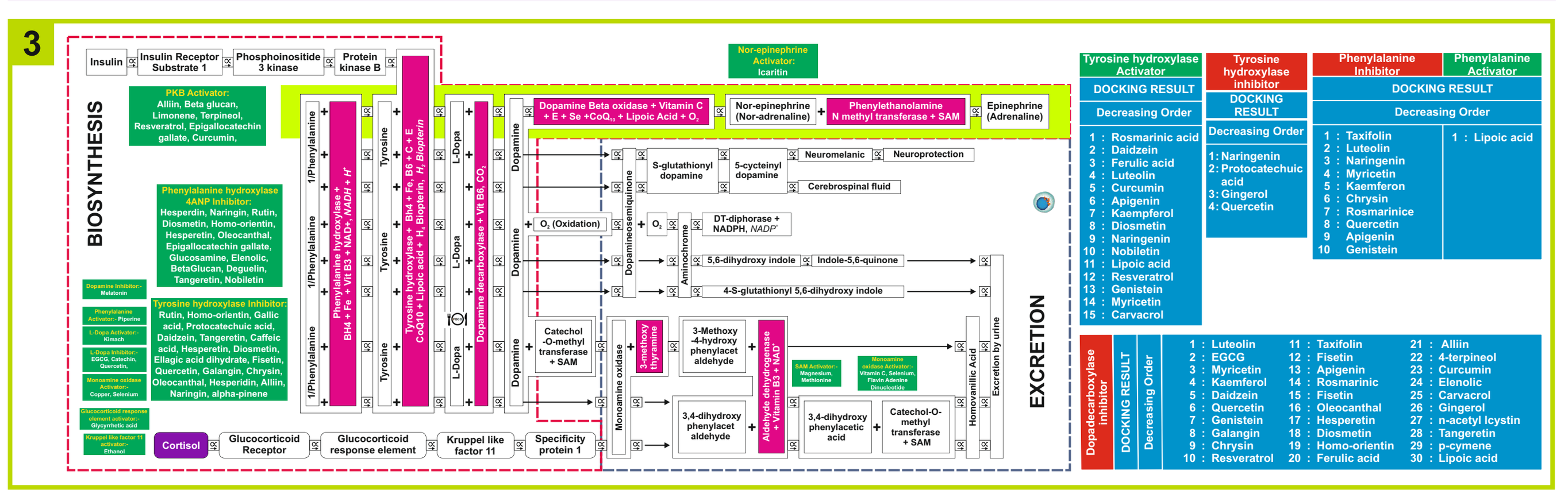
1 BIOSYNTHESIS OF SEROTONIN



2 BIOSYNTHESIS OF CORTISOL & OBESITY


Fasting Blood Sugar:- 103.3 mg/dL, (70-99)
Fasting Blood Sugar:- 136.9 mg/dL, (70-99)

