

Mind/Body Healing: Hypnotherapy, Functional/Integrated Medicine, Epigenetics, Cancer & the Immune System

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Abstract: The intention of this paper is not only to understand how hypnotherapy affects the immune system, but also to shift our concept of healing to an Integrated/Functional Medicine Model of treating illness and disease.

Outline

- Functional/Integrative medicine and hypnotherapy
- Hypnosis vs. hypnotherapy
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Introduction

Understanding the importance of holistically treating the patient versus treating the symptoms of illness in isolation- as well as the role of functional, integrated medicine- radically changes the lens through which disease diagnosis and treatment are perceived. In the modern age of medicine, we have studied how to target various systems in the body to promote a biochemical change, but now we need to widen our lens as we enter into the age of Functional/Integrative Medicine.

This paper proposes that hypnotherapy and other psycho-technologies operate through molecular regulation, specifically, epigenetic modification to achieve their healing function. Understanding the psychophysiology of

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hypnotherapy and elucidating the underlying biological substrates should contribute to greater acceptance and integration of these therapies into conventional medicine. The purpose of this paper is to investigate how hypnotherapy may function as an epigenetic modulator for expressing health potential. Understanding the origin of disease and the most optimal time for intervention or prevention allows healers to create wellness programs that effectively encourage resilience and genetic health expression by utilizing protective factors. Research on integrative and/or functional medicine must be a high priority due to their non-invasive and cost-effective qualities.

Functional/Integrative medicine and hypnotherapy

Functional/integrative medicine might be considered an ambiguous term, or something completely foreign to the layperson. The majority of people that are familiar with this field of medicine are either alternative therapy providers or individuals that have encountered an illness that conventional western medicine was unable to satisfactorily diagnose or treat. This is often the case with chronic diseases that affect over 125 million Americans (Cole, 2012). The field of functional/integrative medicine is not to be practiced in isolation but instead in partnership with western medicine. The challenge is therefore to understand functional/integrative medicine and identify when to utilize these types of intervention to maximize the health benefits. This information is key in assisting healthcare professionals in creating and implementing wellness programs that manifest the deepest healing potential for patients.

Functional Medicine is a medical practice or treatments that focus on optimal functioning of the body and its organs, usually involving systems of holistic or alternative medicine (Dictionary.com, 2017). According to Dr. Mark Hyman, Medical Director at Cleveland Clinic's Center for Functional Medicine, Functional Medicine seeks to identify and address the root cause of disease, and views the body as one integrated system, not a collection of independent organs divided up by medical specialties. It treats the whole system, not just the symptoms. It is a form of integrative medicine, which focuses on interactions between the environment and the gastrointestinal, endocrine and immune system (Wikipedia, 2017).

Proponents of functional medicine adopt a model of disease based on the notion of "antecedents," "triggers," and "mediators," which is built on the discoveries of *epigenetics*. Antecedents correspond to the underlying

causes, triggers refer to the immediate causes and mediators are the particular characteristics of a person's illness. In functional medicine each individual will follow their own "matrix" for healing formulated by their practitioner based on the notion of *biochemical individuality*, which believes nutritional needs, chemical constitution and disease states are unique for every individual.

Some of the complementary therapies utilized in integrated or functional medicine are psycho-technologies from the field of Transpersonal Psychology; hypnotherapy, holographic breath-work and meditation that are used to navigate the mind/body system via an internal locus of control to the state of integrated health and vitality. These psycho-technologies utilize a variety of mechanisms that speak directly to the unconscious. One of the mechanisms of hypnotherapy is the ability to alter the brain wave frequency and enter into the altered theta brain wave pattern. This shifts from a sympathetic nervous system cascade of neurochemicals that promotes stress and illness, to a parasympathetic nervous system neurochemical state of rest and repair. This is only one of the mechanisms of these modalities that demonstrate their potency in mind/body healing. Other components will be addressed later in the paper.

We are only beginning to conceptualize how the mind/body psychotechnologies truly promote healing. Multidisciplinary research utilizing functional neuroimaging and other emerging technology has only begun to investigate the human body's God-given ability to heal and the power of the unconscious mind.

Recent discoveries in epigenetics and neuroplasticity assist us in learning how to navigate our mind-body system into the infinite potential of health and vitality. They demonstrate that by learning to shift our focus from the exterior to the interior, we can program our mind/body system to manifest the potential of health and vitality through a cascade of chemical reactions that affect gene expression.

A basic principle held in integrative medicine is that the mind/body system is self-sustaining and is programmed for life vitality. External variables or influences create a disruption of the energetic flow and the mind/body system begins to breakdown communication between various systems that keep it in balance. Disease is the product of this miscommunication of our mind/body system. The program that creates health and vitality is altered and the system is hijacked. Deepening our knowledge of how to navigate our internal environment through psycho-technologies is crucial due to the key role environment plays in the

findings of epigenetics. Let us familiarize ourselves with one of the powerful mind-altering psychotechnology of Transpersonal Psychology and differentiate its various uses in treatment.

