

# Mentoring Embodiment and Integration: Polyvagal Theory, Flow States and CoreTransformation

by Joseph Loizzo, M.D., Ph.D.

Weill Cornell Division of Epidemiology  
Nalanda Institute for Contemplative Science



## In This Class, We'll Review...

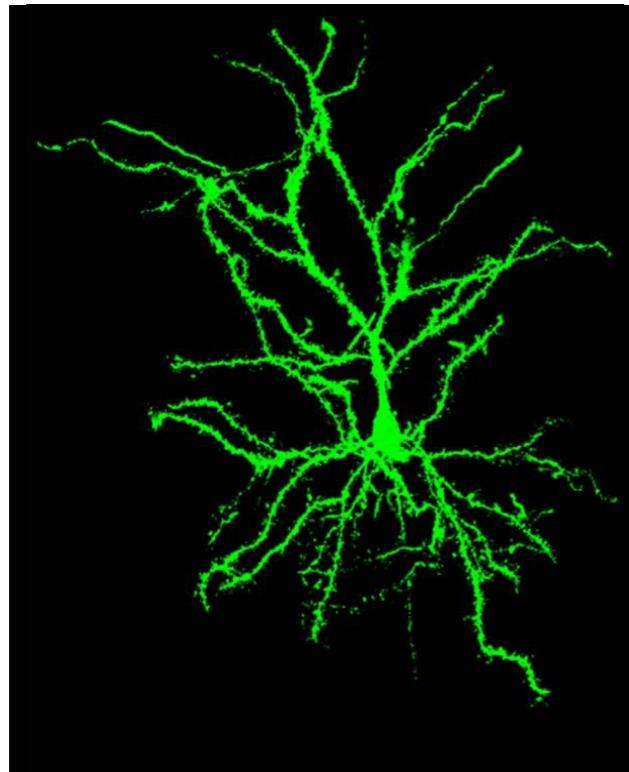
- The Science of Neuroplasticity and Reconsolidation
- The Latest on Stress, Trauma, Meditation and Yoga
- Polyvagal Theory and Embodied Approaches
- How Embodied Practices Transform Core States



In the late 1980's and early 1990's, research from several labs began to show that neurons were not hard wired but plastic—they were constantly shaped and reshaped by the neural activity that supported any lived experience or learning, much as muscles grow and are sculpted based on how we use them.

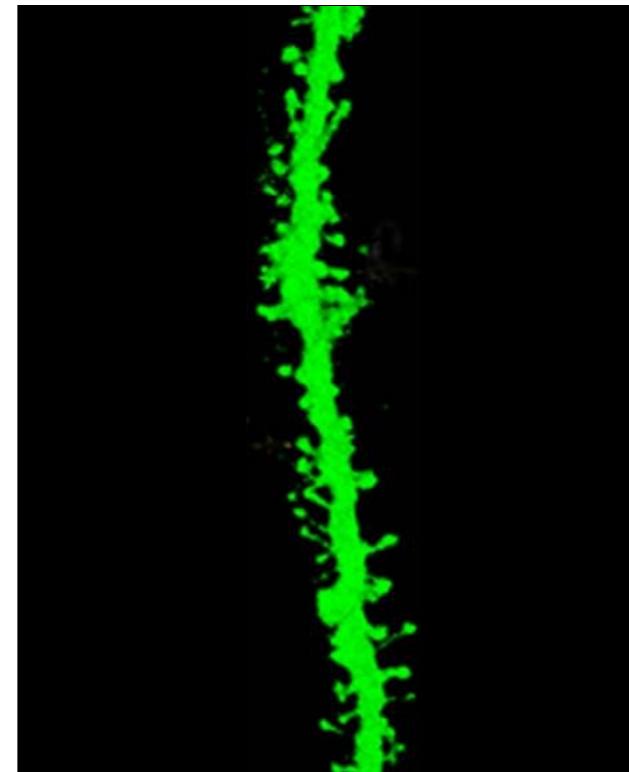


# Remodeling of Neural Architecture and the Science of Memory Reconsolidation



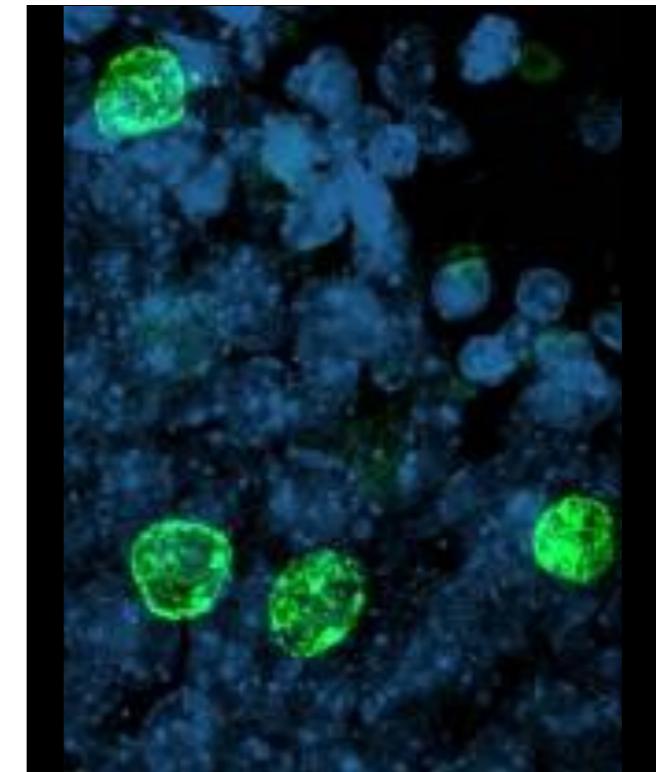
Dendrites

Shrink and expand



Synapses

Dissolved and replaced



Neurogenesis

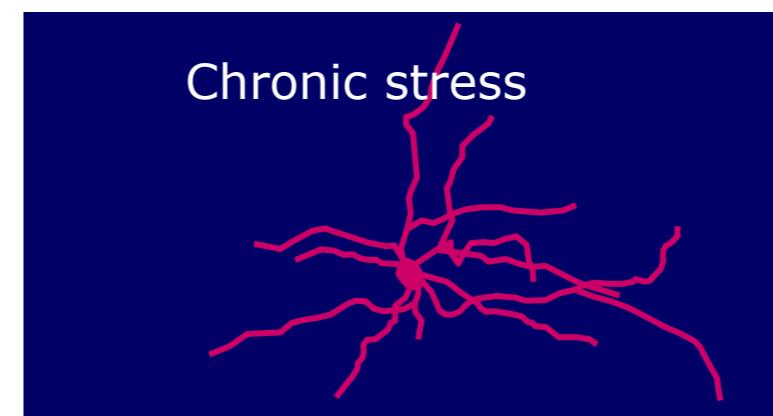
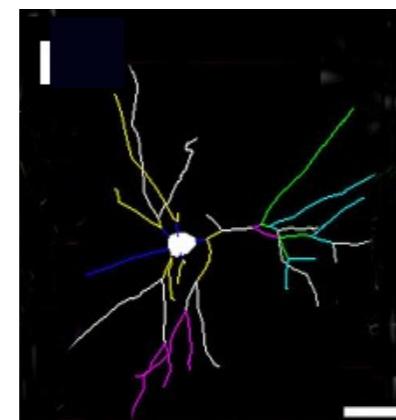
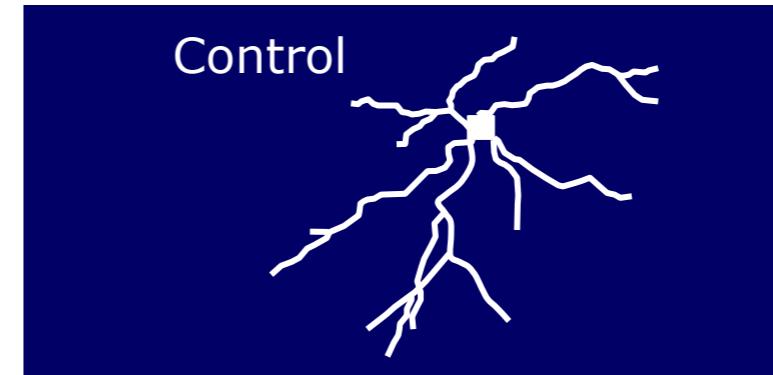
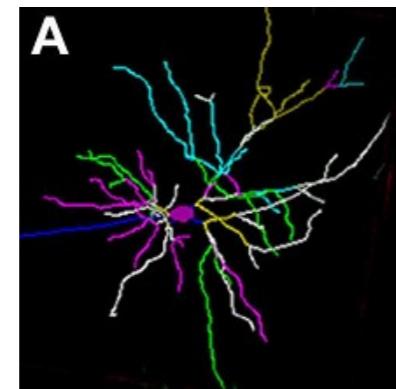
Continues in some areas



However promising this new science may be, the truth is that neuroplasticity is a mixed bag—it can but does not necessarily change our brains for the better. In fact, chronic stress can wear down healthy brain structures and networks at the same time as it grows stress-reactive structures and networks, adapting us to an insidious cycle of hypervigilance, stress-reactivity and stress-related pathology.



# Chronic Stress Shrinks Well-Being Circuits, Grows Reactive Trauma Circuits



Medial prefrontal  
cortex and  
hippocampus

Amygdala,  
orbitofrontal  
cortex

Courtesy Bruce McEwen

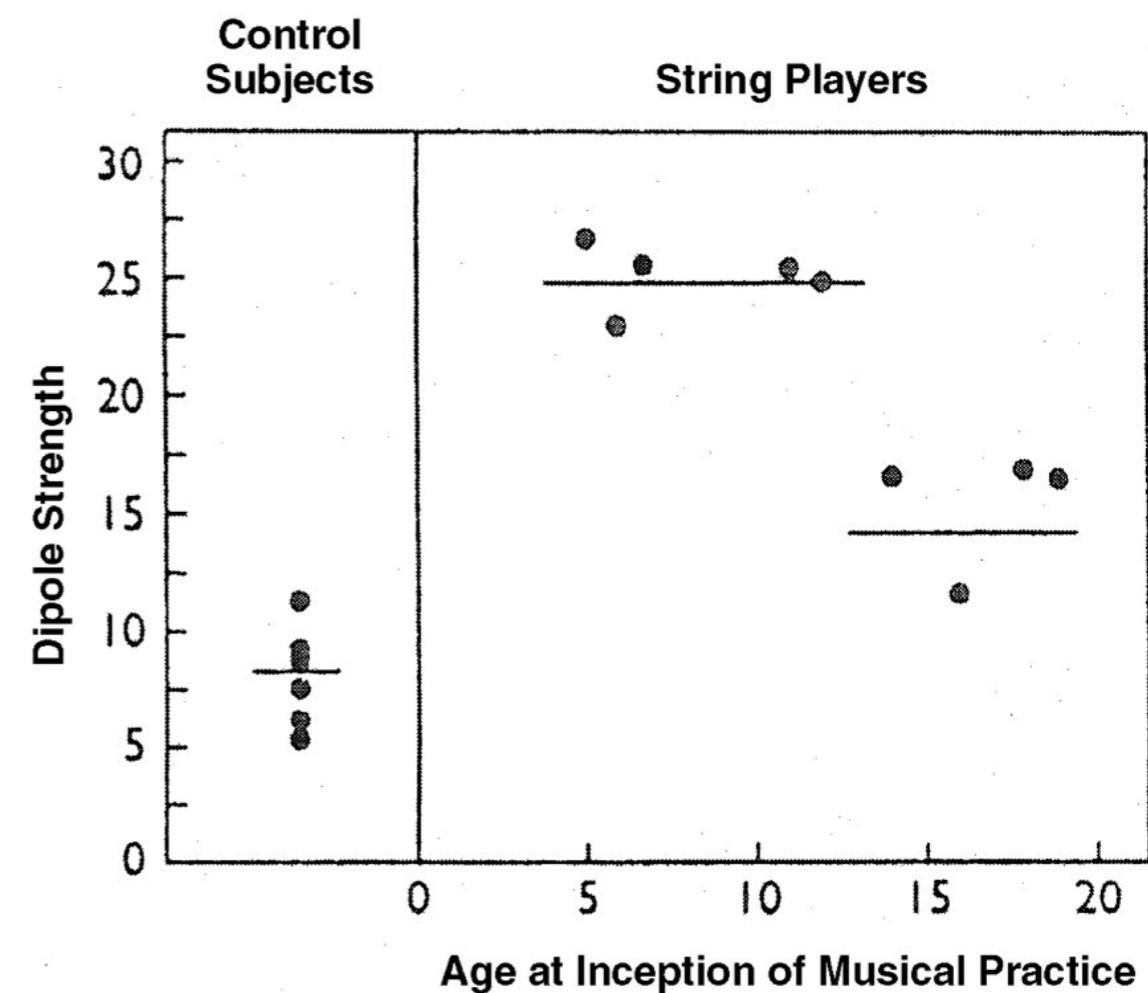
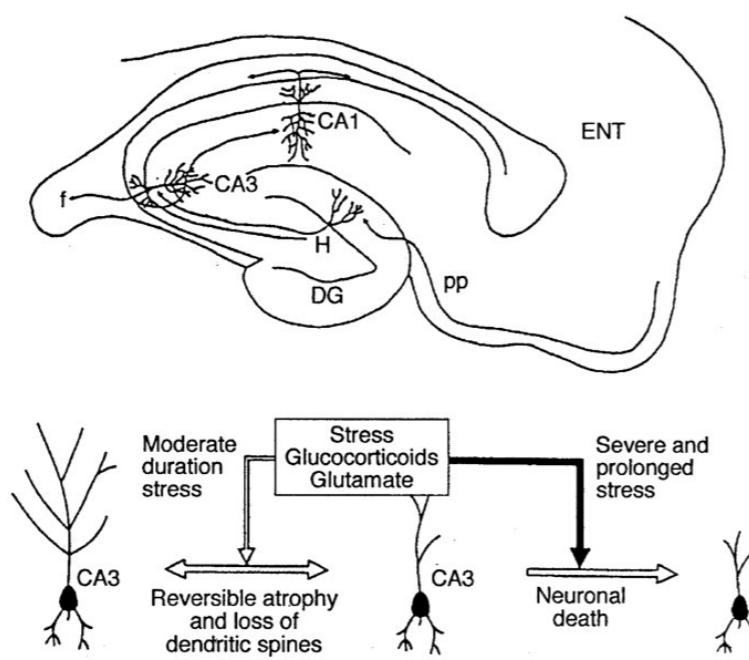
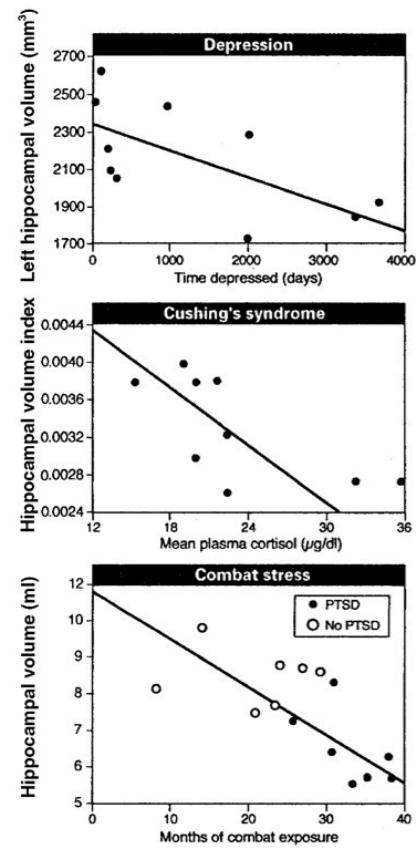


# Eric Kandel's New Paradigm for Mental Health: Stress, Plasticity, and Learning

- All mental processes, healthy or not, depend on brain
- Genes/proteins shape neural connections & functions
- Social factors alter gene expression and brain function
- Learning alters gene expression and neural connections
- Many illnesses reflect stress-induced neural atrophy
- Psychotherapy works by restructuring neural networks



# Kandel's New Paradigm: Stress-Related Wear and Tear versus Use-Dependent Plasticity



Kandel, 2000



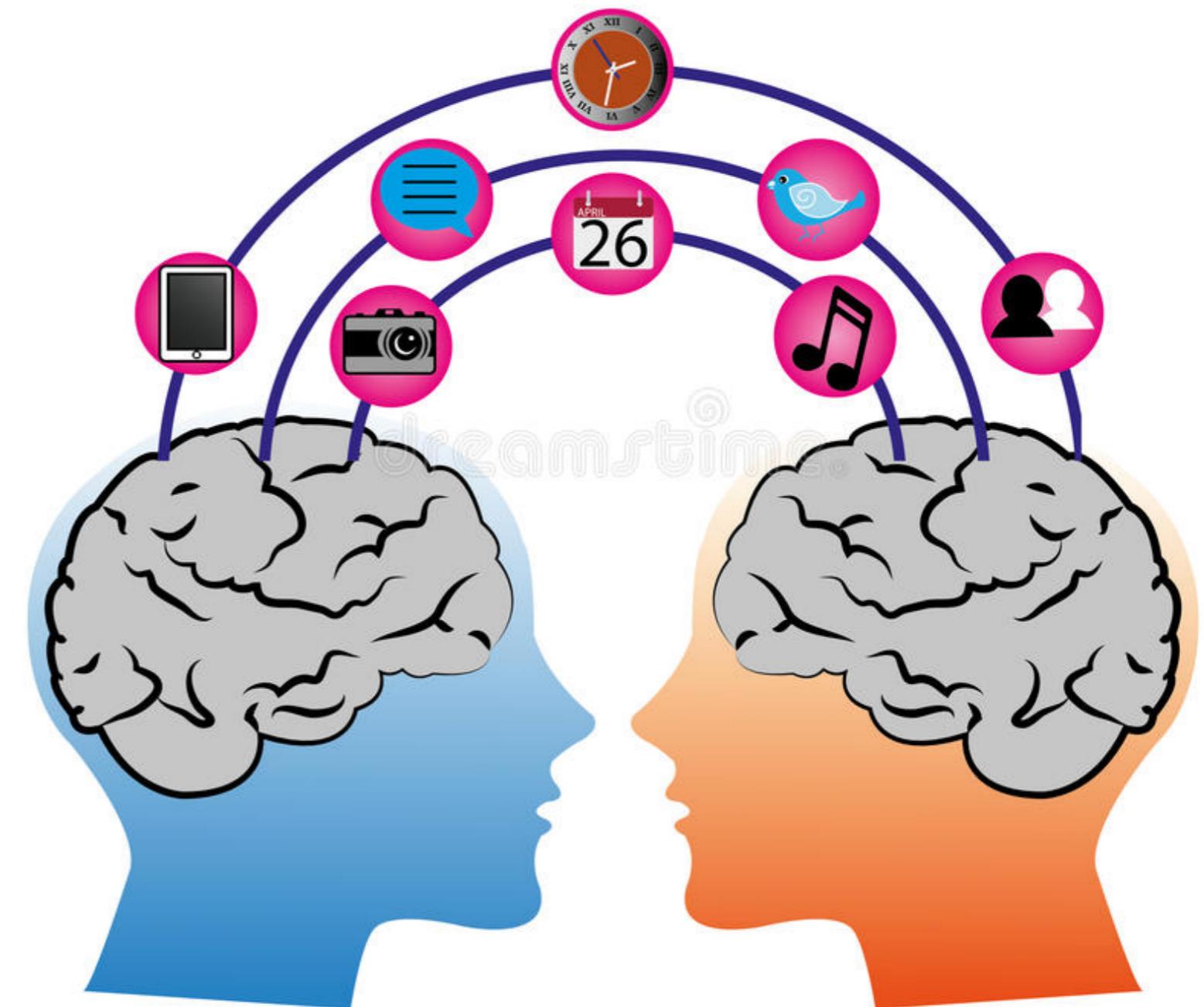
Fortunately, alongside negative neuroplasticity, recent research is also providing us with ample evidence that our nature also primes us for positive plasticity—the growth of integrative structures that promote well-being and social engagement—at least in the context of safe connection and secure empathic bonds...



Developmental research and positive psychology have made clear that the healthy development of human minds and brains critically depends on secure empathic bonds in early and later life...



We now know  
that our brains  
are mainly  
primed for  
social living, to  
support basic  
trust, mature  
empathy, and  
cultural  
cooperation





These converging trends make a compelling case that psychotherapy works by eliciting positive neuroplasticity through establishing a social bond of safe empathic connection like the early caregiving bond, fostering positive mind states, social emotions and healing neural processing like memory reconsolidation.



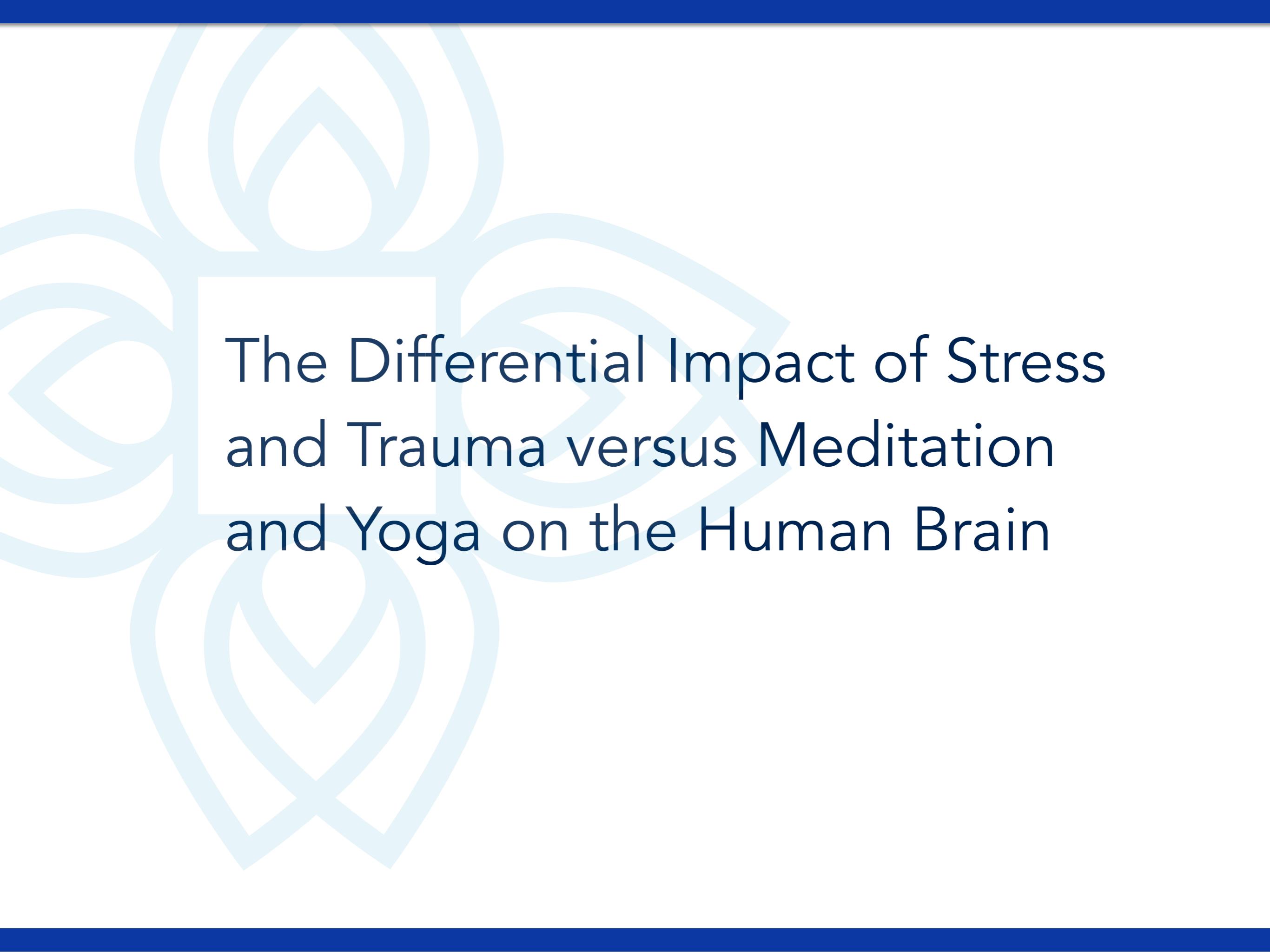
# Bruce Ecker: Memory Reconsolidation Research and Application to Transformational Therapies

- The brain's built-in process for updating what was learned
- When implicit memory is made explicit and reactivated
- Then juxtaposed w/ contradictory memory or experience
- The dissonance/prediction error briefly destabilizes memory
- Timely repeated juxtaposition “erases” target memory
- Clear neural model for transformational learning and change

Bruce Ecker, 2018. *Internat J Neuropsychotherapy* 6(1), 1-92,



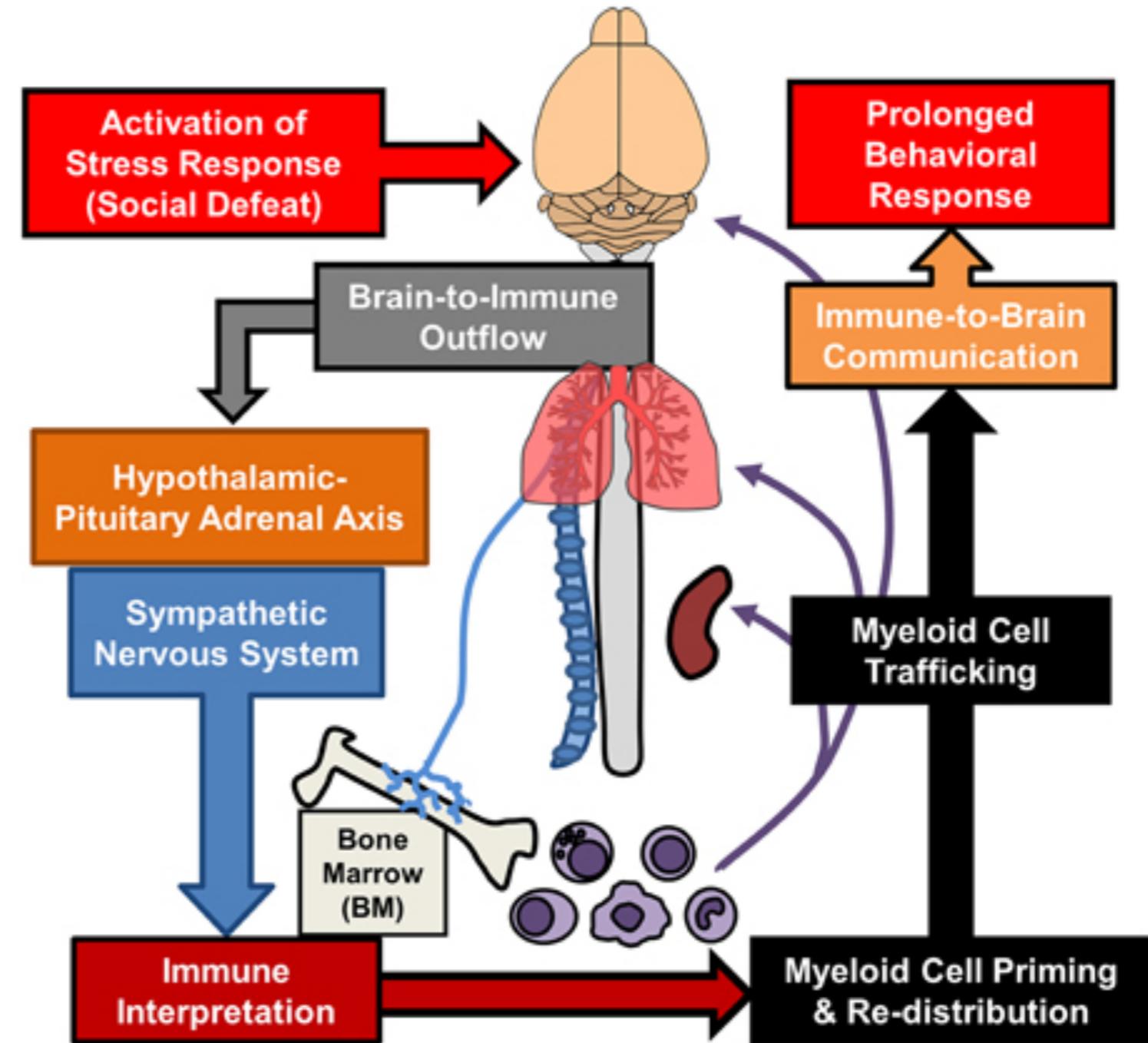
This research shows the vital importance of studying the differential impacts of stress and trauma versus positive mind states, social emotions and interactions on brain processing and development at all levels.