3 BIOSYNTHESIS & EXCRETION OF DOPAMINE

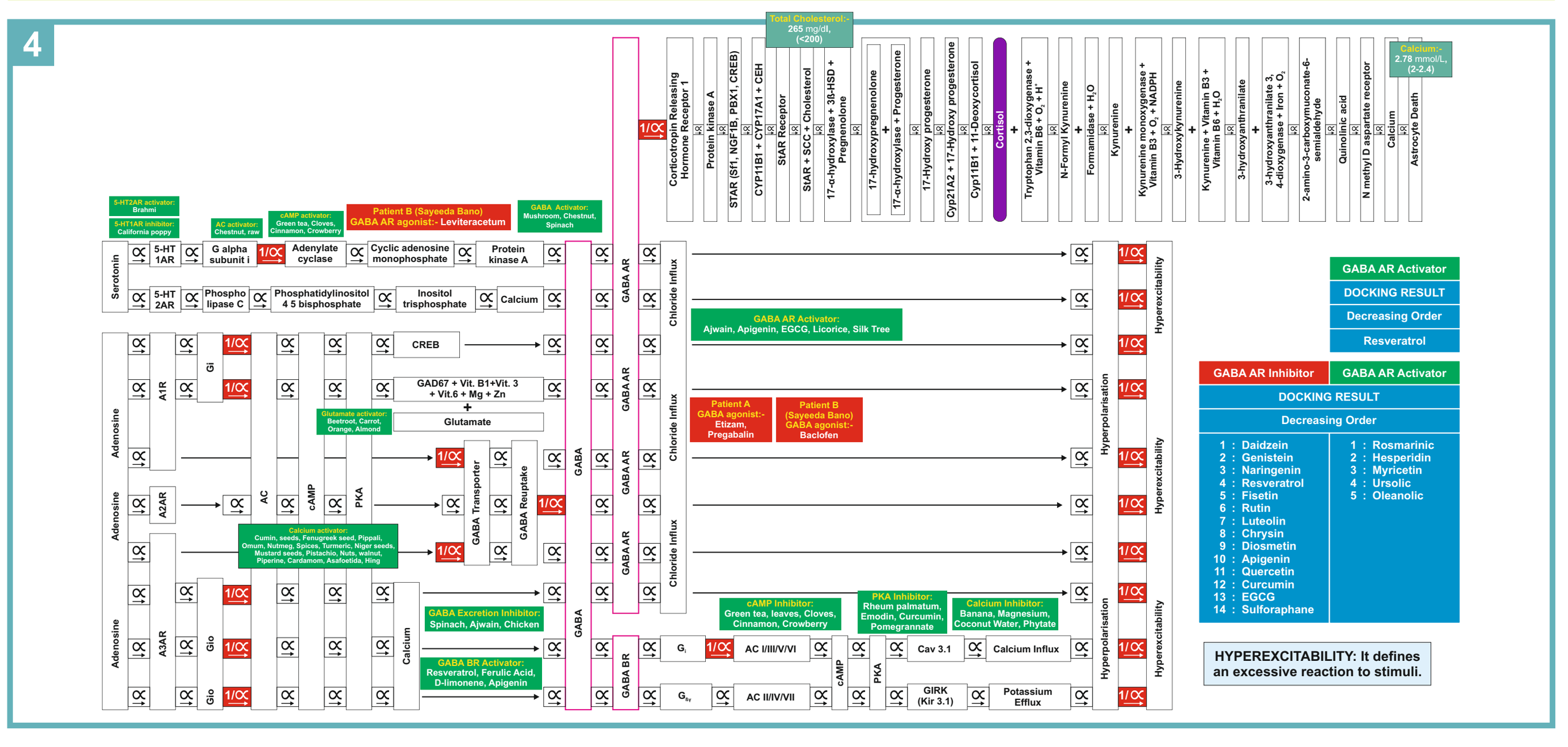

BIOSYNTHESIS
EXCRETION

Tyrosine hydroxylase Activator	Tyrosine hydroxylase inhibitor	Phenylalanine Inhibitor	Phenylalanine Activator
DOCKING RESULT	DOCKING RESULT	DOCKING RESULT	
Decreasing Order	Decreasing Order	Decreasing Order	
1 : Rosmarinic acid 2 : Daidzein 3 : Ferulic acid 4 : Luteolin 5 : Curcumin 6 : Apigenin 7 : Kaempferol 8 : Diosmetin 9 : Naringenin 10 : Nobiletin 11 : Lipoic acid 12 : Resveratrol 13 : Genistein 14 : Myricetin 15 : Carvacrol	1: Naringenin 2: Protocatechuic acid 3: Gingerol 4: Quercetin	1 : Taxifolin 2 : Luteolin 3 : Naringenin 4 : Myricetin 5 : Kaemferon 6 : Chrysin 7 : Rosmarinice 8 : Quercetin 9 Apigenin 10 Genistein	1 : Lipoic acid

Dopadecarboxylase inhibitor — DOCKING RESULT — Decreasing Order

1 : Luteolin	11 : Taxifolin	21 : Alliin
2 : EGCG	12 : Fisetin	22 : 4-terpineol
3 : Myricetin	13 : Apigenin	23 : Curcumin
4 : Kaemferol	14 : Rosmarinic	24 : Elenolic
5 : Daidzein	15 : Fisetin	25 : Carvacrol
6 : Quercetin	16 : Oleocanthal	26 : Gingerol
7 : Genistein	17 : Hesperetin	27 : n-acetyl lcystin
8 : Galangin	18 : Diosmetin	28 : Tangeretin
9 : Chrysin	19 : Homo-orientin	29 : p-cymene
10 : Resveratrol	20 : Ferulic acid	30 : Lipoic acid

