Cancer: Brain-regulated Biphasic Stress Response Induces Cell Growth or Cell Death to Adapt to Psychological Stressors

Charles Thomas, Shruti Bhatia

REVIEW ARTICLE

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ABSTRACT

According to Indian Vedic philosophy, a human being contains 3 major bodies: (1) the matter body—brain, organs, and senses; (2) the mental body—mind, individual consciousness, intellect, and ego; and (3) the soul or causal body—universal consciousness. The third, which is located in the heart according to all spiritual traditions and recent scientific literature, can be seen as the information body that contains all memories. The mental body, which can interface with the matter and information bodies, can be seen as a field of immaterial energy that can carry, regulate, and strengthen all information (eg, thoughts or emotions) both positively and negatively. This body of information may store ancestral and/or autobiographical memories: unconscious memories from inner traumas—inner information (I_i) or *samskaras* in Vedic philosophy—and conscious memories from outer traumas—outer information (I_o). These conscious and unconscious memories can be seen as potential psychological stressors. Resonance between I_i and I_o may induce active conflicts if resistance occurs in the mental body; this conflict may cause specific metabolic activity in the brain and a stress response in the physical body, which permits adjustment to psychological stressors. The brain-regulated stress response may be biphasic: cell death or growth induced by adrenergic molecular pathways during the conflict's unresolved phase and reversion to cell growth or death induced by cholinergic molecular pathways during the conflict's resolved phase. Case studies and data mining from PubMed suggest that this concept complies with the principles of holistic medicine and the scientific literature supporting its benefits. We suggest that the evolution of cancer can be seen as a biphasic stress response regulated by the brain to adapt to psychological stressors, which produce imbalance among the physical, mental, and information bodies. (*Adv Mind Body Med.* 2014;28(3):14-21.)

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"The real voyage of discovery consists not in seeking new lands but in seeing with new eyes."

– Marcel Proust

It is well accepted and documented that cancer is both a genetic and an environmental disease. Whereas only 10% of all cancers are caused by genetic factors, 90% are caused by environmental and lifestyle factors, such as use of tobacco, poor diet, use of alcohol, sun exposure, environmental pollution, infections, psychological stressors, obesity, and physical inactivity.[1] Whatever the risk factors, whether genetic and/or environmental and lifestyle factors, it appears that more than 50% of cancer patients have shown adjustment disorders with major depression that are more severe compared with the general population's.[2,3]

These adjustment disorders may be related to the general adaptation syndrome (GAS) that occurs in response to stress-producing agents or stressors; this syndrome was

discovered by Hans Seyle (1907–1982).[4] The GAS response, now called the stress response, can be induced by any stressors, whether material or immaterial, and can affect organs in a highly selective manner. It appears that for long-term breast cancer survivors, the majority of women believed that their positive attitude had prevented breast cancer recurrence.[5] However, the spectrum of individual adjustments to breast cancer is large; for some patients, cognitive control over cancer was strongly associated with good adjustment, whereas for others, attribution of responsibility for cancer generated guilt, doubt, and shame and was associated with poor adjustment.[6]

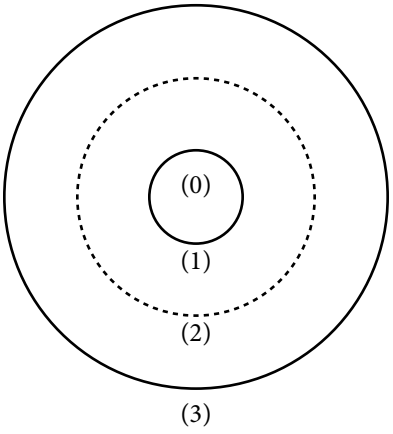
Convergent evidence also shows that patients' adjustment to cancer is related to the manner in which patients recall past events; increased hopelessness during the 6 months following cancer was associated with a decrease in positive memories and an increase in negative memories.[7] Finally, diseases, including cancer, can be seen as the natural elimination process of deep unconscious memories from inner traumas (*samskaras*); this concept is called *bhoga* in Vedic philosophy.[8] Despite these relevant factors affecting cancer patients, randomized trials have produced conflicting results regarding the specific role of psychosocial stressors on cancer progression and survival.[9-11]

