NITROMEDICINE TEAM

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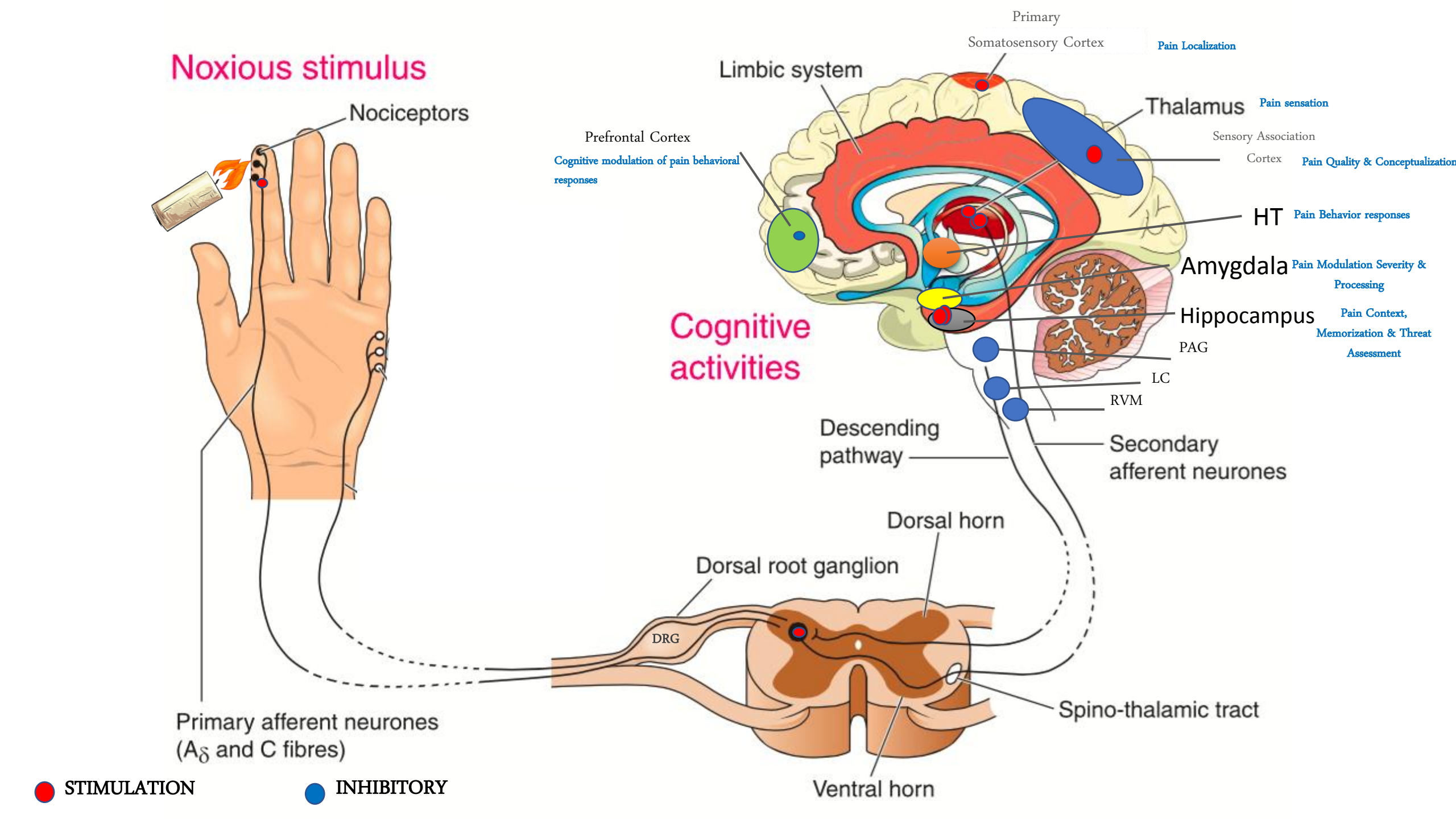
CENTRAL PAIN VS PERIPHERAL PAIN GENERATORS

Central Pain Generator is Neuropathic pain that happens when the central nervous system doesn't process pain signals properly

Peripheral Pain Generator is Nociceptive pain that is not part of the nervous system and caused by inflammation or injury such OA, RA, Burn, fracture, etc

About 20 percent of patients with OA who have had their knee or hip replaced continue to have chronic pain. The pain has likely become centralized—it is no longer caused by the inflammation or injury. Now the pain is driven by dysfunction in the central nervous system (CNS).


