

Review Article

Possible Role of Oxytocin during Meditation-Our Mission toward Oneness and Global Health

Toku Takahashi^{1,2*} and Remi Kanai³

¹Medical College of Wisconsin, Milwaukee, Wisconsin, USA

²Integrative Medicine, Clinic Toku, Nagoya, Japan

³Oneness Consciousness and Healing Institute, Japan

Abstract

Meditation is widely performed to promote self-awareness and to access the level of higher states of consciousness, transcending the ordinary mind. Various neuro-chemical responses occur in response to different styles of meditation in the central nervous system. Recently, meditation has moved away from its religious origin and became a part of mainstream to reduce stress and enhance well-being. However, this practice still has profound spiritual dimensions, connecting to universal peace and harmony. Oxytocin (OT) is produced in the hypothalamus and released into the systemic circulation from the pituitary gland, developing various social and emotional behaviors. OT is released during affectionate touch, hug, and sexual activity. People who meditate regularly report greater feelings of connection and empathy toward others, which is, at least in part, mediated by OT. The increased social connection can also create a positive feedback loop, increasing their capacity for empathy and connection. Recent research demonstrated that OT facilitates empathy by blurring the boundaries between self and others. This indicates that meditation-induced OT release could suppress the activity of cognitive brain areas, resulting in no boundaries between self and others. The concept of Oneness is a fundamental idea observed in various spiritual traditions. It refers to the interconnectedness and unity of all existence, showing that everything in the world/universe is part of a single whole. Once OT levels increase, people feel more empathetic, compassionate, and attuned to others' emotions, which are essential

*Corresponding author: Toku Takahashi, Integrative Medicine, Clinic Toku, Nagoya Chamber of Commerce & Industry Building 11F, Sakae 2-10-19, Nagoya City, Japan, Tel: +81 08015982585; E-mail: ttakahashi58@gmail.com

Citation: Takahashi T, Kanai R (2025) Possible Role of Oxytocin during Meditation-Our Mission toward Oneness and Global Health. J Altern Complement Integr Med 11: 546.

Received: January 17, 2025; Accepted: January 27, 2025; Published: February 03, 2025

Copyright: © 2025 Takahashi T, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

elements of Oneness. Group practices of meditation can enhance the flow of energy and create a shared experience of Oneness. Engaging with the energy body can help individuals transcend the ego, which often produces a false sense of separation. This promotes feelings of unity and interconnectedness, aligning with the principles of Oneness, and helps to prevent war, violence, and stress in society.

Keywords: Bain function Buddhism; Compassion; Consciousness; Empathy; Energy body; Love; Loving Kindness Meditation (LKM); Mindfulness; Spiritual; Transcendence Meditation (TM); Temporo-Parietal Junction (TPJ)

Introduction

Meditation is popular because it promotes self-awareness and inner tranquility. It has been shown that different types of meditation, including, mindfulness [1,2], loving-kindness meditation (LKM) [3,4], and transcendental meditation (TM) [5,6] cause diverse neurochemical reactions in the brain. Meditation is used to reach higher realms of awareness and transcend the ordinary mind in many spiritual traditions. In Asia, meditation has been used for thousands of years as a spiritual discipline. Many people view this inward focus as a springboard for spiritual development. According to Buddhism, meditation can help one establish a connection with the universal energy or the divine.

Metta meditation and LKM aim to develop compassion toward others [1,7]. This aligns with spiritual teachings that emphasize empathy and interconnectedness. Meditation helps practitioners learn to detach from their desires and the material world, promoting non-attachment, which is the central tenet of Buddhism [8]. This spiritual insight helps individuals experience freedom from suffering, which arises from clinging to transient issues. This process involves moving from the surface level of consciousness to the deeper level of unconsciousness.

Spirituality is a search for meaning, connection and transcendence beyond the material world. In Buddhism, chanting or repeating mantras is a common meditative practice. This involves focusing on sacred sounds or phrases believed to have spiritual power, fostering an inward focus and connection with the Buddha [9]. Practiced in Zen Buddhism, walking meditation involves mindful walking at a slow pace, synchronizing movement with the breath [10].

Some spiritual meditation practices involve visualization, such as imagining a deity, a peaceful landscape or spiritual symbols. This technique used in Buddhism is believed to help the practitioner embody the qualities of the visualized object or entity and deepen their spiritual understanding.

In recent years, meditation has separated from its religious roots and become a part of the mainstream of healthy life. Many people practice meditation to reduce daily stress, enhance well-being, and achieve balance [1,2]. However, these practices still have profound spiritual dimensions, connecting them to universal themes of peace

and harmony. Mindfulness involves observing one's thoughts, emotions and body sensations. This practice also helps deepen one's understanding of the impermanence of life. Concentration focuses on developing deep mental stability and clarity by fixing the mind on a single object, for example, breath.