BIOPHYSICAL MODEL OF THE HUMAN BEING

According to Vedic philosophy,[8] a human being contains 3 major bodies: (1) the causal or soul body that contains the samskaras; (2) the subtle or mental body that contains the mind, the individual consciousness, the intellect, and the ego; and (3) the gross or physical body that contains the brain, the organs, and the 5 senses. In contemporary scientific language, the causal body can be seen as the body of information containing all memories—thoughts, feelings, emotions, etc. The mental body can be seen as the tool that can regulate and also strengthen all memories, both positively and negatively. The soul can be seen as a pure and universal consciousness, which is located at the center of the causal body according to Vedic philosophy (Figure 1A).

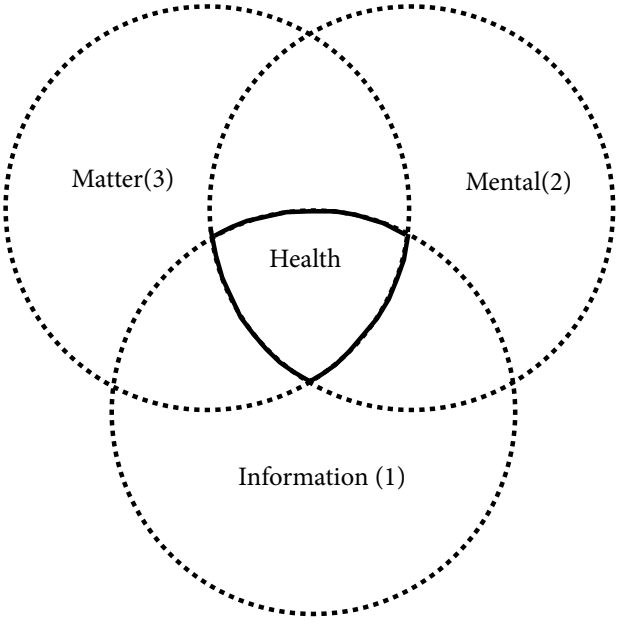
The first goal of *raja-yoga* meditation, which represents the practical aspect of Vedic philosophy, is to train the mental body to regulate thoughts and to maintain a state of balance in the practitioner. The final goal of raja-yoga meditation is to remove all samskaras in the causal body to realize a union of the individual consciousness (lower self) with the universal consciousness (higher Self). According to ayurveda (knowledge of life) in Indian traditional medicine, *prana* is the vital life force, and health can be seen as a subtle balance of prana among the physical, mental, and information bodies (Figure 1B).[12]

Figure 1A. The figure shows a model of a human being according to Vedic philosophy and ayurveda. The human being contains 3 major bodies: (1) the matter body—brain, organs and senses; (2) the mental body—mind, individual consciousness, intellect, and ego; and (3) the soul or causal body —universal consciousness. The third can be seen as the information body containing all memories; this body is located in the heart according to Vedic philosophy and recent scientific literature showing that the heart is coupled to an energetic field of information, perhaps not bound by time and space, that surrounds the physical body.[14]



(0) Center, universal consciousness
(1) Information body (memories—static immaterial energy)
(2) Mental body (dynamic energy)
(3) Matter body (condensed material energy)

Figure 1B. According to Vedic philosophy and ayurveda, thought is the subtlest and highest manifestation of prana, the vital force in each human being. Balance of prana among the physical, mental, and information bodies can generate health, whereas imbalance of prana among these 3 bodies can generate disease, such as cancer.



The mental body may interface with the material body of matter and the immaterial body of information. The mental body can be seen as a dynamic field of energy (E) that is either material energy, according to Einstein's theory of the relationship between matter and energy (Equation 1), or electromagnetic waves of immaterial energy, according to quantum physics (Equation 2):

(1) $E = mc^2$, with m = mass and c = velocity of light; and
(2) $E = hc/\lambda$ with h = plank's constant, c = velocity of light, and λ = wavelength (ie, the distance between successive peaks of the electromagnetic wave).