Noxious stimulus
Nociceptors
Primary afferent neurones
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PAG
LC
RVM
Cognitive activities
Descending pathway
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Dorsal horn
Dorsal root ganglion
DRG
Spino-thalamic tract
Ventral horn
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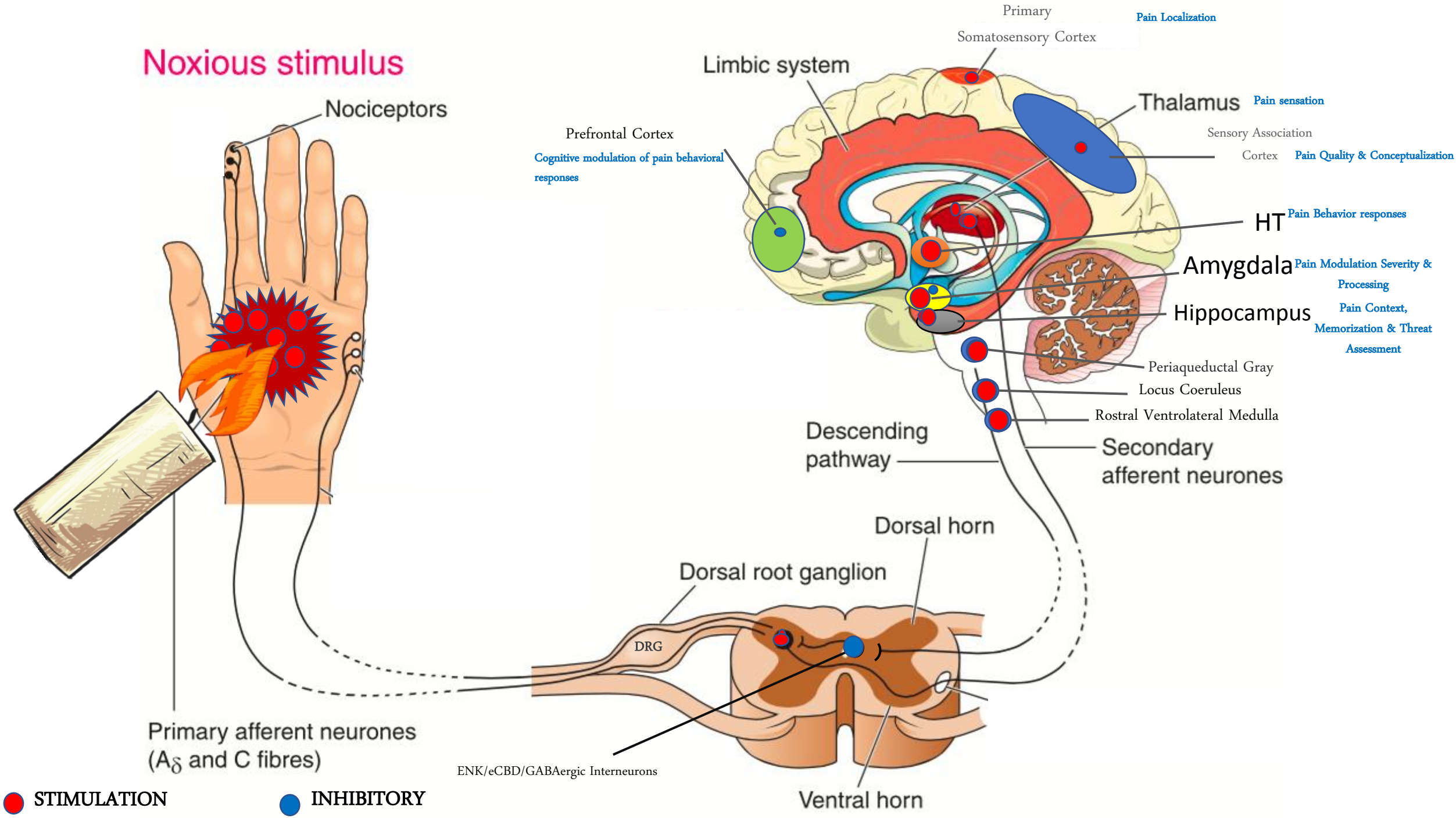