Hypnosis and hypnotherapy

Hypnosis, also referred to as hypnotherapy or hypnotic suggestion, is a trance-like state in which you have heightened focus and concentration. Hypnosis is usually done with the help of a therapist using verbal repetition and mental images. When you're under hypnosis, you usually feel calm and relaxed, and are more open to suggestion. According to the Mayo Clinic (2017), Hypnosis can be used to help you gain control over undesired behaviors or to help you cope better with anxiety or pain. It's important to know that although you're more open to suggestion during hypnosis, you don't lose control over your behavior.

Hypnotherapy can be an effective method for coping with stress and anxiety. In particular, hypnosis can reduce stress and anxiety before a medical procedure, such as a breast biopsy.

Hypnosis has been studied for other conditions, including:

- **Pain control.** Hypnosis may be beneficial for pain associated with cancer, irritable bowel syndrome, fibromyalgia, temporomandibular joint problems, dental procedures and headaches.
- **Hot flashes.** Hypnosis may relieve symptoms of hot flashes associated with menopause.
- **Behavior change.** Hypnosis has been used with some success in the treatment of insomnia, bed-wetting, smoking, obesity and phobias.
- **Fatigue.** Hypnosis has been used to treat fatigue associated with radiotherapy in people with breast cancer.

Hypnosis conducted by a trained therapist or health care professional is considered a safe, complementary and alternative medical treatment. However, hypnosis is only part of Hypnotherapy. Hypnotherapy is the facilitation of a therapeutic session in a state of hypnosis. The session is conducted in an altered state that speaks directly to the unconscious and utilizes a variety of modalities that promote the deepest level of healing.

Let us attempt to conceptualize the process of Hypnotherapy and then identify how it influences physical health. Previous studies have focused

only on the mechanism of activation of the parasympathetic nervous system via the vagus nerve and the benefits of shifting the cascade of neurochemicals into an anti-stress response. This discovery is epic, but as Taylor (2010) states, research should be directed by an empirical framework that integrates knowledge of both established and hypothesized substrates and provides a template useful for evaluating the mechanisms that underlie the efficacy of mind/body techniques.

Heart-Centered Hypnotherapy

Heart-Centered Hypnotherapy (HCH) is a process that was created at the *Wellness Institute*. It uses hypnosis as a mechanism to bypass the ego's defense mechanisms and access the client's unconscious to facilitate deep mind/body integrative healing session. According to the founders, Diane Zimmeroff and David Hartman (2011), the process is designed to bring to our awareness that which we are currently unaware of. The conscious mind is only 10% of the entire mind and 90% is unconscious. The conscious mind thinks, questions, analyzes and processes very overtly. The unconscious mind flies under the radar, we don't know what we think we just feel a certain way or behave a certain way without insight as to why. The unconscious mind regulates bodily functions such as heart rate, breathing, muscle tension, blood pressure and all other automatic functions. When we relax into a trance state, we have access to the other 90% of our mental capacity (Zimmeroff 2011). Deciphering whether we use hypnosis or hypnotherapy depends on how we conceptualize the development of illness and healing. As Zimmeroff (2011) quoted,

If one ascribes to the "physiology as machine" metaphor and considers illness to be strictly the product of disordered biology, then hypnosis will be utilized in an ancillary, mechanistic, and less effective manner. However, if one conceptualizes health and illness as a cybernetic system affected by multiple interactive influences, then hypnosis becomes one of many ways to intervene in that system from an integrative vantage point (Weisberg, 2008).

Understanding the mind/body relationship in healing is eloquently explained by Zimmeroff & Hartman (2011), re-conceptualizing the psychosomatic phenomena. The words psyche and soma are Greek derivatives and translate to spirit/soul and soma/body respectively. Therefore, unlike its colloquial meaning of "all up in their head" it denotes a marriage or interactivity of mind/body interaction.

Stress/Shock as the intersection of mind/body illness

Peter Levine (1997), states in ancient Shamanic approaches to healing, illness was attributed to a separation of a soul from the body. This occurs when people become overwhelmed, in psychological terms they dissociate and become lost in *spiritual suspension*. Loss and disconnection or the sensation of feeling disembodied is often the environment that cultivates disease. This state is medically termed a state of *shock*. Only through somatic experiencing can we feel the parts that are in need of healing. These are identified through the *felt sense*, an unconscious bodily awareness.

Weller (2015) concurs that the concept of soul fragmentation is ancient. He explains the soul's fragmentation occurs from physical or emotional trauma, prolonged sickness, extensive neglect and shaming. He explains that any event that has not been integrated as an experience may also lead to soul fragmentation. Trauma is defined as a *soul-shaking* experience that ruptures the continuity of our lives and tosses us into an altered experience. This altered state is often filled with loss and sorrow and without treatment becomes our ordinary state. In time, the experience of this event resonates in our unconscious mind and only through the use of psychotechnologies and communicating directly to the unconscious body (felt sense) can we achieve homeostasis. Thus, releasing shock and restoring the mind/body to wholeness, cultivates the environment that promotes the genetic expression of health and vitality.