In agreement with traditional Vedic philosophy and contemporary physics, we suggest that (1) the physical body can be seen as condensed material energy; (2) the mental body can be seen as dynamic energy that is both material when the mind is oriented toward the physical body and the 5 senses and immaterial when the mind is oriented toward the information body; and (3) the information body can be seen as subtle and static immaterial energy (Figure 1A).

The largest electromagnetic field of immaterial energy is produced in the beating heart; researchers have suggested that this field extends outside the physical body and that the heart may function as a powerful generator of rhythmic information patterns to synchronize and provide coherence to the entire body.[13,14] According to McCraty et al,[14]

> The most basic definition of information is data that inform, or give shape to, action or behavior; in physiological systems, changes in chemical concentrations, the amount of biological activity, and the pattern of rhythmic activity are common means by which information is encoded in the movement of energy to inform system behavior.

Evidence also exists that sensitive heart-transplant patients show personal changes that parallel the personalities of the donors,[15] suggesting that the heart may contain autobiographical memories. Ancestral memories, such as unresolved past traumas transmitted through generations,[16] may be accessed with hypnosis techniques[17] and driven by morphic fields.[18] Sheldrake suggests that morphic fields are self-organizing regions analogous to magnetic fields, which are located inside and outside the biological systems that they organize. These fields work probabilistically like quantum fields and may contain a kind of memory corresponding either to the collective unconscious as described by Carl Jung or the *akasha*, a term from the *Veda* representing the library of all experiences and memories of human souls during their physical lifetimes.

Pearsall[19] has suggested that the heart may encode and distribute to the brain all information (eg, autobiographical and/or ancestral memories or samskaras in Vedic philosophy), to inform all cells in the physical body. Information encoded in the heart may be transported to the brain and to the physical body either (1) neurologically through neural signals; (2) biochemically through hormones and neurotransmitter signals; (3) biophysically through pressure and sound waves; and (4) energetically through electromagnetic waves, just as messages are transported by cell phones.

Evidence now shows that the heart is coupled with an energetic field of information, perhaps not bound by time and space, that surrounds the physical body and that the heart may receive the information before the brain. In this model, the brain can be seen as a central computer that processes the information and gives orders to the entire body.[20,21] We suggest that this energetic field of information, which is coupled with the heart, may be the universal consciousness described in Vedic philosophy,[8] which states that the "heart is the seat of the soul," as do most spiritual traditions in the world.

DEFINITIONS OF DISEASE

"Disease is the attempt made by Nature to heal."

– C. G. Jung

"I have my own experiences of sufferings and miseries, and after pondering over them a good deal, I have now come to the conclusion that suffering and disease are the boons of Nature in disguise, which helps deliverance from the effects of samskaras."

– Babuji Maharaj (Ram Chandra)

"Psychosomatic disequilibrium or unstable equilibrium is the cause of a disease."

– Charaka Samhita

"Thought is the subtlest and highest manifestation of prana and imbalance of prana produced what we called disease."

– Vivekananda

Imbalance of prana among the physical, mental, and information bodies may generate disease.[12] To illustrate these concepts described in ayurveda and Vedic philosophy, the first case shows an example of disease in a young woman living in Oslo, Norway.

CASE 1

This young woman said,

> Different health problems have followed me throughout my adult life. I have always struggled with symptoms of depression and with fatigue. Then a small series of accidents resulting in several concussions put me out of work for long periods, and I struggled with depression more. Strong feelings of fear and deep loneliness also opened up inside me, and my sleep pattern was significantly disturbed. As I tried to cope with the demands of everyday family and work life, my body and brain got overloaded, and I started to develop epilepsy. This serious medical condition increased my worries and fears even more.