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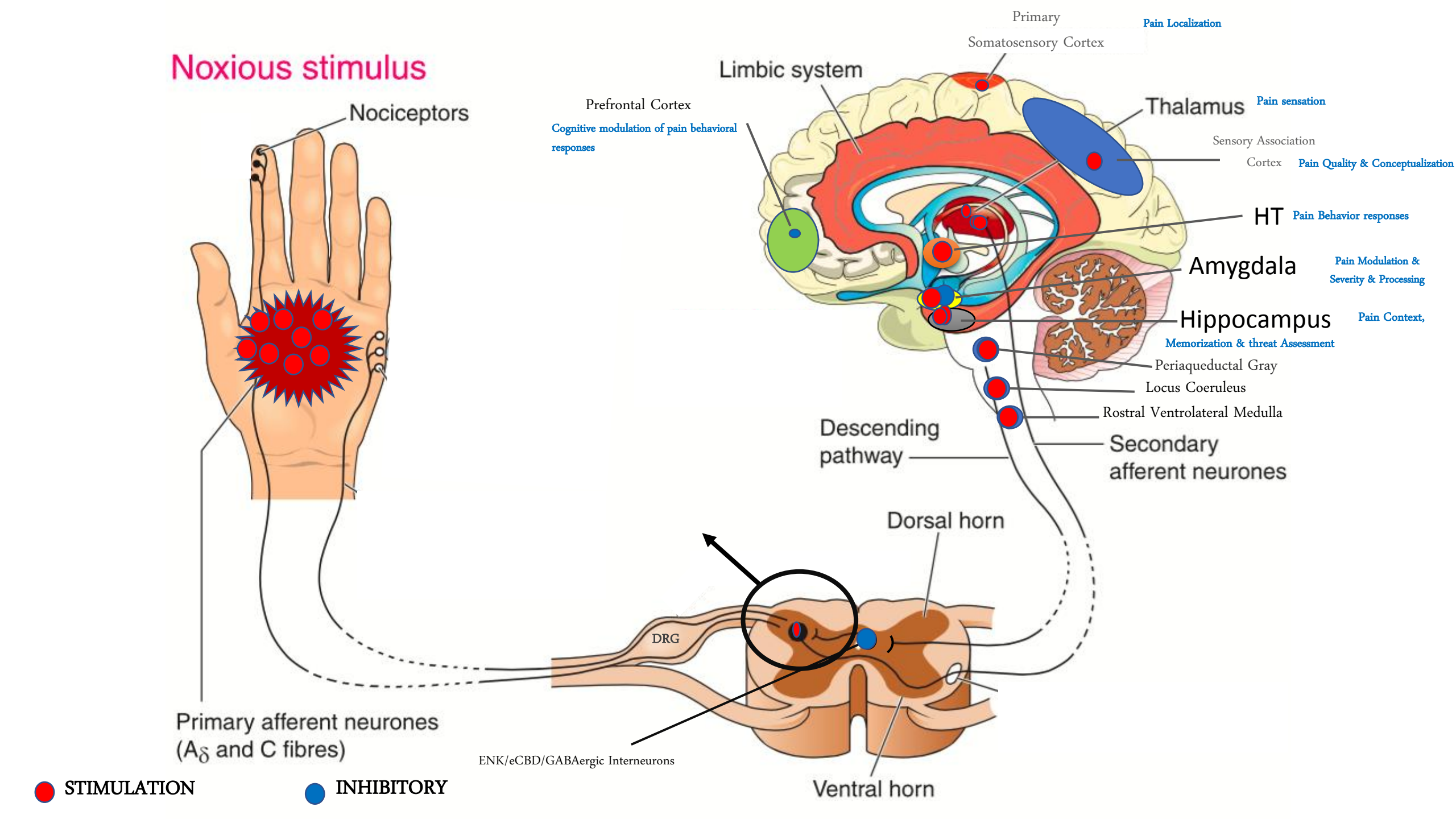
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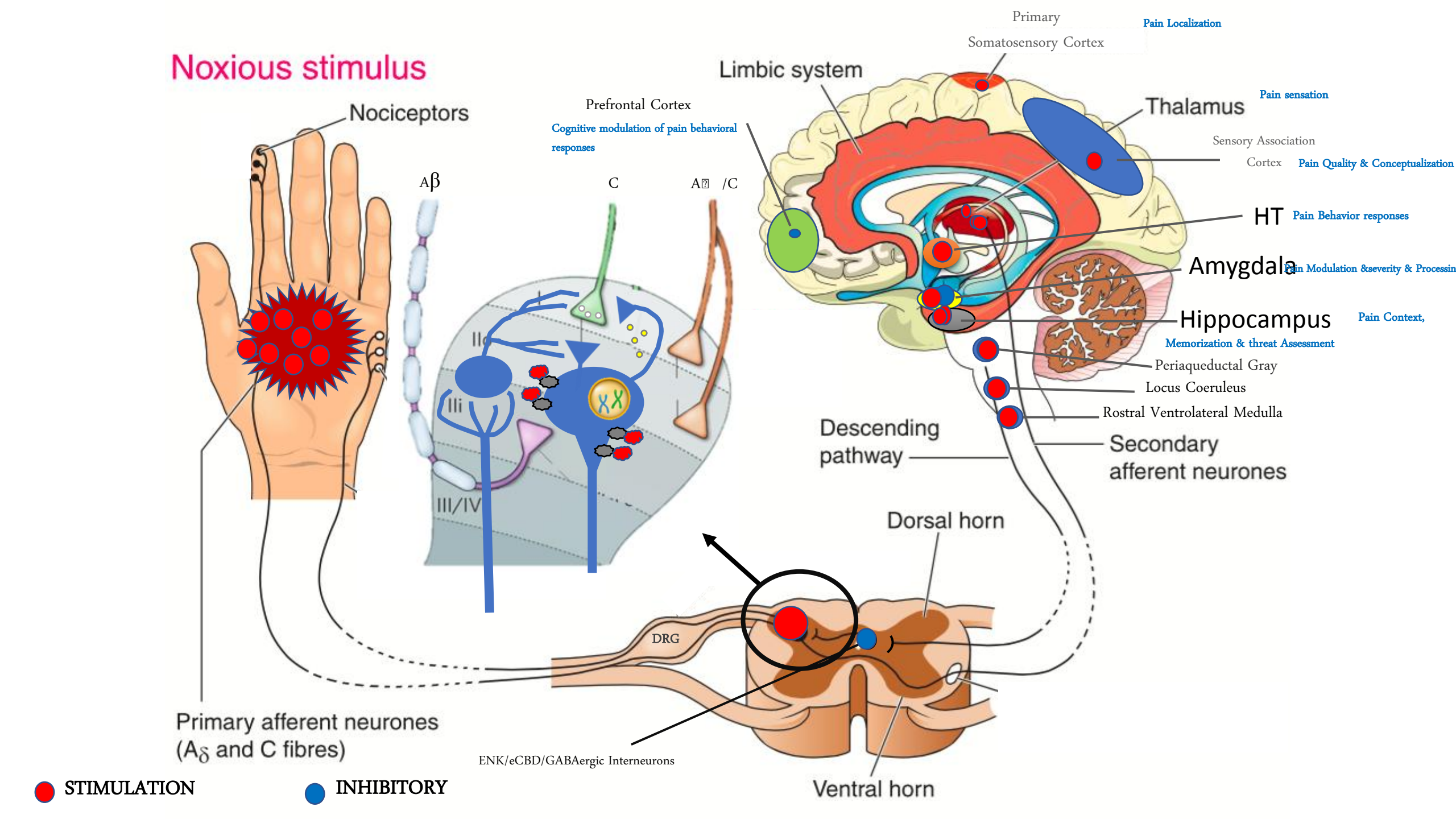
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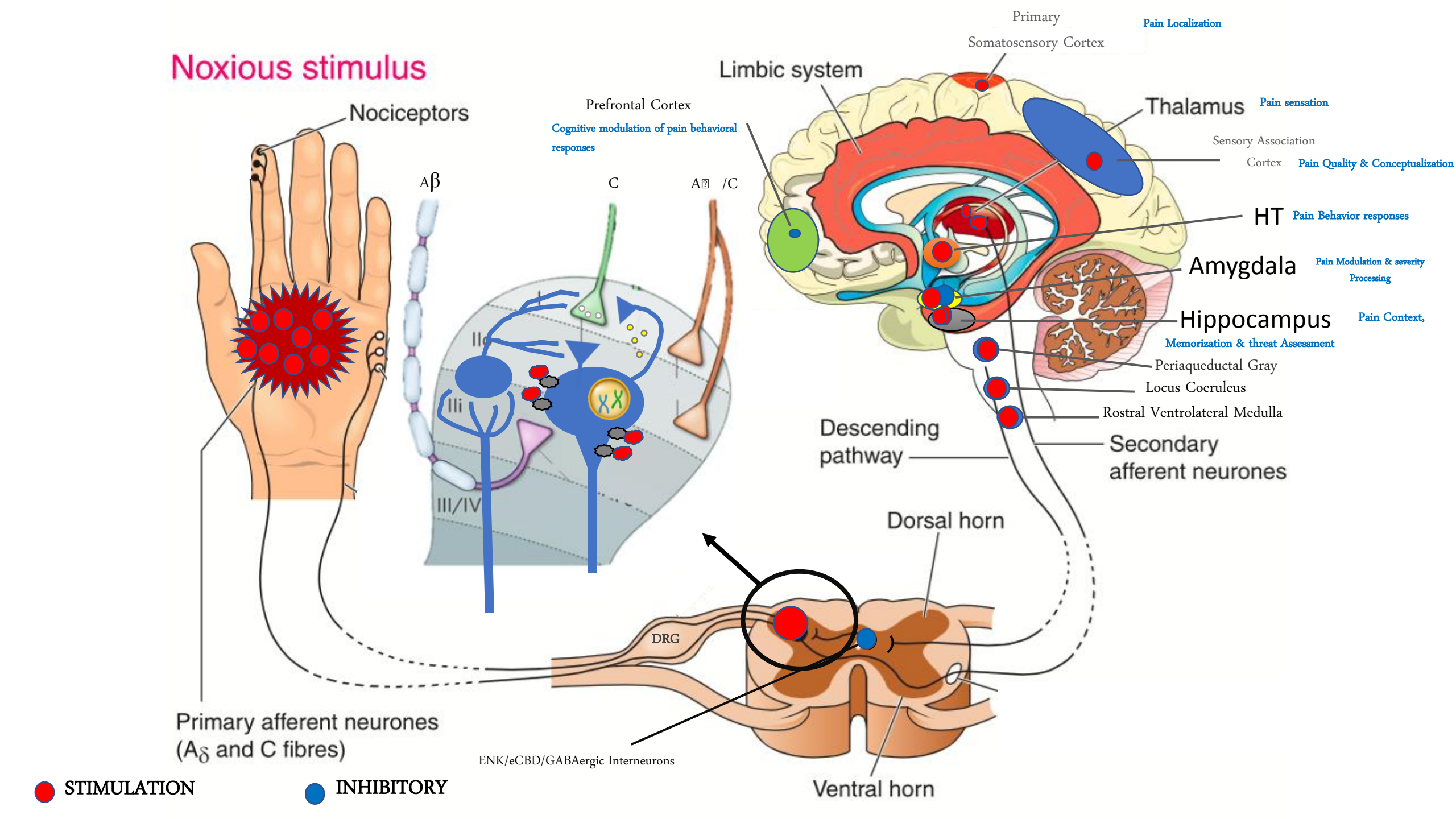
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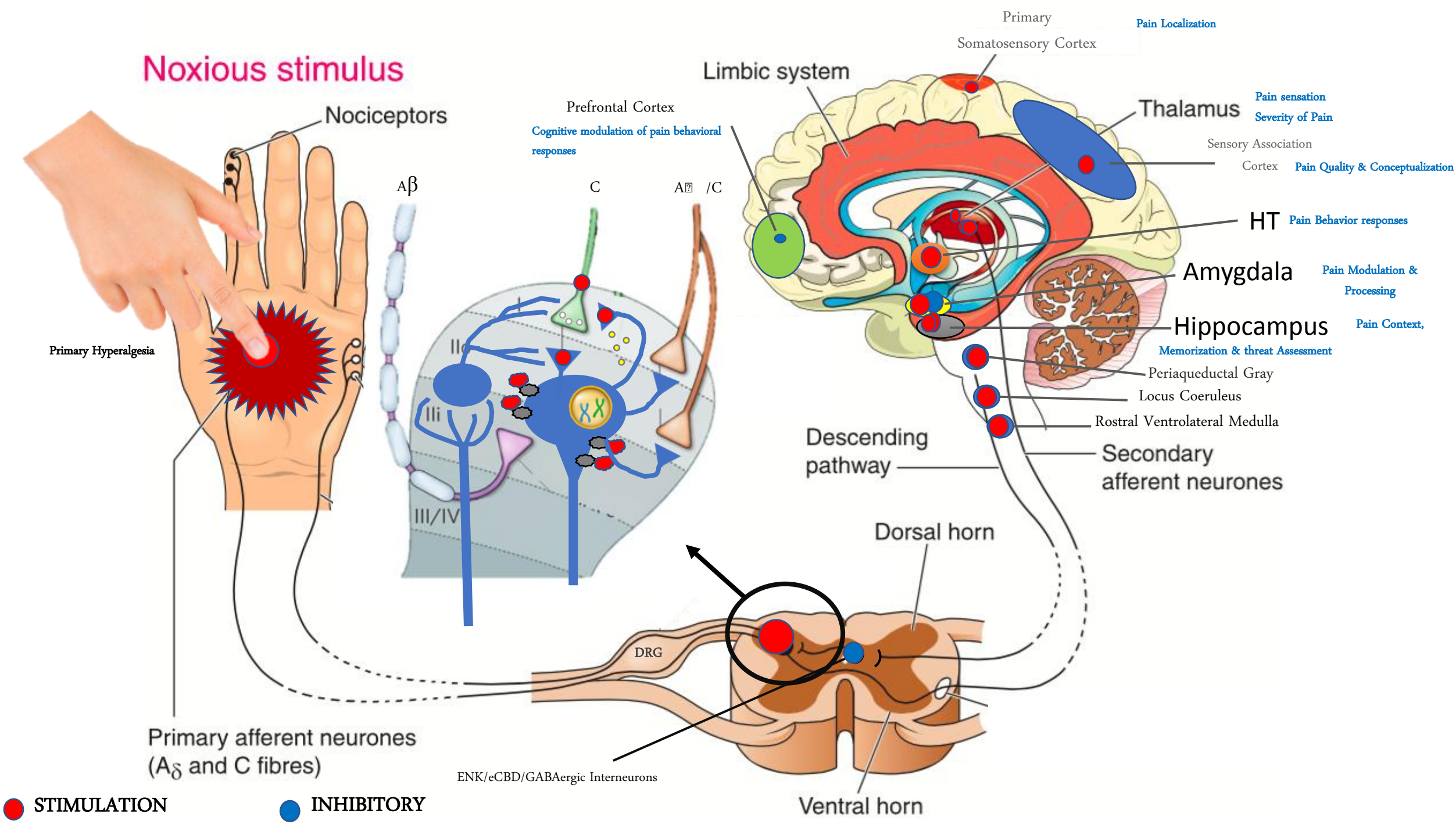