4 ROLE OF GABA

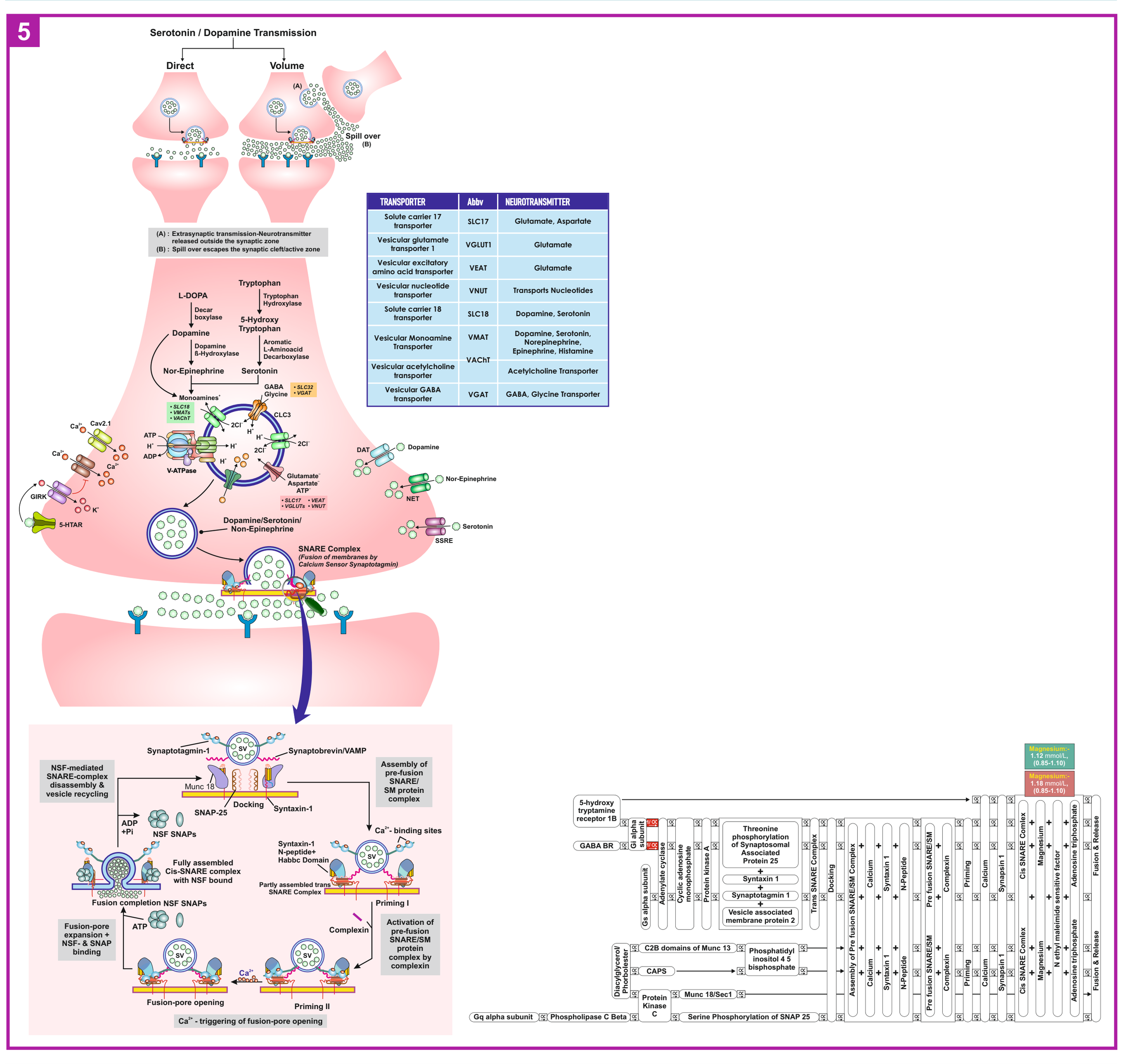

Calcium:- 2.78 mmol/L, (2-2.4)
GABA AR Activator: Ajwain, Apigenin, EGCG, Licorice, Silk Tree
Patient A GABA agonist:- Etizam, Pregabalin
Patient B (Sayeeda Bano) GABA agonist:- Baclofen
cAMP Inhibitor: Green tea, leaves, Cloves, Cinnamon, Crowberry
PKA Inhibitor: Rheum palmatum, Emodin, Curcumin, Pomegranate
Calcium Inhibitor: Banana, Magnesium, Coconut Water, Phytate
Hyperpolarisation
Hyperexcitability

GABA AR Activator
DOCKING RESULT
Decreasing Order
Resveratrol

GABA AR Inhibitor	GABA AR Activator
DOCKING RESULT	
Decreasing Order	
1 : Daidzein 2 : Genistein 3 : Naringenin 4 : Resveratrol 5 : Fisetin 6 : Rutin 7 : Luteolin 8 : Chrysin 9 : Diosmetin 10 : Apigenin 11 : Quercetin 12 : Curcumin 13 : EGCG 14 : Sulforaphane	1 : Rosmarinic 2 : Hesperidin 3 : Myricetin 4 : Ursolic 5 : Oleanolic