Earlier, psychotherapy had alleviated the woman's depressive symptoms, and acupuncture and qigong were effective in reducing stress in her body and brain. However, her health situation had worsened with time. When she started to practice raja-yoga meditation on a regular basis, her health improved. The progress was slow and steady, almost invisible in the beginning but becoming more pronounced with time. She also received treatment from an ayurvedic doctor related to indigestion and imbalances in the body. As a result, her depression, fatigue, and even epilepsy disappeared.

The woman's health problems were related to traumatic experiences that were contained within her body and brain. She indicated,

> I had been flooded and overwhelmed emotionally throughout childhood and carried deep fears as well as many negative thoughts forward. As a result of raja-yoga meditation, I now understand that my health problems were related to memories of past life experiences and that the construct of the soul had to be included to understand the process.

A regular practice of raja-yoga meditation was effective in erasing disease-related memories from her body and soul and in inducing faith, connectedness, and meaning.

The Working Hypothesis

Entropy is a strong candidate that links energy and information. Entropy can be seen as a measure of the amount of uncertainty and the amount of information that characterizes open living systems. The higher the amount of uncertainty, the lower is the amount of information, and the higher is the entropy of the biological system. Although entropy may relate to dynamic energy existing in real mathematical time, information may relate to static energy existing in imaginary mathematical time.

This concept can be visualized using the egg timer. A vertical container of sand, such as an egg timer, represents energy transfer and action in real time, wheras a horizontal egg timer represents only information in imaginary time. The body of information can be either unconscious memories from ancestral and/or autobiographical inner traumas—inner information (I_i), or conscious memories from strong and destabilizing outer traumas—outer information (I_o) (Figure 2A).

Resonance between I_i and I_o in the heart may induce either inactive conflicts in the brain if acceptance in the mental body is present or active conflicts in the brain if resistance in the mental body is present. The inactive mental conflicts maintain entropy at the basic level, whereas the active mental conflicts increase entropy in the physical body (Figure 2B).

Figure 2A. Psychological stressors may induce conflicts in the mental body and the stress response in the physical body. Information involves both unconscious memories from inner traumas—inner information (I_i) or samskaras in Vedic philosophy—and conscious memories from outer traumas—outer information (I_o). These conscious and unconscious memories can be seen as potential psychological stressors. Resonance between I_i and I_o may induce potential mental conflicts.