A *felt sense* is a physical, unconscious bodily awareness, of a person, a situation or event (Levine, 1997). This felt sense is communicated by the vagus nerve, which is the longest cranial nerve. It contains somatic and visceral afferent fibers and can only be accessed through the Bottom-Up Mechanism. The Bottom-Up Mechanism is initiated by stimulation of various somato-viscero and chemosensory receptors. These influence central neural processing and mental activities via ascending pathways from the periphery to the brainstem and cerebral cortex (Taylor, 2010). This will be further expounded upon later as the body's bottom-up communication.

Peter Levine (1997), an expert on healing trauma, states that physicians and mental health workers are faced with restoring wholeness, or homeostasis, to an organism fragmented by trauma or disease. The *felt state* or medically termed *bottom-up state*, is the medium to experience these sensations closely and from a distance creating a gestalt or integration of experiences. Every event can be experienced both in its

duality, as individual parts and as a unified whole. Experiences that are perceived in a unified manner through the felt sense are able to bring revelations about. These revelations are a catalyst for undoing the trauma that has led to disease in the body. Accessing the felt state allows us the ability to renegotiate the overwhelming experience that creates disease and restore resources that were lost in the wake of shock. (Levine, 1997)

Hartman & Zimberoff (2011), note the tendency in traditional medicine to discount the influence of the mind, personality, or psyche on the function or dysfunction of the body is matched by psychotherapists discounting the role of the body in the formation and potential rehabilitation of mental health pathologies. They conclude that understanding the interconnectedness of mind/body demands an integrated approach to treating the whole mind/body system. When the medical knowledge is combined with hypnotherapy techniques to guide the patient to receiving the unconscious message from the *felt sense*- in the body- then healing is generated from the deepest part of the psyche to heal the body. This is the deeper meaning of psychosomatic.

One of the deep healing potential of mind/body therapies is their ability to utilize the body's *top-down and bottom-up* (bidirectional) mechanisms to promote homeostasis. Utilizing the bottom-up mechanism allows a therapist to alter the mind/body's neurochemical systems and influence interactions between the brain and peripheral tissues; including the cardiovascular and immune systems, by directly addressing functional links or multiple levels where the neuraxis at which the mind/body interactions occur. (Taylor, 2010).

This author postulates that all disease originates from fragmentation. Fragmentation is interpreted as severing off, not working as a whole, not working coherently, or a block in the energetic flow. This can be psychological fragmentation that occurs during a stressful situation in which dissociation is the survival mechanism, which is termed as *shock state*. This state of shock and its physiology has been extensively researched and even believed to be a precursor to physical illnesses. Patients diagnosed with post-traumatic stress disorder are not the only ones that exhibit shock. Nearly everyone is in shock at different times of his or her life. Most go back and forth between *sympathetic shock and parasympathetic shock*. Sympathetic shock manifests as *raja sic* energy, shock talk, multitasking, perfectionism, and/or constant frantic motion. The *parasympathetic* shock state creates "paralysis" or a "frozen like"

dissociative state (Zimberoff, 2014). Differentiating these states of shock allows one to understand when the nervous system is out of homeostasis.

Stress, hypnotherapy and the immune system

Traumatic stress is common among medical patients, and treating the trauma is an integral part of treating a disease. According to Hartman & Zimberoff (2011), one third of all cancer survivors suffer from traumatic stress symptoms. Furthermore, amplified stress in cancer patients has been associated with increased morbidity, mortality, decreased immune function and increased relapse. Their findings have concluded that “stress is the basic intersection between mind and body: it cycles from somatic distress generating psychological distress, which advances somatic distress. Therefore, hypnosis/hypnotherapy is one of the most optimal ways of accessing that intersection because traumatic memories are encoded sub-cortically, rather than in autobiographical memory, and must be accessed through the unconscious/somatic psyche rather than through verbal conscious awareness.” Physical symptoms are a body’s way of communicating an unmet need and developing an awareness of inner body sensations and a sensation vocabulary assist one to increase the self-regulation of internal states (Zimberoff, 2011).

Current research supports that psychological interventions such as hypnotherapy, modulate the function of the immune system and buffer the functions of the immune functions (Kovacs 2008). The exact mechanism of what types of immune-related genes can be activated remains under investigation. Hypnosis has generally been used to reduce the impact of psychological stress, and to improve the ability to cope with emotional stress. These strategies mediated immune-modulatory effects.

Other studies have investigated how mind/body therapies can mediate the efficacy of the bidirectional interaction of mind/body system. Taylor (2010) conducted a multidisciplinary study on the benefits of mind/body therapies for patients with cancer, depression, diabetes, metabolic syndrome, arthritis, fibromyalgia, and AIDS. The study proposed that there is a functional and anatomically interconnected network of brain regions located at every level of the neuraxis. Beginning at the spinal and brainstem autonomic nuclei, and extending to cortical regions that integrate emotional and cognition with information regarding bodily states. These components mediate the efficacy of mind-body therapies.

