

# Theoretical Characteristics of Tibetan Medicine

Jing-Nan Liu<sup>a,b,\*</sup>, Tawni Tidwell<sup>c,\*</sup>, Hui-Hui Zhao<sup>a,b</sup>, Qing-Jia Ren<sup>d</sup>, Meng Mao<sup>a,b</sup>, Hui-Chao Wu<sup>a,b</sup>, Xiao-Han Pang<sup>a,b</sup>, Wei Chen<sup>a,b</sup>, Meng-Ling Hu<sup>a,b</sup>, Zi-Juan Zhang<sup>a,b</sup>, Da Man<sup>a</sup>, Xiao-Qiao Ren<sup>a,b</sup>, Li-Li Wu<sup>a</sup>, Tong-Hua Liu<sup>a,d</sup>

<sup>a</sup>School of Traditional Chinese Medicine, Beijing University of Chinese Medicine, Beijing, China, <sup>b</sup>Institute of National Medicine, Beijing University of Chinese Medicine, Beijing, China, <sup>c</sup>Center for Healthy Minds, University of Wisconsin-Madison, Madison, WI, USA, <sup>d</sup>University of Tibetan Medicine, Lhasa, China

\*Both authors contributed equally to this work

## Abstract

Similar to traditional Chinese medicine (TCM), Tibetan medicine emphasizes the concepts of holism, balance, and etiology. With the individual as the nexus of macro- and micro-ecologies, multi-layered systemic etiologies, inform therapeutic pharmacologies for cultivating network effects to induce the healing response. Tibetan medicine approaches health and healing through perspectives that frame the balance achieved in the internal world as inextricably linked to balance in the external world, and vice versa, that includes expressions of mind and consciousness. The external world refers to the broader context of the natural world as comprised of matter and energy expressed through five elemental dynamics (Chi, Tu, Shui, Huo, Feng and Kong; Tib. Sa, Chu, Mé, rLung and Kha) describing principles of solidity, cohesion, heat, motility, and interactive space, or earth, water, fire, wind and space, respectively. The internal world refers to the local context of the physical mass and biochemical cascades of energy transfers comprising the human body, its behaviors and functions, including cognitive factors, as also expressed through the five elemental dynamics. The external and internal systems merge as a unified whole, where the five elemental dynamics characterize materio-energetic exchanges between the broader and local ecologies of individual body and natural world, as well as social relations, mental affects, and contextual conditions. The interdependence, opposition, restriction and transformation among three physiological systems known as *nyépa* (Three Causal Factors) - *rLung*, *Tripa* and *Béken* (pronounced *lōng*, *trīpa*, *baekan*, respectively) - are used to discuss the balance of the whole. The causal origins of disease are explained through disturbances to these systems as a combination of afflictive mental factors, physiologic imbalances, and disturbing conditions from the natural world, such as environmental toxins, pathogens, and exposures. Of the three causal origins, afflictive mental factors are particularly emphasized as important etiological conditioning influences. Initiation and progression of disease is divided into four stages: baseline stage, initiating stage, developing stage, and maturing stage. Each stage has an explicit therapeutic paradigm for treatment, recovery, and health maintenance demonstrating the distinct theoretical framework for disease treatment in Tibetan medicine as specific to individual body, particular disease etiology, and constitutionally-directed unique compound metabolism pharmacodynamically.

**Keywords:** Five elemental dynamics, Research guiding principles, Tradition distinctions, Theoretical characteristics, Tibetan medicine

## INTRODUCTION

Tibetan medicine is based on the theory of five elemental dynamic properties and three default functional energetic systems of pathways that guide differential diagnosis of disease, characterize functional activities of *materia medica*, inform formulation principles of compounding, determine clinical treatment of disease and shape clinical applications of therapeutic modalities. This article presents key theoretical characteristics of Tibetan medicine, framing them through scientifically relevant paradigms to facilitate their accessibility as references for multidisciplinary research and the wider clinical application of Tibetan medicine.