Oxytocin (OT) and Meditation

Oxytocin (OT) is mainly produced in neurons at the Paraventricular Nucleus (PVN) and Supraoptic Nucleus (SON) of the hypothalamus. Synthesized OT is secreted into the peripheral blood stream from the posterior pituitary. OT is also released centrally to act on OT receptors that are widely expressed throughout the Central Nervous System (CNS), promoting various social and emotional behaviors [11]. OT plays an important role in forming attachments, especially in romantic relationships and parent-child bonding. For instance, levels of OT surge during childbirth and breastfeeding, strengthening the mother-infant bonding. Similarly, in romantic relationships, OT is released during affectionate touch, hug, and sexual activity, depending on feelings of attachment [2,12,13].

OT has been shown to develop empathy, which is the ability to understand and share the feelings of another. OT enhances emotional awareness and helps people read social cues better [14,15]. OT promotes nurturing behaviors and reduces fear responses, encouraging individuals to act selflessly, especially toward close family and loved ones [14,15]. Studies have demonstrated that OT administration can increase trust and prosocial behaviors. For example, people given OT in an experimental setting are more likely to trust others in financial games or express generosity, highlighting its role in fostering trust and social cooperation [16].

In parents, OT may drive behaviors that protect and care for children. In romantic partners, it can evoke loyalty, commitment and even jealousy in some cases, reflecting a complex interplay of emotional responses [17].

OT not only influences positive social behaviors but also acts as a buffer against stress. It reduces cortisol levels (a stress hormone) and helps people feel calmer and more secure in social situations, further enabling bonding and empathy. Meditation, especially Mindfulness-Based Stress Reduction (MBSR), has been demonstrated to reduce cortisol levels and increase OT levels, which promote a calm and relaxed state. The lowered stress response achieved through meditation is believed to contribute to the warm and calming feelings closely associated with OT release [17].

People who meditate regularly report greater feelings of connection and empathy toward others, which may be, at least in part, mediated by the central OT release. This increased social connection can also create a positive feedback loop. Positive interactions stimulate OT release, which in turn can make people feel more connected and empathetic, encouraging further social bonding [11,14,18]. In this way, OT promotes emotional regulation, helping people better manage their emotions.

As mentioned above, OT is linked to positive psychological and physiological effects, especially stress reduction, social bonding, and emotional well-being. There is growing research exploring how meditation, especially practices focused on compassion and mindfulness, can influence OT levels and support a sense of connection and relaxation.

OT is involved in various effects of physical stimulation of somatosensory organs, mindfulness meditation, emotion, and fragrance on humans [19]. Mindfulness involves paying attention to the present moment with non-judgmental awareness and is linked to reduced cortisol levels and increased well-being. Reducing stress following mindfulness may stimulate higher OT levels, as stress and OT often counterbalance to each other [20]. Meditative practices focused on compassion and loving kindness, known as Metta meditation [7], encourage feelings of empathy and gratitude. It has been demonstrated that these practices can lead to a measurable increase in OT, likely due to the focus on generating warm, positive emotions toward others [1,21].

The mindfulness session showed a significant increase of OT and reduction in negative affect and anxiety. Guided mindfulness meditation practice is useful to reach an emotional and biological state that facilitates empathy. The increase of OXT after the mindfulness session indicates the biological mechanisms underlying the benefits of meditation [1].

Virtues such as self-sacrifice, altruism, and appreciation have been considered quite essential in every religion. Arigato-Zen (AZ) is a simple voice-meditation practice developed by Soho Machida (1950-), which motivates the feeling of altruism and appreciation. By performing AZ, one is able to cleanse the negative subconscious memories that underlie problematic phenomena. Machida et al. (2018) showed a significant increase of salivary OT release following AZ practice [21].

Both OT and meditation have neuroplastic effects. They can help the brain form new connections that support emotional resilience and well-being. OT is known to support trust and emotional openness. Regular meditation has been shown to enhance brain areas linked to self-regulation.

Through these pathways, OT and meditation might together reinforce each other, supporting a greater capacity for compassion, self-acceptance and positive emotional regulation. While research is still uncovering the exact pathways, it is clear that meditation and OT share a relationship in helping foster well-being and reduce stress. Meditative practices that encourage positive emotions, connection and mindfulness seem to particularly support OT release, making powerful tools for emotional health.

Brain activity During Meditation

To investigate the integrative effects of meditation on the brain and heart, Electroencephalography (EEG) and Electrocardiography (ECG) were simultaneously recorded in 73 monks who practice Tibetan Buddhist meditation. It was found that EEG activities in monks shifted to a higher frequency following meditation. Meditation starts with decrease of the prefrontal delta wave (1-3Hz) activity and increase of the prefrontal high beta (13-25Hz) and gamma wave (26-76Hz) activity; the posterior high-frequency activity was also increased at the deep meditative state. The increase of posterior high-frequency EEG activity was significantly correlated with heart rate. These suggest that brain and heart were highly correlated during meditation [22].