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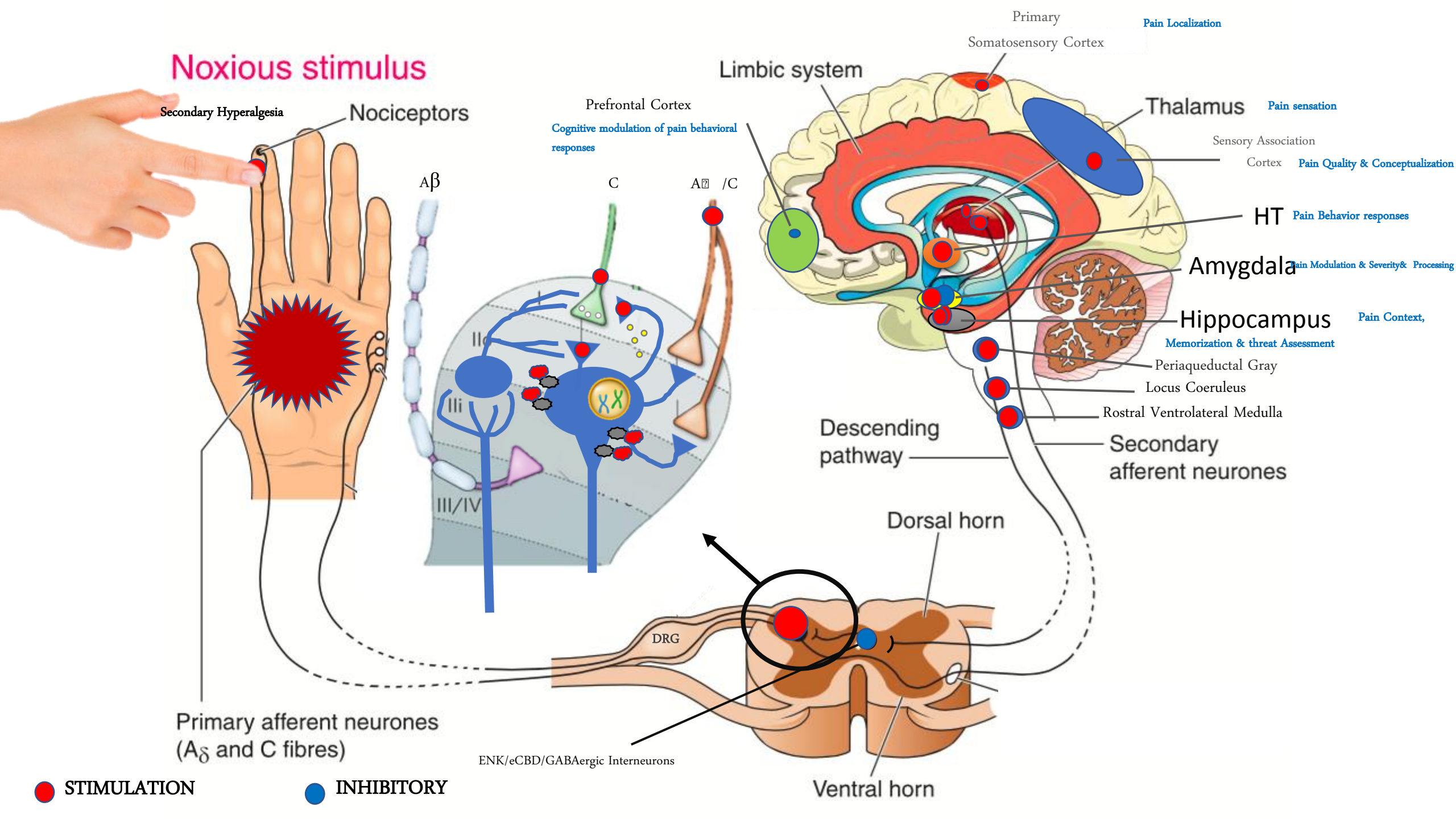
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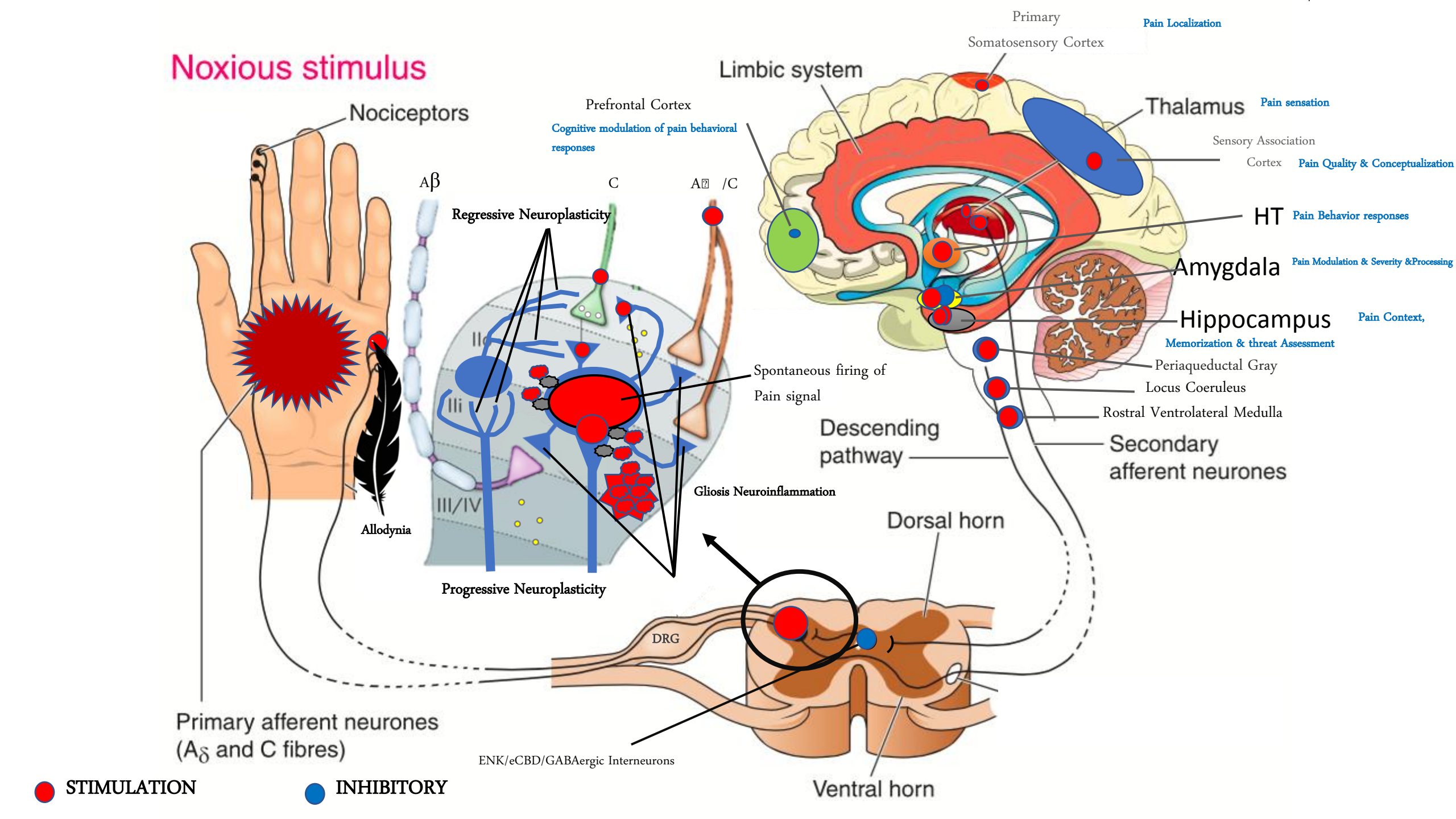
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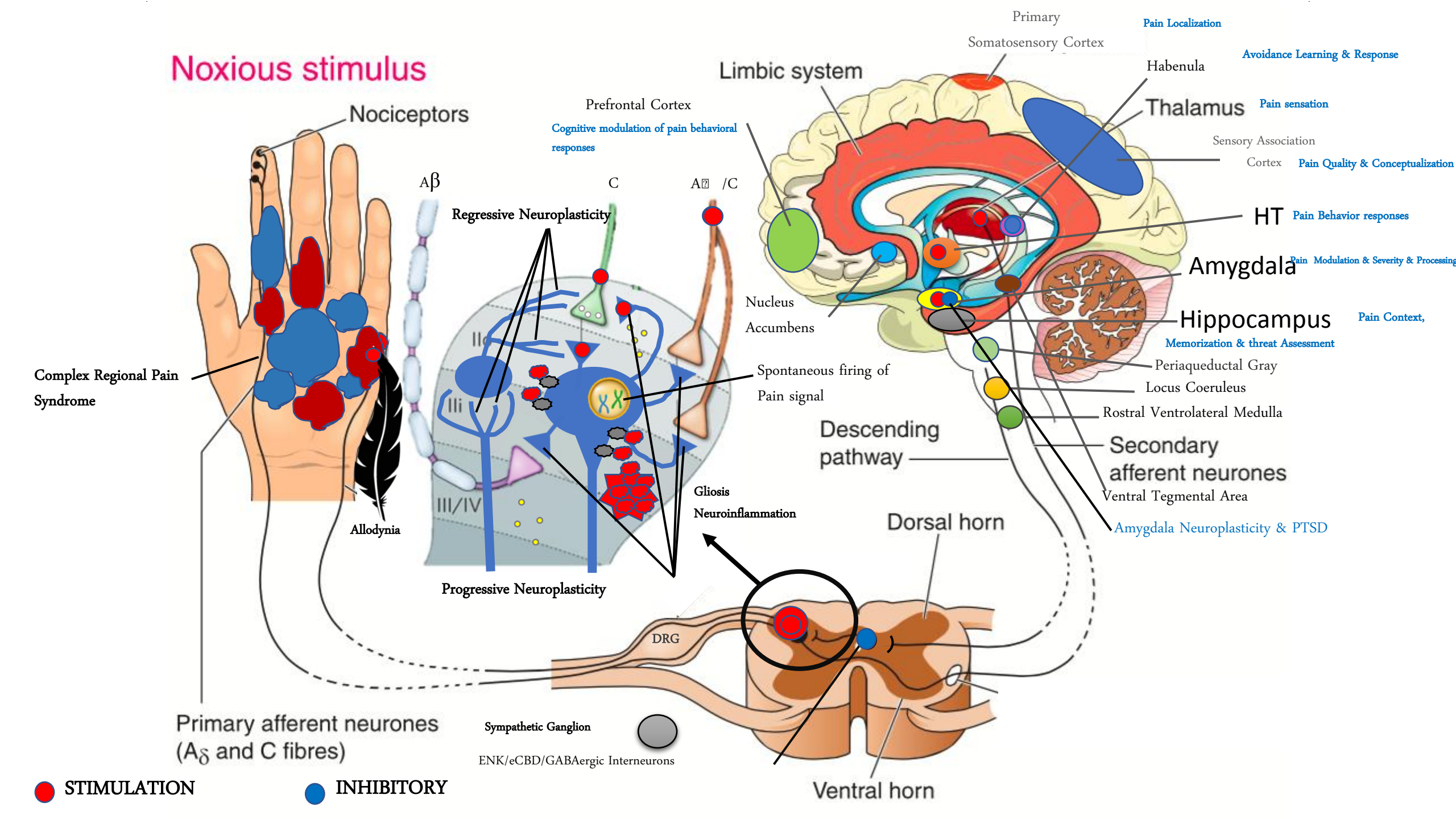
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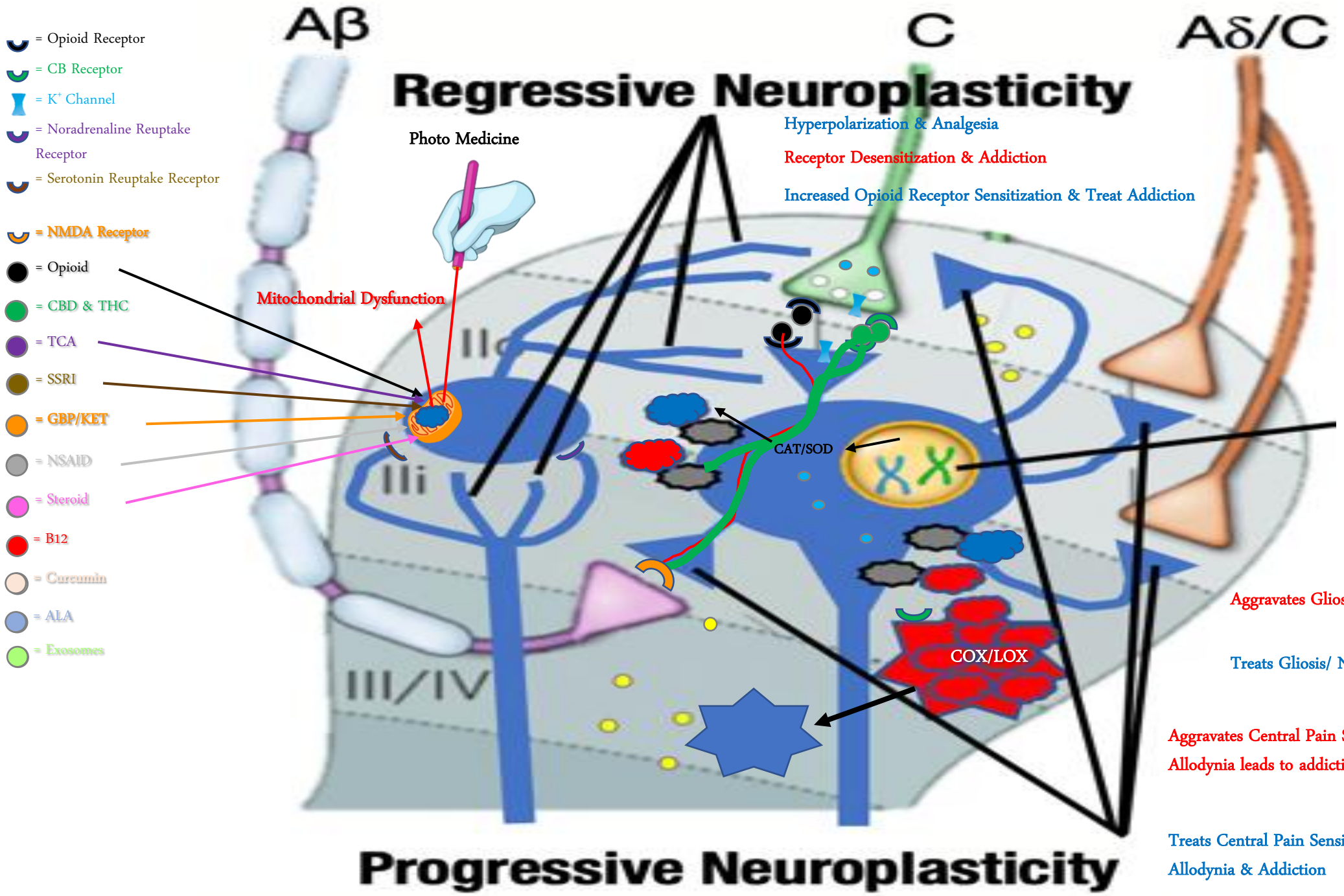
= Opioid Receptor
= CB Receptor
= K+ Channel
= Noradrenaline Reuptake Receptor
= Serotonin Reuptake Receptor
= NMDA Receptor
= Opioid
= CBD & THC
= TCA
= SSRI
= GBP/KET
= NSAID
= Steroid
= B12
= Curcumin
= ALA
= Exosomes
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Regressive Neuroplasticity
Photo Medicine
Hyperpolarization & Analgesia
Receptor Desensitization & Addiction
Increased Opioid Receptor Sensitization & Treat Addiction
Mitochondrial Dysfunction
CAT/SOD
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Aggravates Gliosis/ Neuroinflammation
Treats Gliosis/ Neuroinflammation
Aggravates Central Pain Sensitization, Hyperalgesia & Allodynia leads to addiction
Treats Central Pain Sensitization, Hyperalgesia, Allodynia & Addiction
Progressive Neuroplasticity