**Address for correspondence:** Prof. Xiao-Qiao Ren, School of Traditional Chinese Medicine, Beijing University of Chinese Medicine, Beijing, China.  
Institute of National Medicine, Beijing University of Chinese Medicine, Beijing, China.  
E-mail: rxq2311111@126.com

Prof. Tong-Hua Liu, School of Traditional Chinese Medicine, Beijing University of Chinese Medicine, Beijing, China.  
University of Tibetan Medicine, Lhasa, China.  
E-mail: thliu@VIP.163.com

Prof. Li-Li Wu, School of Traditional Chinese Medicine, Beijing University of Chinese Medicine, Beijing, China.  
Institute of National Medicine, Beijing University of Chinese Medicine, Beijing, China.  
E-mail: qingniao\_566@163.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**For reprints contact:** WKHLRPMedknow\_reprints@wolterskluwer.com

© 2020 World Journal of Traditional Chinese Medicine | Published by Wolters Kluwer - Medknow

**Received:** 13-11-2019, **Accepted:** 31-08-2020, **Published:** 16-12-2020

**How to cite this article:** Liu JN, Tidwell T, Zhao HH, Ren QJ, Mao M, Wu HC, *et al.* Theoretical characteristics of tibetan medicine. World J Tradit Chin Med 2020;6:490-9.

### Access this article online

#### Quick Response Code:



**Website:**  
[www.wjtcn.net](http://www.wjtcn.net)

**DOI:**  
10.4103/wjtcn.wjtcn\_65\_20

## FIVE ELEMENTAL DYNAMICS AND INTERDEPENDENT EXTERNAL-INTERNAL ECOLOGIES

In Tibetan medicine, the maintenance of health and cultivation of healing relies on a paradigm of facilitating systemic functional balances in material flows, signaling exchanges, and pathway activities of organs, body systems and mental patterns. This balance is achieved in two dimensions: (1) through relationship with the external world, and (2) cultivated change in the internal world. The external world refers to the natural world, or the broad-scale environment and its inhabitants.<sup>[1]</sup> Its material form and activities are expressed through five elemental dynamics of earth (in Chinese, *Tu*; in Tibetan, *Sa*), water (*Shui*; *Chu*), fire (*Huo*; *Mé*), wind (*Feng*; *rLung*) and space (*Kong*; *Kha*) respectively.<sup>[2,3]</sup> It also encompasses innumerable organisms of different forms, sizes, and activities, and includes the human organism. The human organism is only one part of a vast natural ecological web. Like many of the other organisms, it depends on the elemental inputs of sunshine, air, water, and various foods from the natural world to survive. It integrally depends on its environmental context and the various resources it gains from the natural world for sustenance, while simultaneously affecting this world through its materio-energetic exchanges. The human body is also made up of the five elements. That is, its material form and activities are expressed through the five elemental dynamics as well. Through a shared basis of elemental form and the continuous exchanges to maintain that form and all its activities, the macro external world and micro internal world produce a unified whole system.

The Tibetan medical classic called the *Four Medical Treatises*<sup>[4]</sup> characterizes the five elemental dynamics as having five functions, or dynamic properties. First, the five elemental dynamics produce material form and substance. Without their mobilizing activities, there would be nothing to catalyze a given set of initial conditions. It would be like a seed that could not become a seedling, a seedling that could not grow into a full tree, or a tree that could not bear fruit. Second, the five elemental dynamics play the role of accumulating substances. Without the dynamic properties of the five elements, matter could not accumulate, more complex forms could not manifest and substances could not emerge. Third, the five elemental dynamics drive the transformation of form. If the five elements are attenuated or damaged, the structures and activities formed by them will also be attenuated and damaged, just as a tree's shadow disappears when the tree is cut down. Fourth, the five elemental dynamics correspondingly depend on the form they themselves produced to create more forms. This can be likened to an elderly wood carver depending on a walking stick he himself produced to seek resources to produce more. Similarly, the five elements constantly proliferate, and the fruits of their formation - the various forms - also continuously proliferate. Fifth, the five elemental dynamics integrally facilitate the growth and maturity of the body—through providing the material substances, the accumulative potential, the energetic

foundations, the generative mobility and the interactive context. In a way, the five elements grow and mature, and their fruits—the various forms and activities produced—are also constantly growing and maturing. In short, there are five functional relationships that the five elemental dynamics have with the “vessel and contents” of the external world as well as that of the internal world. Macro level and micro level organisms constitute both external and internal worlds, and in turn, their bodies are constituted further by other macro and micro level organisms. Therefore, the layers of balance in and protection necessitated for the ecological environment, just as much as that relevant to the human organisms within it, provide core principles of establishing health and wellness for any organism from the Tibetan medical perspective.