In Tibetan Buddhist monk meditation, a large-scale network re-configuration in the gamma and theta bands (4-7Hz) of EEG activity was noticed. Temporal-frontal network connectivity in the EEG theta band was negatively correlated with the duration of meditation

experience, and gamma oscillations were coupled to theta oscillations during meditation. It seems that meditation may utilize cortical plasticity, inducing both immediate and long-lasting changes in the intrinsic organization and activity of brain networks [23].

In contrast to Tibetan Buddhist monk meditation, the low frequencies (delta, theta and alpha) were predominant in mindfulness meditation. Connectivity patterns that were unique to the three conditions predominated in the gamma wave, one-third of the correlations in these patterns were negative. These modulations may reflect the complex interplay between different known brain networks [24]. It seems that compassion meditation of Buddhists mainly stimulates higher frequency of EEG, while mindfulness of non-religious practice rather simulates lower frequency of EEG.

Newberg et al., (2001) measured changes in regional Cerebral Blood Flow (CBF) during the meditation by photon emission computed tomography (PECT) in 8 experienced Tibetan Buddhist meditators. Certain brain areas on the right side showed more blood flow during meditation. These areas are the cingulate gyrus, frontal cortex, and thalamus.

When the left dorsolateral prefrontal cortex had more blood flow, the left superior parietal lobe had less. This may explain why meditators experience a changed sense of space or self during meditation. Increased blood flow in the frontal areas may show strong focus during meditation. Thus, Tibetan Buddhist meditation seems to create a complex pattern of activity in the brain, especially on the right side, involving focus and altered spatial awareness [25].

Neuroimaging has been used to study different meditation types. Meditation practices require several coordinated cognitive activities. The brain responses to meditation seem to be different among them [26]. CBF changes were measured during verbal-based meditation by Franciscan nuns involving the internal repetition of a particular phrase. These results are compared with Buddhist meditators who use a type of visualization technique.

During the verbal meditation, there was increased blood flow in specific brain areas: prefrontal cortex, inferior parietal lobes, and inferior frontal lobes. When blood flow increased in the prefrontal cortex, it decreased in the superior parietal lobe on the same side of the brain. This may reflect a shift in focus inward, reducing spatial awareness. The study shows that meditation involves several coordinated mental processes, like focus, sensory integration, and possibly altered self-awareness [27].

There is also a difference in brain function between experienced meditators and non-meditators. Researchers compared brain function in 12 experienced meditators and 14 non-meditators using a CBF-PECT imaging. Experienced meditators had significantly higher blood flow in areas : prefrontal cortex, parietal cortex, thalamus, putamen, caudate, and midbrain.

They also showed greater thalamic asymmetry; the two sides of the thalamus were functioning differently. This might be linked to changes in sensory processing or focus. The brain changes in experienced meditators involve areas responsible for attention, emotional regulation, and autonomic functions. This suggests meditation impacts both mental and physical processes over time [27].

The ability to distinguish between the self and others involves several interconnected brain regions, primarily within the social

cognition network. These regions are medial prefrontal cortex [28], Temporo-Parietal Junction (TPJ) [29], posterior cingulate cortex [30], insula, and amygdala [31]. In addition, mirror neuron system found in inferior frontal gyrus and inferior parietal lobule is active when observing others' actions and emotions, helping to understand others' experiences while maintaining a sense of self [32].

Especially, recent several studies indicate that the right-TPJ (rTPJ) is a key brain region to distinguish between self and others [33-35]. Neuro-imaging experiments and a meta-analysis have demonstrated increased activation in the rTPJ during tasks that involve understanding others' beliefs and intentions, highlighting its role in social cognition [34].

It has been demonstrated that OT neurons in the paraventricular nucleus (PVN) are involved in modulating fear empathy in rodents, highlighting the role of OT in empathetic fear responses [36]. Intranasal administration of OT reduced the neural differentiation between self and others during empathic processing, suggesting that OT facilitates empathy by blurring self-other boundaries [3,37]. It is, therefore, reasonable to hypothesize that meditation-induced OT release could suppress the activity of these brain areas, leading to a border-less feeling between self and others.

Interestingly, meditation decreases the activity of the posterior parietal lobes [25]. Further studies are needed to determine whether meditation-induced OT release could decrease the activity of rTPJ.

Oneness

The concept of Oneness is a fundamental idea seen in various spiritual and philosophical traditions. It refers to the interconnectedness and unity of all things, emphasizing that everything in the universe is part of a single whole. Oneness involves transcending the ego and personal desires, leading to a more peaceful and harmonious state of being [38,39]. Oneness promotes a sense of compassion, encouraging individuals to look beyond personal differences and see the common threads that connect all life.