According to Taylor (2010) studies support the therapies that address functional links between mind/brain and body may be particularly effective

in treating the range of symptoms associated with chronic disease. Mind/body techniques have been found effective in reducing depression, insomnia, anxiety, post-traumatic stress, irritable bowel syndrome (IBS), nausea, and acute and chronic pain. These therapies are also effective in managing impaired circulation, diabetes, and hypertension. Furthermore, studies have demonstrated physiological changes following mind/body interventions including enhanced cardiac-vagal tone and cardiovascular function; improved glucose tolerance and lipid profiles; and modulation of neuroendocrine responses, immune responses, and inflammatory responses. Taylor concludes these changes are consistent with the theory that mind/body therapies promote homeostasis, or the maintenance of optimal physiological conditions (Taylor, 2010).

According to Taylor (2010), it has become increasingly evident that bidirectional (top-down and bottom-up) interactions between the brain and peripheral tissues, including the cardiovascular and immune systems, contribute to both mental and physical health. Top-down mechanisms are those initiated via mental processing at the level of the cerebral cortex, conscious and intentional mental activities. As explained earlier, bottom-up mechanisms are initiated by stimulation of various somato-viscero, and chemosensory receptors that influence central neural processing and mental activities via ascending pathways from the periphery to the brainstem and cerebral cortex. Mind/body therapies target a combination of both.

Taylor (2010), further explains that attempting to understand the basic components of an integrative psychophysiological framework for research aimed at explaining the underlying interactions of mind-body therapies must include identifying the multiple levels of the neuraxis at which these mind/body interactions manifest. The study presented an integrative model to use in investigating the mechanisms by which mind/body therapies promote mental and physiological functioning.

Taylor's (2010) comprehensive study identified multiple levels of the neuraxis at which bidirectional vagal pathway interactions occur and their role as the following: Specific fronto-temporal cortical regions known as *executive homeostatic network* (EHN) that interact reciprocally and subcortical structures involved in bodily homeostasis and response to stress. The EHN, which includes the anterior cingulate (ACC), prefrontal cortex (PFC) and IC, represents the principle neurophysiological substrate for mind/body therapies that involve physiological self-regulation, cognitive control, and suggestion. These cortical regions are responsible

for integrating psychological, emotional and cognitive information and maintain homeostasis. The medial PFC outputs to autonomic control regions and serves as interface for the top-down emotional and social contributions of the ventral medial PFC. The structures of the EHN function as part of a reciprocal circuit with limbic areas, central autonomic regions of the thalamus, hypothalamus, and brain structures that directly regulate affective, autonomic, endocrine, and immune function. Taylor (2010) concludes together the structures of the EHN are well suited to mediate the effects of the mind-body therapies.

Prefrontal cortex (PFC)

Taylor's (2010) studies conclude both physical and psychological stressors that have been found to impair PFC. Preferential right frontal activation becomes activated during prolonged stress and has been associated with increased pain, depression, anxiety, hostility, and behavioral inhibition in addition to autonomic arousal, immune down-regulation, and activation of the *hypothalamic-pituitary-adrenal* (HPA) axis. It has been proposed that impaired PFC function is a critical link to the association of psychological depression and coronary artery disease. Therefore, normalizing imbalances of prefrontal function in stress-related psychopathology is considered central in successful in mind/body therapies.

The Insular Cortex (IC)

The Insular Cortex (IC) integrates sensory and visceral information and higher order representations of homeostasis. It mediates empathy, in that it serves as an interface between the mirror neurons that subserve imitation, and the limbic areas that contribute to emotional content. The IC functions as a direct target for central viscera-sensory pathways and contributes to aspects of both vagal modulation and immune regulation. The Insular Cortex is an excellent interface between mind/body, and plays a key role in mechanisms hypnotherapy.

Bidirectional autonomic and neuroendocrine pathways serve as mind-body pathways between the CNS and the periphery and facilitate the expression of affective, autonomic, hormonal, immune responses challenges and therapies.

Heart rate variability (HRV)

According to Taylor (2010) standardized measures of HRV are considered valid markers of vagal modulation and gained acceptance as markers of stress. Increased vagal activity correlates to increased HRV, whereas sympathetic activity and stress are associated with reduced HRV. Cardiac-vagal tone is generated by the structures of the central autonomic network. Heart Rate Variability (HRV) and markers of inflammation are important indices of central-peripheral integration and homeostasis within this homeostatic network. Recent neurophysiological evidence implicates bidirectional vagal pathways in the expression of arousal and stress and in immune-brain communication.