The system balance of the five elements in the body depends on the system balance of the five elements as they occur in nature. In the *Explanatory Treatise* section of the *Four Medical Treatises*, it states, “The basis [or body] is generated from the five elements,” and its disintegration similarly depends on their dissolution.<sup>[4]</sup>

In the *Four Medical Treatises*, the chapter on body formation in the same treatise describes, “The causal conditions for conception comprise the union of non-defective sperm of the father and nondefective ovum of the mother; [an entering] consciousness; generative karmic imprints; the inciting influence of afflictive emotions; and the assemblage of [all influential properties from] the five elemental dynamics.”<sup>[4]</sup> It continues, “Without the karmic imprints, the consciousness cannot enter. Without the earth dynamic (*Tu*; *Sa*), the matter cannot manifest; without the water dynamic (*Shui*; *Chu*), the matter cannot cohere into form; without the fire dynamic (*Huo*; *Mé*); the form cannot develop and mature [into a fetus]; without the wind dynamic (*Feng*; *rLung*), [the fetus] cannot grow; without the space dynamic (*Kong*; *Kha*), there is no interactive space in which its growth can expand.”<sup>[4]</sup>

The next section describes, “The functional properties of the earth dynamic produce flesh, bone, and the olfactory organ and its functions. That of the water dynamic forms blood, the other body fluids, the tongue organ and gustatory capacities. The functional properties of the fire dynamic generate heat, overall physical complexion, and the visual organs and their sensory capacities. That of the wind dynamic drives respiration, skin formation and facilitates tactile sensory experience. The functional properties of the space dynamic form orifices and channels in the body, the auditory organ and its sensory capacities.”<sup>[4]</sup> The dynamic properties of the elements described here illustrate a Tibetan medical paradigm that relates well to Western scientific thought in recognizing the relationship between material and energetic properties in the natural environment as identical to that in the human body, and gaining homeostatic balance through interdependent exchanges, coordination, and integration between the two domains.

Five-element theory in Tibetan medicine is used to explain human physiological function, pathological changes,

pharmacological properties, clinical treatment, and so forth. This paradigm is similar to five phase theory in traditional Chinese medicine (TCM) in that the five phases of wood (*Mu; Shing*), fire (*Huo; Mé*), earth (*Tu; Sa*), metal (*Jin; Chak*), and water (*Shui; Chu*) are used to explain physiological function, pathological changes, and clinical diagnosis and treatment; except instead of the wood and metal phases of TCM, Tibetan medicine has wind (*Feng; rLung*) and space (*Kong; Kha*) elements. However, the identical phases in TCM are used in Tibetan medicine for qualities that affect the pulse, particularly those specific to seasonal changes.<sup>[4]</sup> Likewise, space (*Kong*) in TCM is understood as an interactive context for the five phases, and similar principles of the wind dynamic of Tibetan medicine can be seen more readily in the form of *Qi* in TCM. Thus, Tibetan medicine and TCM demonstrate synergies in theory and practical application of the five elemental dynamics and five phases, respectively, in their clinical and pharmacological context, but also exhibit important distinctions.