# The Differential Impact of Stress and Trauma versus Meditation and Yoga on the Human Brain

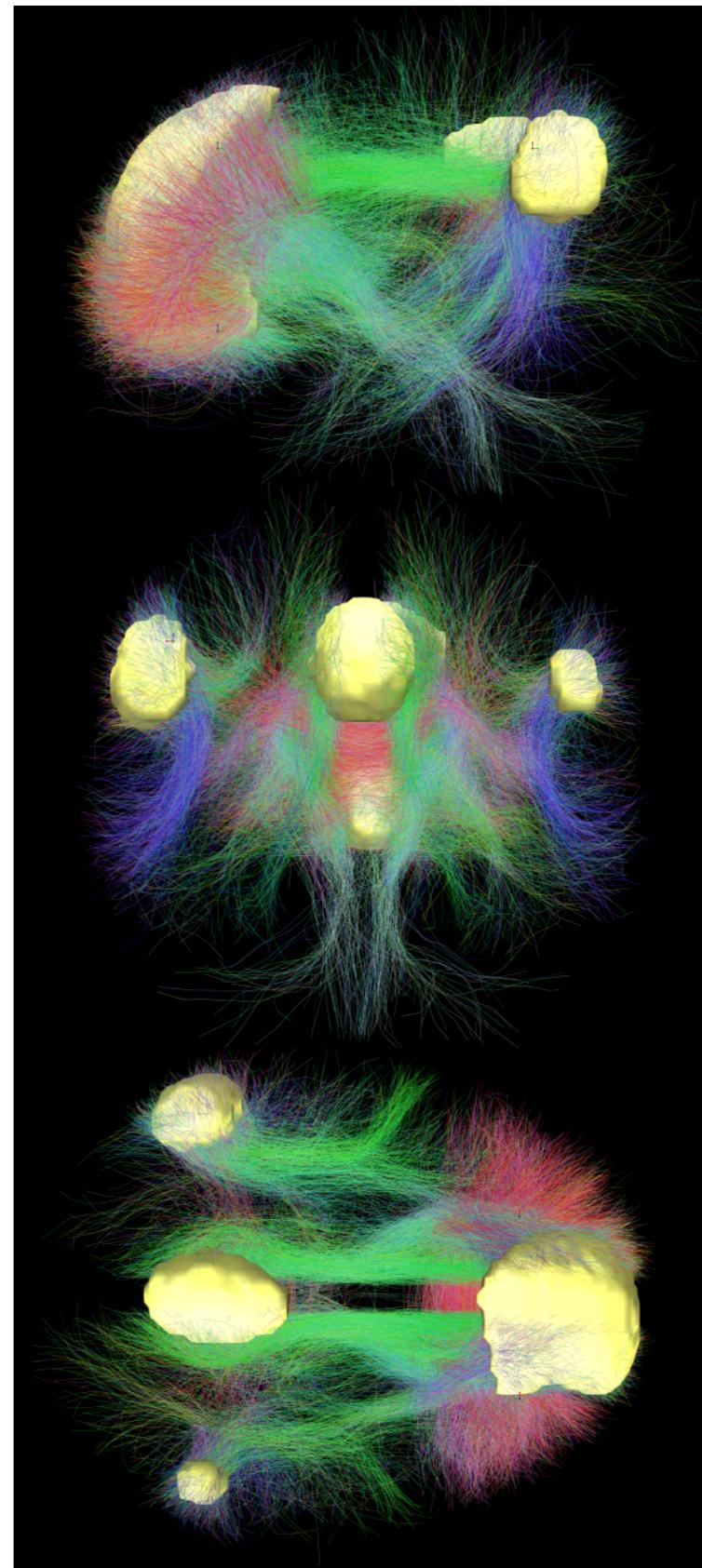


Decades of research have mapped every step of the many pathways by which stress inflicts wear and tear on our bodies and minds





But the new research also explains why stress and trauma shift our complex brains into the self-enclosed processing that anchors traumatic self-states—blocking our social capacities for mindful presence, empathic engagement, and fearless embodiment





# The Human Brain in Evolution

Neurobiology maps the human brain as an aggregate of three neural systems—neocortex, limbic system, brainstem—of primate, mammalian and reptilian origin

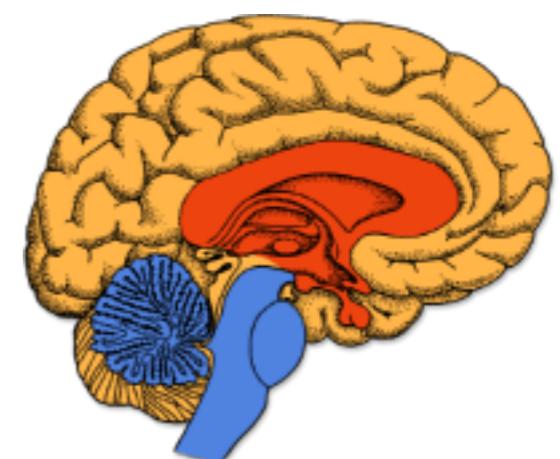




# The Human Brain's Adaptive Modes

Each system runs the brainstem's basic life support network in response to distinct adaptive challenges:

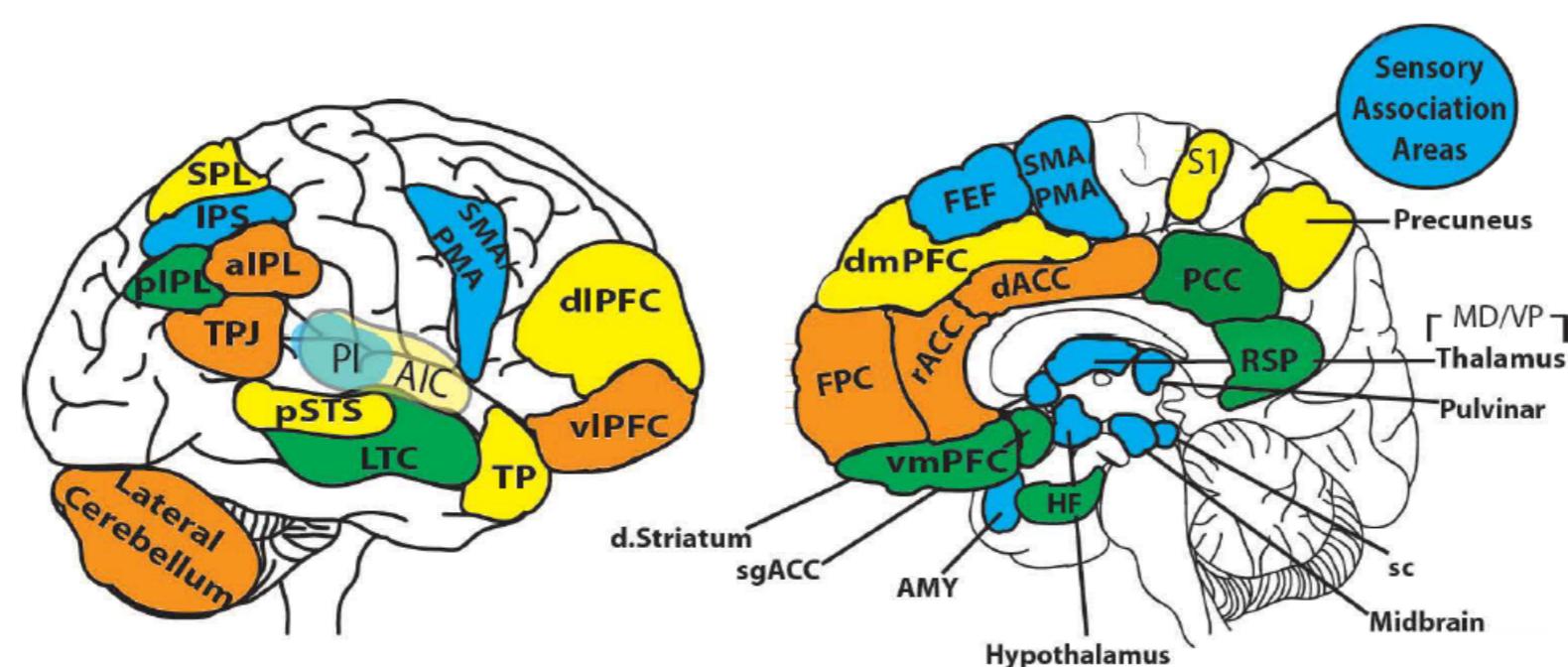
<b>neocortex</b>	<b>role engagement</b>
<b>limbic system</b>	<b>social interaction</b>
<b>brainstem</b>	<b>embodied balance</b>





# The Science of Neural Networks

Neural functions are not run globally by brain systems or locally by one region but by specialized networks that link key regions within and between systems



MOMENT

0



250



500



750ms



Perception

Sensory Awareness

Evaluation

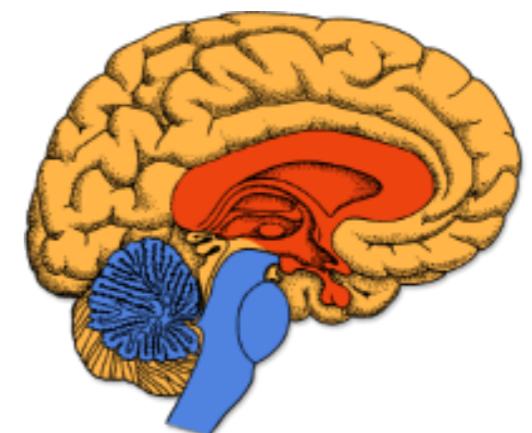
Integration



# The Perceived Safety Hierarchy

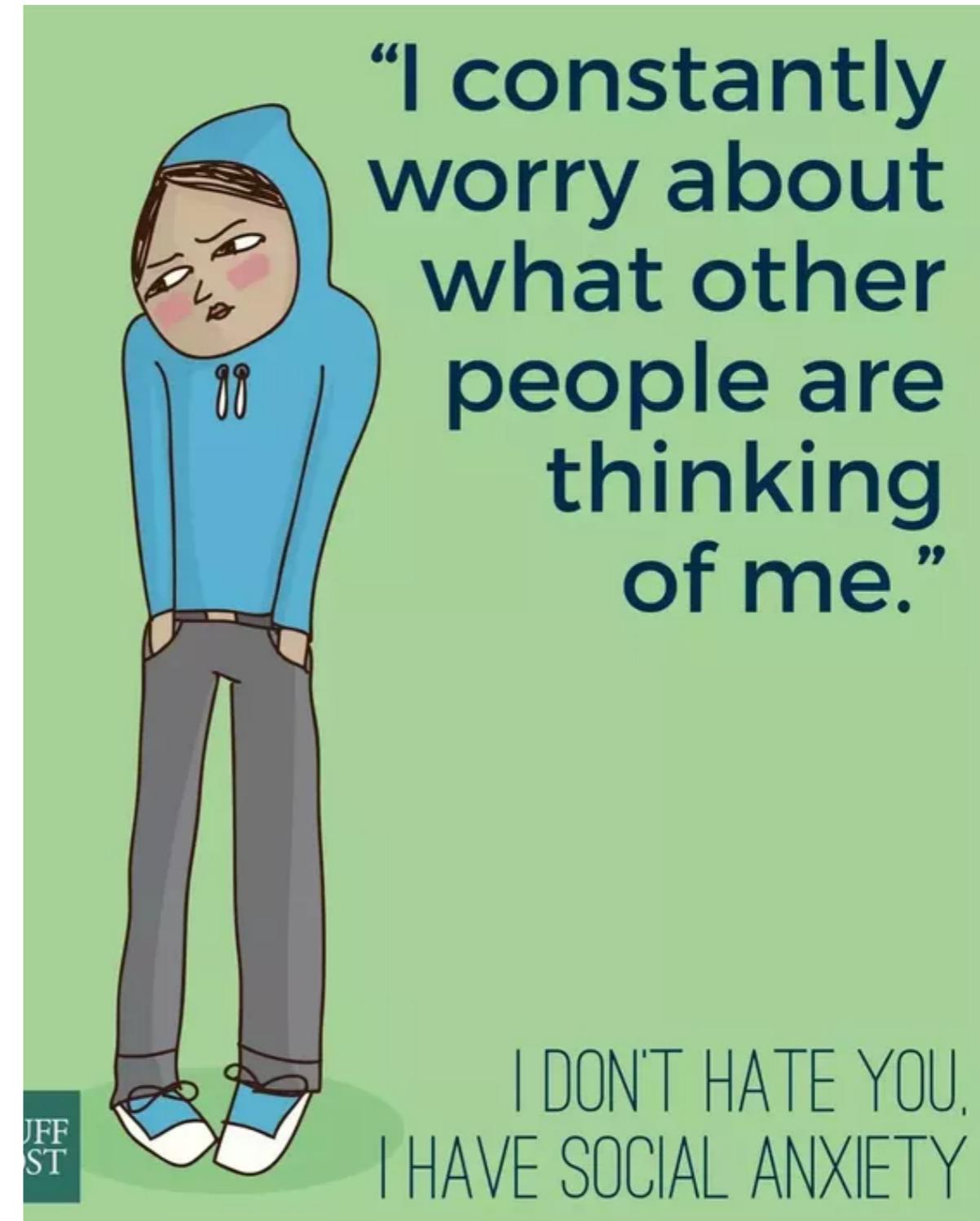
Newer, higher systems and networks support full engagement under safety, but under threat, processing shifts to older, self-protective systems and networks

- In role stress, the **neocortex** shifts from role engagement to self-enclosed **default mode**
- In social stress, the **limbic system** shifts from social engagement to **aversive trauma mode**
- In physical stress, the **brainstem** shifts from embodied balance to **reflex survival mode**





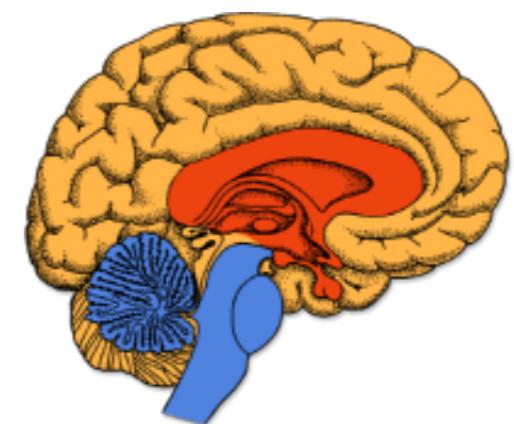
Within our brains, each main system holds opposing networks that shift processing from social engagement to self-enclosure, based on whether we feel safely connected or precariously alone





# The Neurobiology of Traumatic Self-States: Social Engagement Networks versus Self- Enclosing Networks in the Brain

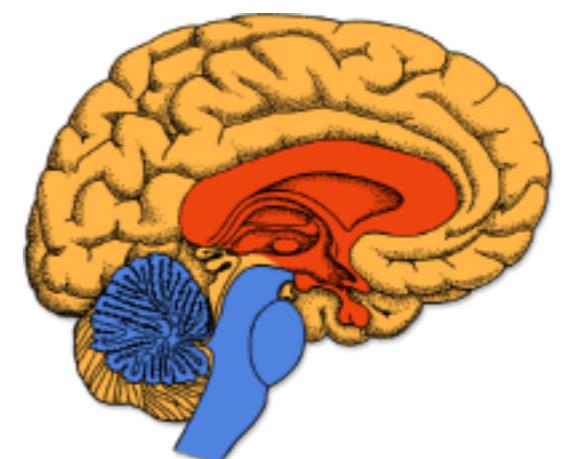
structure	engaged mode	enclosed mode
<b>neocortex</b>	<b>presence network</b>	<b>default network</b>
<b>limbic brain</b>	<b>empathy system</b>	<b>aversion system</b>
<b>brainstem</b>	<b>social resilience</b>	<b>survival reflexes</b>





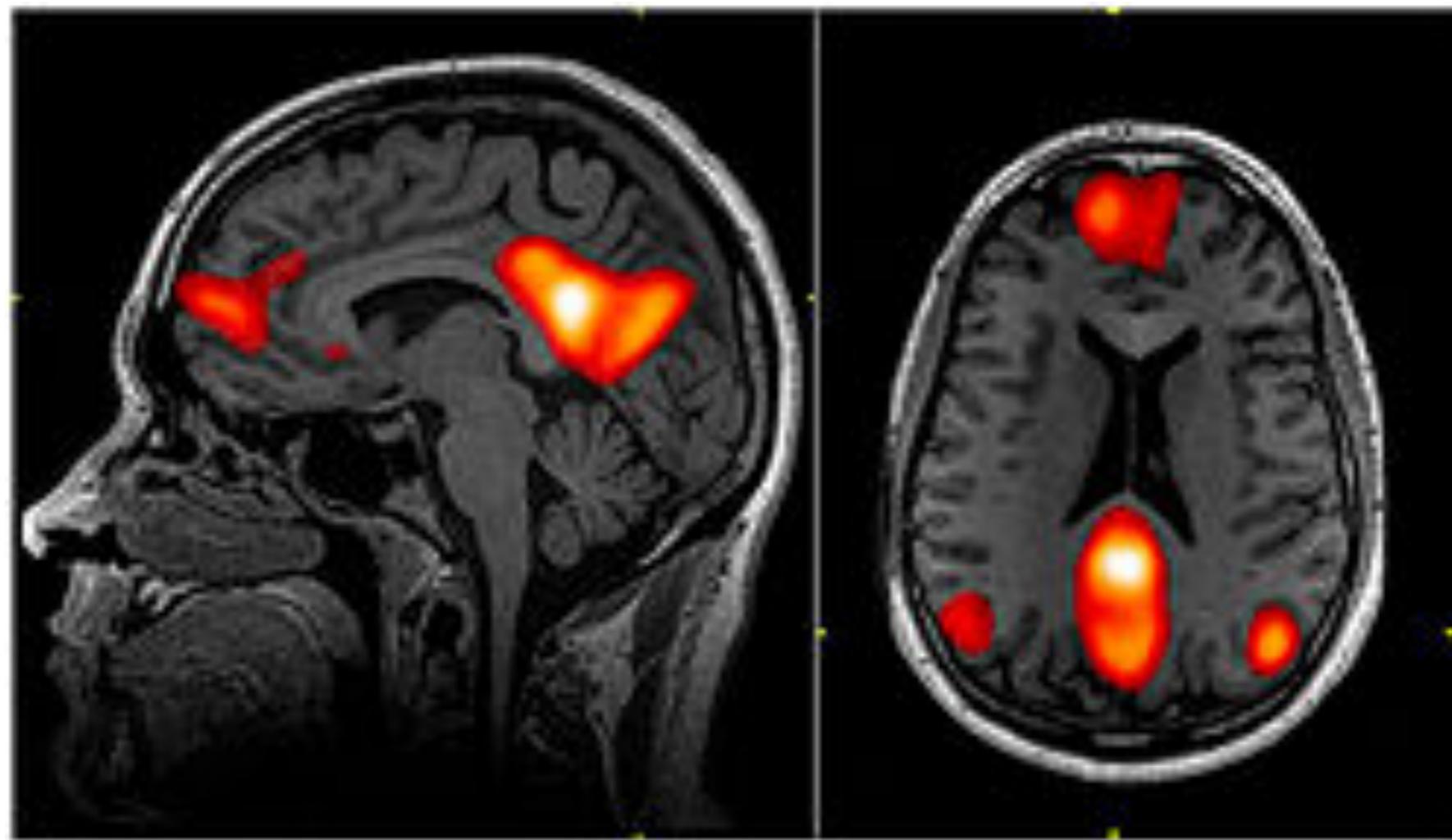
# Neocortical Traumatic Self-States: Self-Enclosed Processing in the Default Mode Network (DMN)

- Links middle prefrontal cortex (PFC), posterior cingulate (PCC), TP junction, and precuneus
- Activated when mind off-task or wandering, defaults cortex to self-referential processing
- Locates us in a self-enclosed loop of personal memory, inner monologue, and future fantasy
- Biased towards traumatic memories, the inner critic, negative emotions, worst-case fantasies





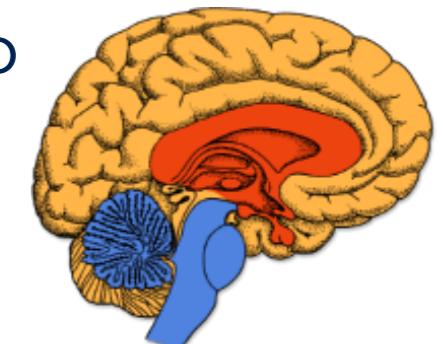
# The Default Mode Network: The Cognitive Brain's Hypervigilant Autopilot





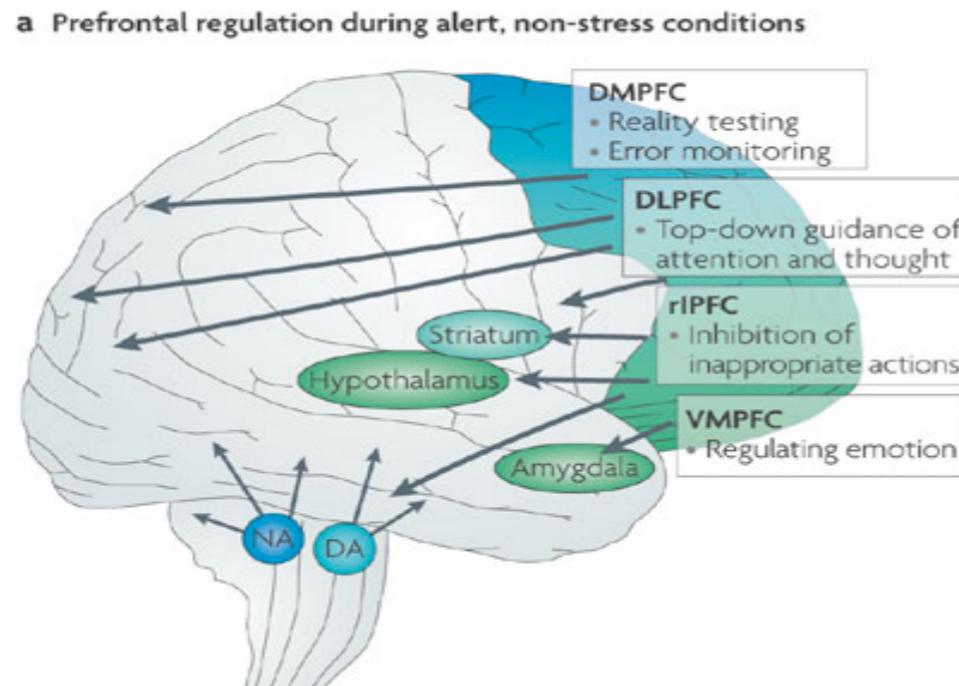
# Limbic Traumatic Self-States: Amygdala Hijack and Social Emotional Stress Reactivity

- The alarm bell of the emotional brain—the amygdala—gets bottom-up sensory input direct from the thalamus
- Most of AMYG (65%) is dedicated to scan for the least hint of danger, by matching input with negative imprints
- While it cross-checks negative stimuli with hippocampus for context, HC is also traumatic emotion biased
- Once the AMYG is triggered, it launches stress-reactive fight-or-flight mode, shutting down the higher brain
- With chronic emotional stress reactivity, the PFC fails to grow/loses the capacities needed for mental health



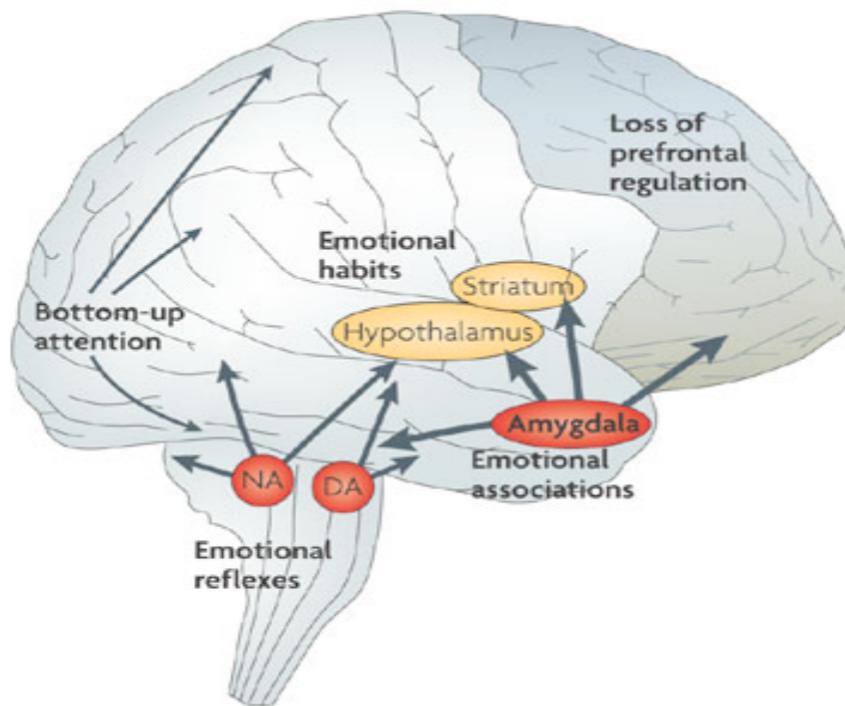


# Shift to Limbic Self-Enclosure in Traumatic States: Amygdala Hijack Launches the Aversion System



The brain in safety in full social engagement mode, under the direction of the prefrontal cortex

b Amygdala control during stress conditions

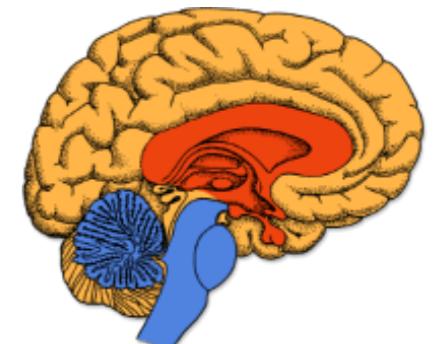


The brain under stress, hijacked by the amygdala's limbic alarm and the hypothalamic driven stress-response



# Brainstem Traumatic Self-States: The Mind/Body Costs of Chronic Visceral Traumatic Stress

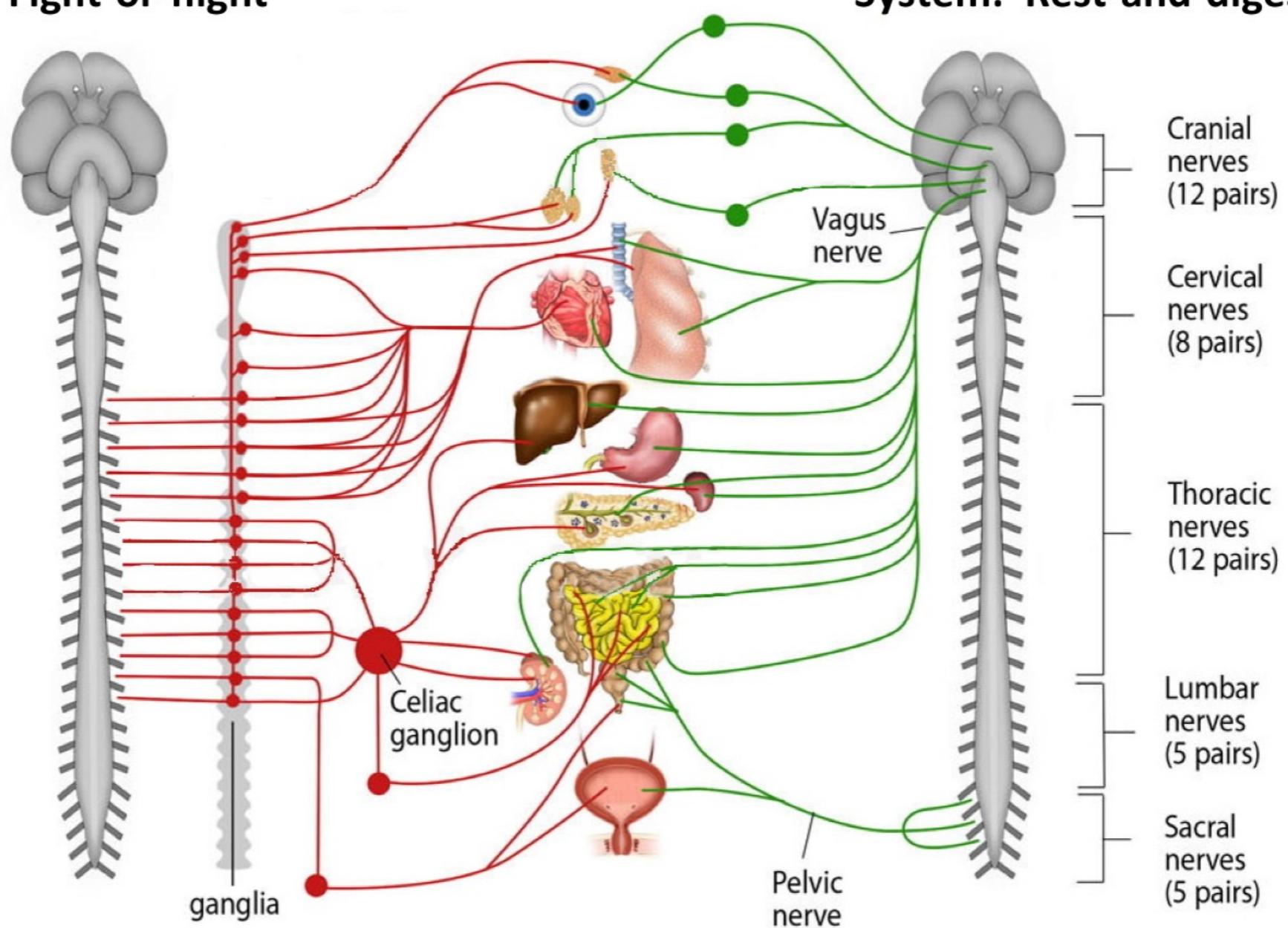
- Limbic social emotional traumatic stress-reactivity triggers older, deeper brain-body stress reflexes
- Hypothalamus is the link to primal fight-flight and freeze-faint reflexes, in two ways:
  - Neurologically, by direct pathways to brainstem sympathetic and dorsal vagal complexes
  - Neurochemically, by pituitary release of ACTH, stimulating adrenal steroids and epinephrine
- Chronic stress fuels brain atrophy, anxiety, PTSD, depression, dementia, addiction, mind/body disease