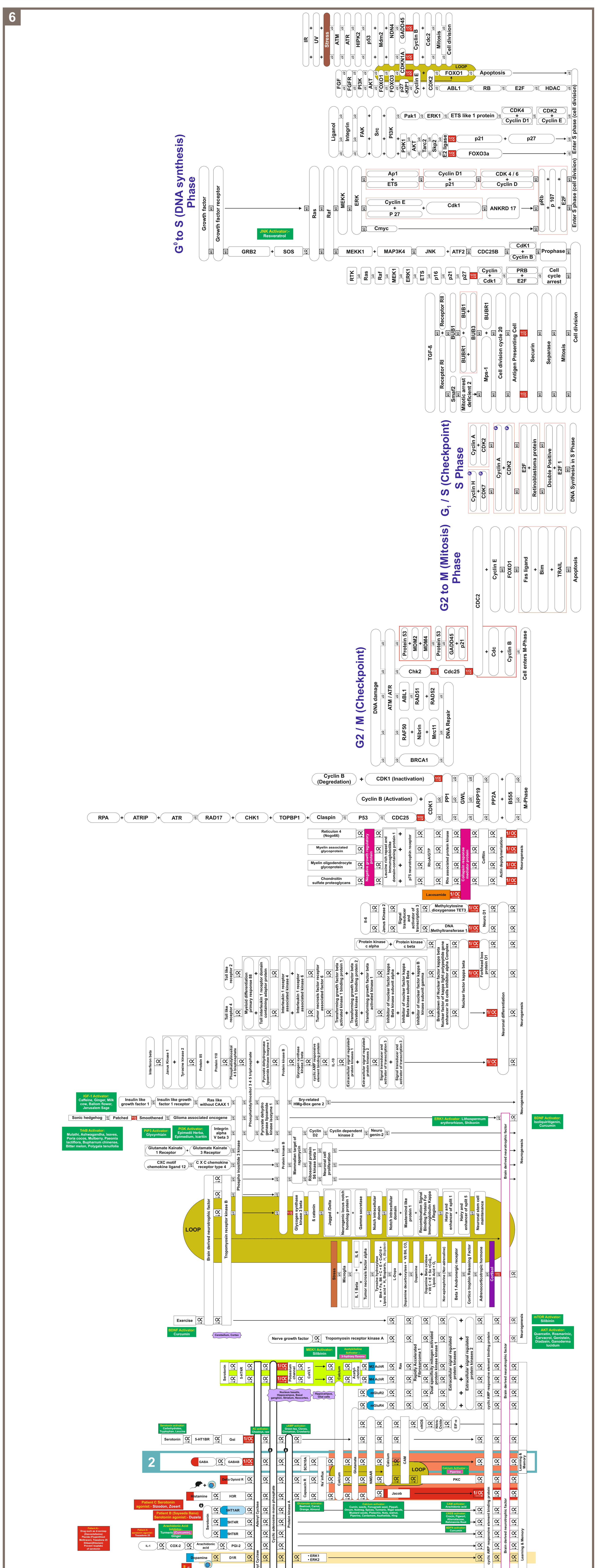
HYPEREXCITABILITY: It defines an excessive reaction to stimuli.

5 SYNAPSE


Serotonin / Dopamine Transmission
Direct
Volume
Spill over (B)
(A) : Extrasynaptic transmission-Neurotransmitter released outside the synaptic zone
(B) : Spill over escapes the synaptic cleft/active zone
Tryptophan
Dopamine
Nor-Epinephrine
Serotonin
DAT
NET
SSRE
SNARE Complex (Fusion of membranes by Calcium Sensor Synaptotagmin)
Synaptotagmin-1
Synaptobrevin/VAMP
Assembly of pre-fusion SNARE/SM protein complex
Ca²⁺- binding sites
Priming I
Complexin
Activation of pre-fusion SNARE/SM protein complex by complexin
Priming II
Fusion-pore opening
Ca²⁺ - triggering of fusion-pore opening

TRANSPORTER	Abbv	NEUROTRANSMITTER
Solute carrier 17 transporter	SLC17	Glutamate, Aspartate
Vesicular glutamate transporter 1	VGLUT1	Glutamate
Vesicular excitatory amino acid transporter	VEAT	Glutamate
Vesicular nucleotide transporter	VNUT	Transports Nucleotides
Solute carrier 18 transporter	SLC18	Dopamine, Serotonin
Vesicular Monoamine Transporter	VMAT	Dopamine, Serotonin, Norepinephrine, Epinephrine, Histamine
Vesicular acetylcholine transporter	VAChT	Acetylcholine Transporter
Vesicular GABA transporter	VGAT	GABA, Glycine Transporter