Therapies using bottom-up pathways have also been shown to positively influence cardiac-vagal tone or HRV (Taylor 2017). As discussed previously, the bidirectional mechanisms in mind/body medicine note that the vagus nerve is the communication highway between the mind/body systems. The vagus nerve is the longest and most complex of the 12 pairs of cranial nerves that emanate from the brain to the tissues and organs to the body. It is responsible for the digestive tract, respiration, and heart rate functioning. It communicates information from the gut to the brain, a bottom-up mechanism, which is linked to stress, anxiety and fear of the body or the *felt sense*. It also regulates the release of certain chemicals that result in anti-inflammatory signals to other parts of the body.

The vagus is composed of sensory fibers that continuously relay information regarding peripheral visceral sensation, organ function, and immune-inflammatory status. The vagal system functions via ascending projections from peripheral receptors to limbic and anterior cortical structures and descending projections that modulate autonomic, visceral, and immune activation. Thus, the bidirectional vagal system provides an important pathway through which mind/body therapies may diminish stress related symptoms encoded in the brain and expressed in the body (Taylor, 2010).

Thus, this paper postulates that the effectiveness of Hypnotherapy is rooted in its ability to create shifts in regional EHN activation. It has direct access to the bidirectional mechanism of the vagus nerve via its gestalt of hypnosis and its ability to communicate directly to the body through the *felt sense* or somatic experiencing. Because of its ability to affect cardiac-vagal tone by utilizing both top-up and top-down mechanisms, hypnotherapy is able to create deep healing in mind/body medicine. Unlike

talk therapy, which does not target the unconscious processes of the body, hypnotherapy utilizes a collection of modalities that penetrate and affect the mind/body system creating an internal neurochemical shift.

Taylor's (2010) studies utilized neuroimaging and psychophysiological research from diverse areas of mind-body medicine. Now, let us deepen our comprehension of the vagal nerve pathway as the mind/body communication highway and its ability to regulate stress and coherence using Heart Rate Variability (HRV) as a measure.

The role of HRV in vagal nerve function and mind/body healing

According to the Heart Math Institute, the new field of Neurocardiology found that the heart has a complex neural network that is sufficiently extensive to be characterized as a brain on the heart. This intrinsic cardiac nervous system (heart-brain) is an intricate network of complex ganglia, neurotransmitters, proteins and support cells, just like the head brain. It is able to act independently not only by processing experiences but also learn, remember, make decisions, feel and sense. The heart sends more information to the brain than the brain sends to the heart. This is due to the majority of fibers in the vagus nerves that are ascending in nature and travel to the medulla, hypothalamus, thalamus, and amygdala and then to the cerebral cortex. (Culbert, 2016)

Hypnotherapy utilizes the heart brain as the key component of the emotional system. This is the explanation of the *felt sense*. Communication between the heart and brain is a dynamic, ongoing, two way dialogue, with each organ continuously influencing the other's function. The Heart Math Institute states the heart's extensive ascending neural, hormonal and energetic system communications to the brain and forms the fundamental components of a dynamic, interactive network from which emotional experience emerges. This is the reverse of most psychological models, which concluded our emotions are contingent on our thoughts.

According to the Heart Math Institute (2016), generalized stress or anxiety disorders comprise the most frequent diagnosis of modern illness. Emotions activate and drive physiological changes that correlate with stress response. Optimal health, resilience and vitality is related to our ability to self-regulate our emotional reactions and experience. The new field of Neurocardiology has identified a number of physiological mechanisms that take place in the heart, including that the heart produces as much of the bonding hormone oxytocin as the brain. Furthermore, the heart communicates directly with the amygdala and is involved in creating

emotional experiences. These discoveries reveal its ability to access a deeper innate intelligence that can shift perceptions to increase vitality, enhance the ability to think clearly, awaken intuition and enhance relationships (Thuber, 2016).

The heart is the primary generator of rhythmic information patterns in the human body. Dr. Karl Pribram, former director of Neuropsychological Laboratory at Stanford, has demonstrated that due to the heart's extensive neural system, it transmits complex patterns to the brain with every heartbeat (Thuber, 2016). It is a powerful entry point into the communication network that connects body, mind, emotions, and spirit. Pribram also discovered that cells in the amygdaloid complex specifically responded to information from the cardiac cycle. The observed interaction with this brain region demonstrates that visceral information not only influences emotional processing but also hormonal and immune response (Culbert, 2017).

The ability to re-establish stability and regulate the viscera-autonomic activity with an internal adjustment shifted the control from external environment dependent to internal locus of control. The repetitive pattern of self-generating, these states hard wires it into our neural architecture and are then established as a new baseline. The ability to intentionally generate heart rhythmic patterns through psychophysiological coherence results in increasing our potential for health. (Thuber, 2016) Assisting clients to alter unconscious default patterns with current evidence based psycho-technologies allows them to shift the locus of control from external to internal. Accessing the core of the *dis-ease* and healing at the origin of the disorder not only emotionally empowers clients but also decreases the use of medications that mask the symptoms and create a cascade of unwanted side effects. In many forms of chronic illness, the general dis-regulation and drain of the illness experience can be reflected in decreased coherence. Feeling hopeless and or ineffective promotes unhelpful neuro-hormonal and immune events that can interfere with recovery (Culbert, 2016).