# Chronic Stress Erodes Mind/Body Health: Primal Fight-Flight/Freeze-Faint Reflexes

**Sympathetic Nervous System :  
Fight-or-flight**





# Chronic Post-Traumatic Stress Triggers Autonomic Reactivity that Drives Many Mind/Body Syndromes

- Dysregulated gut motility, IBS, colitis, etc.
- Increased risk of autoimmune conditions
- Atherosclerotic disease, heart attack, stroke
- Mind/body syndromes like fibromyalgia
- Metabolic disorders like diabetes and obesity
- Progression and spread of cancer



# Plasticity, Integration, and Contemplative Practice: The New Science of Self-Healing & Transformation

- Dan Siegel, Norm Doidge, Richie Davidson cite positive neuroplasticity as the basis for stress-reduction, brain integration, and optimal health—
- Integrative structures wired by brain-training practices use plasticity to prune self-enclosed stress circuits and grow socially engaged circuits—
- Brain training practices like mindfulness are best practices for stress-reduction, neural integration, trauma recovery, resilience and well-being



Dan Siegel, making  
his “Brain-Fist” at  
Nalanda Institute’s  
2015 Benefit,  
while board member  
Robert Thurman  
makes his  
“Diamond Fist”



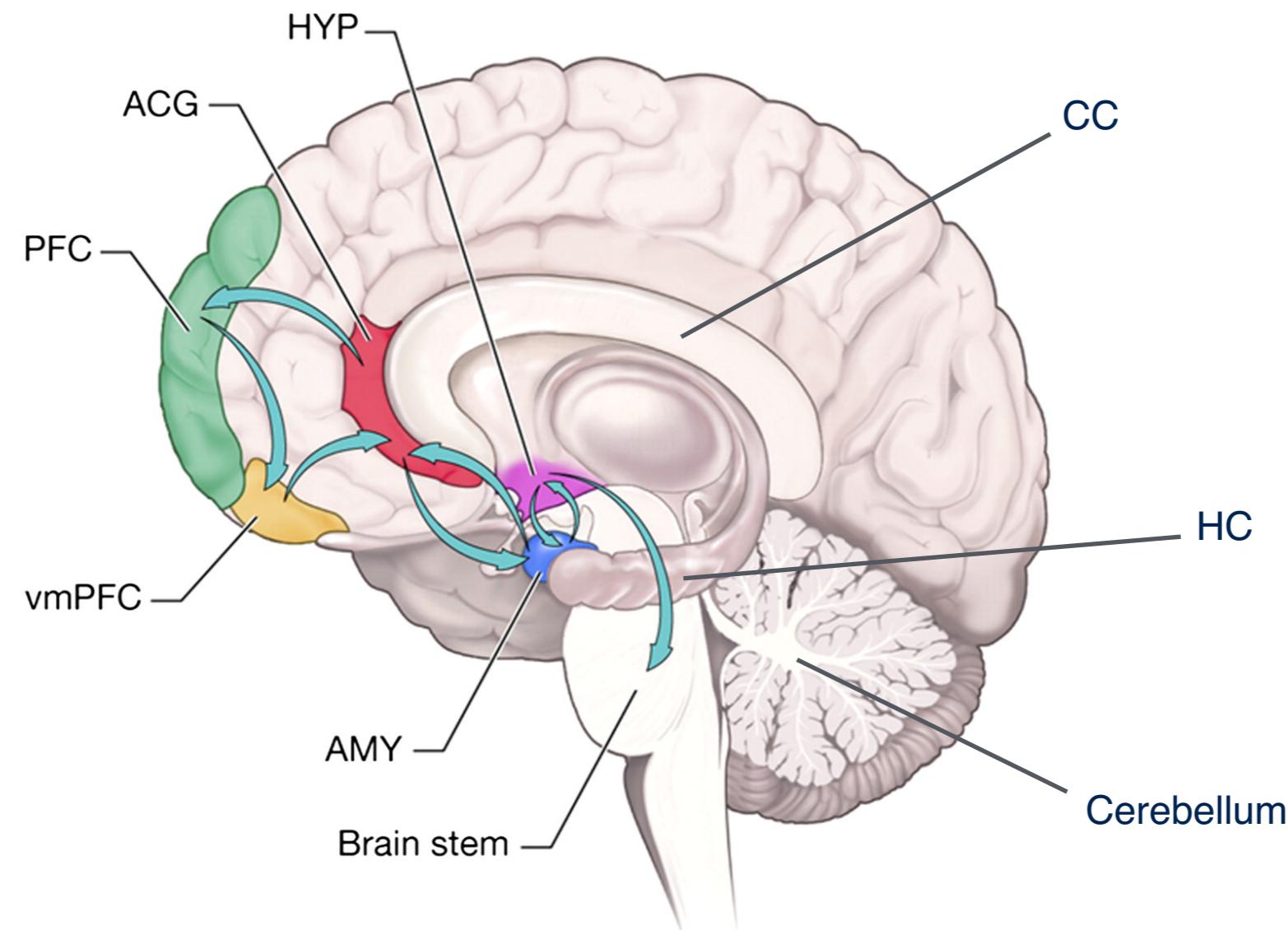


# Prosocial Integrative Brain Structures: Keys to Mind/Body Health and Well-Being

- Prefrontal cortex: "the conductor" of neural integration
- Insular cortex: mind-body sensory integration
- Corpus callosum: left brain/right brain integration
- Cingulate cortex: action, empathy, self-awareness
- Hippocampus: emotional and narrative integration
- Hypothalamus: autonomic and endocrine integration
- Myelinated cranial nerves: social mind/body integration
- Cerebellum: planning, execution, performance integration



# Diagram of Social Integrative Structures

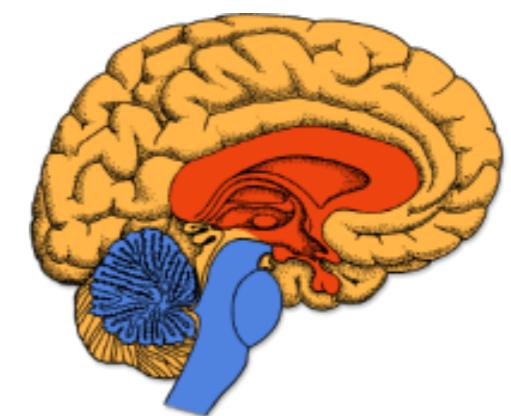




# Current Research Maps of Meditation: Linking Practices with the Triune Brain

Each main practice type helps shift one brain system from self-enclosure to social engagement:

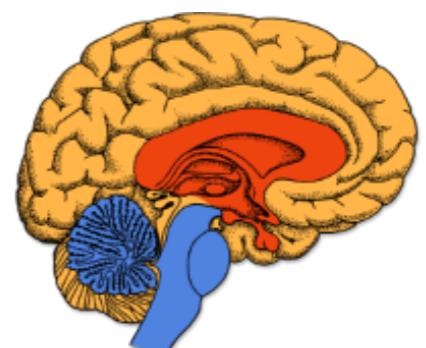
<b>neocortex</b>	<b>mindfulness training</b>
<b>limbic system</b>	<b>compassion training</b>
<b>brainstem</b>	<b>embodied practices</b>





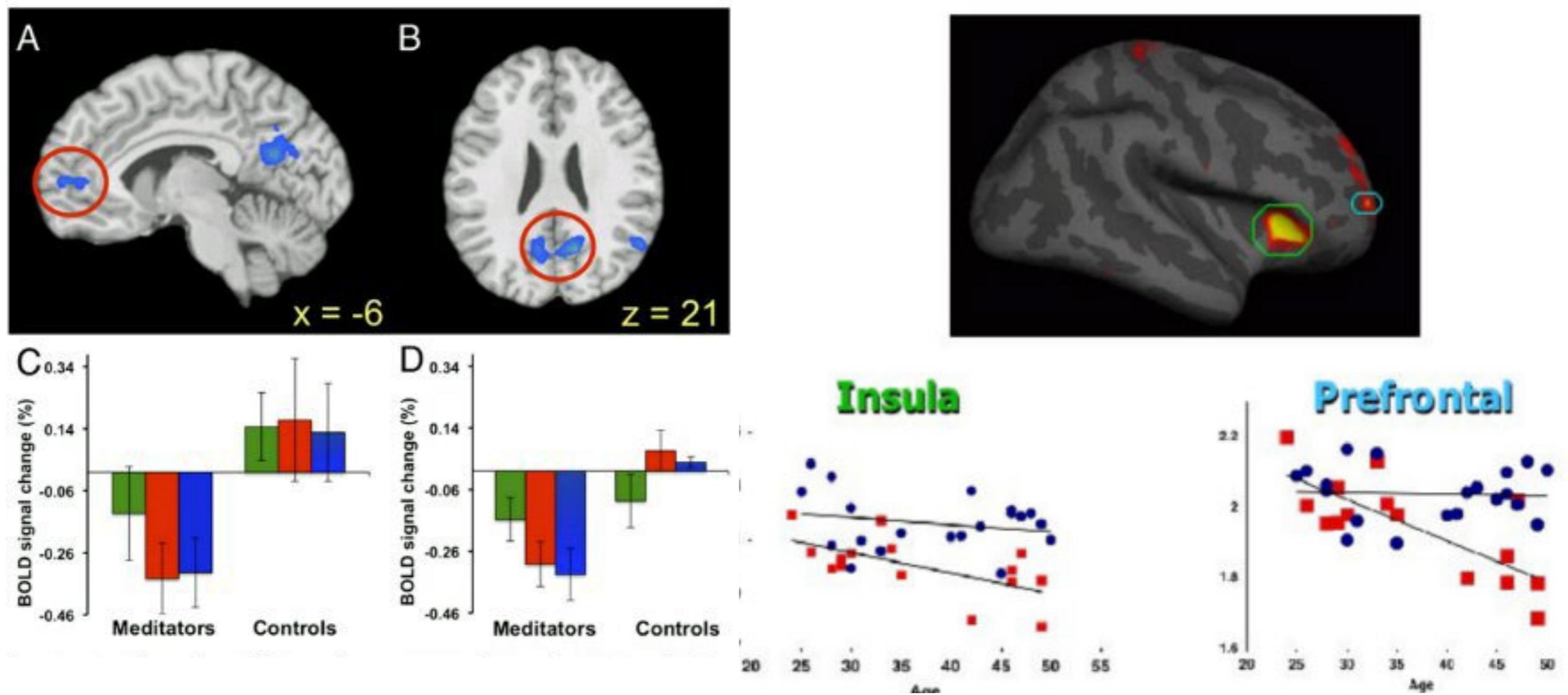
# Mindfulness/Concentration Enhances Neocortical Integration

- Transcendental meditation enhances neocortical alpha synchrony (Travis et al, 2011)
- Decreased default mode network self-referential activity (Brewer et al, 2011)
- Shift to balanced hemispheric processing (Jella et al, 1993)
- Increased thickness of corpus callosum (Luders et al 2012)
- Increased gray matter in left hippocampus, temperoparietal junction, and posterior cingulate (Holtzel et al, 2011)
- Increased thickness/activation of insula and anterior prefrontal cortex (Lazar et al, 2005)





# Brain Regions Involved in Mindfulness Reduce Default Mode and Enhance Engagement

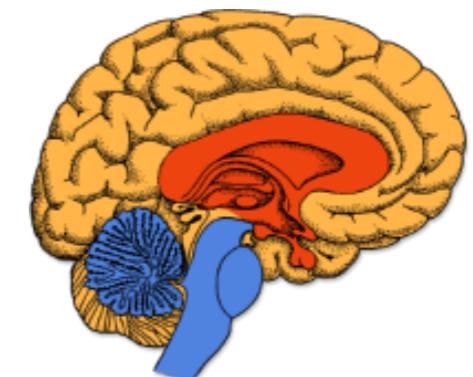


Brewer et al, 2011; Lazar et al, 2005



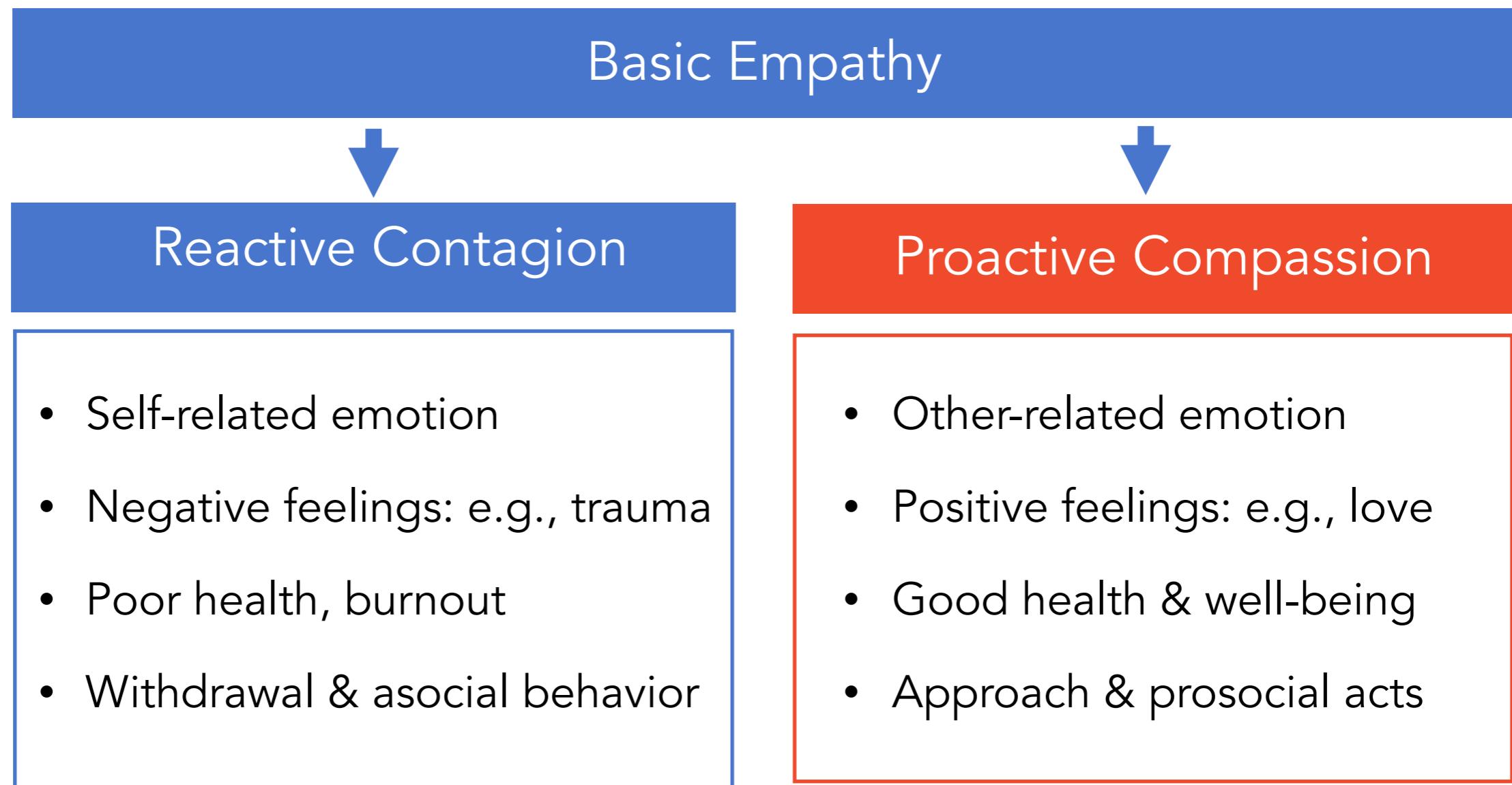
# Limbic Integration and Emotional Trauma States: Compassion Shifts Reactivity to Well-Being

- More IFC Mirror, DLPFC executive activity, and nucleus accumbens connectivity (Weng et al, 2013)
- More reinforcement activity in MOFC, putamen, ventral pallidum, VTA/SN (Klemecki et al, 2012)
- Enhanced prosocial behavior (Leiberg et al, 2011)
- More active MPFC, anterior insula, ACC, amygdala, STS, temperoparietal junction, PCC (Lutz et al, 2008)
- More active empathy regions AI/ACC, coupled with cardiovascular arousal (Lutz et al, 2009)





# Compassion Training Shifts Reactive Social Contagion to Proactive Compassion

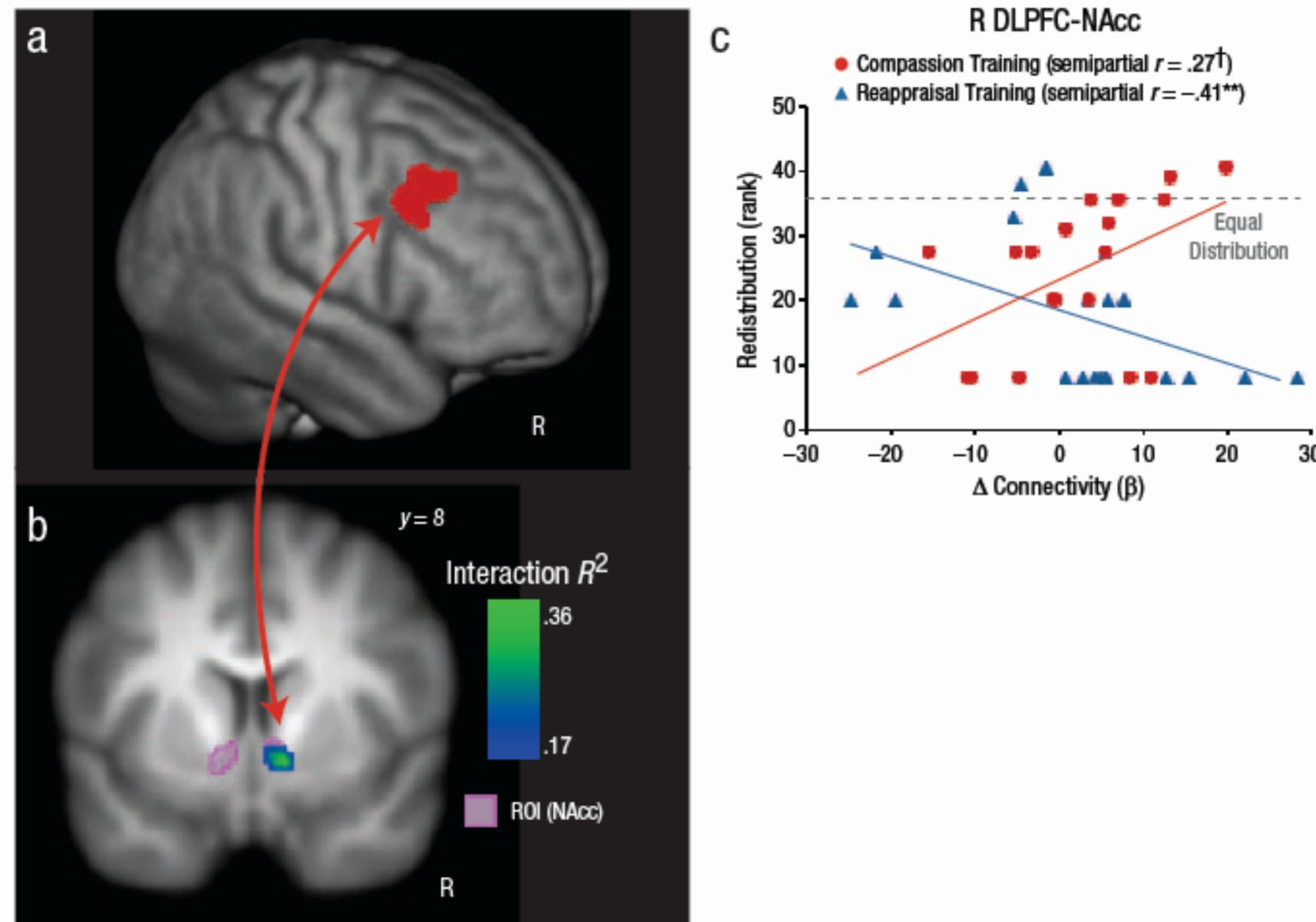


Current Biology

Singer & Klimecki, 2014



# Compassion Training Links Prefrontal Executive with Limbic Well-Being System





# What are Embodied Practices and How Do They Work?

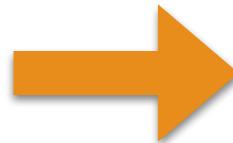
- *Top-down tools:* imagery, narrative—  
bottom-up: posture & breath-work
- Role-modeling imagery helps  
internalize ideal self-other states
- Recitation helps revise traumatic self-story into heroic vision & narrative
- Heroic posture and breathing tap flow states to fuel vision & narrative
- Breath-induced flow states help fire & wire vision & narrative into flow traits





# Imagery and Recitation Enhance Hypothalamic and Brainstem Integration

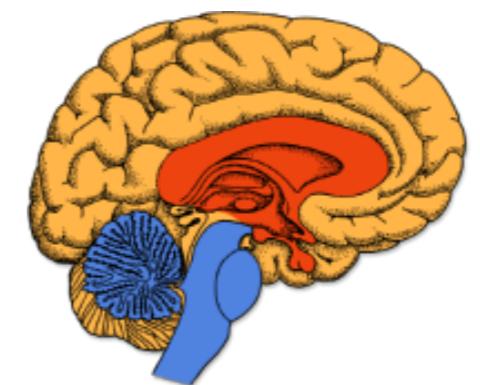
- Recitation increases hypothalamic vasopressin, modulates autonomic system (O'Halloran et al, 1985)
- Recitation modulates hypothalamic control of vital rhythms (Harinath et al, 2004)
- Imagery activates orbitofrontal cortex, dorsolateral prefrontal cortex, thalamus (Newberg et al, 2001)
- Imagery and recitation promote flow states of peak balanced arousal (Amihai & Koshevnikov, 2014)





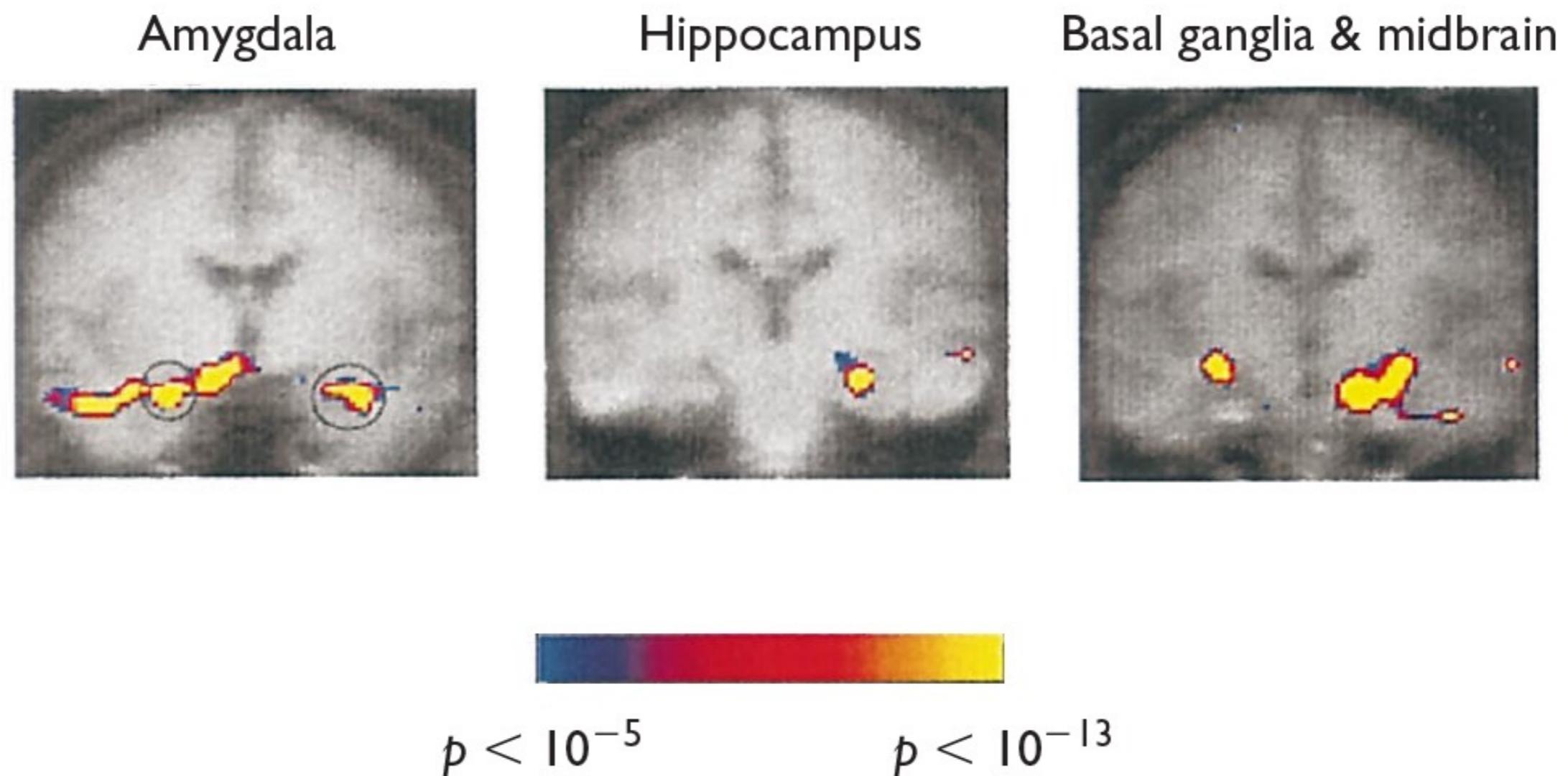
# Imagery and Recitation Enhance Hypothalamic and Brainstem Integration

- Recitation stirs (AVP?) sympathetic arousal and orientation, galvanic skin response (Corby, 1978)
- Recitation activates frontal/parietal cortex, anterior cingulate, hippocampus, putamen, parahippocampus, midbrain (Lazar et al, 2000)





# Recitation with Conscious Breathing Activates Subcortical Centers





# Prosocial Movement and Breath-Control Enhance Brainstem Integration

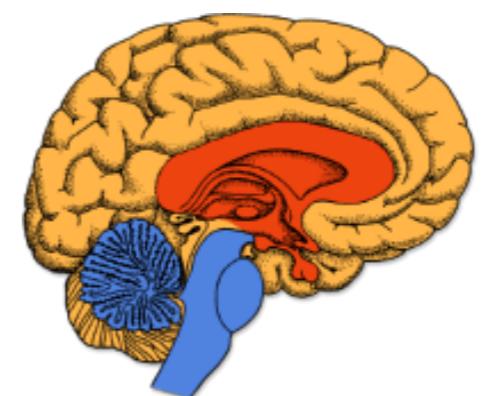
- Breath-control cuts energy cost by up to 64% while promoting peak cortical synchrony (Benson, 1990)
- Tibetan breath-control raises core body temperature (Koshenikov et al, 2013)
- Yogis self-regulate metabolism through diving reflex (Heller et al, 1987)
- Sleep yoga integrates restful waking alpha rhythm with deep sleep delta wave activation (Mason et al, 1997)