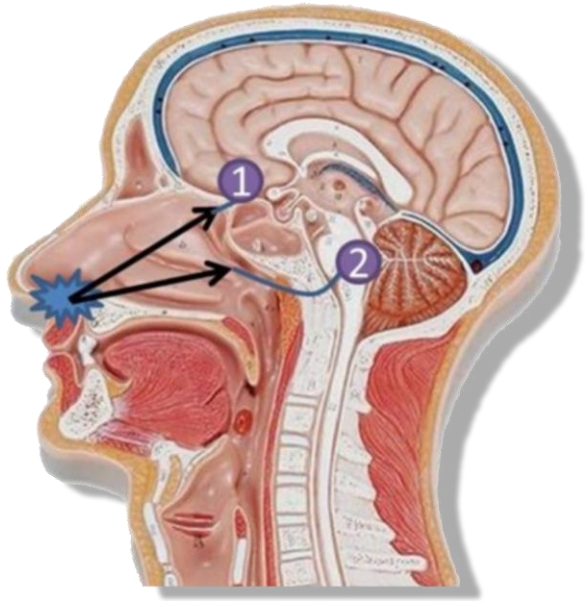
CBD's Effect in the Brain

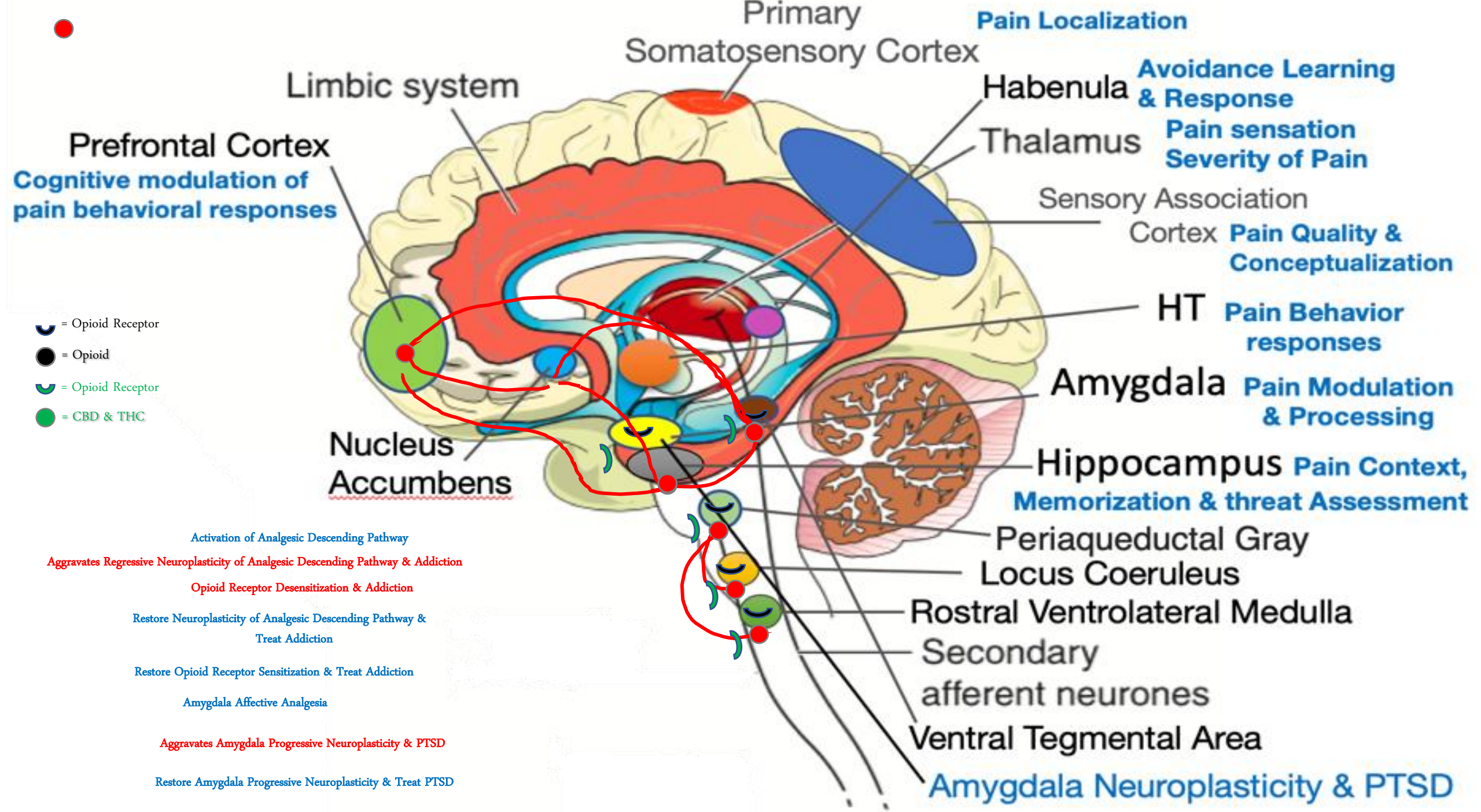
- Blocks the NMDA receptor
- Reduces free radical generators
- Prevents Ca+ influx
- Stops the activation of the NOX enzyme
- Restore Opioid Receptor Sensitization & treats addiction

What is the delivery of choice for CBD?