New evidence suggests that HRV training, breath control and engaging positive emotions, affect positive changes that promote immune functioning in such conditions as cancer. Patients or clients with a chronic illness share the feeling of a sense of loss of control. Mastering a safe non-pharmacological tool that offers some self-management of symptoms and giving back some measure of control has great therapeutic impact (Culbert, 2016)

Weller (2015) states when illness enters our life we may feel betrayed by our body, as if we no longer have a stable foundation beneath us. It dislodges our sense of control and invulnerability. If our health deteriorates we feel diminished and shed tears for our mind/body wholeness. At these times of crisis, Weller states, we are called to create radical changes. Radical comes from the Latin word *root*. We are invited to deepen our roots in life by cultivating a lifestyle that promotes healing. The word *healing* and *health* is derived from the Proto-Germanic word *khailaz*, which means, “to make whole”. In rewiring our mind/body systems to resonate in coherent patterns that are devoid of fragmentation through current psycho-technologies of transpersonal psychology, the deepest level of healing becomes available to individuals. Only through integrating ourselves through these unconscious dimensions can we begin to create a deep sustainable healing. To continue to conceptualize the effects of mind/body therapies, specifically hypnotherapy, let us utilize the discoveries of epigenetics to further our understanding on the mind/body system.

Epigenetics – influencing gene expression

Laying a context for epigenetics is crucial to understand how to cultivate an environment that supports health expression. According to the Institute of Functional Medicine, the primary driver of chronic disease is the interaction among genes, activities of daily living (lifestyle), and the environment (Jones, 2017). Adopting a new operating model integrating what we now know about how the human body works with individualized, patient-centered, science-based care that addresses the causes of complex, chronic disease, which are rooted in lifestyle choices, environmental exposures, and genetic influences will facilitate deeper sustainable mind/body healing.

We now know that less than 5% of all diseases today stem from single-cell disorders whereas 95% of all illnesses are related to lifestyle choices, chronic stress, and toxic factors in the environment (Dispenza, 2011). Current thought is that the environment of the gene is the most causative factor in producing disease by activating or deactivating particular genes. There are two types of genes: experience-dependent genes that are activated when there is growth, healing, or learning; and behavioral state dependent genes that are influenced during stress, emotional arousal, or dreaming (Church, 2007).

Epigenetics studies the changes in organisms caused by modification of gene expression rather than altering the genetic code itself. Epigenetics dispels the myth of genetic determination. It also creates a paradigm shift from victim of our genetic inheritance to active participant in co creating health.

The National Institute of Health (2017), explains chemical compounds that are added to single genes can regulate their activity; these modifications are known as epigenetic changes. The epigenome comprises all of the chemical compounds that have been added to the entirety of one's DNA (genome) as a way to regulate the activity (expression) of all genes within the genome. The chemical compounds of the epi-genome are not part of the sequence, but are attached to DNA ("epi"- means above in Greek). Epigenetic changes regulate the production of protein in certain cells by turning on and off various genes. Methylation is a common type of epi-genomic modification that can silence a gene and stop the protein from that gene to be produced. By stopping the protein from being produced we stop the expression of the trait or gene. Errors in the epigenetic process create conditions such as cancers, metabolic disorders, and degenerative disorders. Epi-genomics represents a critical link between genomic coding and phenotype expression that is influenced by both underlying genetic and environmental factors. Understanding epigenetics shifts the responsibility of health into a co-creating relationship of self and our inherited reality. Coupling current sciences discoveries of epigenetics, demonstrating that we have the ability to alter gene expression by altering our internal environment through the neurochemicals of our brain; and neuroscience discovery that a high percent of our brain's neurochemicals are created by our unconscious bottom-up mechanism, renders an obvious conclusions that the most efficient intervention for promoting long lasting health and vitality is the utilization of the psychotechnologies of Transpersonal psychology to navigate the brain's cascade of chemicals to promote gene expression of health and vitality.

A basic understanding of epigenetics is needed to understand how hypnotherapy and other psychotechnologies operate through molecular regulation, specifically, epigenetic modification to achieve their healing function. According to Andrea Nakayama (2017), biomarkers-single nucleotide polymorphisms (many forms of a gene) exist in an environment or terrain in which the gene expresses it's self, shifting the environment shifts gene expression. Single nucleotide polymorphisms (SNPS) and epigenetic factors capable of influencing drug response currently represent

the cutting edge of personalized medicine from a Western perspective (Kanherkar, 2017). Epigenetic factors such as smoking during pregnancy and maternal stress create mutations that occur in a non-genetic region that might not affect an expressed region. The expressive genotype is a fuller picture of the whole person, not each individual marker or hereditary gene. The expression of the gene potential from one's genetic blueprint is dependent on the environment that triggers genetic expression. Self-awareness is the key to personalize self-care to create health potential. This is not an external fix through medication or acute surgeries but instead deeper self-knowledge that needs constant work but also shifts the locus of control from external to internal (Nakayama, 2017).