Many of the religious, spiritual, and philosophical traditions show the idea that the self is inextricably interrelated to the rest of the world or that everything is part of the same whole. This can be seen in Eastern traditions such as Buddhism, Hinduism, Confucianism, and Taoism and in Western traditions such as Christianity and Platonism. These traditions espouse Oneness-related concepts [39]. In philosophy, non-dualism suggests that distinctions between self and other, mind and body, and subject and object are illusions. The study of ecosystems highlights how all living organisms interact and depend on one another, illustrating the interconnectedness of life on the Earth.

Collective unconscious, popularized by Carl Jung (1875-1961), suggests that certain groups of people can share a set of psychological patterns and beliefs that influence our behavior on a subconscious level (Figure 1). The collective unconscious is not just a collection of individual unconscious minds but a shared reservoir of experiences, memories, and emotional patterns that shape how people in a group think, feel, and act [40].

There is a connection between Oneness and the collective unconscious. Oneness stands for the objective of overcoming the delusion of separateness to feel unity, while the collective unconscious shows the psychological patterns that collectively shape behavior and thought within the group. To develop and get closer to a common experience

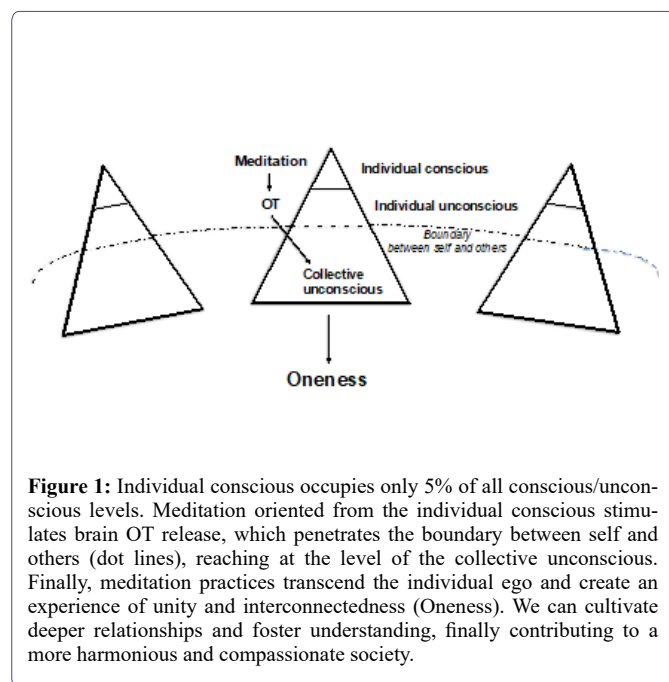


Figure 1: Individual conscious occupies only 5% of all conscious/unconscious levels. Meditation oriented from the individual conscious stimulates brain OT release, which penetrates the boundary between self and others (dot lines), reaching at the level of the collective unconscious. Finally, meditation practices transcend the individual ego and create an experience of unity and interconnectedness (Oneness). We can cultivate deeper relationships and foster understanding, finally contributing to a more harmonious and compassionate society.

of Oneness, a society/community must bring unconscious group into consciousness. Greater harmony and connectivity can result from a collective unconscious awakening to Oneness.

Practices of meditation encourage individuals to experience the present moment fully, fostering a sense of connection to the world around them. Embracing the concept of Oneness can lead to a more compassionate lifestyle, where individuals recognize their impact on others and the environment, inspiring actions that promote harmony and sustainability.

Physical Body and Energy Body

The physical body and energy body is an integral concept of spiritual philosophy. Although not yet proven by our modern technology/science, the ancient wisdom has demonstrated that these two aspects are seen as interdependent: one is influencing the other one in a significant way [41,42].

Physical body functions are observable and measurable through scientific methods. Energy body, often referred as the subtle body, consists of non-physical layers of energy that interact with the physical body. These include the aura, chakras, and meridians, which are considered channels and fields through which life force energy flows [43]. In many spiritual traditions, it is believed that all beings share a universal life force energy (prana or Qi). This shared energy reinforces the idea of Oneness, as it flows through and connects all forms of life.

The energy body is believed to influence the physical body's health and well-being. When energy flows smoothly and is balanced, it promotes optimal physical function. In contrast, blockage or imbalance in the energy body may down-regulate physical and mental health. The state of the physical body also affects the energy body. Practices like Yoga, Taichi, and Qigong aim to harmonize physical movement with energy flow to maintain overall well-being [44-46].