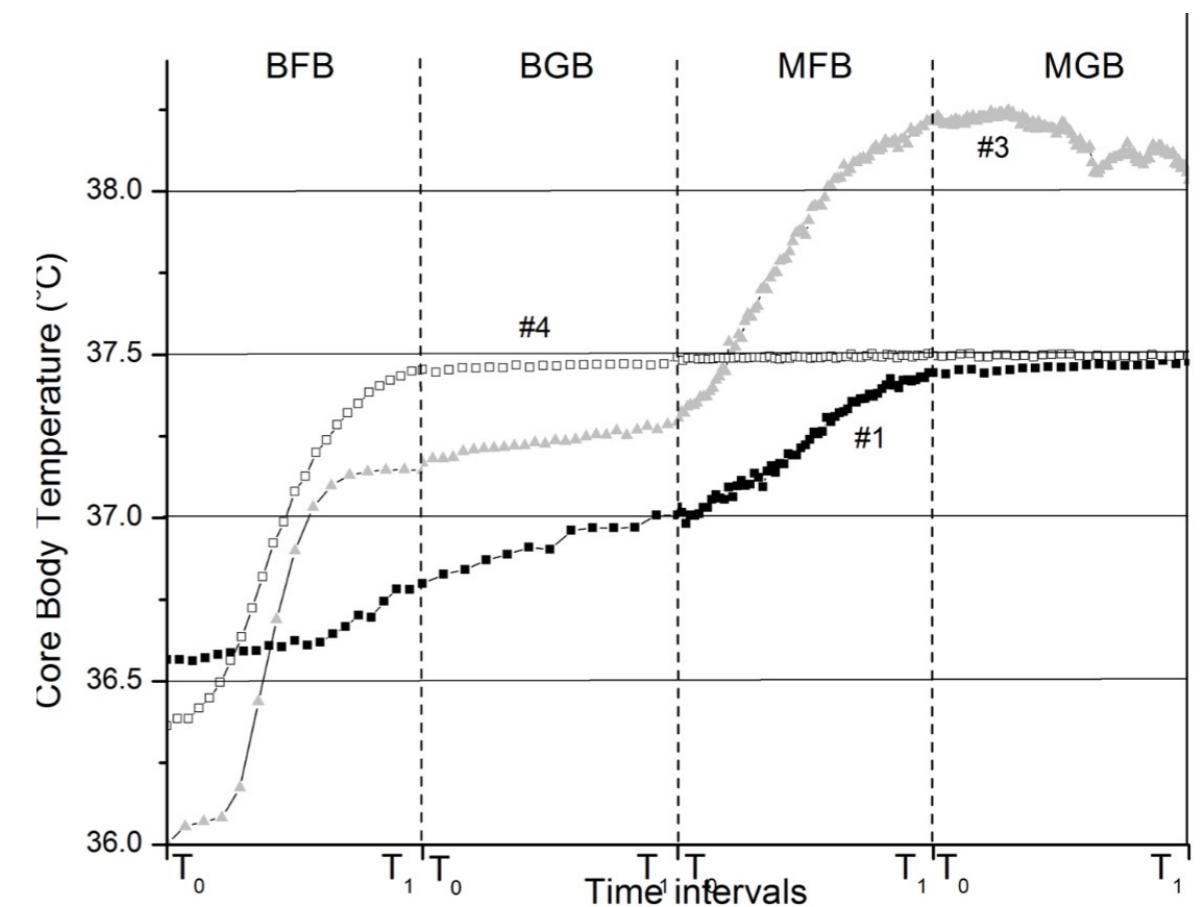
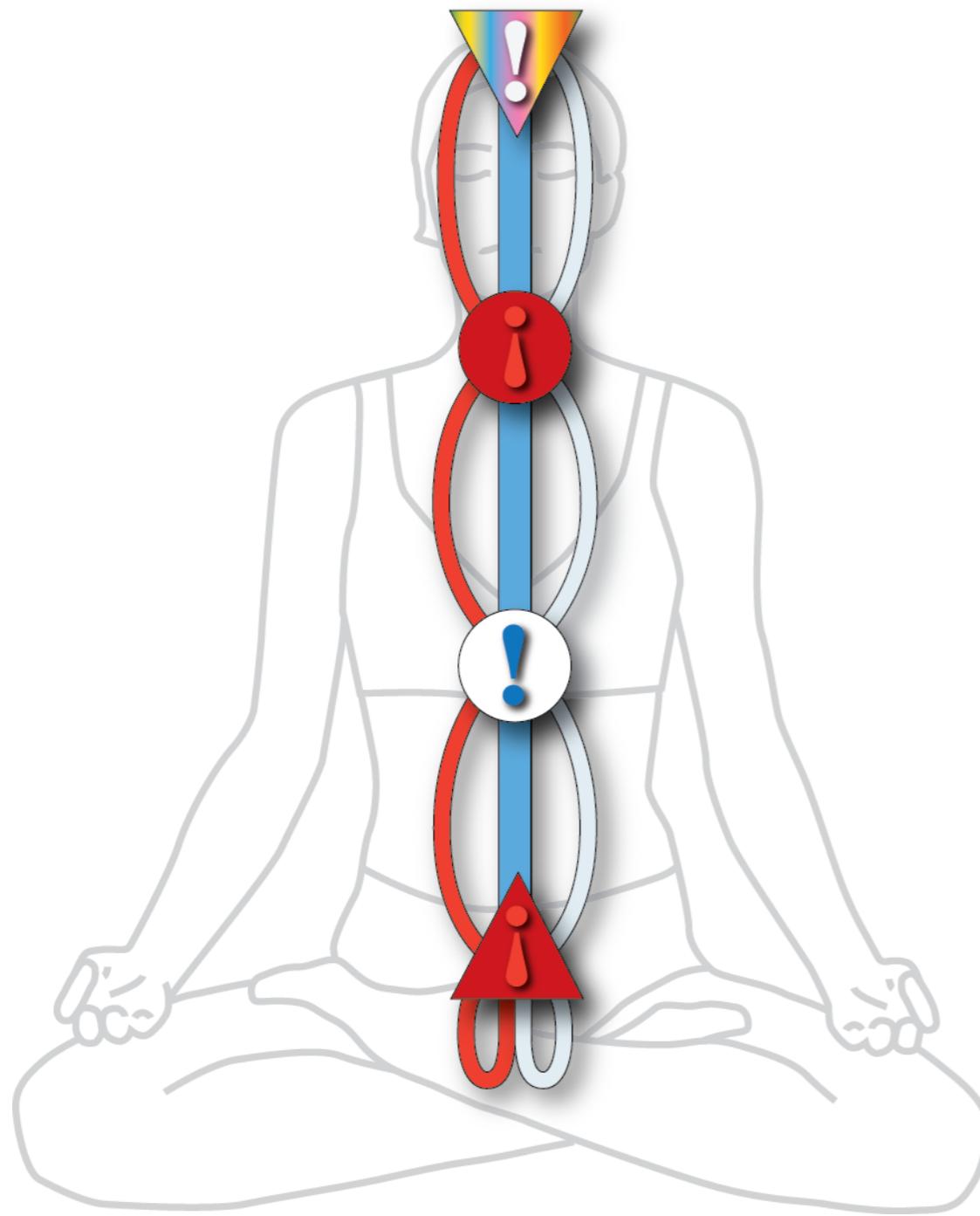
# Prosocial Movement and Breath-Control Enhance Brainstem Integration

- Qi-Gong modulates brainstem autonomic processing (Liu et al, 1990)
- Flow awareness practice grows gray matter of vagal complexes in the medulla (Vestergard-Poulsen, 2009)
- Flow awareness boosts connectivity of brain & between intrinsic/extrinsic networks (Josipovic, 2013)



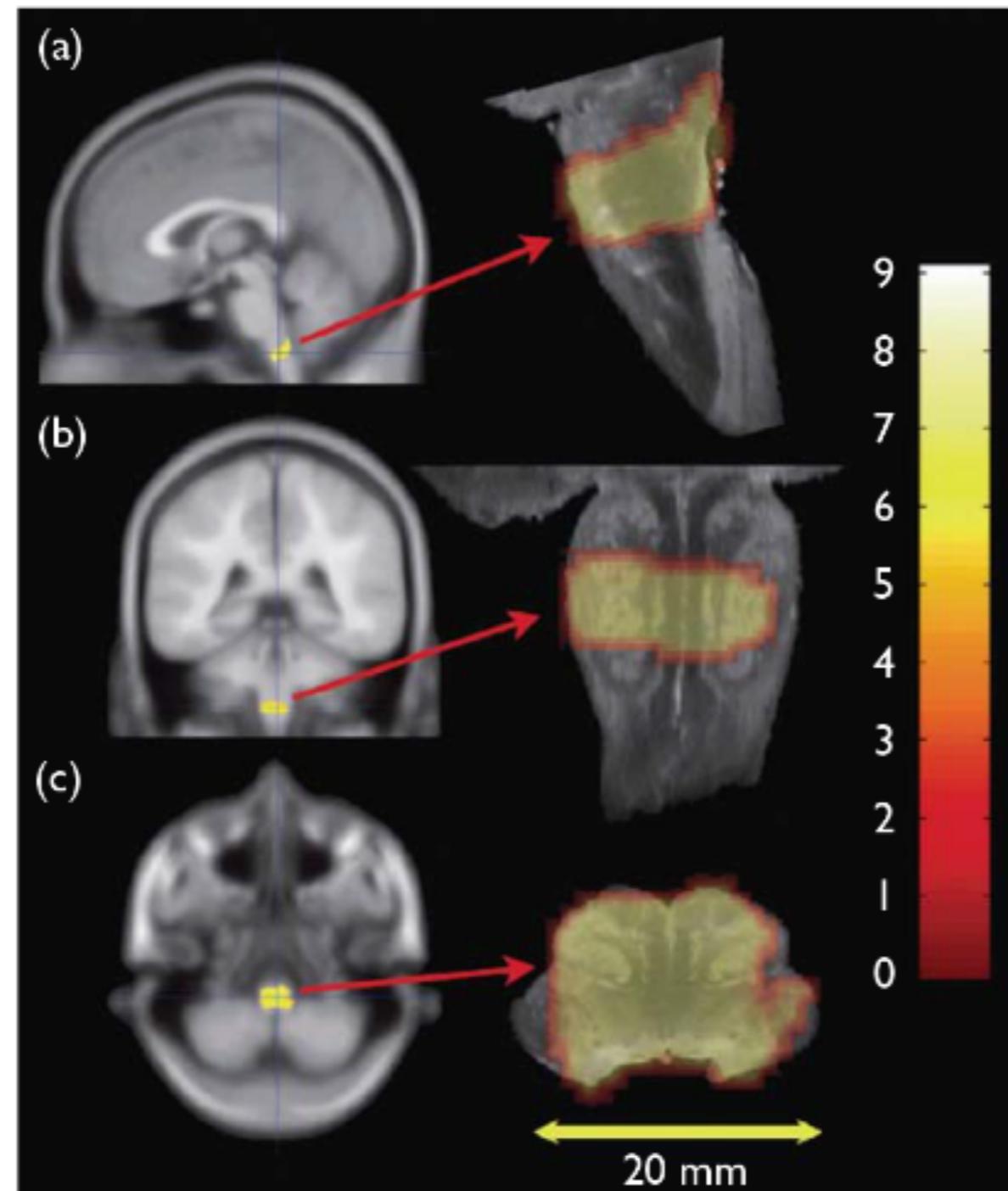


# Tibetan Psychic Heat (*Tummo*) Breath-Control Raises CBT, Cuts Metabolism





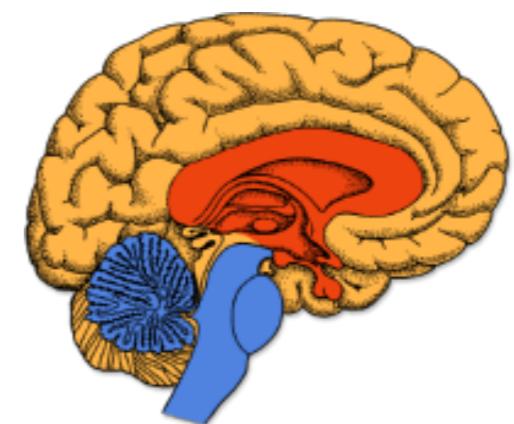
# Embodied Non-Dual Awareness Grows Vagal Social Engagement System





# The Neurobiology of Traumatic Self-States: Social Engagement Networks versus Self- Enclosing Networks in the Brain

structure	engaged mode	enclosed mode
<b>neocortex</b>	<b>presence network</b>	<b>default network</b>
<b>limbic brain</b>	<b>empathy system</b>	<b>aversion system</b>
<b>brainstem</b>	<b>social resilience</b>	<b>survival reflexes</b>





By nature we're born on the fence—prepared to survive in the wild, and equally prepared to thrive in community. Given neural plasticity, the question is—what side of our nature do we practice? As a Cherokee proverb says, which wolf will we feed?



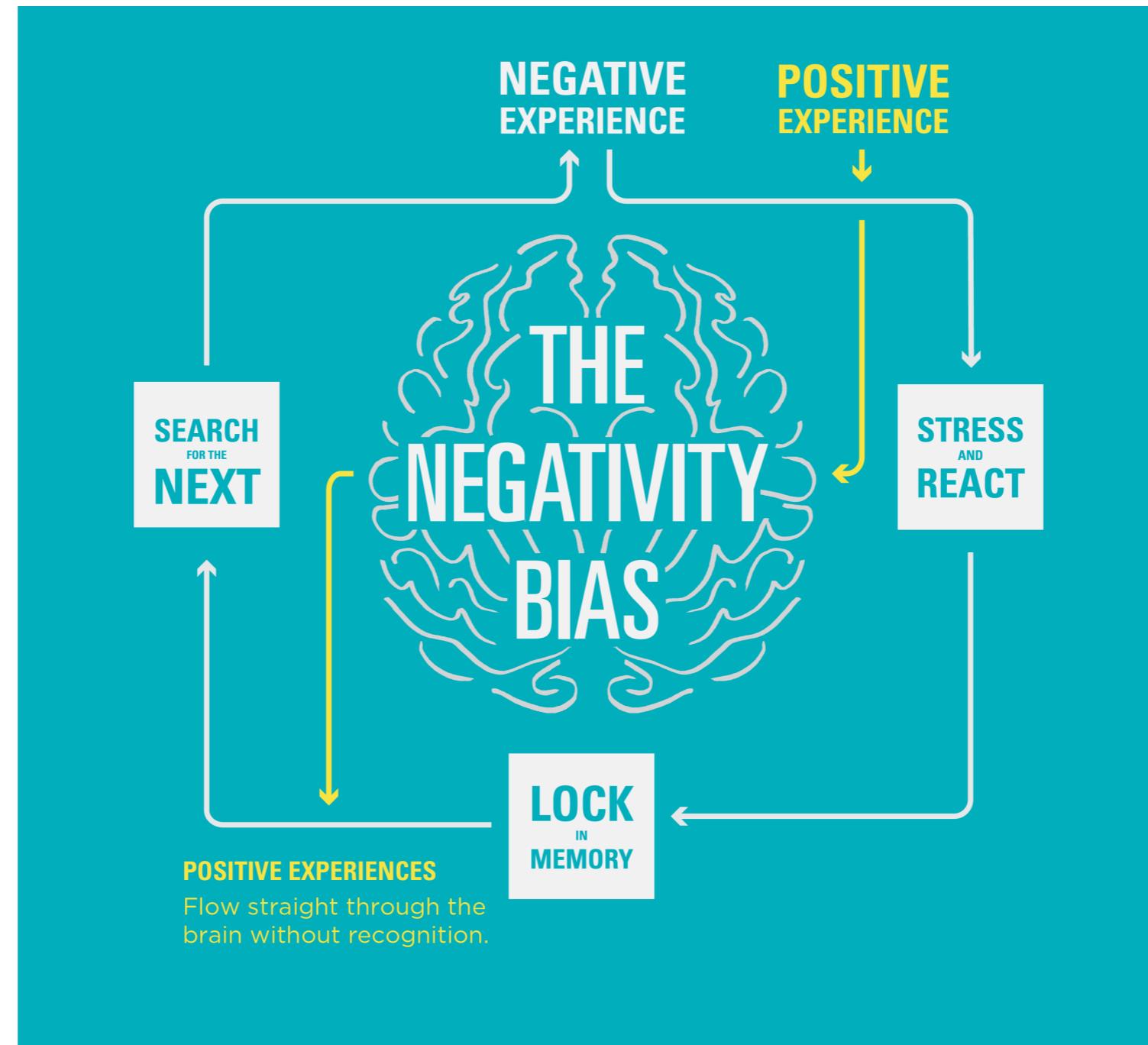


# Here's the Rub: The Brain's Negativity Bias

- The brain's default structure is biased towards self-protection
- With stress, brain networks fragment and default to negativity
- It has a 10-100 fold bias for avoiding loss vs. securing gain
- Bad memories are made 5X quicker, last 5X longer than good
- The neocortex (R >L) responds more to negative than positive
- The limbic system (AMYG/HC) is 65% geared to negative events
- The brainstem supports more negative emotions than positive



Hanson: "Survival Has Wired Our Brains to be like Velcro for Suffering but like Teflon for Happiness"





# Attachment Theory: The Social Face of Stress and Trauma



- Attachment: human connection is our primary drive, more key to our well-being than mere survival
- Affective neuroscience: our brains evolved for social engagement, and run on social emotions
- Trauma research: social stress and trauma hijack our brains, eroding self-regulation and empathy networks
- Polyvagal theory: mammalian upgrades in autonomic regulation support social engagement and intimacy



# Van der Kolk's Model of Developmental Trauma: The Return of Dissociated Stress

- Attachment trauma comes before integrative structures develop
- Trauma imprints stored in preverbal sensorimotor fragments
- Imprints encoded in subcortical structures: AMYG, BG, HTHAL
- Bottom-up flooding and flashbacks involve vertical dissociation
- Poor top-down regulation by integrative structures: PFC, HC, THAL
- Flooding and flashbacks also involve lateral dissociation
- More active R INS, AMYG, MTL/ less active L Broca's, DLPFC



# Blocks to Social Engagement Locked In Place By Traumatic Self-States



- Traumatic Affects: Panic, Rage, Envy, Greed, Pride & Shame
- Traumatic Memories: Repressed, Implicit, Procedural
- Core Shame Beliefs: Inner Critic Based on Preverbal Self-Attack
- Primitive Embodied Stress States: Hyperarousal, Freezing

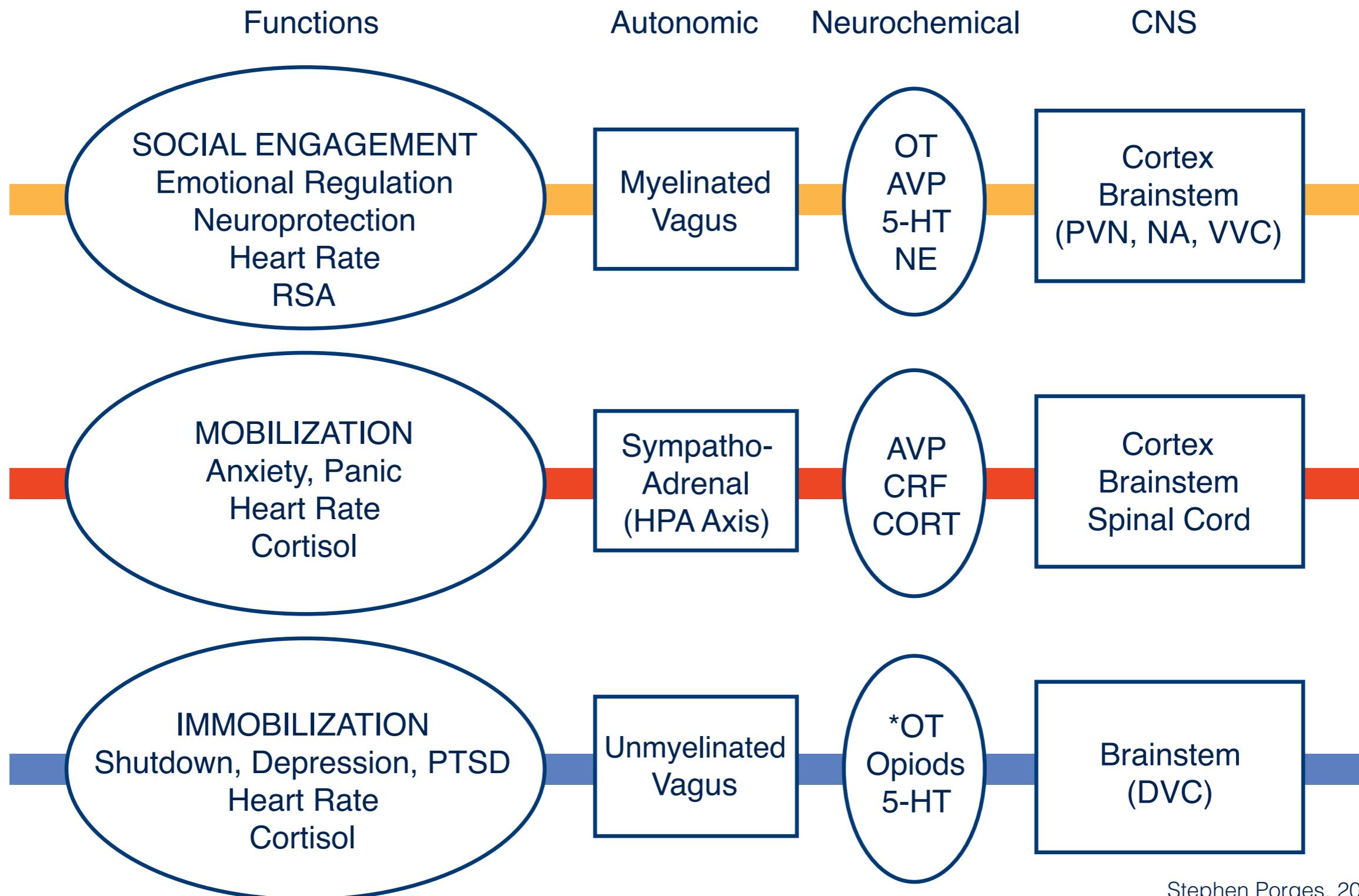


# Stephen Porges' Polyvagal Theory: The Hidden Variable Governing Shifts Between Traumatic Stress Reactivity and Prosocial Engagement

- The mammal brain has three stress response systems
- The ventral vagal, sympathetic, and dorsal vagal systems
- They follow an evolutionary hierarchy of stress responses
- The mammalian smart vagus needs safe connection cues
- Fear triggers 1) hypervigilance, 2) fight-flight, 3) faint-freeze
- Full mammal mode stabilized by cues of safe connection



# Stephen Porges' Polyvagal Theory: The Mammalian ANS



Stephen Porges, 2011



# The Archeology of Post-Traumatic Attachment Reactivity: Shame-Based Moods & Reflex Modes

<p><i>Secure</i> Accepting Shame from Empathic Blocks with Humility, Resilience &amp; Repair Smart Vagal “Chill”</p>	<p><i>Ambivalent</i> Fleeing Shame from Empathic Blocks with Self-Attack, Fearful Clinging Sympathetic “Flight”</p>
<p><i>Avoidant</i> Avoiding Shame from Empathic Blocks with Defensive Pride Rigidity &amp; Denial Old Vagal “Freeze”</p>	<p><i>Disorganized</i> Fighting Shame from Empathic Blocks with Shame-Blame Violence &amp; Rage Sympathetic “Fight”</p>

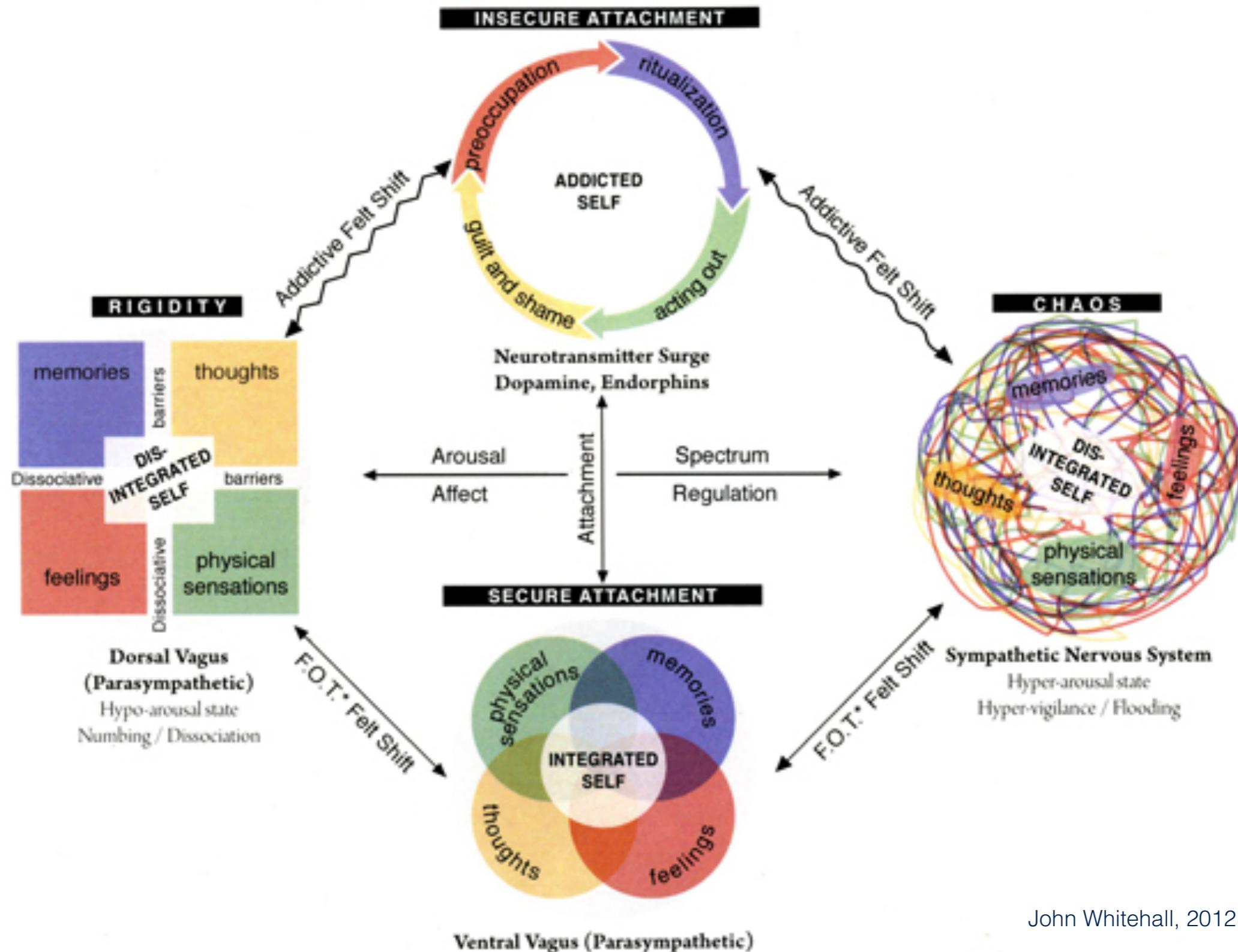


# Transforming Trauma: Shifting Core Self-States from Shame-Based Reactivity to Prosocial Resilience

- Shame refers to a range of let-down distress affects that signal threats of interpersonal rejection or group exclusion
- In the emotional memory of even secure individuals shame has a conditioned association with psychosocial death
- Given our negativity bias to cling to worst-case fears, we tacitly grasp onto core shame self-states as our real identity
- Such traumatic self-states block positive affects and repel caring interpersonal or group experience
- Only when we deconstruct our core shame identity are we open to give and take empathy, love, compassion & intimacy



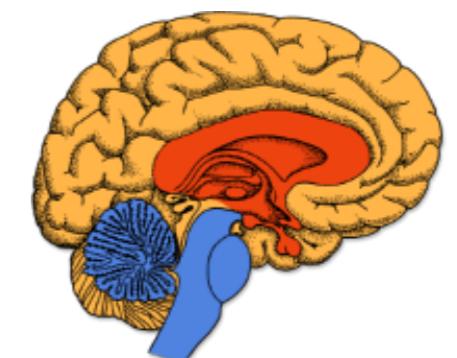
# Transforming Trauma: Shifting Core Self-State From Shame to Love