The mind/body system is self-sustaining and programed for life vitality. External variables or influences create a disruption of the energetic flow and the mind/body system begins to break down communication between systems that keep it in balance (homeostasis). Disease is the end product of miscommunication of the mind/body system. The program that creates health and vitality is altered and the system is hijacked.

The role of methylation in healing the mind/body system

Dr. Kara Fitzgerald (2017), from the *Institute of Functional Medicine*, clearly outlines methylation, the mechanism that supports and shuts down gene expressions. Understanding the role of Methylation in expression of genetics has come into more focused awareness since the successful mapping of the genome (genomics) and the momentum of Functional Medicine. Methylation not only is responsible for making DNA but also regulating expression of genetics.

Recent findings within the realm of behavioral epigenetics demonstrate that stressors and/or adverse psychosocial environments can affect gene expression by altering the epigenetic pattern of DNA methylation and/or chromatin structure.

Any chronic condition, especially cancer has at its root a methylation imbalance. Dis-regulation of epigenetic methylation is prominent in cancer, cardiovascular illness and even in aging. Hypo-methylation (insufficient) inhibits the expression of the gene, for example, genes of inflammation or cancer genes. Hyper-methylation supports or promotes healthy expressions of genetics for example tumor suppression genes via supplements and methylation adaptogens found in foods. Supplements and diet are not the only methylation adaptogens. Balancing the mind/body

system and learning to navigate our internal cascade of stress hormones are also methylation adaptogens (Fitzgerald 2017).

The field of epigenetics has transformed our conceptualization of the impact of the environment upon our genes and upon our health. Recent studies demonstrate that epigenetic modifications shape behavior, modulate stress response, and alter immune function (Mathews, 2011). As epigenetics seeks to understand the interactive linkages that connect the psychological and social environment with the epigenetic processes that modulate gene expression and influence behavior; the integrative field of psychoneuroimmunology continues to advance the understanding of the complex networks that connect brain, behavior and immunity. In this field attention is now focused on the analysis and understanding of the molecular process, which underlie these complex networks (Mathews, 2011).

Research in mind/body medicine and immune system outcomes is complex not only because of the limited studies on hypnotherapy but also because of our evolving understanding of the immune system and its regulators. Let us start with a basic understanding of the immune system on a molecular level.

Hypnotherapy and the immune system

According to Torem (2007), in the field of psychoneuroimmunology, studies have shown how the central nervous system influences the functions of the immune system. The mind affects the immune system by secreting neurotransmitters and hormones that activate specific receptors on the surface of *T* and *B-lymphocytes*. This activates certain molecules to be released that either suppress or enhance the activity of the immune system. When the immune system is suppressed or underactive, it can lead to malignant proliferative disease or infections. When it is enhanced, it can lead to allergies. And when it is confused, it can lead to autoimmune disorders. The brain's connection with the immune system is mediated through the limbic-hypothalamic-pituitary pathway. The immune system communicates to the central nervous system through a secretion of hormones called neuroimmunotransmitters.

Torem (2008), also included the following research study findings: Rossi (1993), when patients shift into a state of hypnosis, we can communicate with the unconscious mind and speak directly to tissues and cells by using all five senses. Kiecolt-Glaser et al. (2005), concluded hypnosis can be used as a modulator of cellular immune dysregulation and

change a person's resistance or susceptibility to disease onset. Several studies conducted by Gruzelier (2002), have shown that hypnosis and guided relaxation cause a significant modulation of the immune response, increasing the number of CD4-positive T cells while buffering the drop in natural killer (NK) and CD8 cells that occur in humans experiencing stress.

Research conducted on the connection between brain and the immune system, concludes hypnosis can inhibit or enhance immune activity and consequently contribute to the weakened or strengthened resistance to disease onset or enhanced recovery from illness (Hall 1982-83) (Torem, 2010). Hall, Longo and Dixon (1982) showed the capacity of hypnotic suggestion to modulate the function of activity of the immune system by changing the number and response capacity of T and B cells. The balance in immune system between T helper cells and T suppressor cells as critical for optimal functioning of the immune system.

It is understood today that the mind affects the immune system by secreting neurotransmitters and hormones that activate specific receptors on the surface of T and B-lymphocytes. This activates certain intracellular mechanisms that either suppress or enhance their activity as cells of the immune system response. Some have referred to these specific molecules that are secreted by the central nervous system that affect the immune system as neuroimmunotransmitters (McDonald, 2013).

As previously stated, our understanding of the immune system is continuing to evolve, but in order to understand how hypnotherapy modulates the immune system; let's understand the production and function of antigens. In immunology, an antigen is a molecule capable of inducing an immune response (to produce an antibody) in the host itself in an autoimmune disease. Antigens induce the immune system response by interacting with an antibody that matches the antigen's molecular structure (Wikipedia, 2017).