## THEORY OF THREE CAUSAL FACTORS OF RESTRICTION AND BALANCE

Elemental theory in Tibetan medicine informs another one of its theoretical frameworks called the “*Three Causal Factors*”, which are functional energetic systems of pathways or activities that, in their default mode, link body constituent, organ, fluid, and energetic signaling dynamics to provide specific systemic health-sustaining activities in the body.<sup>[5]</sup> Imbalance of the *Three Causal Factors* drive disease formation, and therapeutic regimens are prescribed according to the degree and nature of the imbalance. The *Three Causal Factors* are comprised of *rLung*, *Tripa* and *Béken*. Similar to the elemental dynamics, the functional activities of the *Three Causal Factors* work in conjunction with and maintain homeostasis throughout the life course starting from the moment of conception.<sup>[4]</sup> The wind dynamic animates *rLung* activities, the fire dynamic facilitates *Tripa* activities, and the earth and water dynamics drive *Béken* activities. Just as the five elements comprise the material basis and activities of the human body, its constituents, pathways, and activities are determined by the *Three Causal Factors*.

The *Four Medical Treatises* describe *rLung* as the motive force of life-sustaining activities and provides the fundamental functions of breathing, movement, excretion, circulation, sensation, and immunity.<sup>[4-7]</sup> *rLung* has six definitional attributes: rough, light, cold, subtle, mobile, and “hard” in the sense that it imparts force that can move things. According to five major functional pathways that *rLung* controls, it can be divided into five subtypes: (1) Life-Sustaining *rLung*; (2) Upward-Ascending *rLung*; (3) All-Pervasive *rLung*; (4) Fire-Accompanying *rLung*; and (5) Downward-Voiding *rLung* [Table 1].

*Tripa* is described as the metabolic source for systemic activities of the body and mind. As far as the specific physiological activities of the body are concerned, the main functions are regulating body temperature, facilitating digestion and enhancing blood qualities, visual perception,

mental acuity, and motivation.<sup>[4-6]</sup> It has seven attributes: oily, sharp, hot, light, odorous, purgative, and moist or shearing. According to five major functional pathways that *Tripa* manifests, it can be divided into five subtypes: (1) Digestive *Tripa*; (2) Complexion-Clearing *Tripa*; (3) Accomplishing *Tripa*; (4) Sight-Facilitating *Tripa*; and (5) Color-Transforming *Tripa* [Table 1].

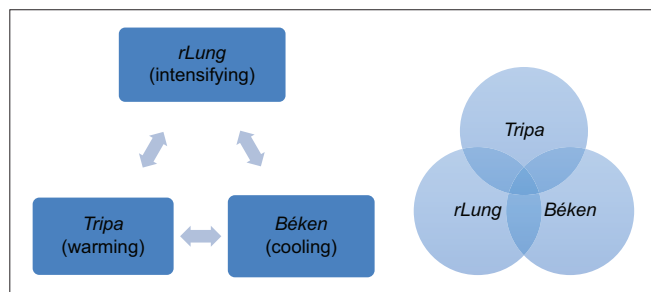
*Béken* provides the material foundations and stabilizing functions for a healthy body. As far as its specific physiological activities for the body are concerned, it mainly provides connectivity and lubrication at the joint spaces, breaks down dietary input for subsequent digestion and absorption, facilitates sensory satisfaction, emotional contentment, and physical strength.<sup>[4-6,8]</sup> *Béken* has seven basic attributes: oily, cool, heavy, dull, smooth, stable, and sticky. According to the major functional pathways that *Béken* supports, it can be divided into five subtypes: (1) Supporting *Béken*, (2) Decomposing *Béken*, (3) Experiencing *Béken*, (4) Satisfying *Béken*, and (5) Connecting *Béken* [Table 1].

The *Three Causal Factors* also drive the functions of the organs. Although each vital and vessel organ tends to have a predominant relationship with one particular *Causal Factor*, functional aspects of *rLung*, *Tripa*, and *Béken* contribute to the structure, function and metabolic load of each organ. Likewise, without the matter and activities of the body and its organs, the *Three Causal Factors* can also not exist. They are basis and dependents at the same time. The same principles of relative balance and coordination on the systemic scale should also be maintained locally at each organ site. Macro and micro scales of these interdependencies continue to nest at increasingly finer levels. Balance and coordination at the organ level depend on that at the tissue level, and the tissue level depends on that of the cellular level, and the cellular level on that of its subcellular parts and so forth.