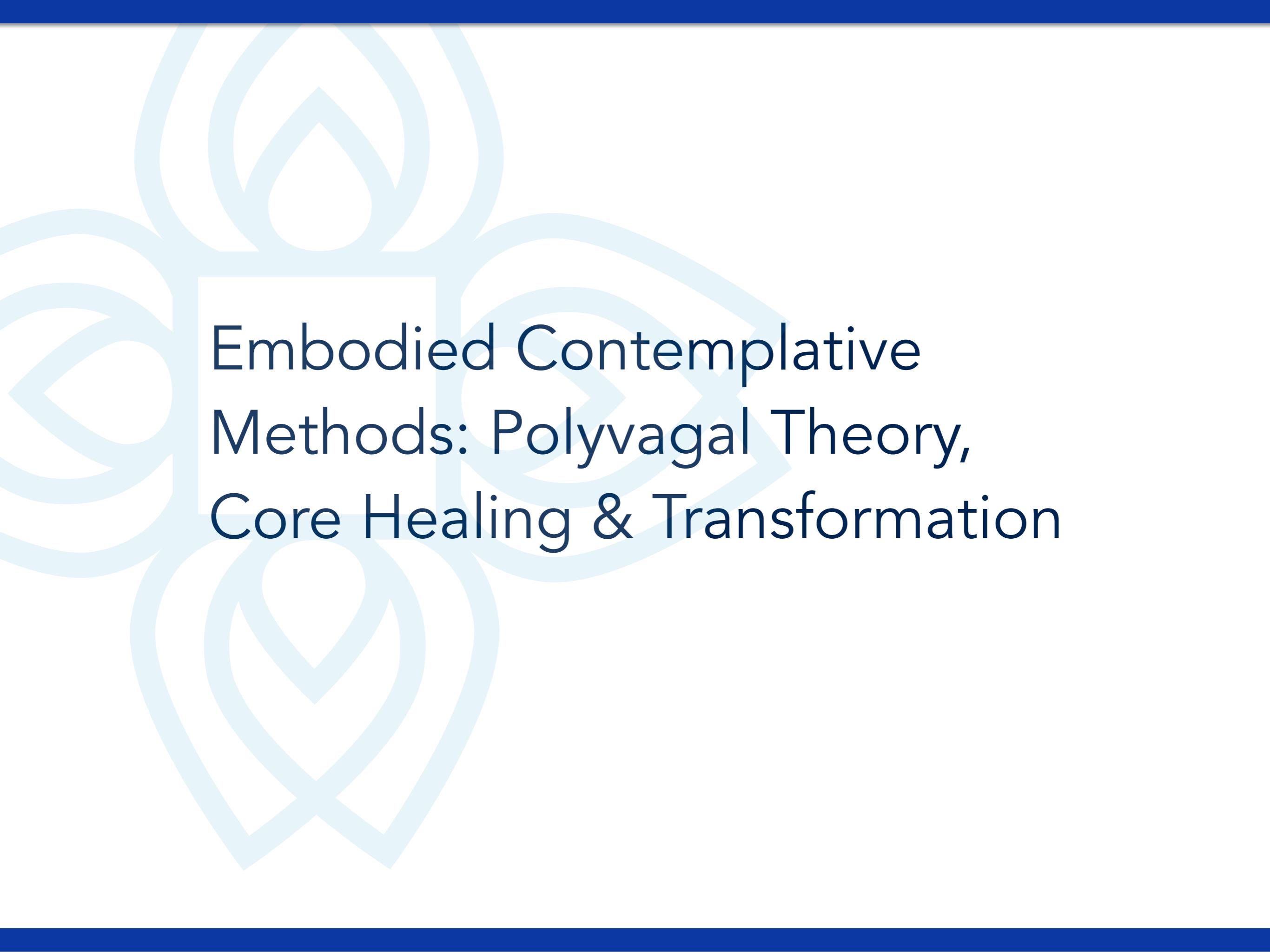




# The Basis, Method, and Outcome of Contemplative Practices for Mind/Body Health

neural basis	practice method	health outcome
<b>neocortex</b>	<b>mindfulness</b>	<b>presence</b>
<b>limbic system</b>	<b>compassion</b>	<b>resonance</b>
<b>brainstem</b>	<b>embodiment</b>	<b>resilience</b>





# Embodied Contemplative Methods: Polyvagal Theory, Core Healing & Transformation



# Embodied Contemplative Practices: The Tantric Yoga Traditions of India & Tibet

- Contemplative methods explicitly meant to tap and transform the subtlest core layers of mind/CNS
- *Tantra*—“loom” or “weave”—means re-weaving the fabric of the core layers of the mind/body process
- After mindfulness and compassion preliminaries, top-down and bottom-up methods transform the core
- *Creative imagery* stage meant to “purify and revise” traumatic perception of self and world
- *Integration stage* meant to unblock core bliss network, tap flow states and deep open awareness



# Polyvagal Theory Applied: Harnessing Top-Down Cues to Stabilize Brainstem Social Engagement

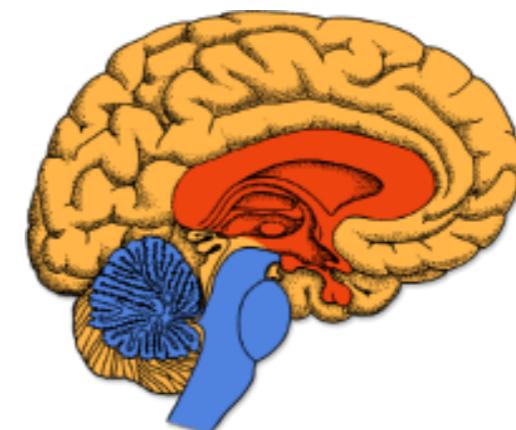
- Prosocial imagery boosts lateral integration of vagal dominant L cortex and sympathetic dominant R, creating a positive affect bridge linking syntax module with trauma
- It also sends safety cues from mirror neuron facial recognition circuits, linking PFC through ACC, HC & HYPTHL to release OXY/VP and activate the VVC





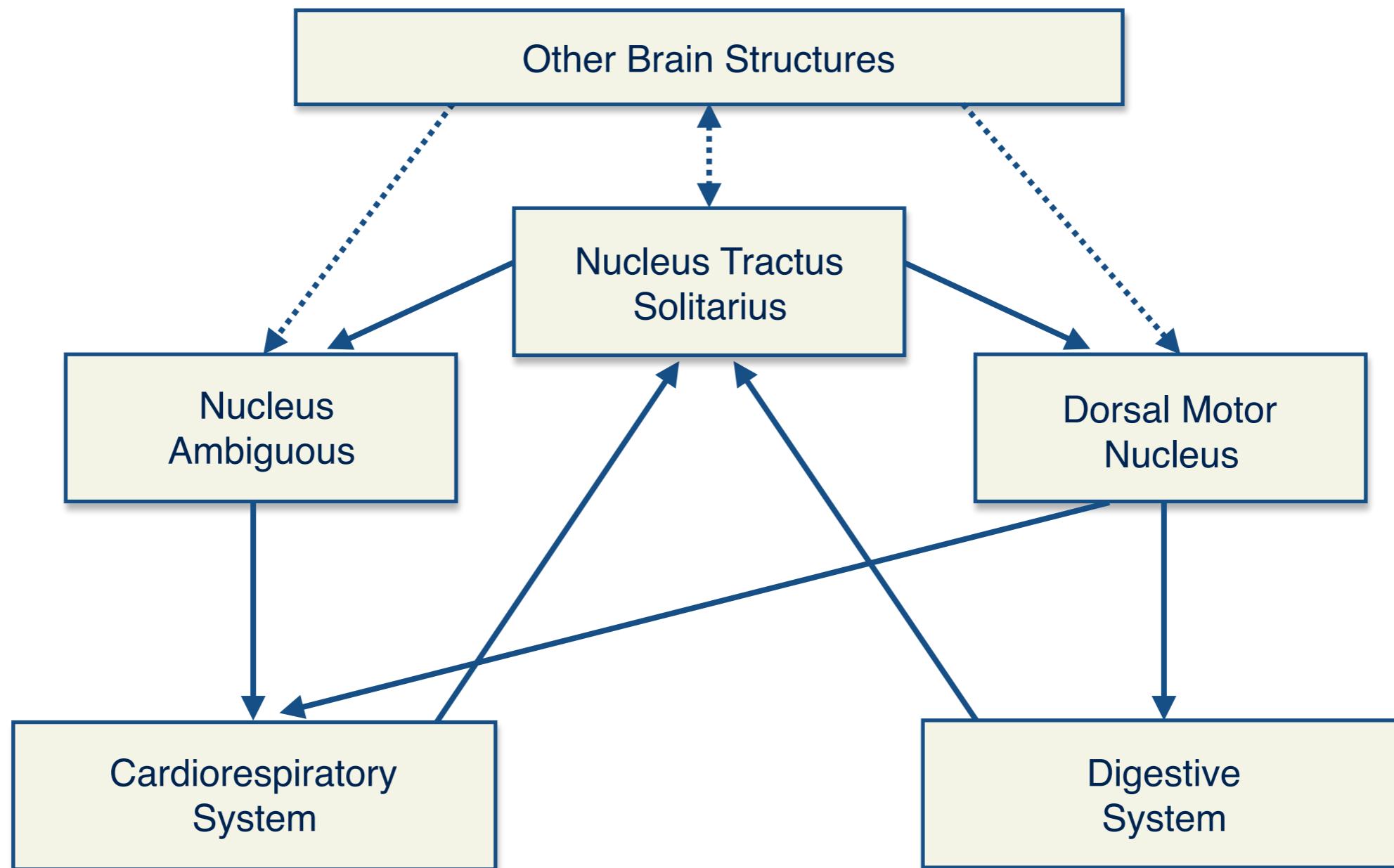
# Polyvagal Theory Applied: Harnessing Top-Down Cues to Stabilize Brainstem Social Engagement

- Prosocial recitation offers added safety cues via auditory and glossopharyngeal feedbacks that cross-activate the VVC—the solitary nucleus and nucleus ambiguus
- It also involves frontal breath motor neurons that boost smart vagal tone and directly activate the brainstem social engagement system in the VVC





# The Ventral and Dorsal Vagal Complex, Cardiorespiratory and Digestive Systems





# Polyvagal Theory Applied: Harnessing Bottom-Up Cues to Deepen Brainstem Social Engagement

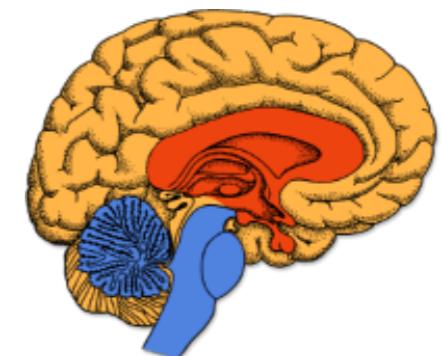
- Prosocial posture and movement offer bottom-up safety cues via vagal afferent feedbacks that activate both the ventral & dorsal vagal complex, deepening vagal tone
- They also offer added bottom-up safety cues by engaging cerebellar pathways that activate both vagal complexes, deepening vagal tone





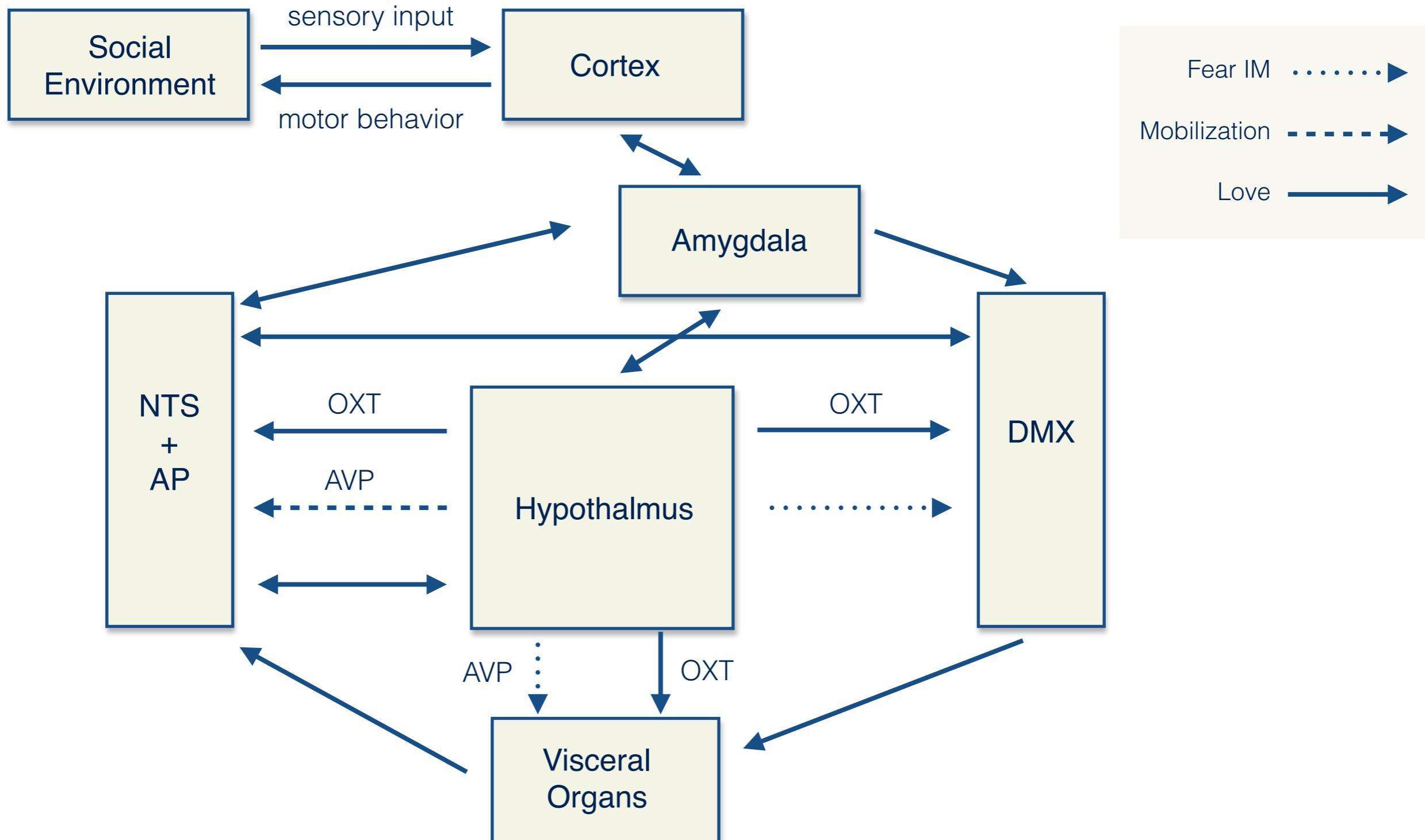
# Polyvagal Theory Applied: Harnessing Bottom-Up Cues to Deepen Brainstem Social Engagement

- Abdominal breathing, breath slowing, breath holding & forced breathing offer bottom-up safety cues via visceral vagal afferents to both vagal complexes, deepening tone
- With triggers like swallowing, extended breath holding, and Kiegl exercises, breath elicits fearless immobilized flow states akin to orgasm, diving, hibernation & NDE's





# Circuitry of Fearful vs. Safe Social Immobilization





# Embodied Contemplative Practices as Depth Psychotherapy: A Crucible for Transformation

- Embodied methods help safely access and transform traumatic residues in implicit & procedural memory
- Top-down imagery & narrative replace the negatively biased default self-loop and attachment patterns
- Ideal images and affirmations are chosen by the client based on cultural or personal preference
- Bottom-up movement & breath-work wire the self-regulation of vagal tone, deepening safe embodiment
- Heroic vision, narrative, posture & breathing make a crucible for the integration of flow states & traits



# Embodied Contemplative Practice Primes Self-Transformation in an Alchemical Way

- The work begins with an encounter that galvanizes a sense of possibility and leads to a *confidential bond*
- The first phase of work is guided by top-down heroic imagery and narrative in the *creative imagery stage*
- The imagery can be co-constructed with the mentor/therapist over time out of memes, dreams or fantasies
- Once the ordinary traumatic self-state is displaced by the heroic self-state, narrative transformation begins
- Narrative transformation has three nodes: dissolving traumatic self; emerging as nascent hero; then as fully integrated hero (*loss of trauma-self; transition; new life*)



# Chosen Archetypes, like Campbell's Hero w/ 1000 Faces, Come in All Shapes, Moods, & Sizes

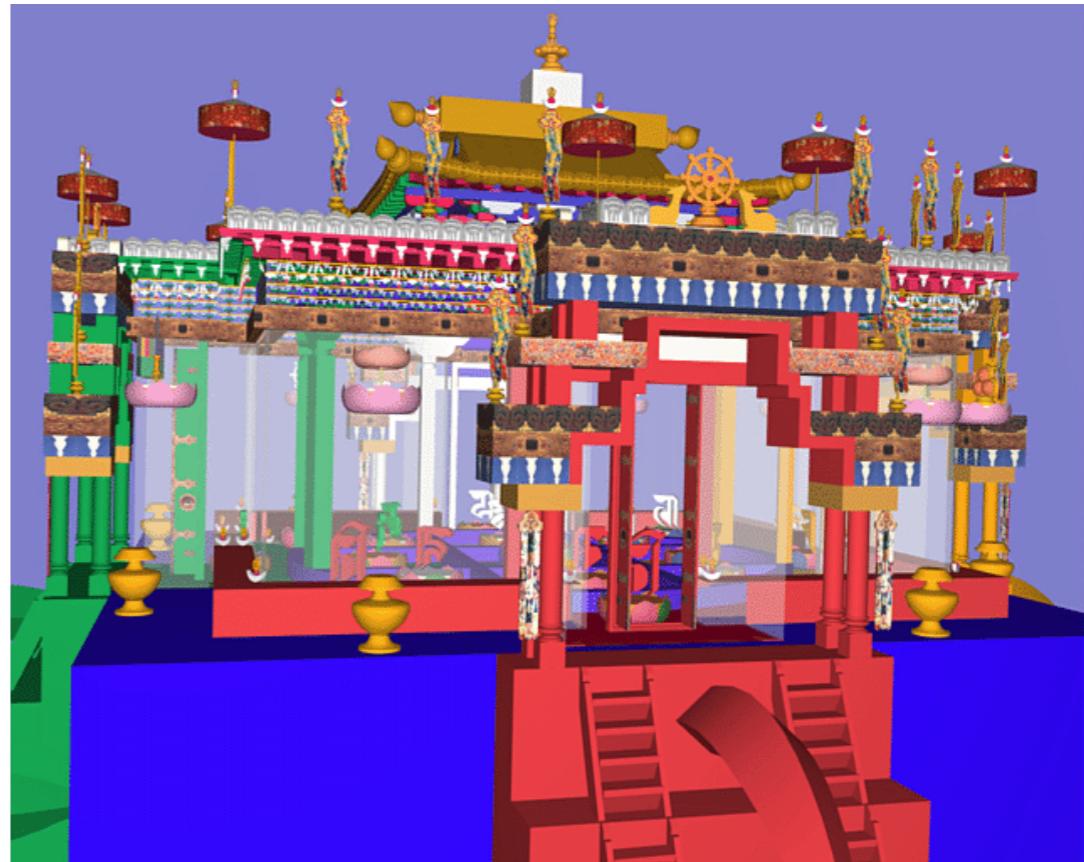
- Hero and Heroine Forms  
(Deva/Devi) Solitary/Paired
- Their Affects Range from  
Calm, Mixed to Fierce
- For Transmuting Addictive  
Craving, Defensive Anger, or  
Reactive Self-Enclosure
- Grounded by Link to Positive  
Mentors & Role-Models
- Include Transformational  
Family, Mansion & Natural  
Crucible (Mandala)



*Mystic Communion (Guhyasamaja)*



# The Nested Crucibles of Mystic Communion: Nature, Home, Body, CNS, Meme, Drop





# Embodied Contemplative Practice Revolves around a Congenial Mentor-Archetype Bond

- **Admiring** = focusing on the desired qualities the mentor/archetype embody
- **Sharing** = arranging/envisioning and offering to share all desirable objects and positive experiences
- **Disclosing** = exposing one's deepest self-doubts, worst errors, and most shameful limits and flaws
- **Enjoying** = rejoicing at the mentor's affirmation that the we naturally share her/his qualities



# Embodied Contemplative Practice Revolves around a Congenial Mentor-Archetype Bond

- **Asking for help** = requesting guidance and encouragement needed to deeply transform
- **Requesting continuity** = asking the mentor/archetype for a long-term commitment to one's full transformation
- **Dedication** = earmarking the transformative intuition, affect and energy stirred by practice to full realization

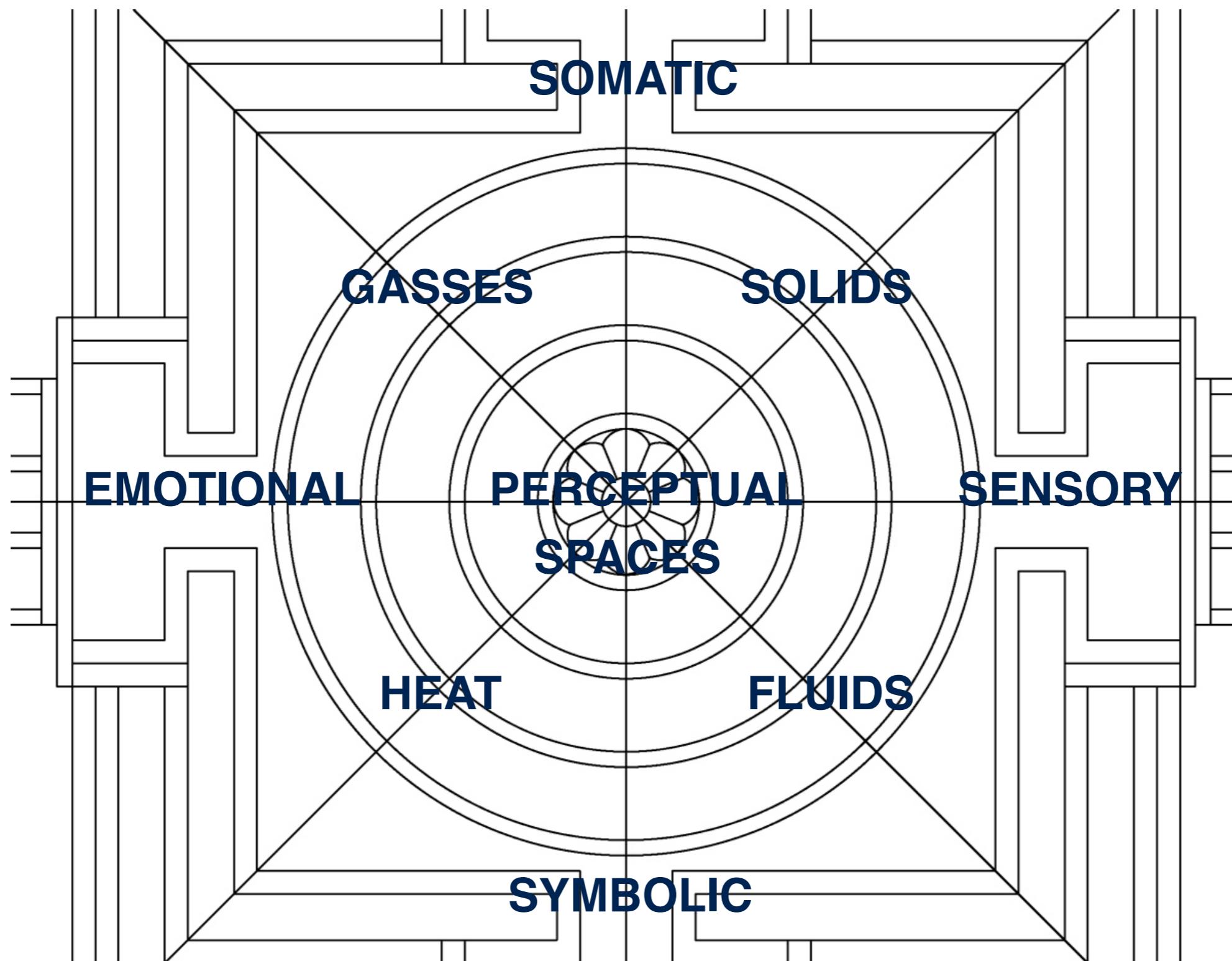


# Narrative Self-Transformation Revolves around Three Existential Nodes

- **Transforming death-like states** into paths to embody the realization that there is no fixed self or world
- **Transforming emergent transitions** into paths to embody the joyful expression of self-creation
- **Transforming fully developed life** into a path to embody the joyful energy and artistry of heroic altruism



# Basis: Traumatic Mind/Body Systems & Elements





# Path: The Eight Step Dissolution and Five Step Re-Emergence Process of Self-Transformation

## Eight-Step Dissolution

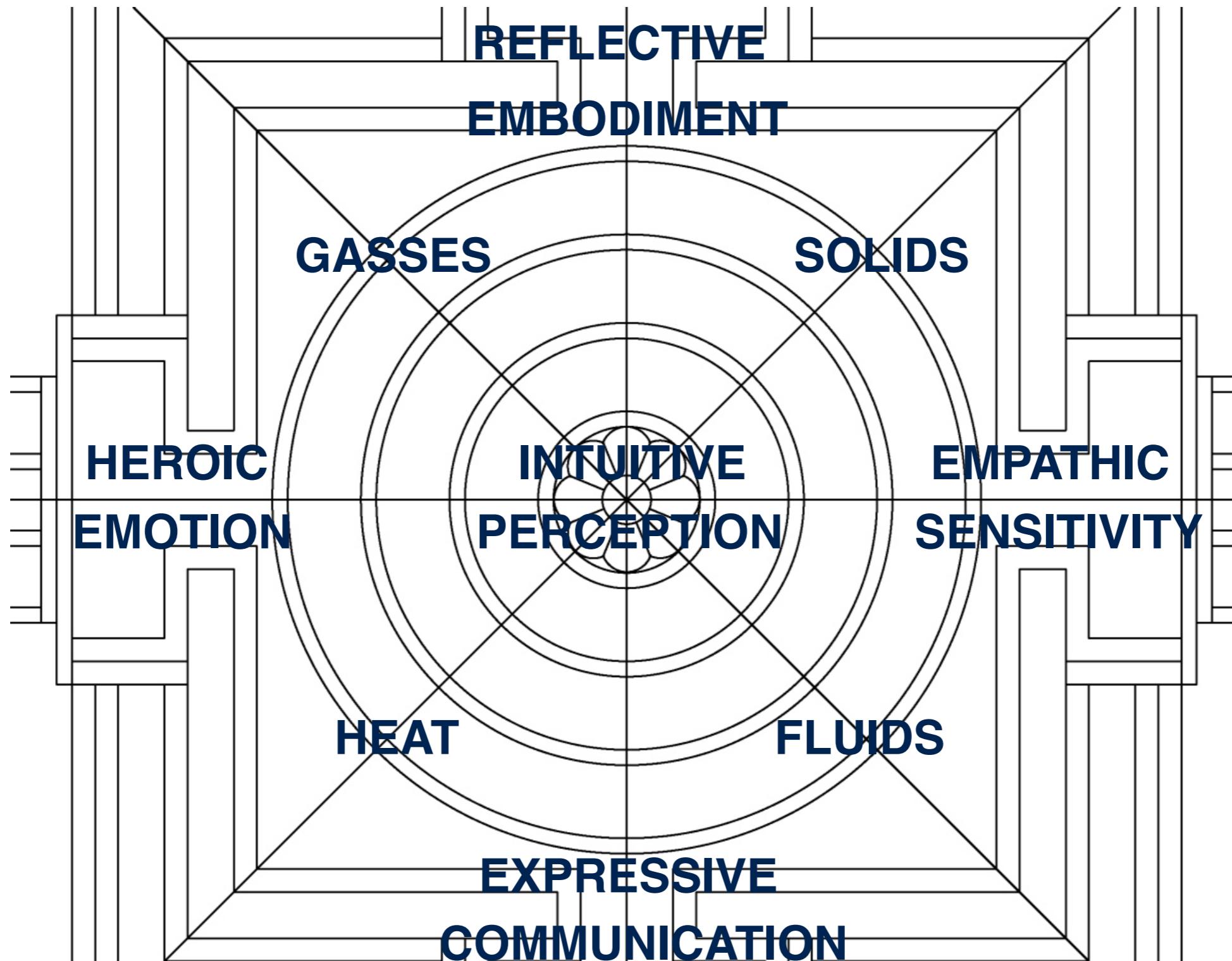
- Solids->Liquids, Mirage/Vision
- Liquids->Heat, Smoke/Hearing
- Heat->Gases, Sparks/Smell
- Gasses->Space/Taste & Touch
- Seeking>Moonlight/Luminance
- Guarding->Twilight/Radiance
- Isolating->Midnight/Immanence
- Openness->Predawn/Translucency

## Ten Step Re-Emergence

- Deep Space
- Cosmic Wind
- Solar Heat
- Planetary Water
- Fertile Land
- Moonlight
- Sunlight
- Spirit Meme
- Hero Symbol
- Hero Archetype