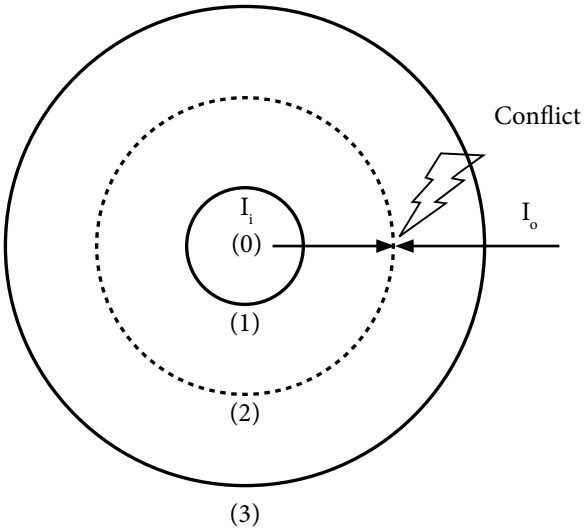


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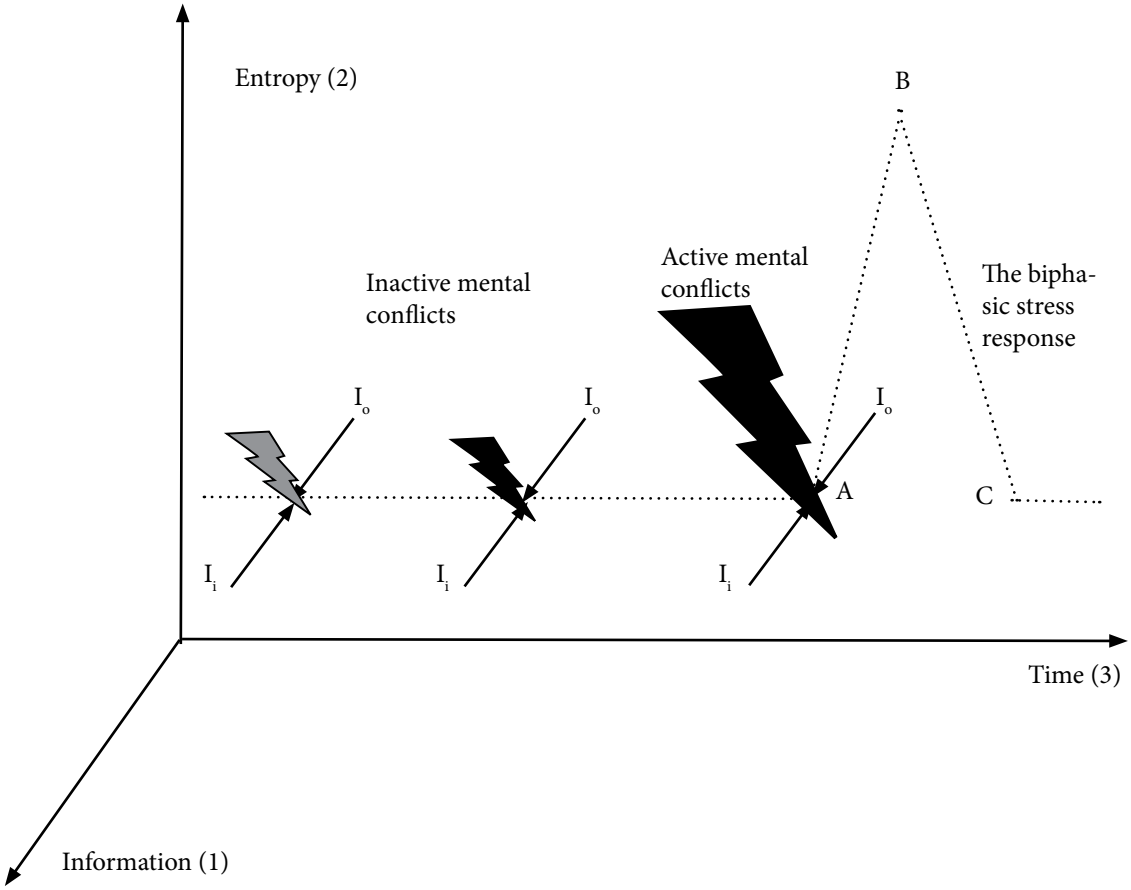
Figure 2B. The figure shows a representation in 3 dimensions of the relationship between information, entropy, and time during the stress response. Resonance between I_i and I_o in the heart may induce either inactive conflicts in the brain if acceptance in the mental body is present or active conflicts in the brain if resistance in the mental body is present. The inactive conflicts maintain entropy at the basic level, whereas the active conflicts increase entropy in the physical body. The brain-regulated, biphasic stress response in the physical body is produced in specific organs with time to adjust to psychological stressors.



AB = Brain-induced adrenergic molecular pathways during the unresolved phase of active mental conflict—pathogenesis phase.
B = Solution to active mental conflict.
BC = Brain-induced cholinergic molecular pathways during the resolved phase of active mental conflict—healing or salutogenesis phase.

Such active psychological stressors may depend on an individual's personality. Humans appear to have 3 large, mental representations of the self: (1) the actual self—who we are really; (2) the ideal self—who we would like to be; and (3) the ought self—who we and others think we ought be regarding our duties and obligations.[22] Tension between I_i and I_o may induce active mental conflicts in the brain among these 3 self-identities. A stress response can be activated in the physical body to adjust to such psychological stressors.