The energy body serves as a bridge between the physical and spiritual realms, reflecting the idea that everything is interconnected. The energy body embodies the concept of Oneness by illustrating that they are all part of a greater energy system, while individual beings (physical body) may appear separate. The health and well-being of everyone can influence the whole, highlighting the interdependence of all.

The energy body can be influenced by our emotions and thoughts through the energy field and vibration. As OT and/or meditation promote our emotions and thoughts, the energy body can be modulated by OT and/or meditation. As a result, these effects propagate like a web, as we are all interconnected through this energetic network. This means that if emotions and thoughts can be refined into a state of calmness, empathy, and sophistication, we can harmoniously influence others and the world through this energetic web. This influence can be amplified through understanding and empathizing with others.

Once individuals become more aware of their energy body, we may develop greater sensitivity to the energies of others. This increased awareness fosters compassion and empathy, reinforcing the understanding that everyone is connected. The interactions between individuals involve energy exchanges that can either uplift or diminish one's energy. By exploring and nurturing the energy body, individuals can cultivate a greater awareness of their connection to others and the universe.

OT, Meditation and Oneness

On a physiological level, OT plays a significant role in facilitating emotional connection, empathy, trust, and social bonding. OT is released during intimate social interactions like hug, touching, and emotional bonding. When OT levels increase, people feel more empathetic, compassionate, and attuned to others' emotions, which are essential elements of Oneness. It can heighten feelings of compassion and the desire to care for others, both of which contribute to the experience of Oneness.

OT has been shown to reduce stress and anxiety, and it can also promote feelings of safety and comfort. In environments where people feel connected and supported, OT help individuals relax and feel a sense of calm. For example, the comfort from a supportive partner or group can alleviate stress and foster emotional healing, reinforcing a sense of well-being.

Meditation is a practice aimed at calming the mind, increasing awareness and achieving a relaxation. Practices such as LKM or compassion meditation promote feelings of warmth, connection and empathy toward others, via OT release [1,21]. When a practitioner experiences a reduction in the ego through concentration, they may experience a more profound sense of connection to all beings, nature or the universe. The concept of Oneness suggests a transcendence the boundaries between self and others, where the distinction between "I" and "you" dissolves. Recent studies suggest that OT decreases the self-other boundary, which in turn, increases social interaction [3,37]. Compared to individual practice, group meditation, such as collective meditation or healing sessions, are explored in mitigating collective violence through public health models [5]. Group practices can enhance the flow of energy and create a shared experience of Oneness. Participants often report feelings of unity and connectedness during the practices. Engaging with the energy body can help individuals transcend the ego, which often creates a false sense of separation. This promotes feelings of unity and interconnectedness, aligning with

the principles of Oneness and leading to the prevention of violence and war.

Conclusion

In certain meditative states, individuals might experience a dissolution of the sense of separateness, leading to a feeling of Oneness with the world. This sense of interconnectedness is often described as a peak experience in various spiritual traditions, whether through the Buddhist concept of interdependence, the Hindu idea of non-duality and the Christian idea of union with the divine. Meditation practices that emphasize mindfulness and awareness of the present moment can reduce the attachment to the individual self, which is central to the experience of Oneness. This helps us to transcend the idea of separateness. As a result, meditation can lead to an experience where the sense of self merges with the environment, people or even the universe, producing a deep sense of peace and unity.

Wars and conflicts are caused by humans. At their root lies a lack of understanding, empathy, and tolerance toward others. Meditation can increase OT, which enhances emotional bonding and compassion. The emotional states of connectedness can then create and deepen the experience of Oneness.

The relationship among meditation, OT, and Oneness can be understood through both scientific and philosophical lenses, as each of these concepts connect to emotional and psychological states. Meditation practices seek to dissolve the boundaries between self and others, leading to profound feelings of spiritual Oneness (Figure 1). Thus, people can cultivate deeper relationships, foster understanding and contribute to a more harmonious and compassionate society.