# Result: Lucid Blissful Systems & Elements



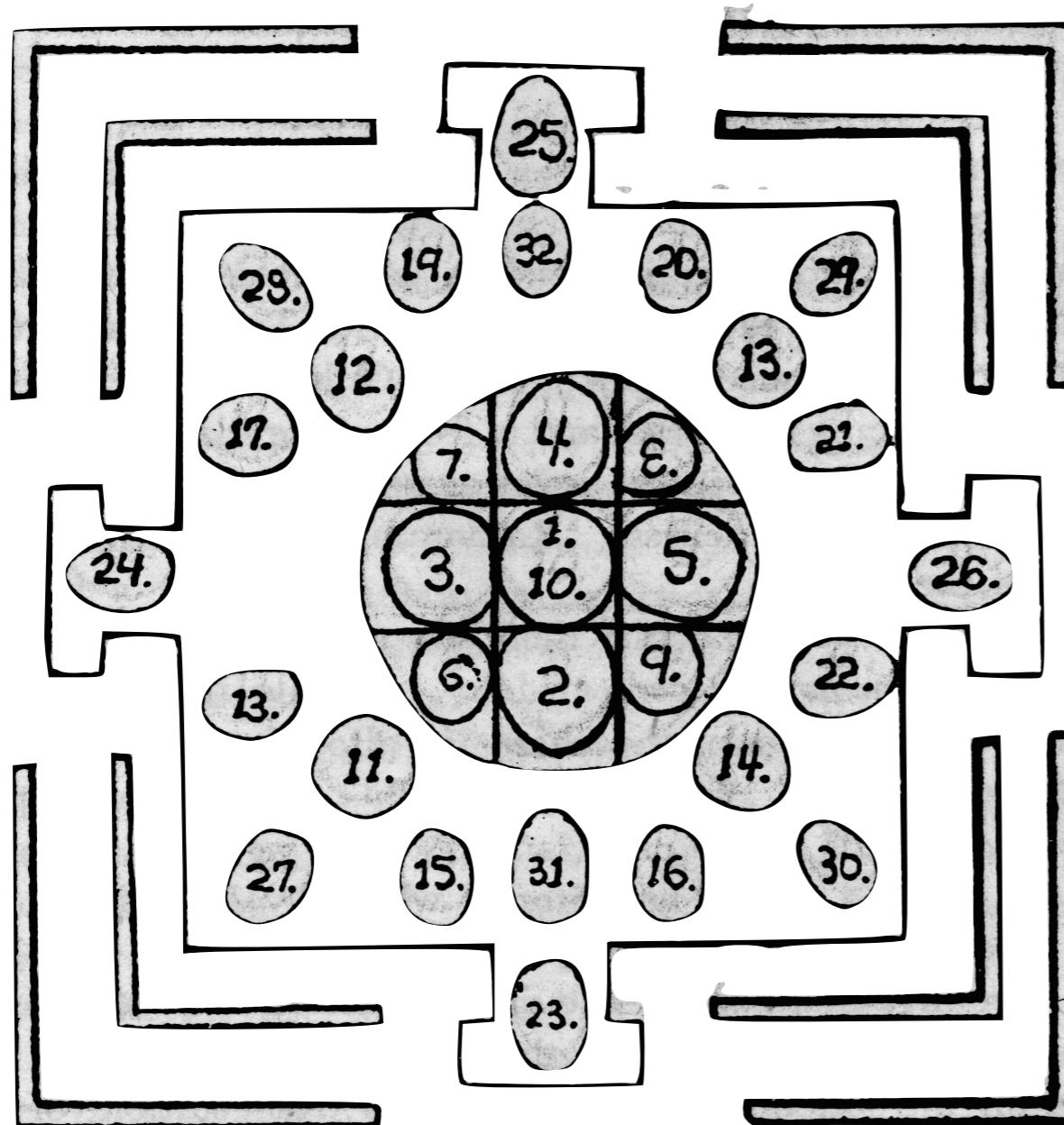


# Embodied Contemplative Practices Integrate Self-Transformation in an Alchemical Way

- When role-modeling imagery and narrative have been internalized, the work enters the *integration stage*
- To prepare the way for bottom-up work, this stage begins by installing mentor family/memes in the body
- Now the dissolution process (simulating death) is primed by breath holding, w/ or w/o erotic imagery
- Breath holding is accentuated by upper and lower “breath-locks” helping to elicit the diving reflex
- Psychic “kindling” is achieved by priming dorsal vagal and sympathetic afferents to induce a mixed flow state



# Body Mandala: Making the Mind/Body Process a Crucible for Transforming Trauma to Bliss



1-10 = Icons of the Five  
Mind/Body Systems  
and States of Matter

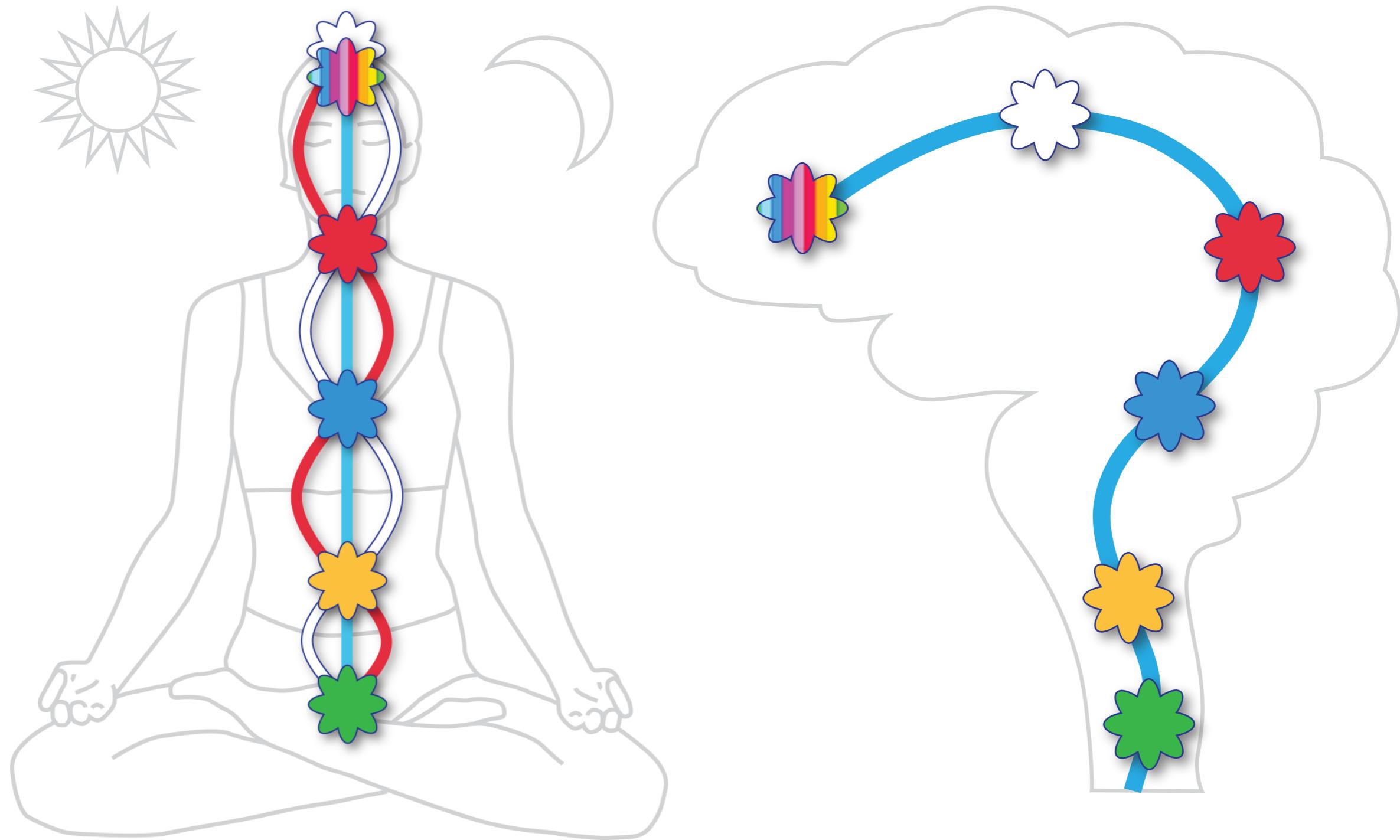
11-14 = Icons of the Five  
Sensory Objects

15-22 = Icons of the Eight  
Sensory Faculties

23-32 = Icons of the Ten Motor  
Functions



# Bottom-Up Embodied Practices Use Yoga's Interoceptive Map of the Central Nervous System





# If the Indic subtle body maps the CNS, why so different from our brain map?

## Subtle Body Map

- first/second-person, qualitative
- virtual, functional map
- for self-care and self-regulation
- maps network at end organ synapse
- to live better in one's own body

## Brain Map

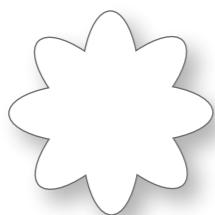
- impersonal, quantitative
- gross anatomical
- for mechanical intervention
- maps at central cell body
- to diagnose and treat others



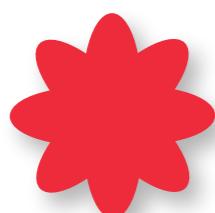
# How are the primary circuits characterized?



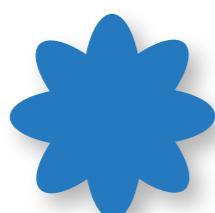
**Command Hub** behind the forehead,  
6 control elements align with PFC



**Thousandfold Bliss Hub** under the crown,  
32 sensorimotor elements align with neocortex



**Pure Enjoyment Hub** behind the throat,  
16 mood state elements align with limbic system



**Truth Hub** behind the heart, 8 reward and appetite  
elements align with midbrain



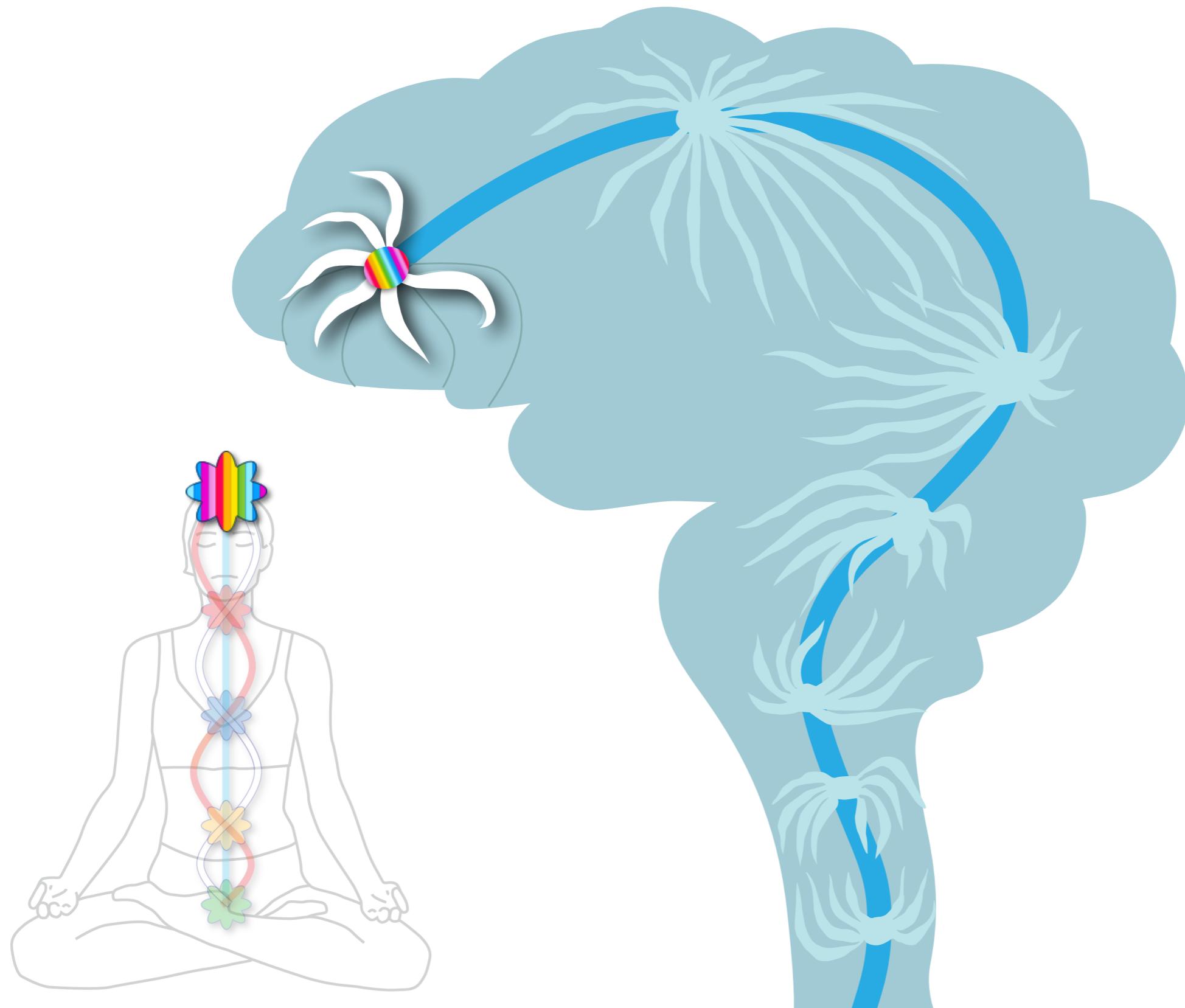
**Embodiment Hub** behind the navel,  
64 vital energy elements align with pons