We suggest that the stress response, which is regulated by the brain in the autonomous nervous system, may be biphasic: (1) adrenergic activation during the conflict's unresolved phase—pathogenic process; and (2) reversion to cholinergic activation during the conflict's resolved phase—the salutogenic or healing process (Figure 2B). The salutogenic process has been a well-established principle of holistic medicine since the time of Hippocrates and was recently reviewed.[23] The authors found that interventions aimed at improving the quality of life and inducing healing—today often called salutogenesis—helped or cured 30% to 90 % of the patients, typically within 1 year, independently of the type of health problem; they suggest that unconditional love for the patients is the basic "tool" that takes the patient into salutogenesis.[23] Salutogenesis may also be associated with spontaneous tumor regression or unexpected remission, which has been occurring for hundreds, if not thousands, of years.[24]

In agreement with the brain-regulated, biphasic stress response, it is well documented that both adrenergic and cholinergic molecular pathways can induce either cell growth[25-27] or cell death[28-30] in specific organs. Specifically, we suggest that the evolution of cancer can be seen as a brain-regulated biphasic stress response, which induces either cell growth or cell death to adapt to active psychological stressors.

Testing the Hypothesis in a Clinical Department

Seminal studies using PET scans have shown that spatial cerebral activity is modified in patients with cancer (without cerebral tumors) compared with patients without cancer.[31] Complementary studies indicate that the spatial cerebral activity is both related to the immune activity[32] and to some psychosocial factors[33] in patients with cancer. However, these studies do not investigate whether the change in brain activity is related to either tumor-cell growth (progression) or tumor-cell death (regression) in cancer patients. Does tumor progression or regression induce change in brain activity, or inversely, does change in brain activity induce tumor progression or regression? Is the brain-induced stress response biphasic? These basic questions can be investigated with cancer patients using modern techniques such as PET scan and MRI. Finally, researchers need to investigate, in a clinical environment, the relationships between cerebral activity, heart coherence, and tumor progression or regression and the nature of psychological stressors that induced the imbalance of prana among the physical, mental, and information bodies in cancer patients. The next section describes the nature of these psychological stressors.

Evolution: Stress Responses Induced by Psychological Stressors

Table 1 displays empirical relationships between evolutionary steps, active psychological stressors, brain localization, embryology, and phenomena related to cell growth and cell death occurring during the stress response, which were first discovered by Ryke Geerd Hamer[34,35] using brain imaging and interviews of cancer patients.

First Evolutionary Step. This step involved the development of the endodermic cerebral trunk in the hindbrain, which regulates vital functions such as breath, digestion, elimination, and reproduction that have allowed living organisms to survive in the environment. Active mental conflicts that are induced by strong emotional shocks related to vital functions (eg, "I am afraid of death" or "I cannot eliminate a strong contrariety" or "I cannot accept the loss of a relative") may be solved by the hindbrain-induced function of endodermic organs, such as the lower mucosa of the respiratory, digestive, and genital systems, respectively. According to this hypothesis, cell growth may occur during the *unresolved* phase of a vital conflict while reversion to cell death may occur during its *resolved* phase.

Second Evolutionary Step. This step involved the development of the mesodermic cerebellum at the hindbrain-midbrain junction to protect vital organs against environmental stressors. Active mental conflicts that are induced by strong emotional shocks related to protection after an aggression (eg, "I must protect my thorax or my abdomen or my heart") may be solved by the cerebellum-induced function of mesodermic organs, such as the pleura, peritoneum, or pericardium. According to this hypothesis, cell growth may occur during the *unresolved* phase of a protection's conflict whereas reversion to cell death may occur during its *resolved* phase.

Third Evolutionary Step. This step involved the development of the mesodermic midbrain to move in the environment (ie, movements of organs are induced by the midbrain). Active mental conflicts that are induced by strong emotional shocks related to movement (eg, "I feel devalued, and I cannot move") may be solved by the midbrain-induced dysfunction of mesodermic organs, such as the bones or muscles. Indeed, according to evolution, function does not create organs, but absence of function damages organs.[36]

Table 1. Empirical relationships between evolutionary steps, active mental conflicts, brain anatomy, embryology, and the brain-regulated biphasic stress response that induces either cell growth or cell death in the physical body to adapt to mental conflicts. Adapted from Mambretti and Séraphin.[34]