6 CELL DIVISION — ROLE OF NEUROGENESIS — LEARNING MEMORY, ASTROCYTOGENESIS, NEUROPROTECTION, AND LONG-TERM POTENTIATION

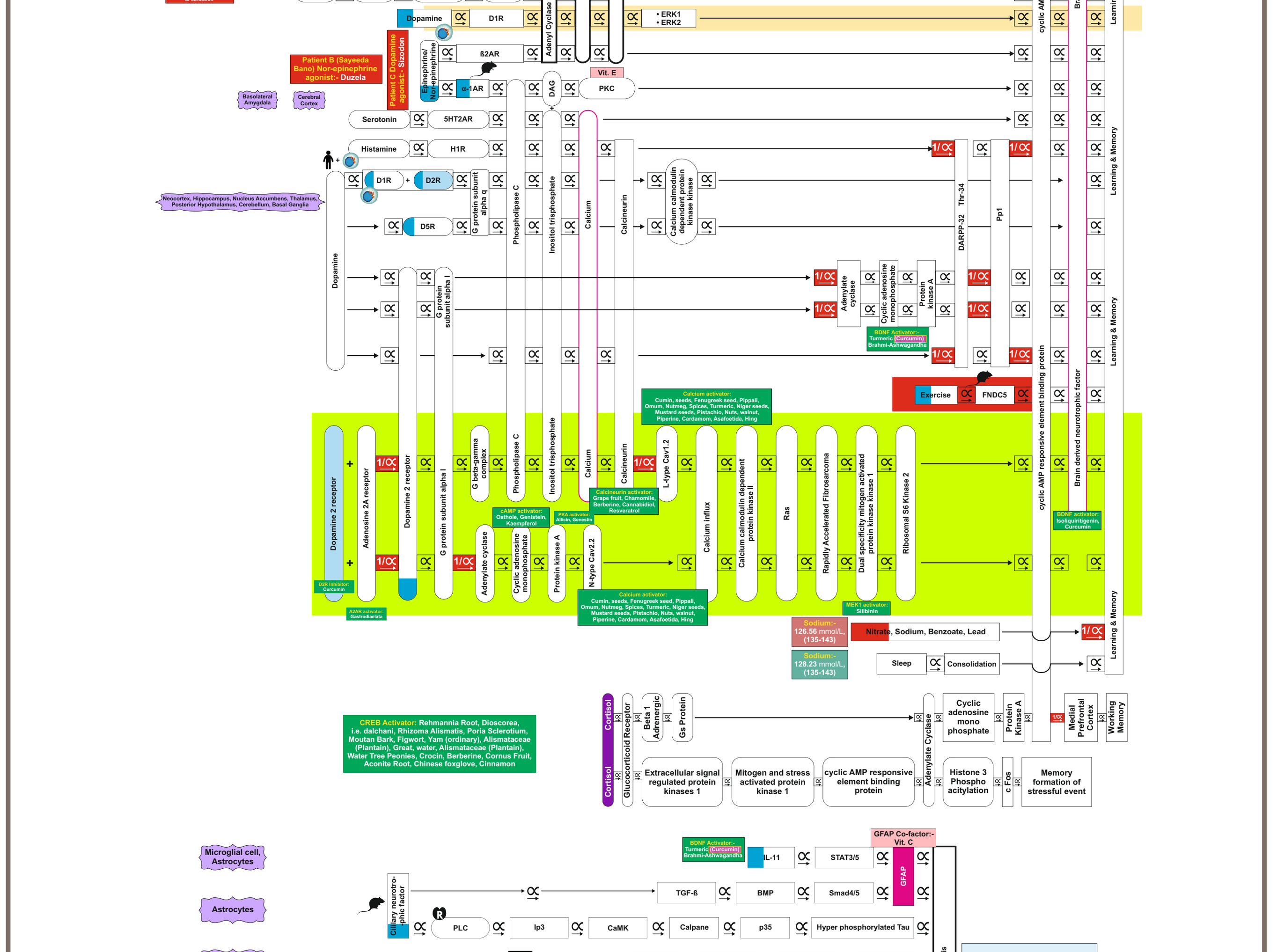

G⁰ to S (DNA synthesis) Phase
G₁ / S (Checkpoint) S Phase
G2 to M (Mitosis) Phase
G2 / M (Checkpoint)
Cell division
Apoptosis
Enter S phase (cell division)
Cell enters M-Phase
LOOP
Neurogenesis
Learning & Memory
Astrocytogenesis
Neuro protection
LTP

ASTROCYTOGENESIS : It refers to the creation and development of astrocytes.

NEURO PROTECTION : Neuroprotection refers to the relative preservation of neuronal structure and/or function. In the case of an ongoing insult (a neurodegenerative insult) the relative preservation of neuronal integrity implies a reduction in the rate of neuronal loss over time, which can be expressed as a differential equation.

