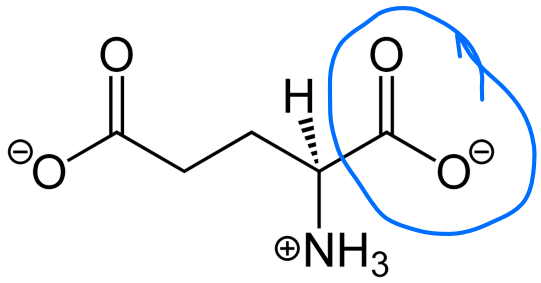
Glutamate

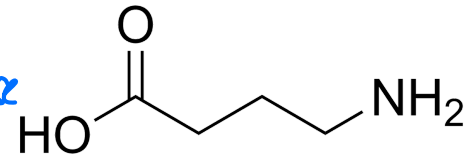
major excitatory NT

Glutamate



L-glutamic acid

decarboxylase



GABA

↑ excitatory

↑ inhibitory

↑↑ 3 major subtypes of receptors

too much → seizures

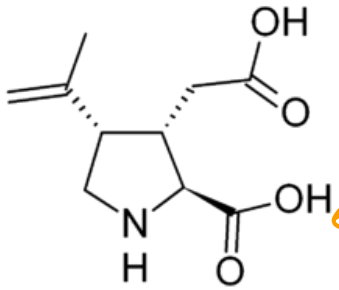
little → coma

glutamic acid - found in food

oral ingestion has little effect on CNS levels

Subtypes classified by ligand

Kainate



← found in seaweed

← can be used for worm

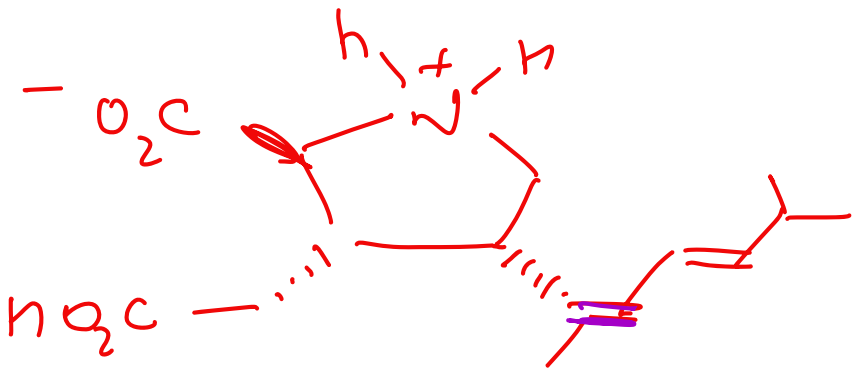
the 3 subtypes all ionotropic usually Na+ Channels

Also where domoic acid binds

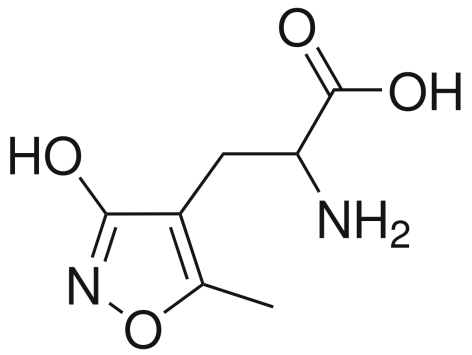
found in red algae

Can accumulate in shellfish

Amnesic Shellfish Poisoning



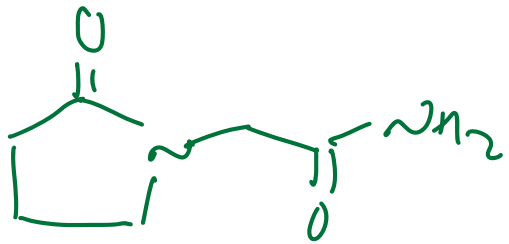
AMPA (2-amino-3-hydroxyl-5-methyl-4-isooxazole propionic acid



analogous to muscimol

amanita mushrooms

Binds piracetam



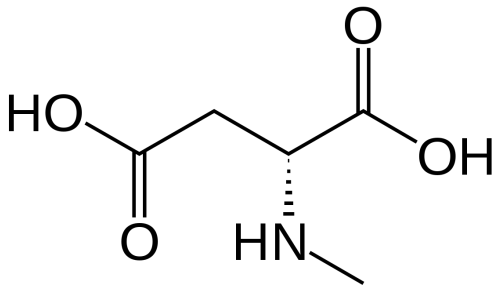
nootropic drugs

improve mental performance

Ampakines - agonists for these receptors

this type of receptor is activated by binding Glut Ely

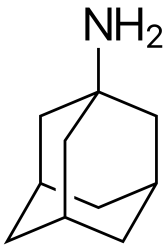
NMDA (N-methyl-D-Aspartate)