Imbalances, or disease, from the Tibetan medical perspective, are characterized as distorted, disordered or dysfunctional pathways, structures, and activities of one or more of the bodily constituents; the body’s excrements and waste products; or the related organs, fluids and tissues; and the *Three Causal Factors*, which link all these various components together. The *Four Medical Treatises* states, “The aspects that are harmed and that which causes harm, that is, the bodily constituents, waste products and *Three Causal Factors*, mutually depend on one another, forming the basis for birth, existence and death, and thus, define the body.”<sup>[4]</sup> From this perspective, these components define health when in functional balance, and define disease and disorder when in dysfunction. The *Three Causal Factors* provide the interconnected relationships amongst structure and function, as well as physical and mental aspects. The interdependence maintaining the aspects of the body and the driving forces of emotions center one’s behavior as central to the cultivation of balance and re-establishment of health out of disorder. The *Four Medical Treatises* states: “*rLung* resides in bone, *Tripa* in sweat and blood, and *Béken* in the remaining bodily constituents and

**Table 1: Summary of Three Causal Factors subtype, pathways and functions in Tibetan medicine**

<i>rLung</i>			<i>Tripa</i>			<i>Béken</i>		
Sub-type	Location and pathways	Function	Sub-type	Location and pathways	Function	Sub-type	Location and pathways	Function
Life-Sustaining <i>rLung</i>	Crown of head; through throat and medial thorax	Swallowing, salivary expulsion, breathing, provides clarity to mind and sensory organs and binds mind and body together	Digestive <i>Tripa</i>	Between stomach and small intestine, regions transitioning undigested to digested intake	Digests food, separates nutrient and waste products, generates body heat. Also comprised of a type of bile that supports and increases the rest of bile	Supporting <i>Béken</i>	Chest	Supports the other four types of <i>Béken</i> and regulates bodily fluids
Upward-Ascending <i>rLung</i>	Thorax; through esophagus, larynx, nose and tongue	Manages production of speech, esophageal and larynx activities, enhances physical strength, facilitates perseverance, and memory acuity	Complexion-Clearing <i>Tripa</i>	Liver	Supplies color-enhancing components to the seven bodily constituents, such as providing hemoglobin and its vermilion tone to blood and flesh	Decomposing <i>Béken</i>	Upper stomach, regions of undigested contents	Breaks down ingested solids into a semi-liquid state
All-Pervasive <i>rLung</i>	Heart region; pathways throughout body	Responsible for most body movement, such as movements of the limbs, closing and opening the eyes, mouth, etc., and animating minor winds throughout the body	Accomplishing <i>Tripa</i>	Heart	Gives sense of confidence, pride, resourcefulness, and drive to achieve one's desires; facilitates the development of wisdom	Experiencing <i>Béken</i>	Tongue	Tastes, experiences and discrimination between the six tastes
Fire-Accompanying <i>rLung</i>	Stomach and colon; pathways from cells to tissues	Assists in the digestion of dietary intake, extracts nutrients from food and transforms nutrients into blood, enriching the seven bodily constituents	Sight-Facilitating <i>Tripa</i>	Eyes and supporting pathways	Generates vision	Satisfying <i>Béken</i>	Head	Facilitates sensorial satisfaction of the sensory organs
Downward-Voiding <i>rLung</i>	Pelvis; pathways through colon, pelvic region, bladder, reproductive organs and thighs	Excretion, expulsion and release of stool, sperm and seminal fluid, menstrual blood and fetus in childbirth	Color-Transforming <i>Tripa</i>	Skin across all regions of body	Provides skin tissue integrity and luster that appears rosy and radiant	Connecting <i>Béken</i>	Joint intersections; and tendon, ligament, and sensory organ orifice interstices	Maintains connectivity, adhesion, lubrication and mobility of joints and connective spaces
Main habitat	Animated by emotional attachments; depends on pelvis, spine and peripheral nervous system; resides in lower body below the navel			Animated by emotions of aversion and anger; depends on liver, gallbladder and vital blood, and resides in middle body between navel and heart			Animated by delusional tendencies, inattention and dullness; depends on brain, in upper body above heart	
Sites Where Primary Disorders Reside	Regions engaged in post-digestion activities; pelvis; bones; joints; skin; heart, colon and nerves			Regions near navel; stomach; blood, sweat glands, nutritional essence, interstitial and pre-lymph fluid ( <i>chuser</i> ); eyes; skin; small intestine, liver, and gallbladder			Regions of chest, throat, lungs, stomach, head and brain, nutritional essence, fat, bone marrow, regenerative fluid, feces, urine, nose, tongue, spleen, kidney, bladder	