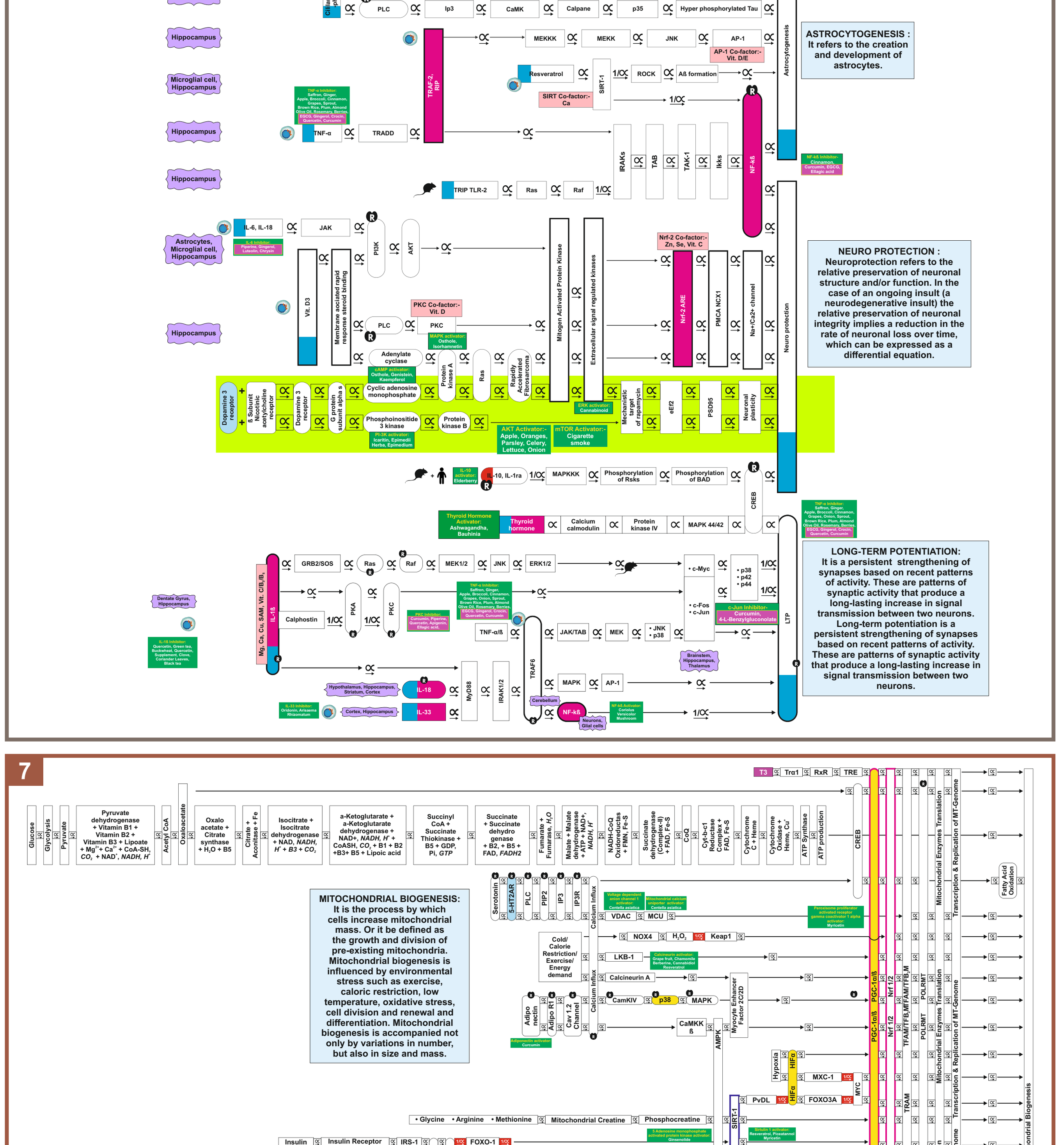
LONG-TERM POTENTIATION: It is a persistent strengthening of synapses based on recent patterns of activity. These are patterns of synaptic activity that produce a long-lasting increase in signal transmission between two neurons. Long-term potentiation is a persistent strengthening of synapses based on recent patterns of activity. These are patterns of synaptic activity that produce a long-lasting increase in signal transmission between two neurons.

7 MITOCHONDRIAL BIOGENESIS



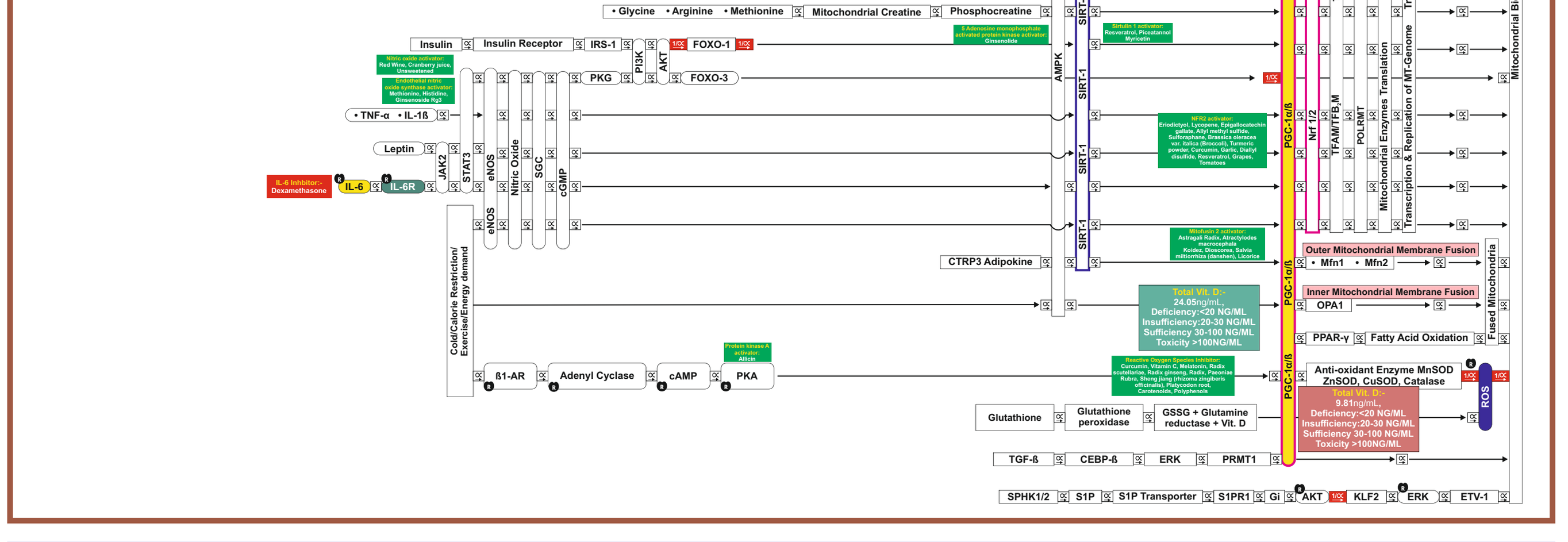
MITOCHONDRIAL BIOGENESIS: It is the process by which cells increase mitochondrial mass. Or It be defined as the growth and division of pre-existing mitochondria. Mitochondrial biogenesis is influenced by environmental stress such as exercise, caloric restriction, low temperature, oxidative stress, cell division and renewal and differentiation. Mitochondrial biogenesis is accompanied not only by variations in number, but also in size and mass.