agonists - increase alertness
Convulsions

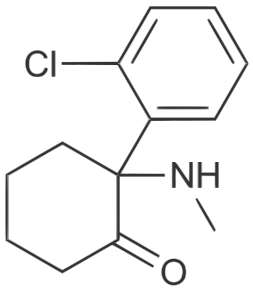
antagonists - Sedatives

Antagonists for Glu receptors



Amantidine

designed to replace PCP; fewer hallucinations



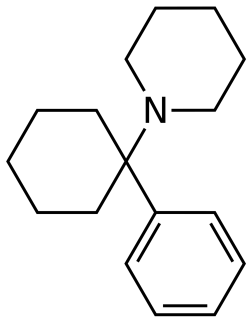
Ketamine

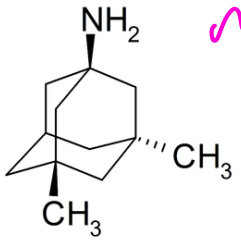
Cataleptic anesthesia

PCP

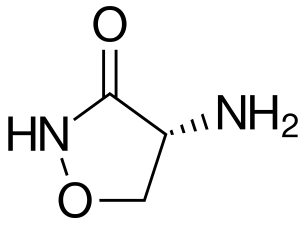
phencyclidine

originally an anesthetic → hallucinations





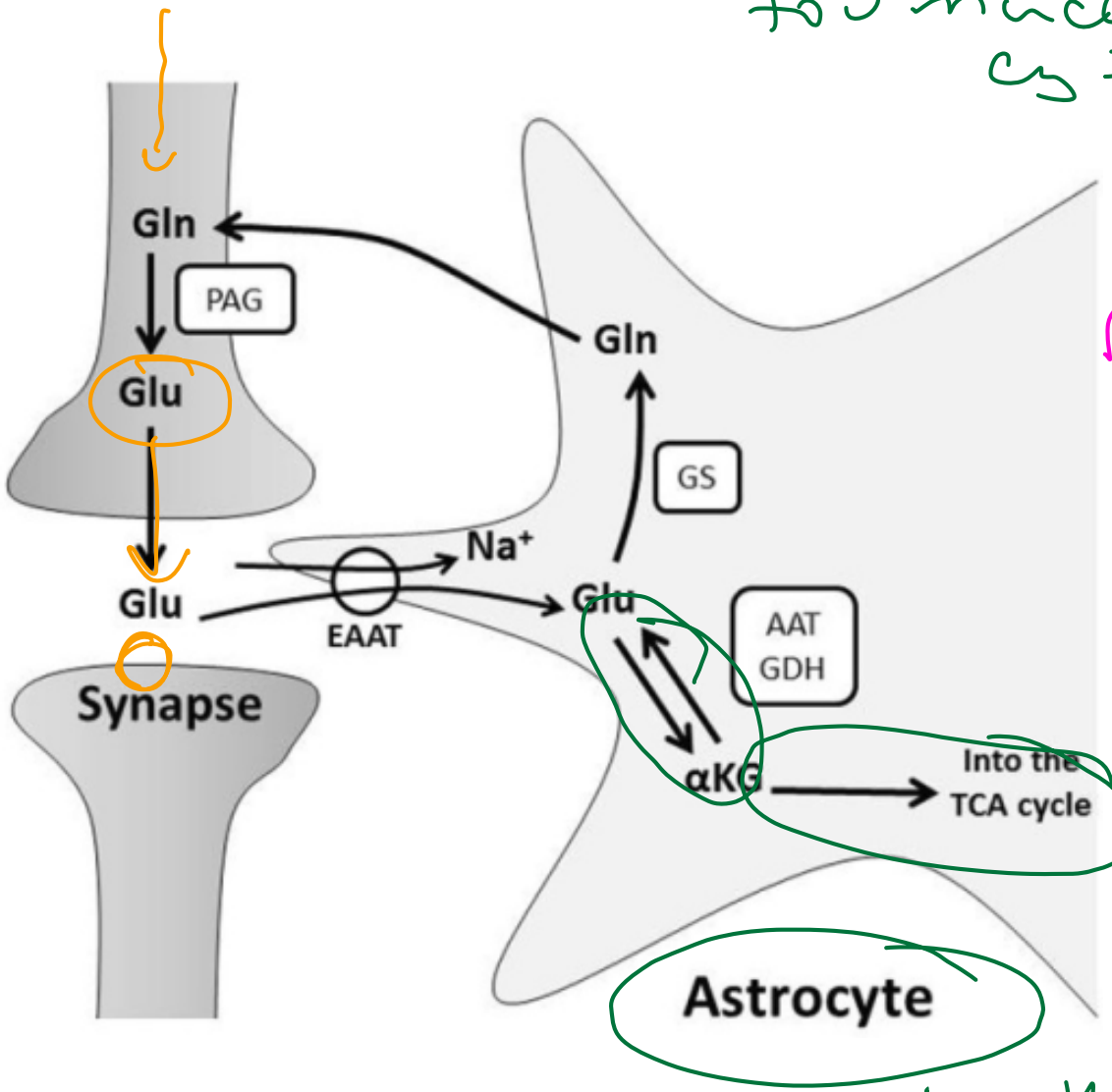
memantidine



Cycloserine

Glutamate-Glutamine Cycle