**Secret Hub** within the sexual organ,  
32 life support elements align with medulla

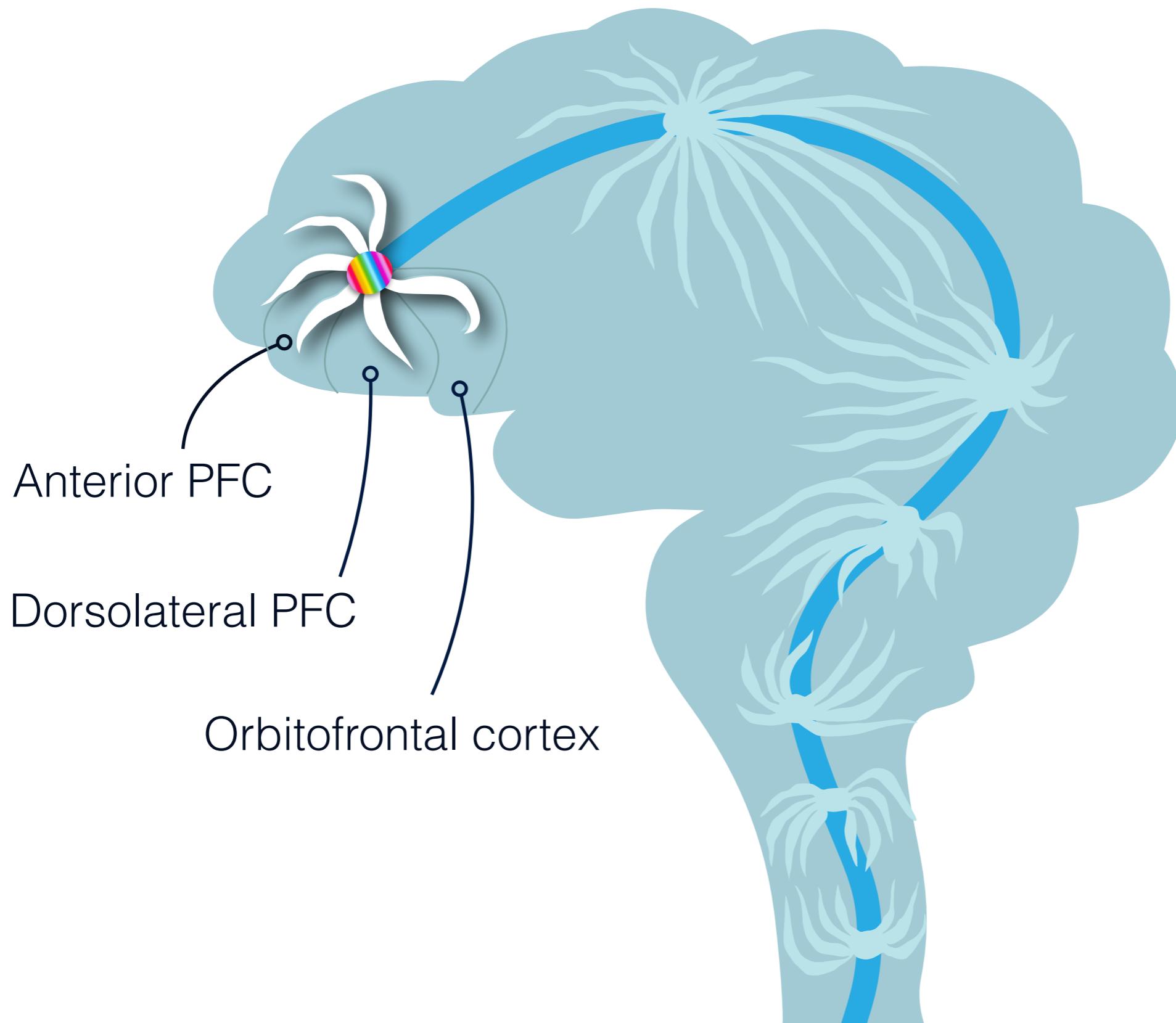


# Command Hub



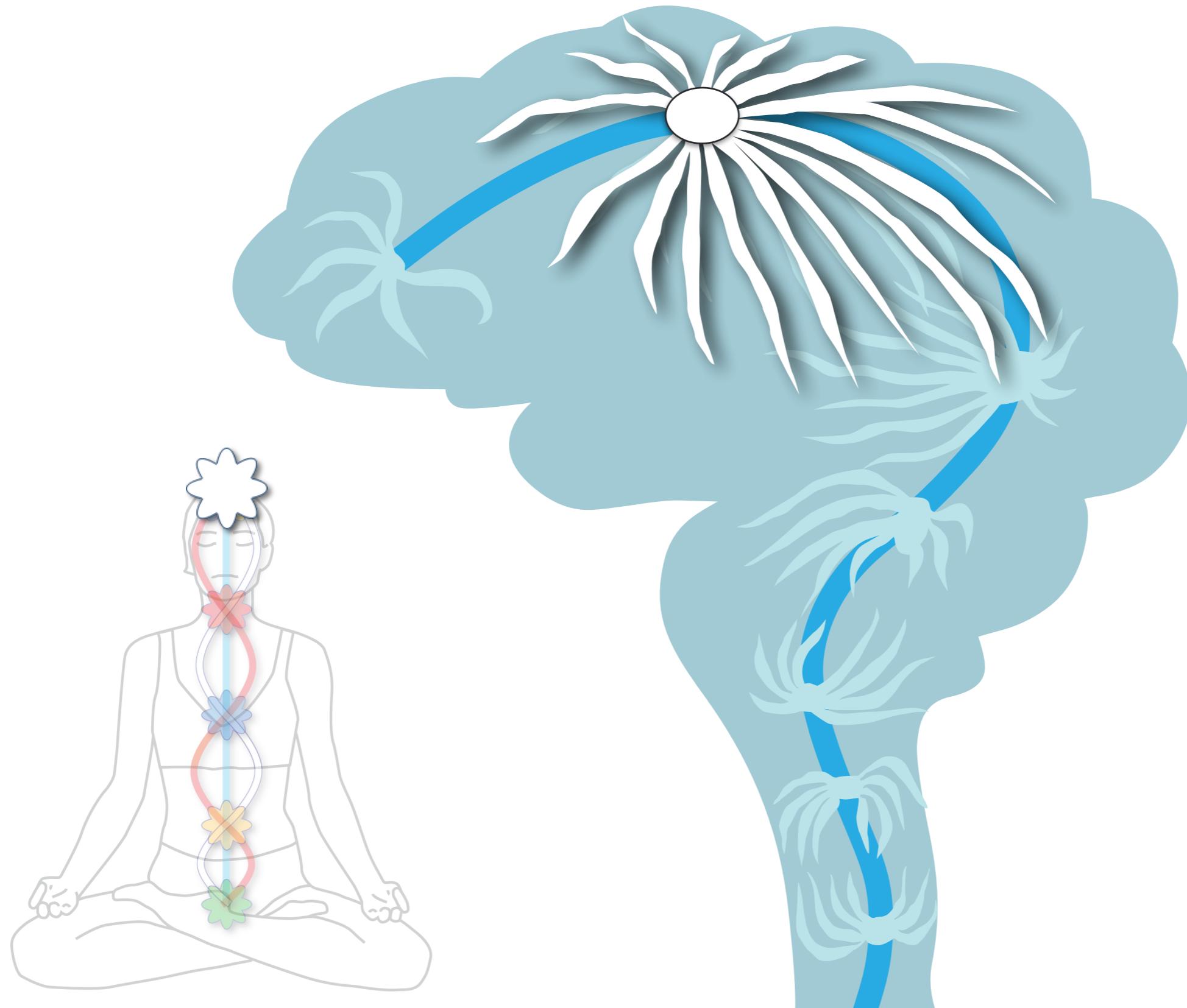


# Command Hub



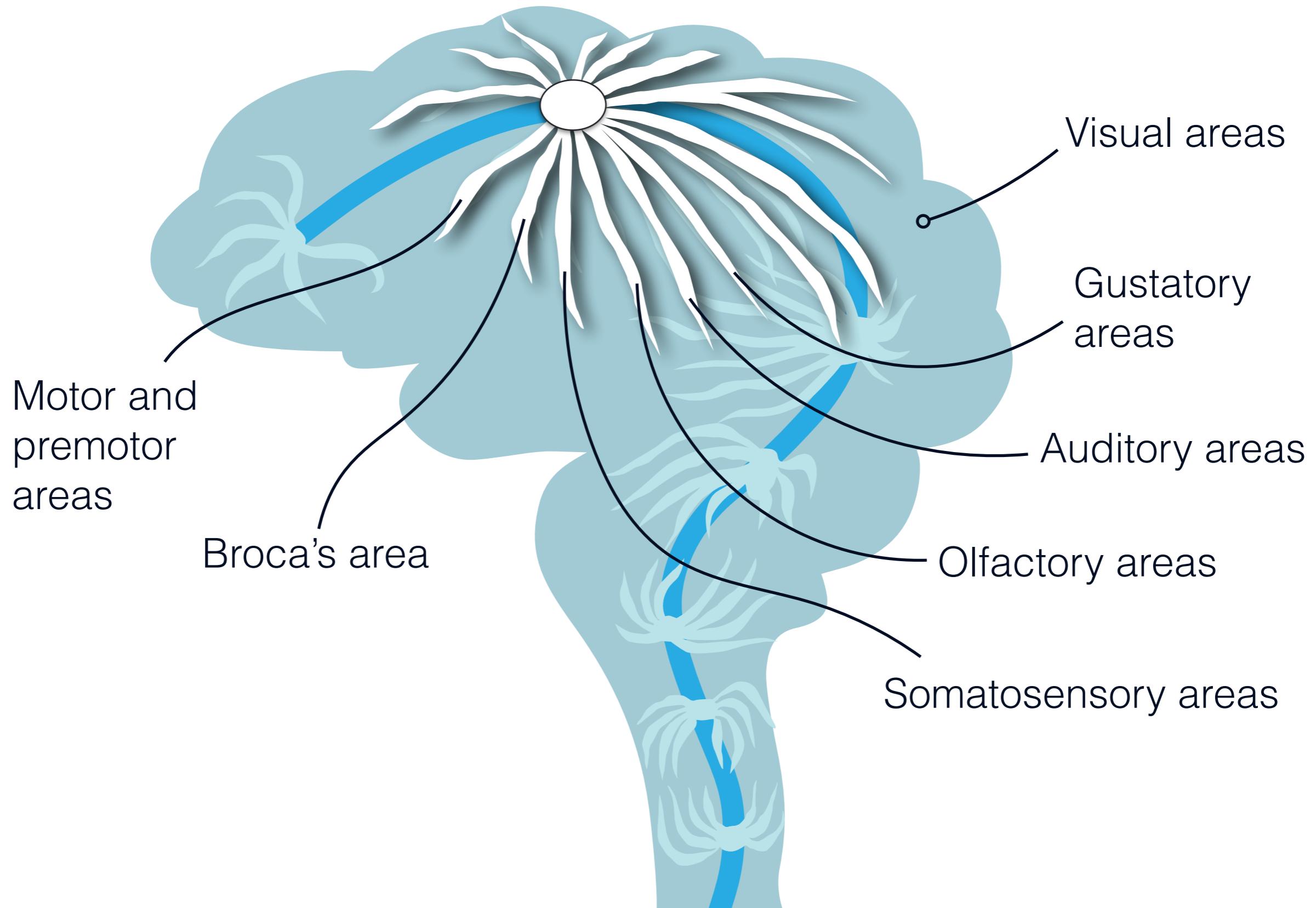


# Thousandfold Bliss Hub



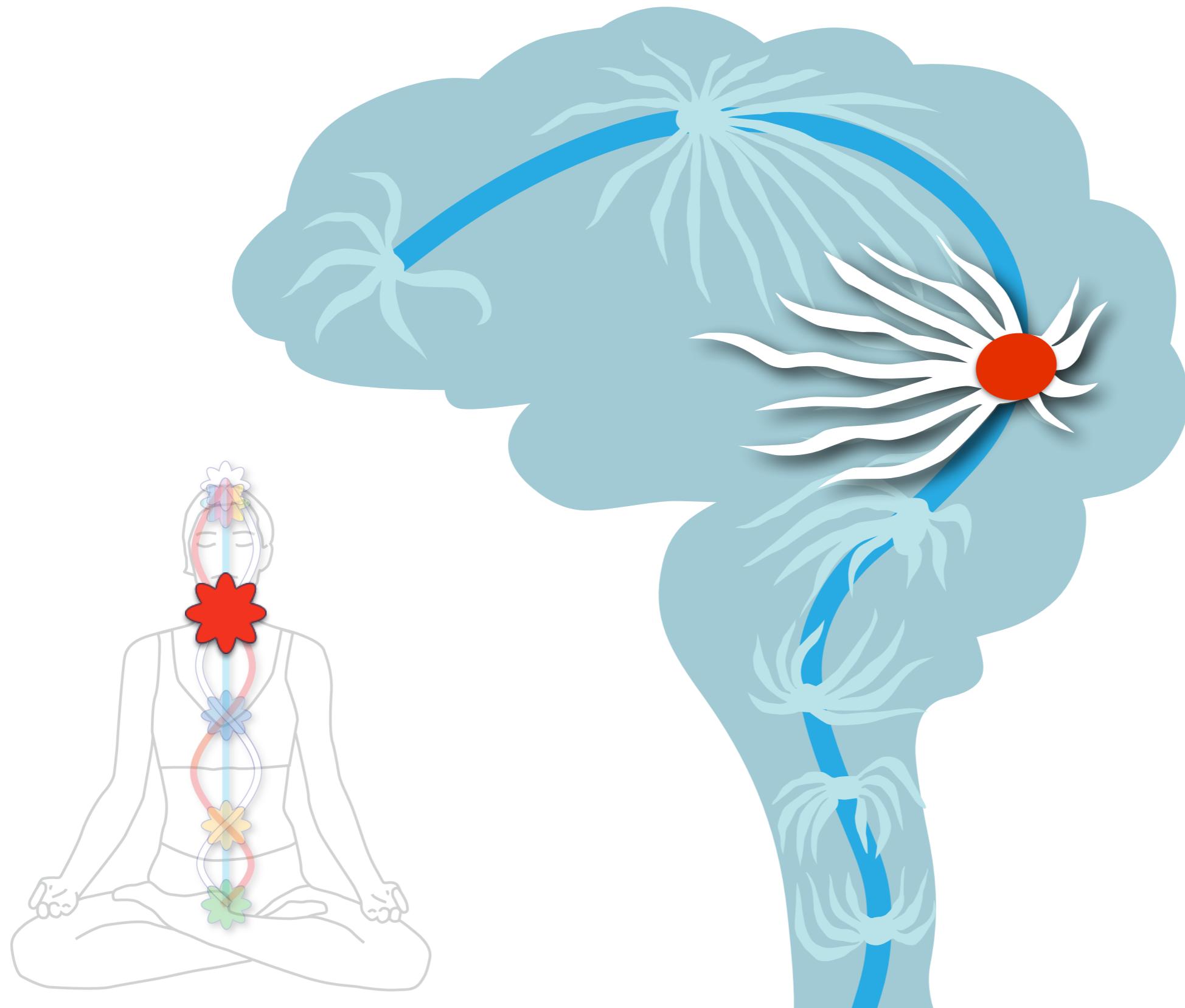


# Thousandfold Bliss Hub



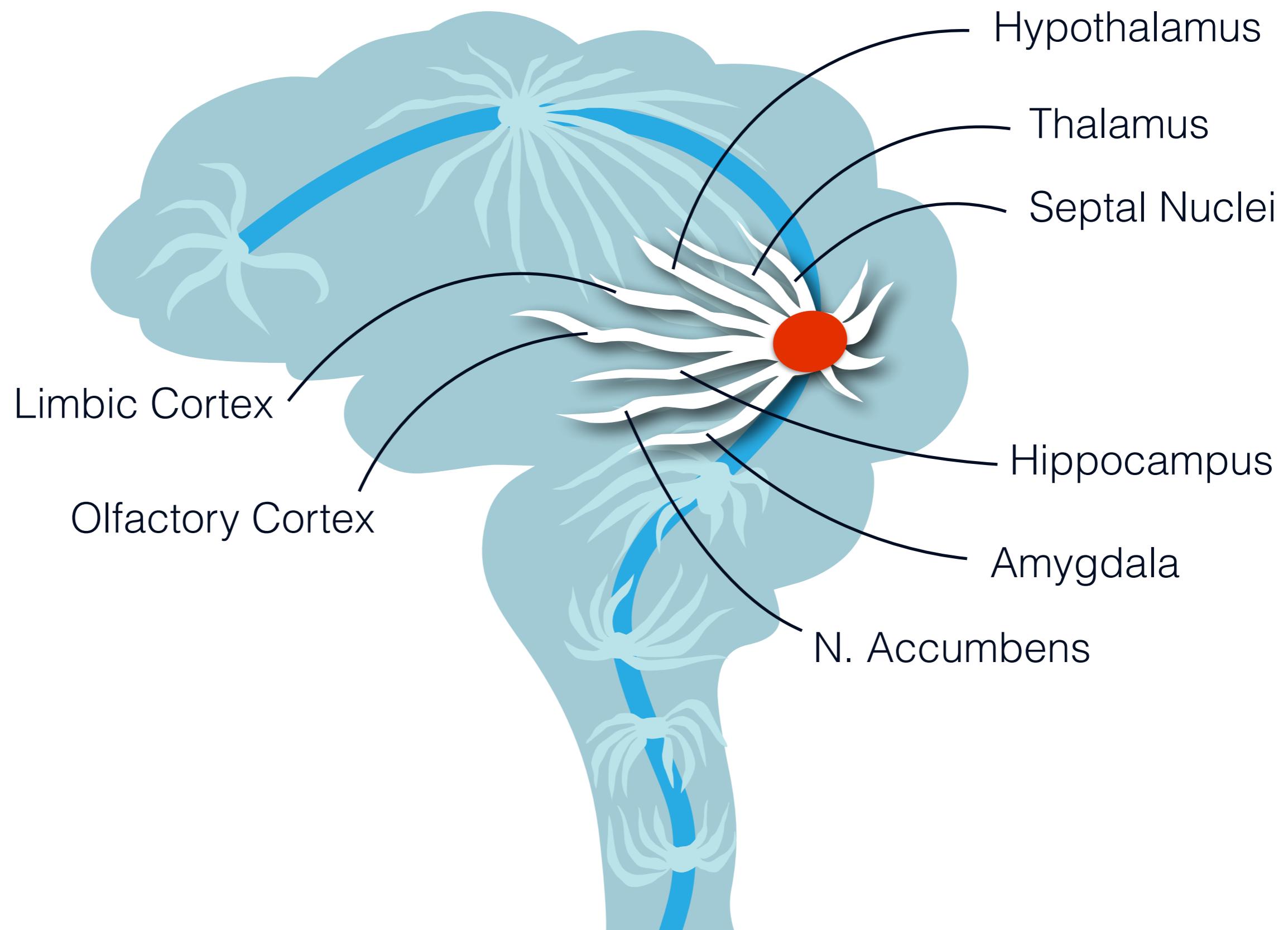


# Pure Enjoyment Hub



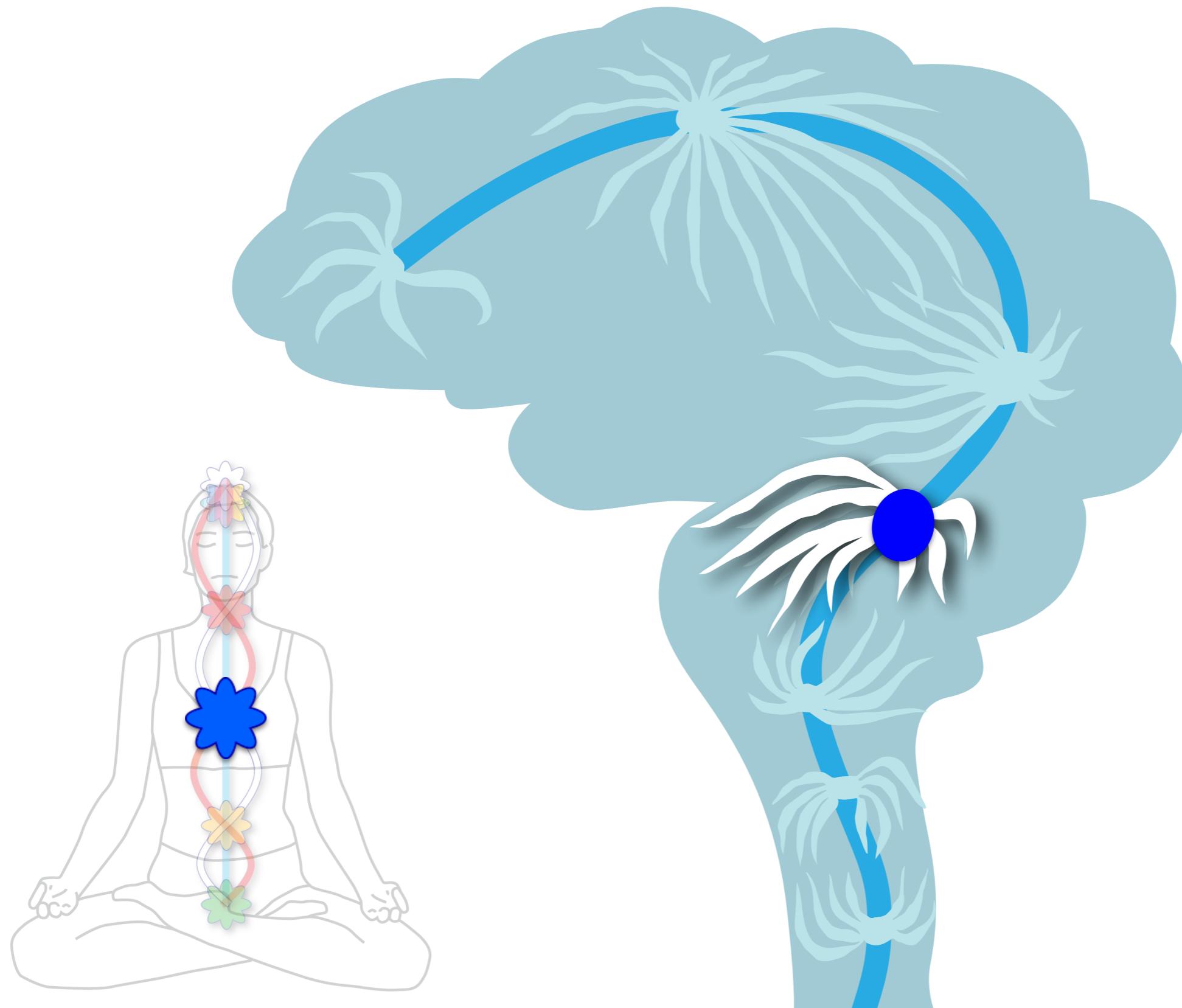


# Pure Enjoyment Hub



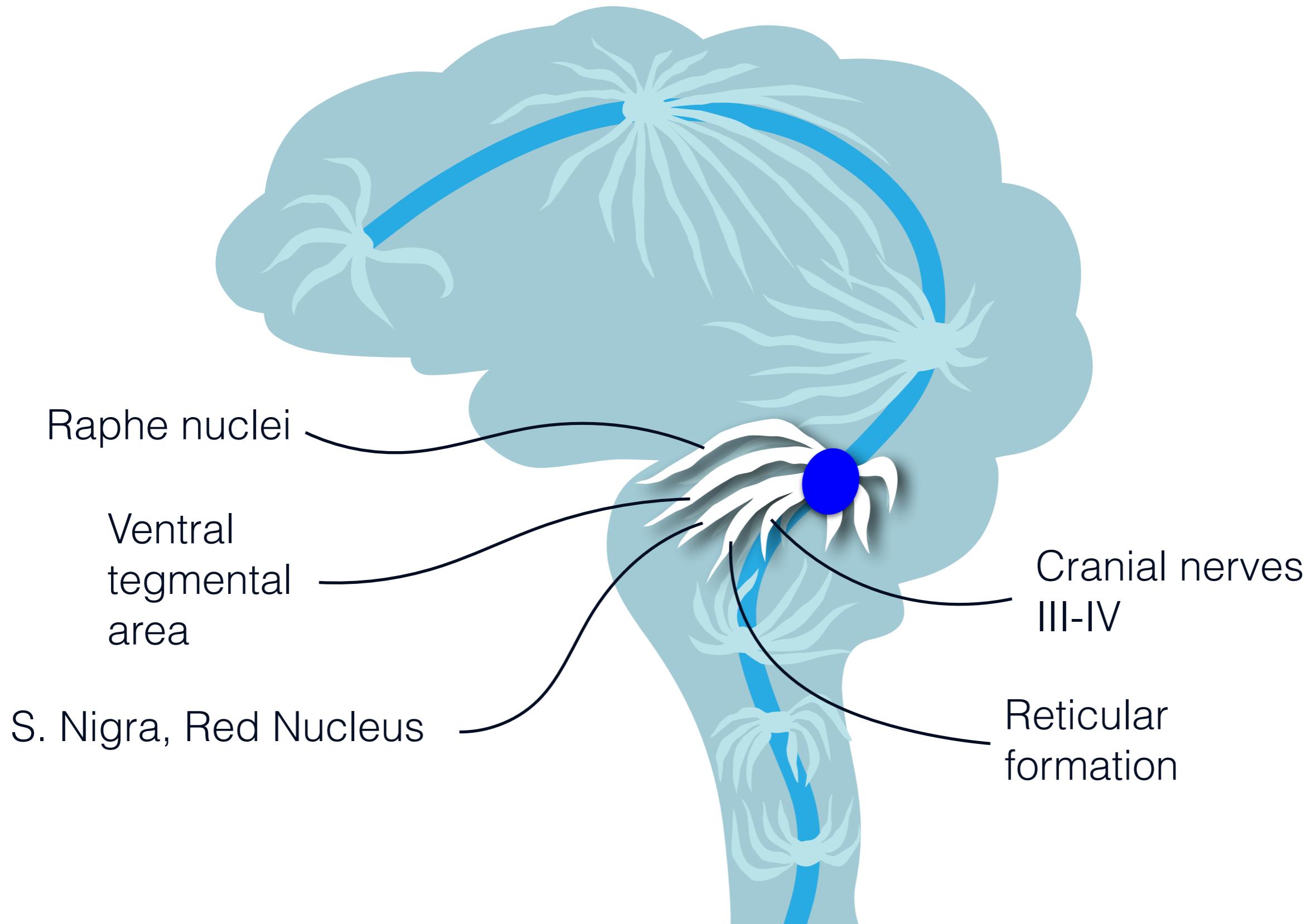


# Primal Truth Hub



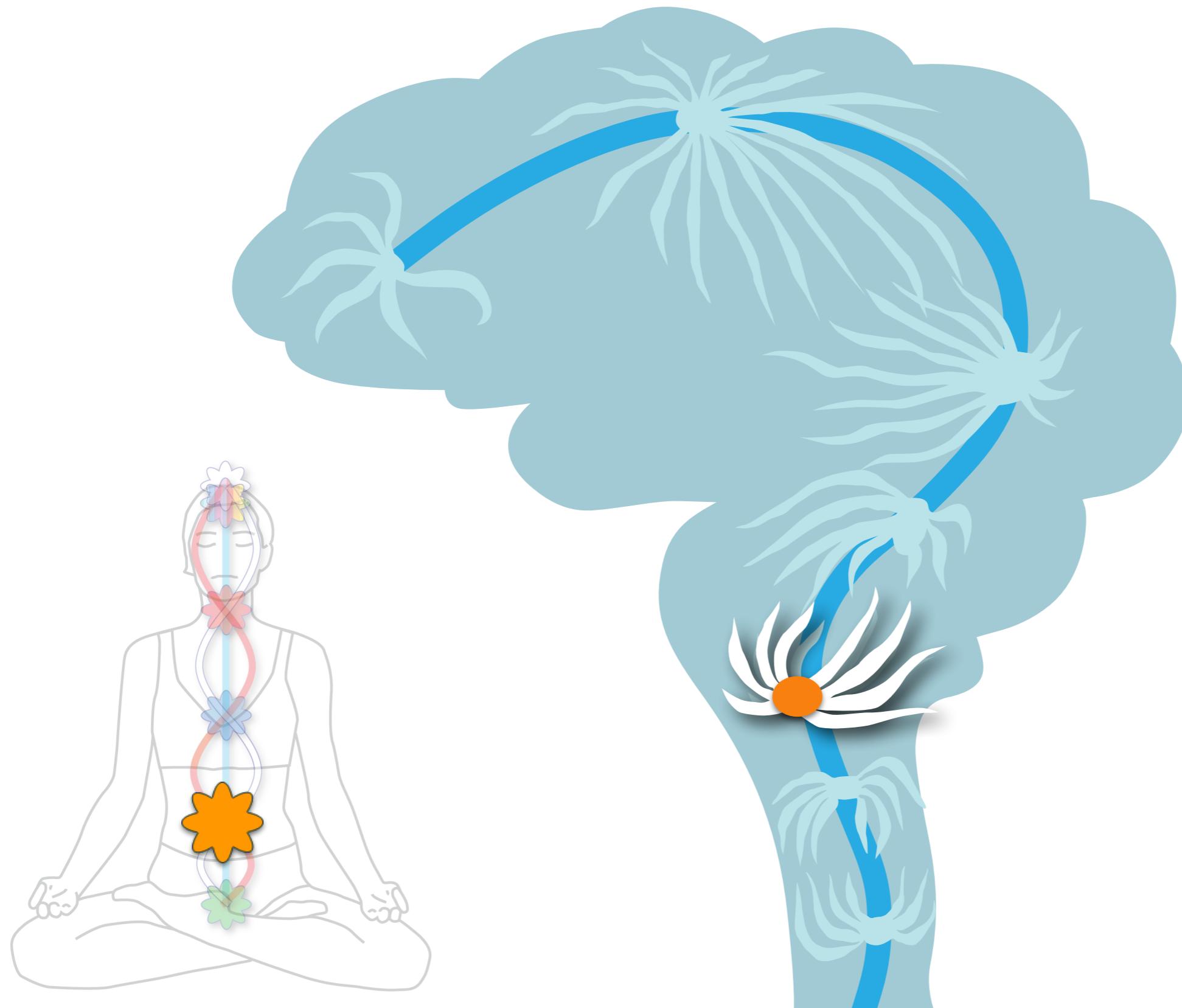


# Primal Truth Hub



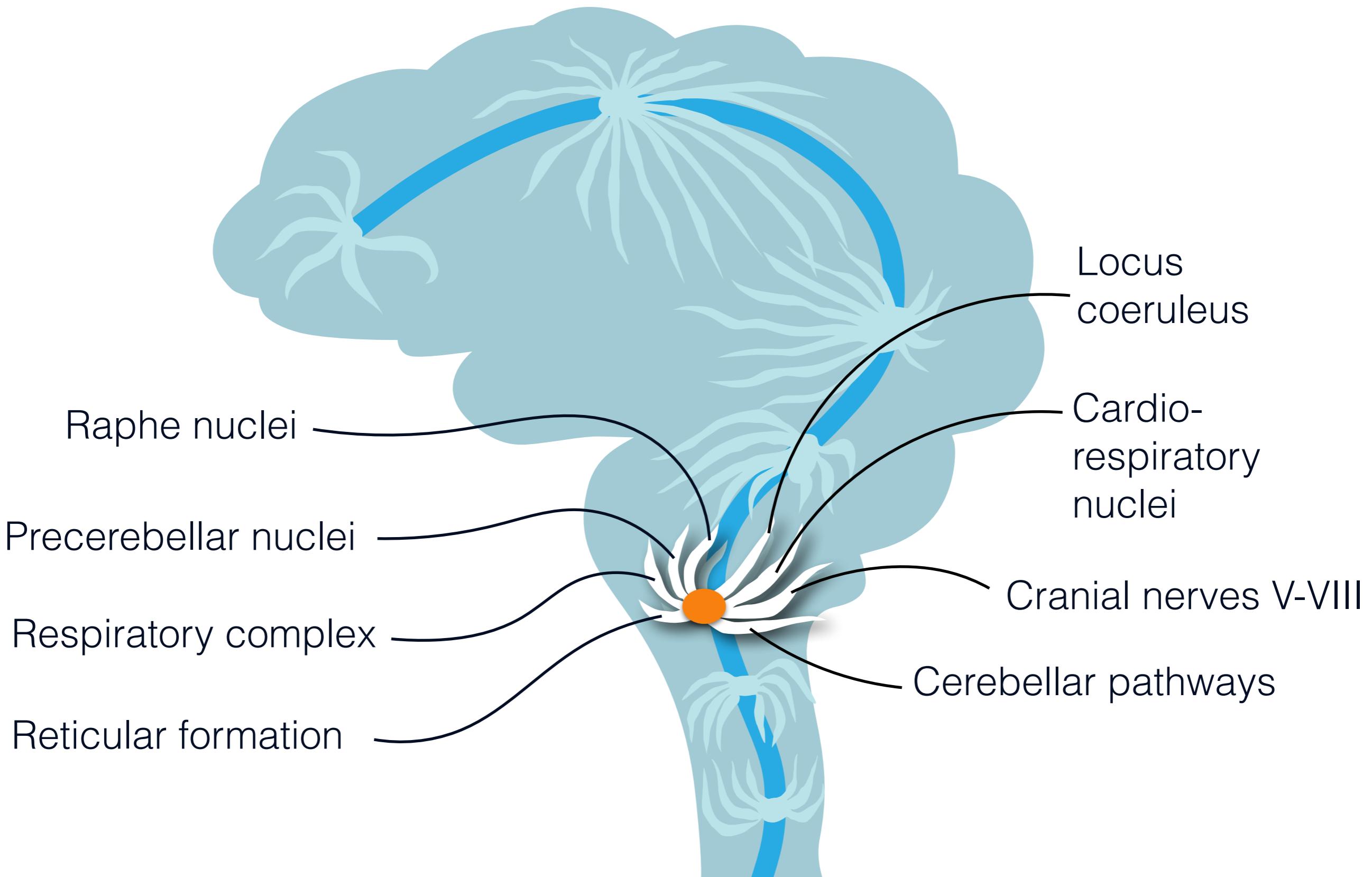


# Embodiment Hub



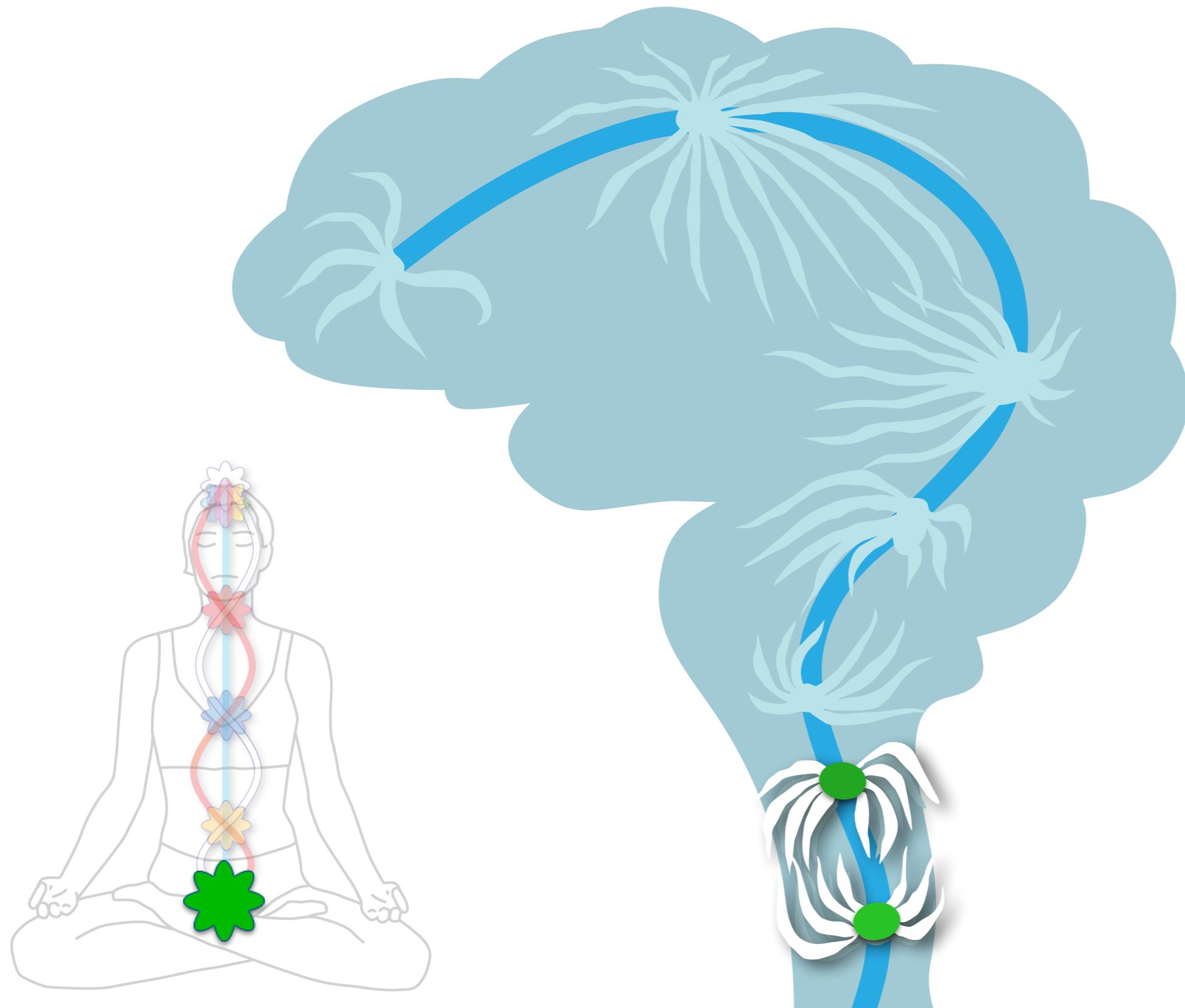


# Embodiment Hub



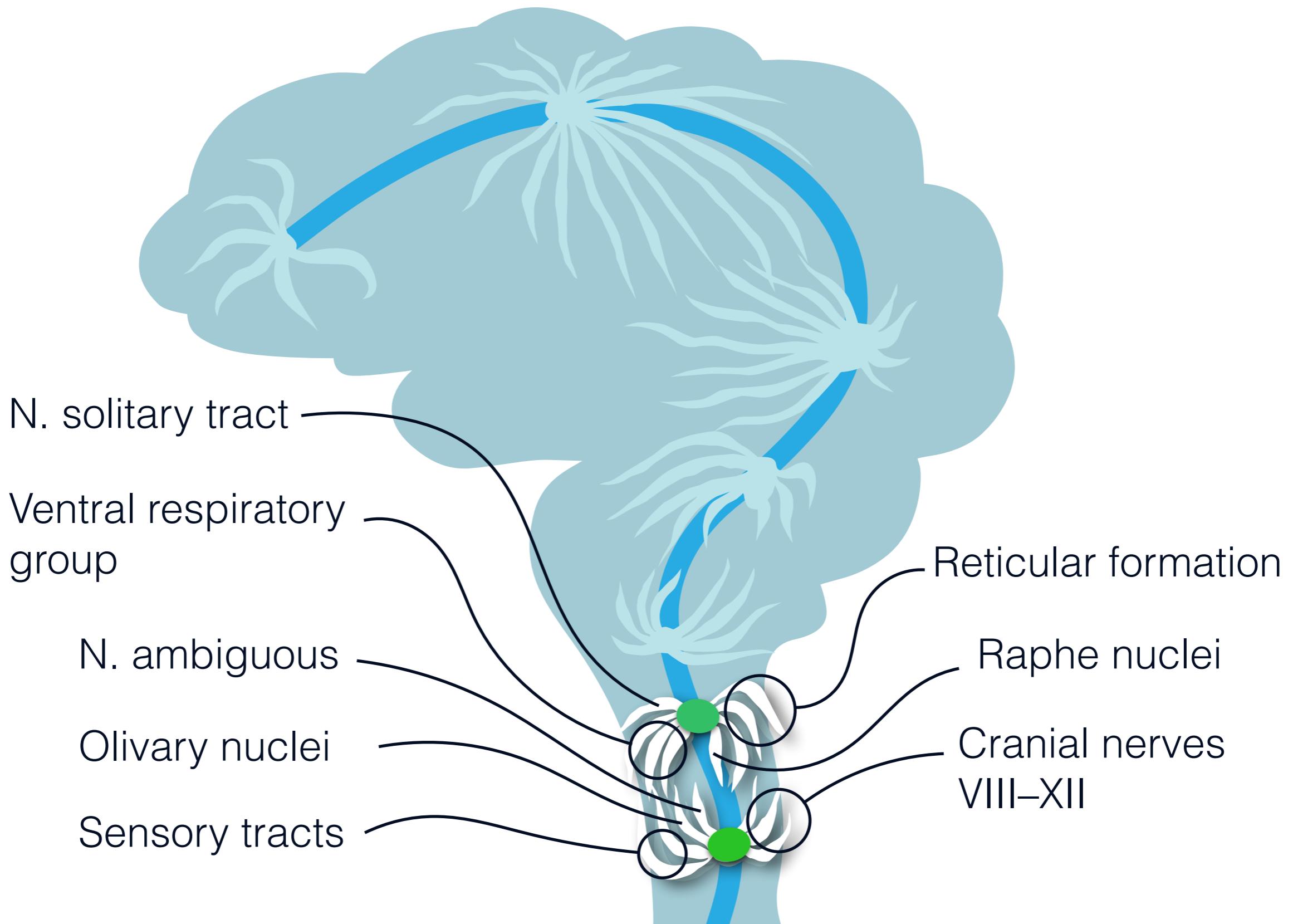


# Secret Sexual Hub





# Secret Sexual Hub





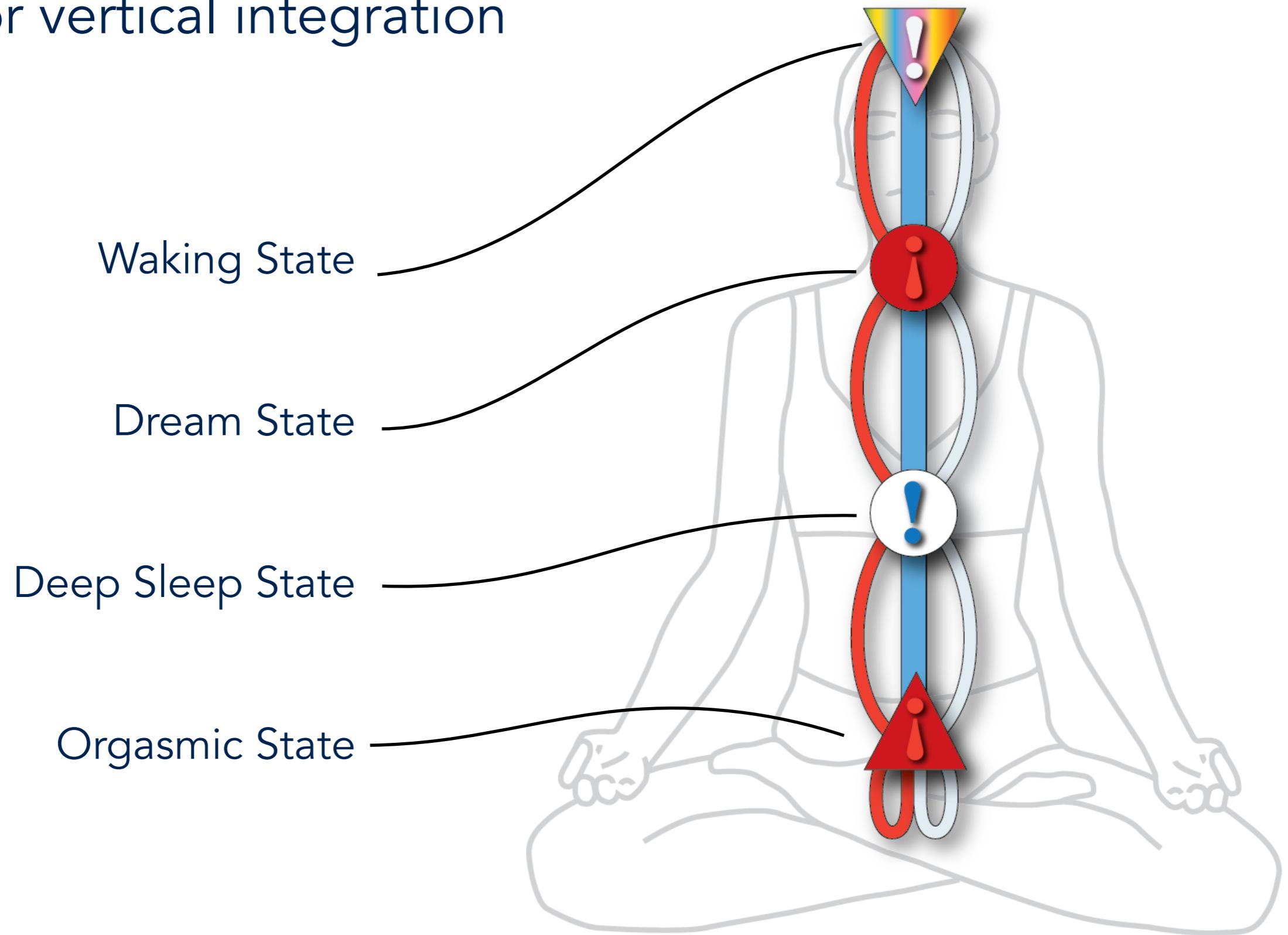
# How the subtle body maps *vertical* integration