Nearly all antigens in human cells can generate autoimmunity. However, the body has developed various mechanisms that induce tolerance of our immune system to such antigens. Specific immune system mechanisms ensuring tolerance to cells are B cells. B cells are generated in the bone marrow and some migrate thymus gland and become specialized in their activity thus called T cells. There are two types of T cells: T helper cells that help B cells produce antibodies that attack and destroy the invading pathogenic organisms and T suppressor cells that are designed to reign in the B cells and the T helper cells when they become too aggressive. An immune system that loses its natural balance creates

disease.

Kovacs (2008) specifically asked, “Can hypnosis alter the gene expressions of lymphocytes and if so, what type of immune-related genes can be activated by such psychotherapy?” Kovacs’ (2008) study revealed that genes that are regulated by inflammation are overexpressed following Hypnotherapy (RH) treatment. They may also play both protective and harmful roles in the progression of certain autoimmune diseases, such as diabetes, lupus, atherosclerosis and allergen induced asthma. The nervous and immune systems cooperate via the release of mediators from both sources. Catecholamine, a product of the sympathetic nervous system, regulates the immune function by acting on specific adrenergic receptors. Noradrenaline exerts its effects on the immune system directly through β -adrenergic receptors and indirectly through the modulation of its own release. Conversely, cytokines released by monocytes/macrophages and lymphocytes have immune-regulatory and neuro-modulatory effects since they are able to cross over blood-brain barrier and modulate the nervous functions. Furthermore, cytokines are also produced in the brain and especially in the hypothalamus. Hypnosis has been shown to increase immune response in cancer patients (Kovacs, 2008).

Recent evidence indicates that the activity of the hypothalamus pituitary-adrenal axis and serum levels of cortisol, prolactin and growth hormone are all influenced by the emotional status during hypnotherapy (Wood, 2003). However, Kovacs (2008) concluded it is still not known how hypnotherapy can modify the expression of the peripheral immune factors and why only the expressions of certain cytokines have been found to be sensitive to this type of treatment. Hypnosis and relaxation methods have generally been used to reduce the impact of psychological stress and to improve the ability to cope with emotional stress but now this provided the first experimental evidence that peripheral immune-related gene expressions may harbor relevant information as regards the effects of a psychotherapeutic approach, Hypnotherapy (RH). These results suggest that the lymphocyte gene expression signature could be informative concerning the immune- activating effects of Hypnotherapy (RH), but further studies are needed to confirm this and to explore the nature of these changes in the human genome (Kovacs, 2008).

Conclusion

Understanding the psychophysiology of hypnotherapy and elucidating the underlying biological substrates should contribute to greater acceptance

and integration of these therapies into conventional medicine. This paper investigated how hypnotherapy may function as an epigenetic modulator for expressing health potential, and hopefully has offered an in depth understanding of the origin of disease using the functional/integrative medicine model which is built on the discoveries of epigenetics.

Research identifies a high correlation of chronic or untreated stress as a precursor to illness and disease. It also identifies hypnotherapy as a mind/body therapy to be an effective molecular regulator of the immune system and specifically, an epigenetic modulator that promotes genetic expression of health and vitality. Research on integrative/functional medicine and the psychotechnologies of transpersonal psychology must be a high priority due to its non-invasive and cost effective qualities. Understanding the most crucial time for intervention or prevention allows healers to create wellness programs that effectively encourage resilience and genetic health expression by utilizing protective factors.

The field of epigenetics has shifted the locus of control from external to internal but now with this new power comes a new responsibility to cultivate a lifestyle that promotes an environment for the genetic expression of health. In this lifestyle interventions will be necessary that will address stress factors as well as nutritional and exercise lifestyle components. It is imperative that we remember supplements and diet are not the only methylation adaptogens. Balancing the mind/body system and learning to navigate our internal cascade of stress hormones are also methylation adaptogens.

As these new discoveries are conceptualized, increased resources are invested in functional genomics studies in diseases known or hypothesized to be stress-related and thus amenable to mind-body approaches. Studies will be able to identify specific pathways of action and determine new integrative programs for these interventions. This research will provide greater understanding of the profound links between the mind, the body, and the environment and inform clinical practice by providing doctors and their patients with an understanding of how to prevent disease, treat disease, and promote health using the power of the unconscious, the body.

A paradigm shift

These times call for a paradigm shift in how we perceive disease and health. These times call for a return to wholeness of mind, body, and spirit. This begins with understanding the mind/body/spirit are not separate and the mind/body was created to heal itself by maintaining homeostasis.

Understanding the intricate complex multidirectional quantum energetic mind/body communication we can utilize it to promote healing. By identifying the origin of the disease and releasing blocks that create fragmentation, or lack of coherence, whether it is stress or trauma or a toxic chemical from the environment like smoking, we allow the body to function at its optimal level. In this paradigm shift the focus is on supporting and resourcing the mind/body system. In this paradigm shift the focus is not only on surviving disease but seeing disease as a wake up call to go inward and find what we need to cultivate a life in which we not only survive, but also, thrive by consciously creating a lifestyle that promotes the genetic expression of health and vitality.

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