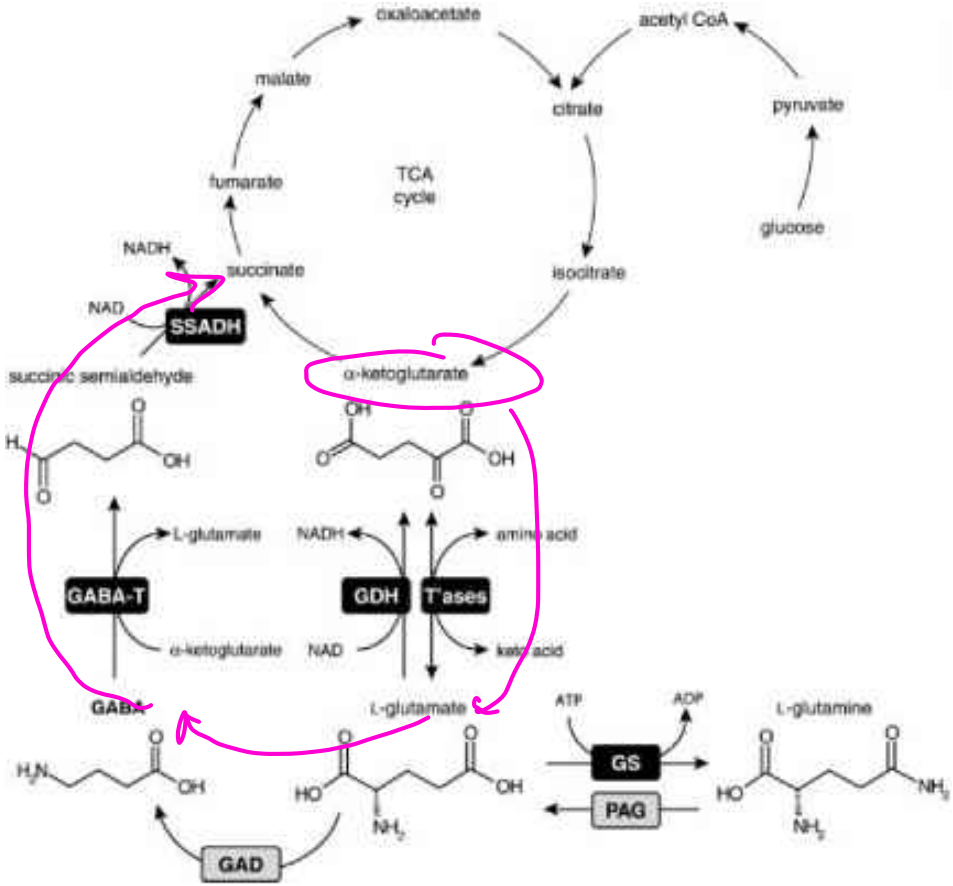
Conc. of Gln in Synapse tightly controlled too much cytotoxic



release from glial cells may play a role in stroke related brain damage

+ other glial cells act as reservoirs

GABA Shunt


oxaloacetate
acetyl CoA
malate
citrate
pyruvate
TCA cycle
fumarate
glucose
NADH
succinate
isocitrate
NAD
SSADH
succinic semialdehyde
α-ketoglutarate
L-glutamate
NADH
amino acid
GABA-T
GDH
T'ases
α-ketoglutarate
NAD
keto acid
GABA
L-glutamate
ATP
ADP
L-glutamine
GS
PAG
GAD