8 MITOPHAGY



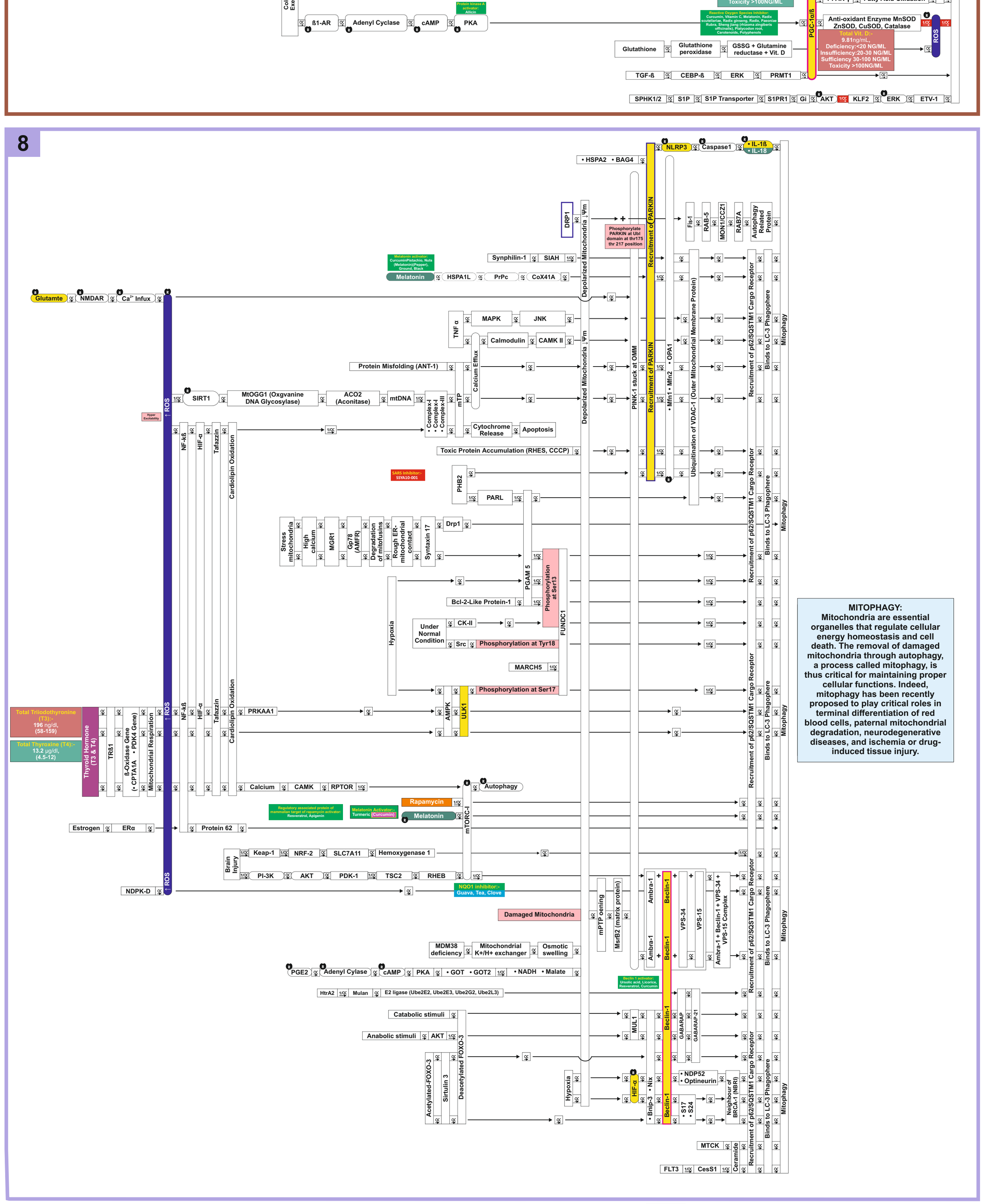
MITOPHAGY: Mitochondria are essential organelles that regulate cellular energy homeostasis and cell death. The removal of damaged mitochondria through autophagy, a process called mitophagy, is thus critical for maintaining proper cellular functions. Indeed, mitophagy has been recently proposed to play critical roles in terminal differentiation of red blood cells, paternal mitochondrial degradation, neurodegenerative diseases, and ischemia or drug-induced tissue injury.