Neuroprotective drugs are proven to be exceptionally difficult to activate due to the blood-brain barrier.

- **Intranasal**
  - Transport CBD directly to the brain
  - Olfactory thru the cribriform plate and Trigeminal nerves.
- **Water-soluble CBD**
  - Enhances the bioavailability creating an absorption process superior to any other form of delivery.
- **Methylcobalamin B12**
  - creates an even greater absorption to the brain.
  - blocks the NDA receptors

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Aggravates Regressive Neuroplasticity of Analgesic Descending Pathway & Addiction
Opioid Receptor Desensitization & Addiction
Restore Neuroplasticity of Analgesic Descending Pathway & Treat Addiction
Restore Opioid Receptor Sensitization & Treat Addiction
Amygdala Affective Analgesia
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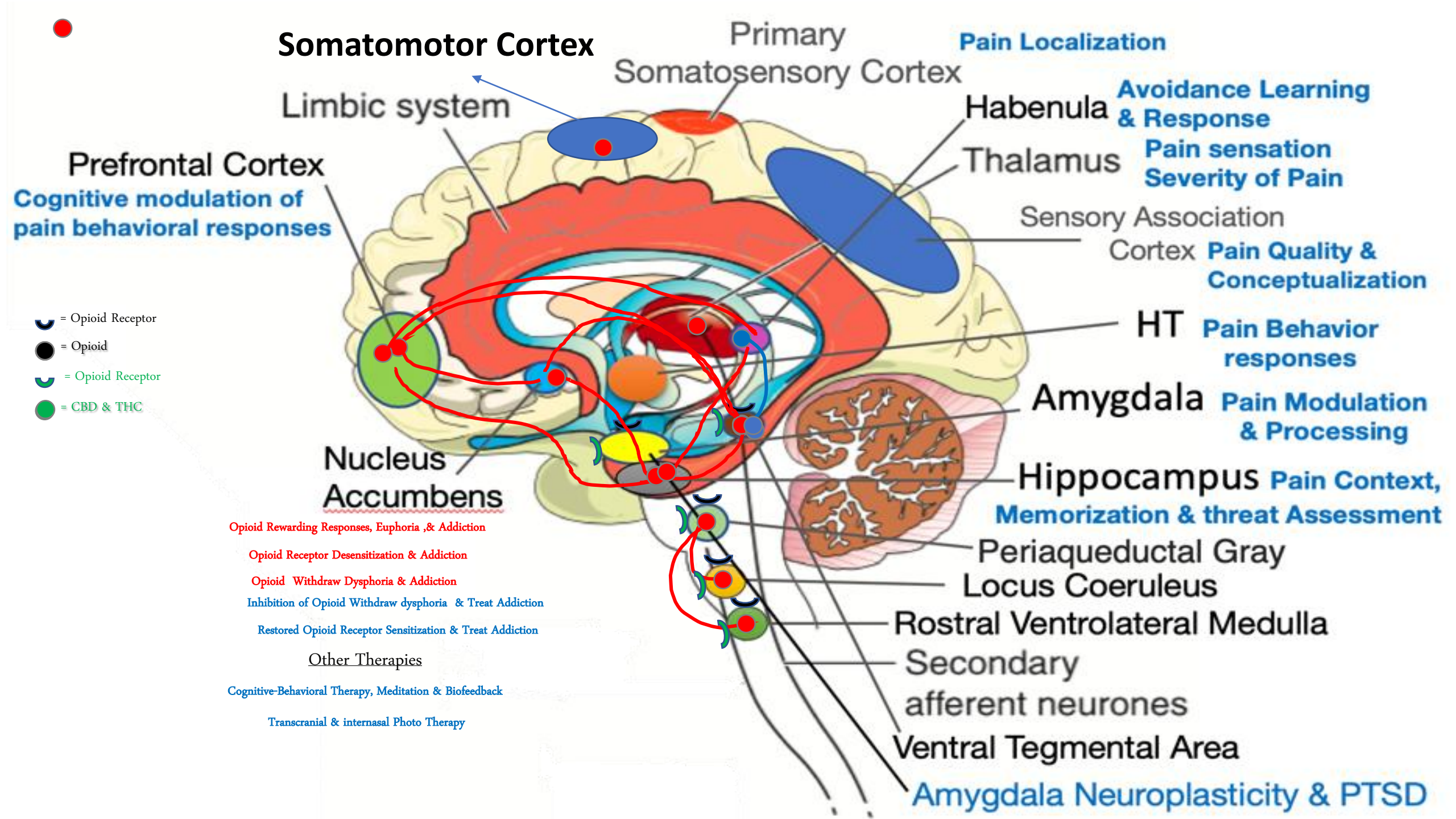
Restore Amygdala Progressive Neuroplasticity & Treat PTSD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Opioid Rewarding Responses, Euphoria ,& Addiction
Opioid Receptor Desensitization & Addiction
Opioid Withdraw Dysphoria & Addiction
Inhibition of Opioid Withdraw dysphoria & Treat Addiction
Restored Opioid Receptor Sensitization & Treat Addiction
Other Therapies
Cognitive-Behavioral Therapy, Meditation & Biofeedback
Transcranial & internasal Photo Therapy

Patient With Complex Regional Pain Syndrome

A 42 -year-old man presented to my office with a history of left arm pain and swelling for a duration of 5 years. The patient twisted his left arm at work while drilling a hole in the ground. He was diagnosed with ulnar nerve entrapment and underwent a complicated ulnar nerve dislocation surgery which progressed into left upper limb CRPS and he received series of unsuccessful left cervical ganglion steroid injection blocks.

The Patient suffered five years of constant and sever left upper limb swelling, deep aching pain, allodynia, hyperalgesia and discoloration and he was on the highest dose of narcotics without relief. He lost his job, disabled and sustained a harsh economic and social life.

After 6 months of series blue, infrared and red photobiomodulation therapies on his left arm and left cervical sympathetic ganglions along with application of topical Nitrocompounding medications, the patient recovered from his pain, weaned from narcotics , returned back to his work and he was able preform his normal daily activities.