- It maps four states of consciousness as a hierarchy onto successive circuits of neuraxis
- More differentiated, higher states mapped rostrally, undifferentiated, primal states caudally

<b>Self-Regulation Level</b>	<b>Mind-Training Practice</b>	<b>Conscious Level</b>	<b>Neural Level</b>
Cognitive	Mindfulness	Waking State	Neocortical
Emotional	Compassion	Dream State	Mesolimbic
Intuitive	Imagery-Prosody	Sleep State	Mesopontine
Embodied	Breath-Control	Orgasmic State	Medullary



# Subtle body map of mind states for vertical integration





# How the subtle body maps *lateral* integration

- As the self-regulation of polar left and right side channels with integral central channel
- Side channels parallel neuraxis, map sympathetic-parasympathetic balance
- Central channel maps smart vagus and integrative reward and activation networks

Level of Integration	Mind-Body Practice	Dichotomy	Neural System
Coarse Mind/Body	Alternate Nostril	Approach/Avoid	L/R Neocortex
Subtle Mind/Body	Breath-Holding	Relax/Stress	Limbic SNS/PNS
Subtlest Mind/Body	Breath of Fire	Pleasure/Pain	Core Reward/Drive
Whole Mind/Body	Diamond Breathing	Whole/Split	Mind/Body Rhythms



# Subtle body map of the ANS for lateral integration

## Central

Androgynous Channel

Called "Midnight," "Released"

Smart Vagal Control of ANS

## Right Dominant

Feminine Channel

Called "Solar," "Luscious"

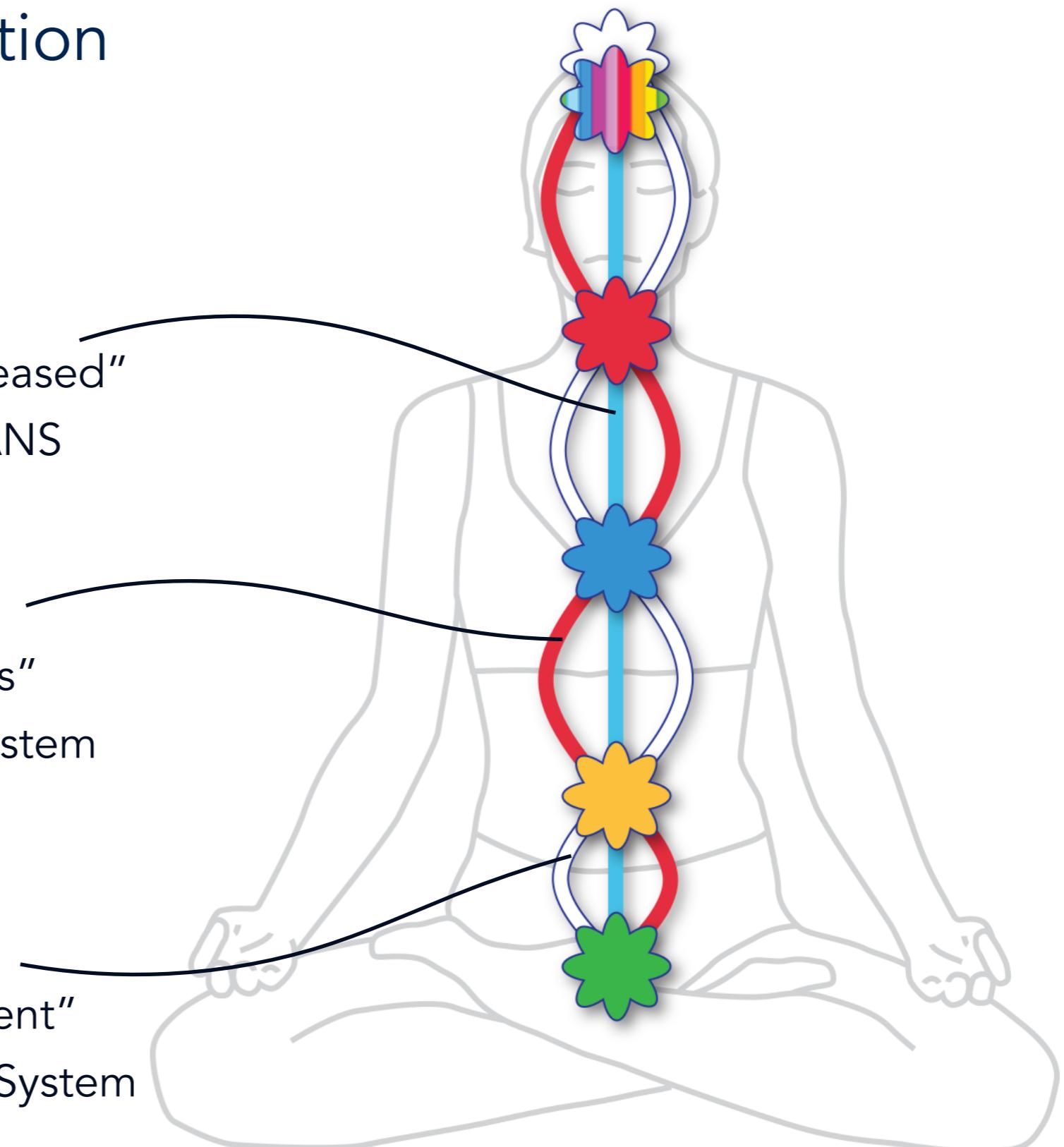
Sympathetic Nervous System

Left Dominant

Masculine Channel

Called, "Lunar," "Succulent"

Primitive Vagal Nervous System





# Subtle body map of five mind/body energy circuits

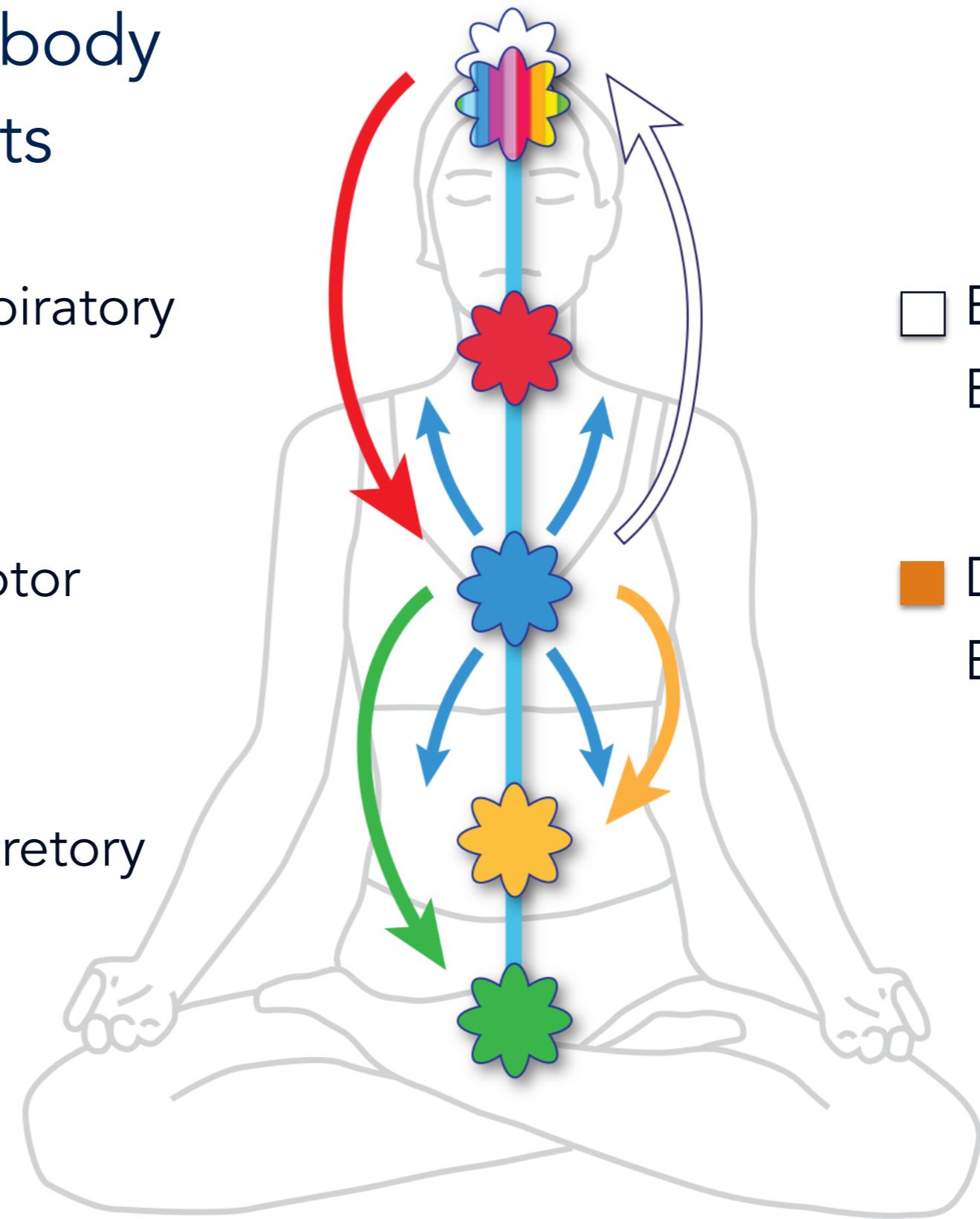
■ Cardiorespiratory Energy

■ Sensorimotor Energy

■ Genitoexcretory Energy

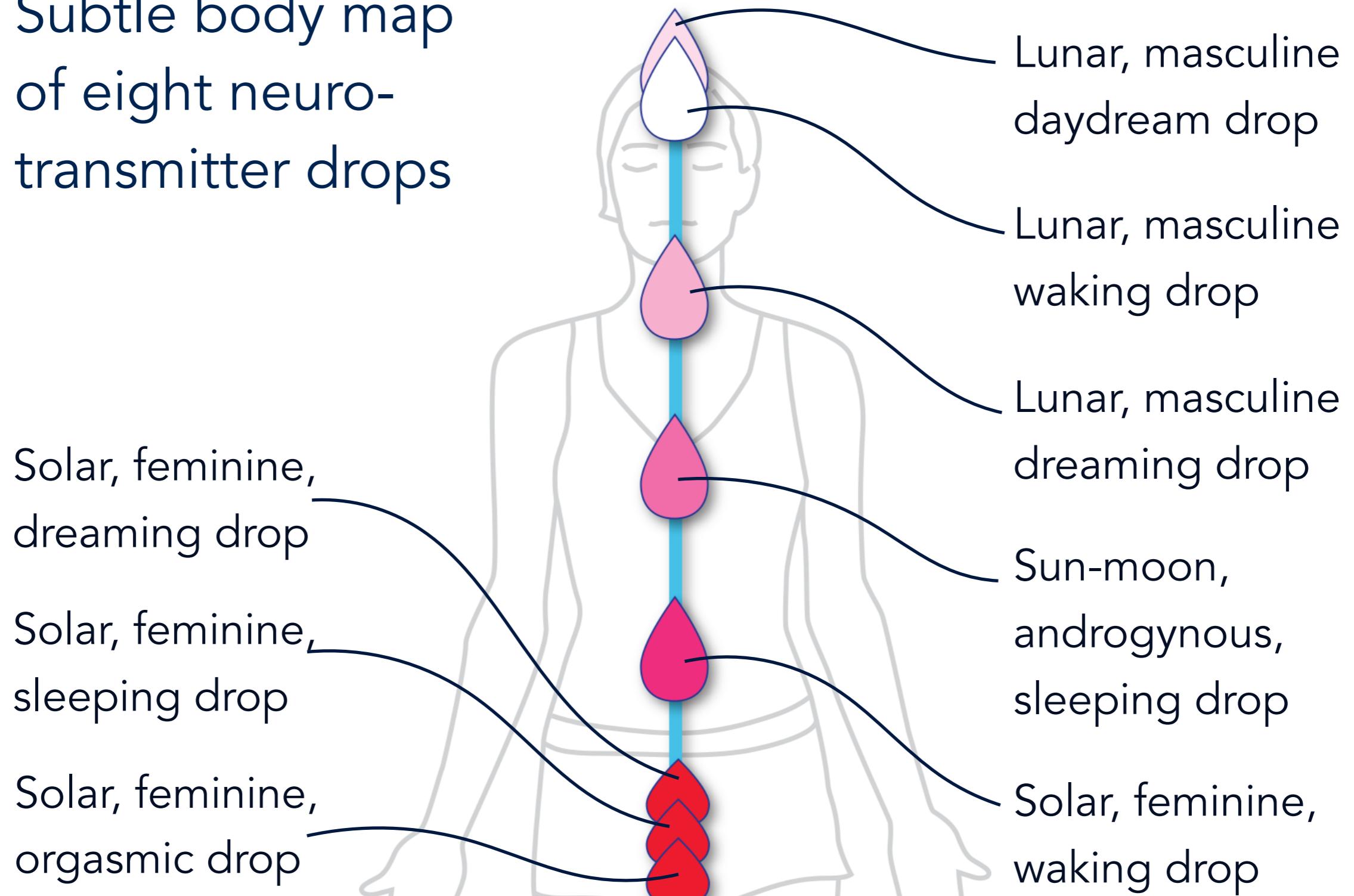
□ Expressive Energy

■ Digestive Energy





# Subtle body map of eight neuro- transmitter drops





# How the subtle body maps neural plasticity and integration

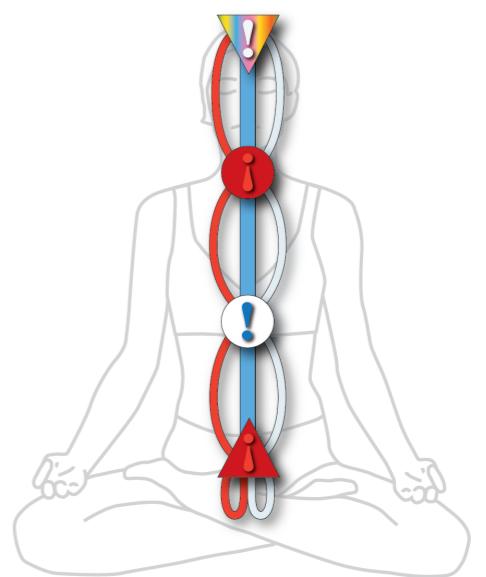
- Loosening and releasing stress-reactive wiring patterns called “knots”
- Akin to Reich’s “character armor” and Lowen’s “bioenergy blocks”
- Seen as “atomic, subtle material structures” ingrained by reactive habit-patterns
- “Knots” block electrochemical flow within integrative reward and activation pathways





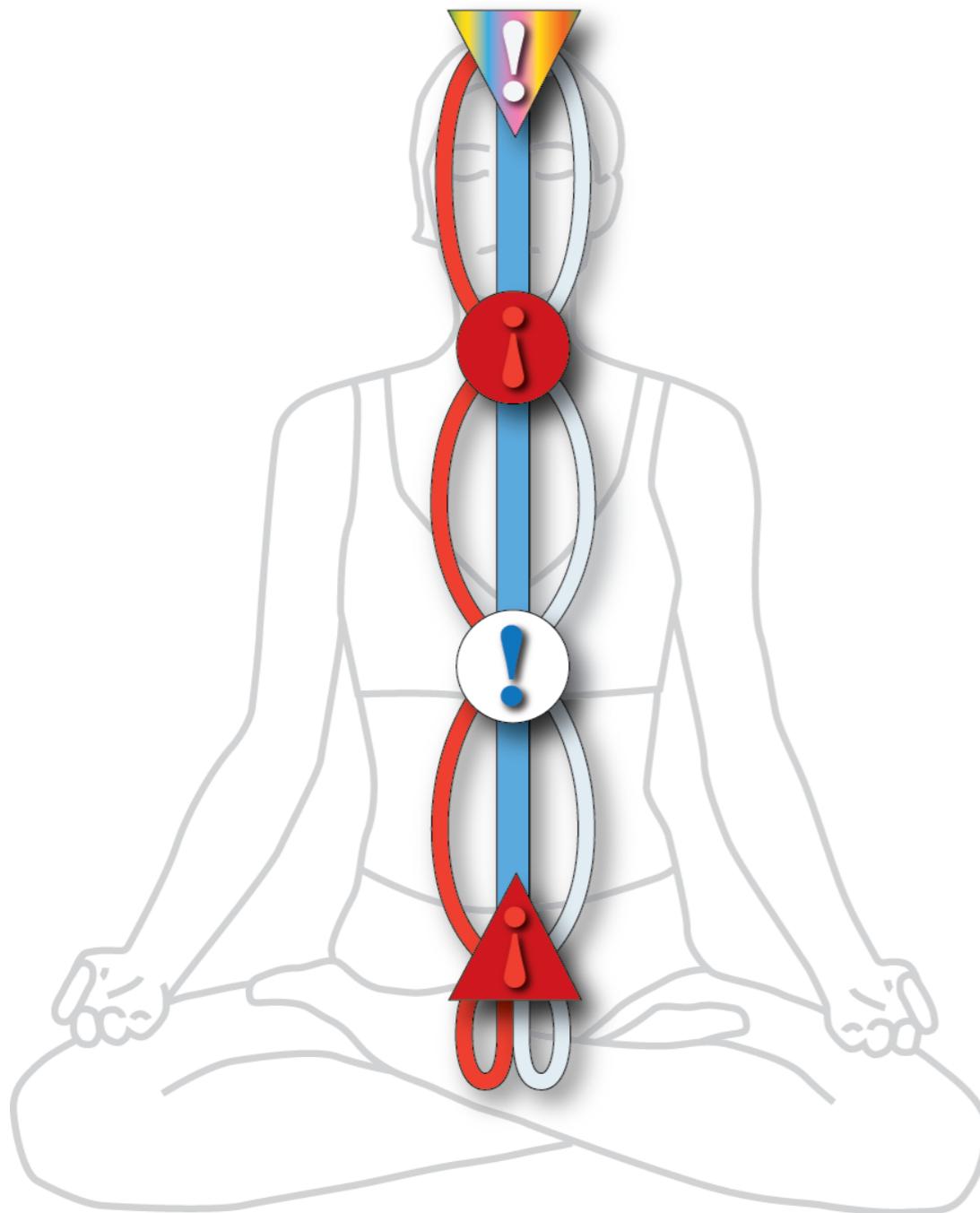
# How the subtle body maps neural plasticity and integration

- By mindfulness, concentration, wiser choices, and repeated practice
- Habit-patterns dematerialized and knots unravelled, releasing flow
- Mind and nervous system rewired for self-regulation and integration





# CNS Mandala: Installing Mentor Archetype Memes to Guide Breath-Induced Flow

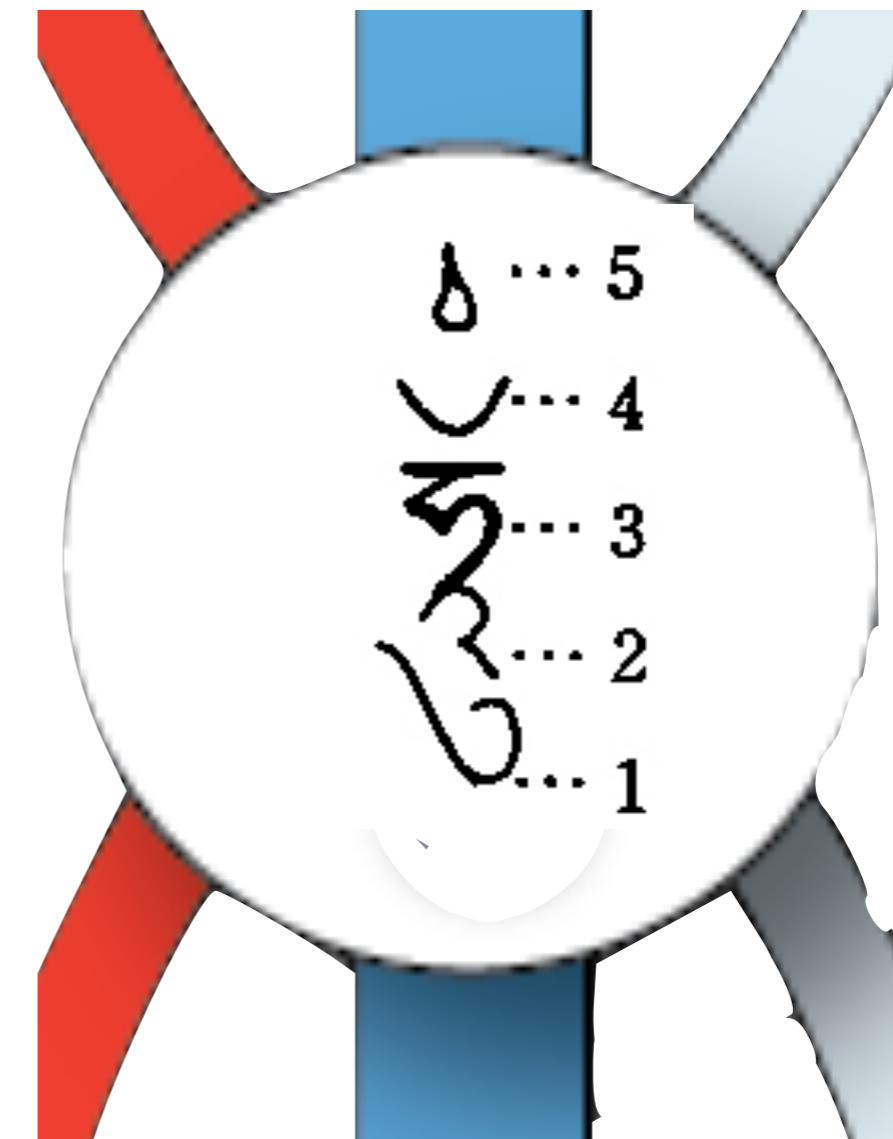


- **Lucid Mind Meme** sends calming lunar bliss chemistry from crown
- **Blessed Speech Meme** sends solar warmth up to melt Mind Hero
- **Open Heart Meme** sends mixed sun-moon bliss chemistry from heart
- **Embodied Passion Meme** sends solar fire up to kindle bliss network



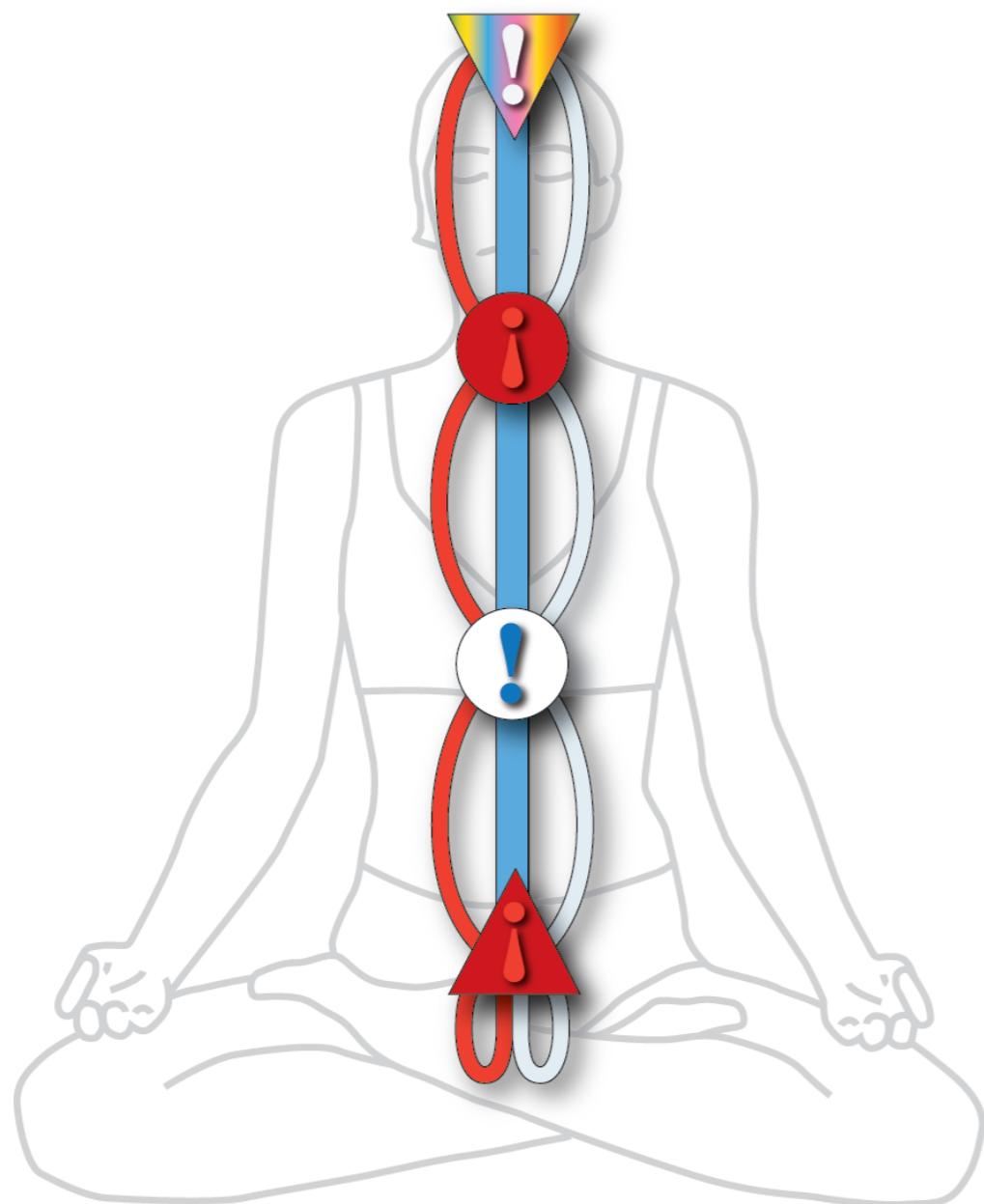
# Meme Mandala: Harnessing All Five Mind/ Body Energies to Open Hearted Self Meme

- **5. Intuitive Heart Breath**
- **4. Reflective In-Breath**
- **3. Expressive Out-Breath**
- **2. Empathic Gut Breath**
- **1. Heroic Root Breath**





# Drop Mandala: Breath-Induced Flow Unlocks CNS, Taps the Core Network of Lucid Bliss-Openness



- **Deep abdominal breath-holding w/ locks** kindles a mixed ANS flow state
- **Bottom-up rush** deepens top-down vagal tone to blissful immobilization
- **Deeper dissolution** taps the core network of orgasmic bliss chemistry
- **Heartfelt emergence** harnesses bliss energy/chemistry to heroic core self

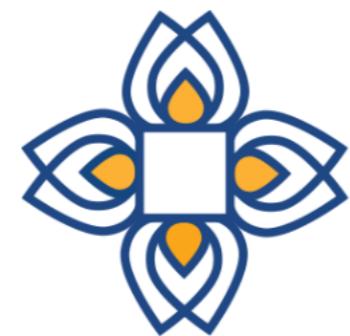


# Can Embodied Contemplative Practices Accelerate Resilience Training and Trauma Recovery?

**Joseph J. Loizzo\***

*Nalanda Institute for Contemplative Science and Weill Cornell Medical College, New York, NY, United States*

**Keywords:** resilience, trauma, mindfulness, imagery, yoga breathing, polyvagal theory, vagal tone, tantra



**Nalanda Institute**  
for CONTEMPLATIVE SCIENCE

[nalandainstitute.org](http://nalandainstitute.org)