References

1. Bellosta-Batalla M, Carmen Blanco-Gandia MD, Rodriguez-Arias M, Cebolla A, Perez-Blasco J, et al. (2020) Brief mindfulness session improves mood and increases salivary oxytocin in psychology students. *Stress Health* 36: 469-477.
2. Laneri D, Krach S, Paulus FM, Kanske P, Schuster V, et al. (2017) Mindfulness meditation regulates anterior insula activity during empathy for social pain. *Hum Brain Mapp* 38: 4034-4046.
3. Hoehne K, Vrticka P, Engert V, Singer T (2020) Plasma oxytocin is modulated by mental training, but does not mediate its stress-buffering effect. *Psychoneuroendocrinology* 141: 105734.
4. Weiss K, Mahnkopf C, Kohls N (2024) Effects of meditation on health promoting protective factors of persons with cardiovascular disease-a quasi-experimental pilot study with pre-post comparison. *Cardiovasc Diagn Ther* 14: 537-546.
5. Schneider RH, Dillbeck MC, Yeola G, Nader T (2024) Peace through health: traditional medicine meditation in the prevention of collective stress, violence, and war. *Front Public Health* 12: 1380626.
6. Travis F, Nash J, Parim N, Cohen BH (2020) Does the MRI/fMRI Procedure Itself Confound the Results of Meditation Research? An Evaluation of Subjective and Neurophysiological Measures of TM Practitioners in a Simulated MRI Environment. *Front Psychol* 11: 728.
7. Mascaro JS, Darcher A, Negi LT, Raison CL (2015) The neural mediators of kindness-based meditation: a theoretical model. *Front Psychol* 6: 109.
8. Thuan TX (2001) Cosmic design from a Buddhist perspective. *Ann N Y Acad Sci* 950: 206-214.
9. Xu J (2021) The lived experience of Buddhist-oriented religious coping in late life: Buddhism as a cognitive schema. *J Health Psychol* 26: 1549-1560.
10. Prakhinkit S, Suppakitporn S, Tanaka H, Suksom D (2014) Effects of Buddhism walking meditation on depression, functional fitness, and endothelium-dependent vasodilation in depressed elderly. *J Altern Complement Med* 20: 411-416.
11. Takahashi T (2013) Physiology of love: Role of oxytocin in human relationships, stress response and health Nova Biomedical.
12. Uvnas-Moberg K (1998) Oxytocin may mediate the benefits of positive social interaction and emotions. *Psychoneuroendocrinology* 23: 819-835.
13. Moberg KU, Julius H, Handlin L, Petersson M (2020) Editorial: Sensory Stimulation and Oxytocin: Their Roles in Social Interaction and Health Promotion. *Front Psychol* 13: 929741.
14. Babygirija R, Cerjak D, Yoshimoto S, Gribovskaja-Rupp I, Bulbul M, et al. (2012) Affiliative behavior attenuates stress responses of GI tract via up-regulating hypothalamic oxytocin expression. *Auton Neurosci* 169: 28-33.
15. Babygirija R, Yoshimoto S, Gribovskaja-Rupp I, Bulbul M, Ludwig K, et al. (2012) Social interaction attenuates stress responses following chronic stress in maternally separated rats. *Brain Res* 1469: 54-62.
16. Barraza JA, McCullough ME, Ahmadi S, Zak PJ (2011) Oxytocin infusion increases charitable donations regardless of monetary resources. *Horm Behav* 60: 148-151.
17. Zheng X, Kendrick KM (2021) Neural and Molecular Contributions to Pathological Jealousy and a Potential Therapeutic Role for Intranasal Oxytocin. *Front Pharmacol* 12: 652473.
18. Babygirija R, Zheng J, Bulbul M, Ludwig K, Takahashi T (2010) Beneficial effects of social attachment to overcome daily stress. *Brain Res* 1352: 43-49.
19. Ito E, Shima R, Yoshioka T (2019) A novel role of oxytocin: Oxytocin-induced well-being in humans. *Biophys Physicobiol* 16: 132-139.
20. Zheng J, Babygirija R, Bulbul M, Cerjak D, Ludwig K, et al. (2010) Hypothalamic oxytocin mediates adaptation mechanism against chronic stress in rats. *Am J Physiol Gastrointest Liver Physiol* 299: 946-953.
21. Machida S, Sunagawa M, Takahashi T (2018) Oxytocin release during the meditation of altruism and appreciation (Arigato-Zen). *International Journal of Neurology Research* 4: 364-370.
22. Guo X, Wang M, Wang X, Guo M, Xue T, et al. (2022) Progressive increase of high-frequency EEG oscillations during meditation is associated with its trait effects on heart rate and proteomics: a study on the Tibetan Buddhist. *Cereb Cortex* 32: 3865-3877.
23. Jiang H, He B, Guo X, Wang X, Guo M, et al. (2020) Brain-Heart Interactions Underlying Traditional Tibetan Buddhist Meditation. *Cereb Cortex* 30: 439-450.
24. Bauer PR, Sabourdy C, Chatard B, Rheims S, Lachaux JP, et al. (2022) Neural dynamics of mindfulness meditation and hypnosis explored with intracranial EEG: A feasibility study. *Neurosci Lett* 766: 136345.
25. Newberg A, Alavi A, Baime M, Pourdehnad M, Santanna J, et al. (2001) The measurement of regional cerebral blood flow during the complex cognitive task of meditation: a preliminary SPECT study. *Psychiatry Res* 106: 113-122.
26. Newberg AB, Wintering NA, Yaden DB, Waldman MR, Reddin J, et al. (2015) A case series study of the neurophysiological effects of altered states of mind during intense Islamic prayer. *J Physiol Paris* 109: 214-220.
27. Newberg A, Pourdehnad M, Alavi A, d'Aquili EG (2003) Cerebral blood flow during meditative prayer: preliminary findings and methodological issues. *Percept Mot Skills* 97: 625-630.
28. Mitchell JP, Cloutier J, Banaji MR, Macrae CN (2006) Medial prefrontal dissociations during processing of trait diagnostic and nondiagnostic person information. *Soc Cogn Affect Neurosci* 1: 49-55.