				Phase of Mental Conflict	
Evolutionary Steps	**Mental Conflict**	**Brain Region**	**Germ Layer**	**Unresolved (Adrenergic Nervous System)**	**Resolved (Cholinergic Nervous System)**
Basic functions	Vital	Hindbrain (cerebral trunk)	Endoderm	Cell growth	Cell death
Protection	Filth aggression	Hindbrain-midbrain (cerebellum)	Mesoderm	Cell growth	Cell death
Movement	Self-devaluation	Midbrain	Mesoderm	Cell death	Cell growth
Communication	Territory	Forebrain (cortex)	Ectoderm	Cell death	Cell growth

According to this hypothesis, cell death may occur during the *unresolved* phase of the devaluating conflict, whereas reversion to cell growth may occur during its *resolved* phase.

Fourth Evolutionary Step. This step involved the development of the ectodermic cortex to communicate with the environment or in the territory. Active mental conflicts that are induced by strong emotional shocks related to territory (eg, fear in the territory, disorganization in the territory, or sexual frustration in the territory), may be solved by the forebrain-induced dysfunction of ectodermic organs, such as the upper mucosa of respiratory, bladder, or genital systems, respectively. According to this hypothesis, cell death may occur during the *unresolved* phase of the conflict of territory, whereas reversion to cell growth may occur during its *resolved* phase. According to this hypothesis, cell death and reversion to cell growth are well described for patients with colorectal carcinoma associated with ulcerative colitis,[37] but whether this observation is related to territorial's conflict inducing changes in brain activity deserves further clinical investigation. To illustrate these psychosomatic concepts in relationship to evolutionary steps, the next section shows the case of a woman living in France who experienced several shocks before being diagnosed with a melanoma at the age of 45.

CASE 2

> At 11 years old, I experienced my first shock; I learned that my father had abused one of my friends, by kissing her. At 25, I was married with 2 children when I experienced the second shock; shortly after getting married, I found out that my husband had been arrested in the past by the police for child abuse and sent to jail. At 35, I experienced the third shock: my 2 daughters told me that my husband had tried to abuse them by inappropriate sexual touching. At 38, I experienced the fourth shock; I discovered that my second husband was having an affair with another woman. I was devastated, lost all self-esteem, and experienced conflicts of loss of integrity and filth; the later corresponds to a conflict of coming in contact with something filthy or "feeling soiled."

These conflicts can induce brain activity in the cerebellum and a stress response in the skin (derma) because the function of this organ is protection against aggression according to the evolutionary steps (Table 1).

The woman continued,

> I knew that this conflict was in resonance with the experiences of my great grandmother, grandmother, and mother, who all suffered such conflict during their lives. At 45, I was diagnosed with a melanoma (level IV) without metastases and had an operation. As a result of raja-yoga meditation, I finally accepted the melanoma with faith, abandon, and confidence and without any fear of death because I knew that a samskara had been removed from the causal body. I am now 65 years old and cured.

CONCLUSION

In summary, according to Vedic philosophy and ayurveda, thought is the subtlest and highest manifestation of prana, the vital force in each human being, and imbalance of prana among matter, mental, and information bodies may generate disease, such as cancer. The body of information may store all conscious and unconscious memories, which can be seen as potential psychological stressors. Our working hypothesis is that resonance between unconscious memories from inner traumas (samskaras) and conscious memories from outer traumas may induce active conflicts, if resistance exists in the mental body; this conflict can cause an imbalance of prana among the physical, mental, and information bodies. We suggest that cancer may be seen as a brain-regulated biphasic stress response, which induces either cell growth or cell death to adapt to psychological stressors and active conflicts in the mental body. On the other hand, if acceptance exists in the mental body, cancer can be seen as a natural process to remove samskaras from the causal or information body, a concept called bhoga in Vedic philosophy. The causal body may be coupled to the heart—"the seat of the soul"—and science is beginning to rediscover this Vedic knowledge with contemporary tools.

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AUTHOR DISCLOSURE STATEMENT

The authors have no conflict of interest. The viewpoints expressed are not necessarily those of INSERM.

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