9 ROLE OF VASODILATION



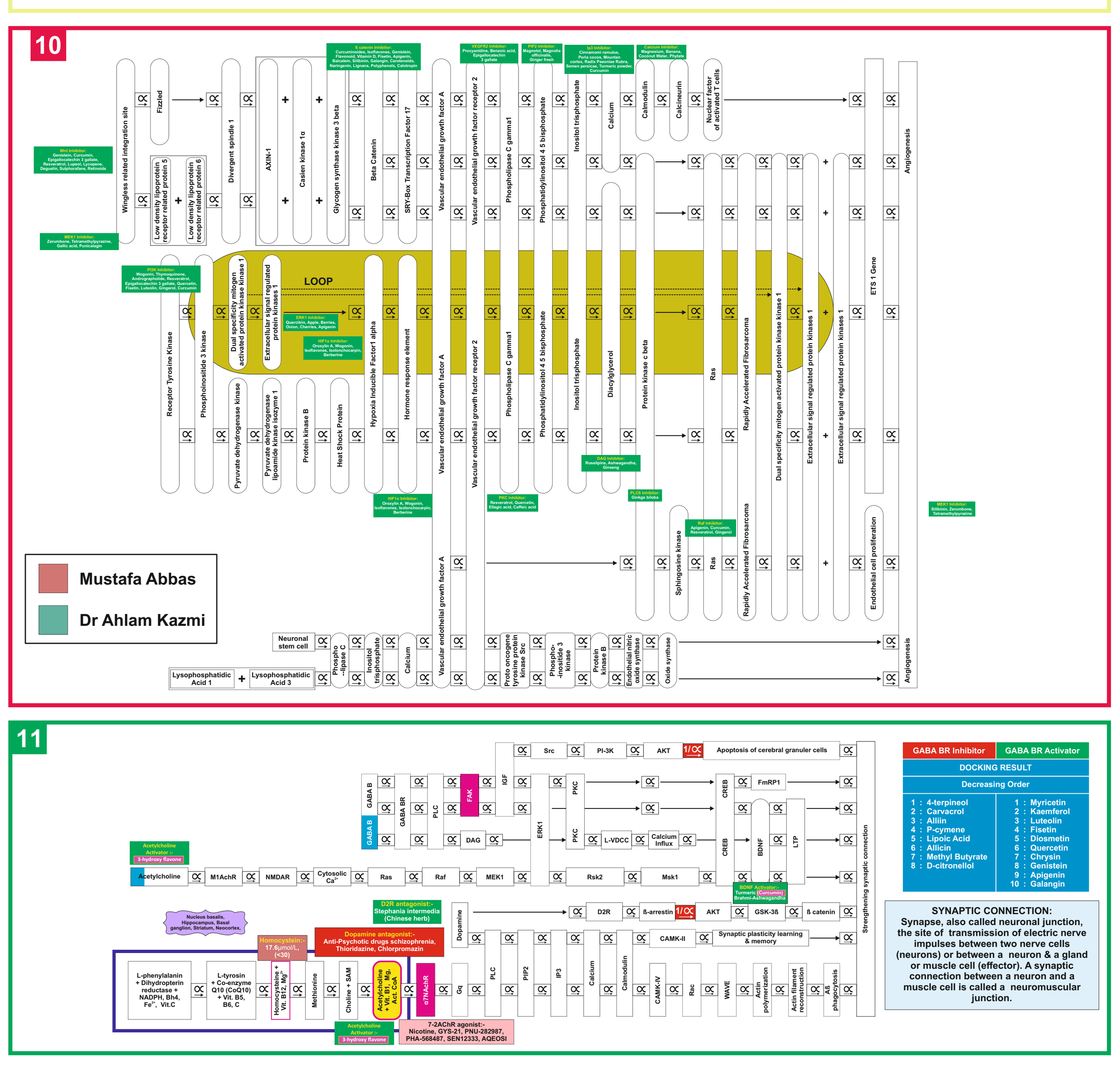
VASODILATION: It is the widening of your blood vessels, vasoconstriction is the narrowing of blood vessels. It's due to a contraction of muscles in the blood vessels. When vasoconstriction occurs, the blood flow to some of your body's tissues becomes restricted.

10 Angiogenesis


LOOP
Angiogenesis
MEK1 Inhibitor: Silibinin, Zerumbone, Tetramethylpyrazine

- 🟥 Mustafa Abbas
- 🟩 Dr Ahlam Kazmi

11 SYNAPTIC CONNECTION & ACETYLCHOLINE


Strengthening synaptic connection

GABA BR Inhibitor	GABA BR Activator
DOCKING RESULT	
Decreasing Order	
1 : 4-terpineol 2 : Carvacrol 3 : Alliin 4 : P-cymene 5 : Lipoic Acid 6 : Allicin 7 : Methyl Butyrate 8 : D-citronellol	1 : Myricetin 2 : Kaemferol 3 : Luteolin 4 : Fisetin 5 : Diosmetin 6 : Quercetin 7 : Chrysin 8 : Genistein 9 : Apigenin 10 : Galangin

SYNAPTIC CONNECTION: Synapse, also called neuronal junction, the site of transmission of electric nerve impulses between two nerve cells (neurons) or between a neuron & a gland or muscle cell (effector). A synaptic connection between a neuron and a muscle cell is called a neuromuscular junction.