29. Saxe R, Kanwisher N (2003) People thinking about thinking people. The role of the temporo-parietal junction in “theory of mind”. *Neuroimage* 19: 1835-1842.
30. Decety J, Sommerville JA (2003) Shared representations between self and other: a social cognitive neuroscience view. *Trends Cogn Sci* 7: 527-533.
31. Singer T, Seymour B, O’Doherty J, Kaube H, Dolan RJ, et al. (2004) Empathy for pain involves the affective but not sensory components of pain. *Science*. 303: 1157-1162.
32. Oliver LD, Vieira JB, Neufeld RWJ, Dziobek I, Mitchell DGV (2018) Greater involvement of action simulation mechanisms in emotional vs cognitive empathy. *Soc Cogn Affect Neurosci* 13: 367-380.
33. Eddy CM (2022) The Transdiagnostic Relevance of Self-Other Distinction to Psychiatry Spans Emotional, Cognitive and Motor Domains. *Front Psychiatry* 13: 797952.
34. Quesque F, Brass M (2019) The Role of the Temporoparietal Junction in Self-Other Distinction. *Brain Topogr* 32: 943-955.
35. Sun F, Yang T, Liu N, Wan X (2023) The Causal Role of Temporoparietal Junction in Mediating Self-Other Mergence during Mentalizing. *J Neurosci* 43: 8442-8455.
36. Zhang L, Chen HC, Li B, Cao JX, Su XM, et al. (2024) Oxytocin neurons in the paraventricular nucleus and fear empathy among male mice. *J Psychiatry Neurosci* 49: 192-207.
37. Pfundmair M, Rimpel A, Duffy K, Zwarg C (2018) Oxytocin blurs the self-other distinction implicitly but not explicitly. *Horm Behav* 98: 115-120.
38. Church D, Vasudevan A, Foe AD (2024) The Association of Relational Spirituality in an EcoMeditation Course with Flow, Transcendent States, and Professional Productivity. *Adv Mind Body Med* 28: 4-14.
39. Lente EV, Hogan MJ (2020) Understanding the Nature of Oneness Experience in Meditators Using Collective Intelligence Methods. *Front Psychol* 11: 2092.
40. Paulson S, Hustvedt S, Solms M, Shamdasani S (2017) The deeper self: an expanded view of consciousness. *Ann NY Acad Sci* 1406: 46-63.
41. Gary S (2001) Individuation and subtle body: a commentary on Jung’s Kundalini seminar.: UMI Dissertation Services.
42. Samuel G, Johnston J (2015) Religion and the subtle body in Asia and the West: between mind and body. Routledge, USA.
43. Aïvanhov OM (1998) Man’s subtle bodies and centres: the aura, the solar plexus, the charkras: Editions Prosveta, France.
44. Csala B, Ferentzi E, Tihanyi BT, Drew R, Koteles F (2020) Verbal Cuing Is Not the Path to Enlightenment. Psychological Effects of a 10-Session Hatha Yoga Practice. *Front Psychol* 11: 1375.
45. Nair RR, Yajna A (2017) A Prototype of South Asian Traditional Medical Knowledge. *J Acupunct Meridian Stud* 10: 143-150.
46. Wirth DP, Cram JR (1997) Multisite surface electromyography and complementary healing intervention: a comparative analysis. *J Altern Complement Med* 3: 355-364.



- Advances In Industrial Biotechnology | ISSN: 2639-5665
- Advances In Microbiology Research | ISSN: 2689-694X
- Archives Of Surgery And Surgical Education | ISSN: 2689-3126
- Archives Of Urology
- Archives Of Zoological Studies | ISSN: 2640-7779
- Current Trends Medical And Biological Engineering
- International Journal Of Case Reports And Therapeutic Studies | ISSN: 2689-310X
- Journal Of Addiction & Addictive Disorders | ISSN: 2578-7276
- Journal Of Agronomy & Agricultural Science | ISSN: 2689-8292
- Journal Of AIDS Clinical Research & STDs | ISSN: 2572-7370
- Journal Of Alcoholism Drug Abuse & Substance Dependence | ISSN: 2572-9594
- Journal Of Allergy Disorders & Therapy | ISSN: 2470-749X
- Journal Of Alternative Complementary & Integrative Medicine | ISSN: 2470-7562
- Journal Of Alzheimers & Neurodegenerative Diseases | ISSN: 2572-9608
- Journal Of Anesthesia & Clinical Care | ISSN: 2378-8879
- Journal Of Angiology & Vascular Surgery | ISSN: 2572-7397
- Journal Of Animal Research & Veterinary Science | ISSN: 2639-3751
- Journal Of Aquaculture & Fisheries | ISSN: 2576-5523
- Journal Of Atmospheric & Earth Sciences | ISSN: 2689-8780
- Journal Of Biotech Research & Biochemistry
- Journal Of Brain & Neuroscience Research
- Journal Of Cancer Biology & Treatment | ISSN: 2470-7546
- Journal Of Cardiology Study & Research | ISSN: 2640-768X
- Journal Of Cell Biology & Cell Metabolism | ISSN: 2381-1943
- Journal Of Clinical Dermatology & Therapy | ISSN: 2378-8771
- Journal Of Clinical Immunology & Immunotherapy | ISSN: 2378-8844
- Journal Of Clinical Studies & Medical Case Reports | ISSN: 2378-8801
- Journal Of Community Medicine & Public Health Care | ISSN: 2381-1978
- Journal Of Cytology & Tissue Biology | ISSN: 2378-9107
- Journal Of Dairy Research & Technology | ISSN: 2688-9315
- Journal Of Dentistry Oral Health & Cosmesis | ISSN: 2473-6783
- Journal Of Diabetes & Metabolic Disorders | ISSN: 2381-201X
- Journal Of Emergency Medicine Trauma & Surgical Care | ISSN: 2378-8798
- Journal Of Environmental Science Current Research | ISSN: 2643-5020
- Journal Of Food Science & Nutrition | ISSN: 2470-1076
- Journal Of Forensic Legal & Investigative Sciences | ISSN: 2473-733X
- Journal Of Gastroenterology & Hepatology Research | ISSN: 2574-2566
- Journal Of Genetics & Genomic Sciences | ISSN: 2574-2485
- Journal Of Gerontology & Geriatric Medicine | ISSN: 2381-8662
- Journal Of Hematology Blood Transfusion & Disorders | ISSN: 2572-2999
- Journal Of Hospice & Palliative Medical Care
- Journal Of Human Endocrinology | ISSN: 2572-9640
- Journal Of Infectious & Non Infectious Diseases | ISSN: 2381-8654
- Journal Of Internal Medicine & Primary Healthcare | ISSN: 2574-2493
- Journal Of Light & Laser Current Trends
- Journal Of Medicine Study & Research | ISSN: 2639-5657
- Journal Of Modern Chemical Sciences
- Journal Of Nanotechnology Nanomedicine & Nanobiotechnology | ISSN: 2381-2044
- Journal Of Neonatology & Clinical Pediatrics | ISSN: 2378-878X
- Journal Of Nephrology & Renal Therapy | ISSN: 2473-7313
- Journal Of Non Invasive Vascular Investigation | ISSN: 2572-7400
- Journal Of Nuclear Medicine Radiology & Radiation Therapy | ISSN: 2572-7419
- Journal Of Obesity & Weight Loss | ISSN: 2473-7372
- Journal Of Ophthalmology & Clinical Research | ISSN: 2378-8887
- Journal Of Orthopedic Research & Physiotherapy | ISSN: 2381-2052
- Journal Of Otolaryngology Head & Neck Surgery | ISSN: 2573-010X
- Journal Of Pathology Clinical & Medical Research
- Journal Of Pharmacology Pharmaceutics & Pharmacovigilance | ISSN: 2639-5649
- Journal Of Physical Medicine Rehabilitation & Disabilities | ISSN: 2381-8670
- Journal Of Plant Science Current Research | ISSN: 2639-3743
- Journal Of Practical & Professional Nursing | ISSN: 2639-5681
- Journal Of Protein Research & Bioinformatics
- Journal Of Psychiatry Depression & Anxiety | ISSN: 2573-0150
- Journal Of Pulmonary Medicine & Respiratory Research | ISSN: 2573-0177
- Journal Of Reproductive Medicine Gynaecology & Obstetrics | ISSN: 2574-2574
- Journal Of Stem Cells Research Development & Therapy | ISSN: 2381-2060
- Journal Of Surgery Current Trends & Innovations | ISSN: 2578-7284
- Journal Of Toxicology Current Research | ISSN: 2639-3735
- Journal Of Translational Science And Research
- Journal Of Vaccines Research & Vaccination | ISSN: 2573-0193
- Journal Of Virology & Antivirals
- Sports Medicine And Injury Care Journal | ISSN: 2689-8829
- Trends In Anatomy & Physiology | ISSN: 2640-7752

Submit Your Manuscript: <https://www.heraldopenaccess.us/submit-manuscript>