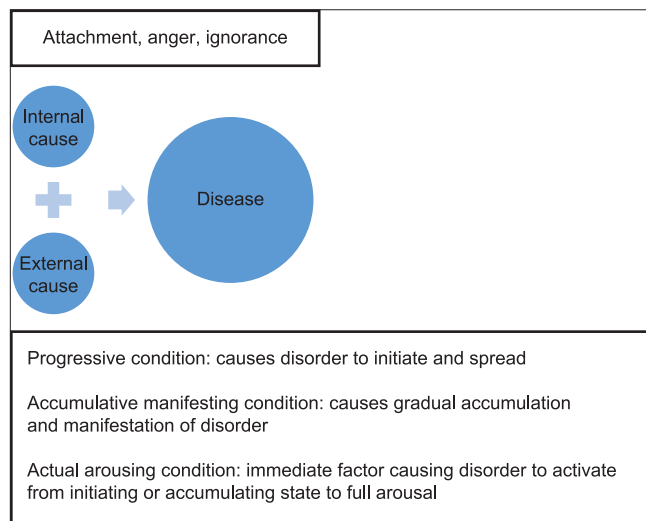


**Figure 1:** Interrelationships of the *Three Causal Factors* in Tibetan medicine

waste products.”<sup>[4]</sup> Those three sets of bodily constituents exhibit functional characteristics related to their predominant *Causal Factor*, and their consequent dysfunction or abnormalities then indicate a disorder most associated with that *Causal Factor*. Each bodily constituent also has all *Three Causal Factors*’ functions and constituents present at all times under all conditions.

In describing the contributing aspects of each *Causal Factor* to the digestive process, the *Explanatory Treatise* section of the *Four Medical Treatises* states, “First, dietary intake, which is comprised of the six tastes, is broken down and its components reduced by Decomposing *Béken*, transforming the intake into a sweet, frothy mixture. Then Digestive *Tripa* digests the mixture through heat aspects and transforms it into sour chyle. Finally, Fire-Accompanying *rLung* separates nutrient essence for absorption and waste product for expulsion, transferring the substances to their respective pathways.”<sup>[4]</sup> Even the process of digestion illustrates the interdependence of the *Three Causal Factors* as contributing their respective functional activities to the metabolic stages of gastric peristalsis and mixing, digestive enzyme input, alkalinizing bile neutralization of gastric acids, and subsequent absorption in the intestinal tract as nutrient components transfer to blood and lymph circulation and wastes move further down to exit the body. These processes are similar to accounts in modern medical physiology.

The *Three Causal Factors* also have general regions of the body where their activities are most significant. The *Four Medical Treatises* states: “*Béken* relies upon the brain and therefore generally exists in the upper part of the body. *Tripa* relies upon the liver and gallbladder, and therefore generally exists in the middle part of the body. *rLung* relies on the pelvis and waist region, and therefore exists in the lower part of the body.”<sup>[4]</sup> The positionality and dominant activities of each *Causal Factor* also result in some effects that can become antagonistic to that of the other *Causal Factors* when imbalanced. For example, the functional activities of *Béken* are described to have a “cold” nature in the sense that they inscribe the properties of the earth and water elemental dynamics of structure and cohesion. Such properties are slow-acting, build and dissipate gradually, and exhibit significant inertia to influences of change, hence describing them as “cold.” *Tripa*, on the other hand, is “hot”-natured due to its relationship with the properties of the fire elemental dynamic that confers heat,



**Figure 2:** The etiological nexus relating internal and external factors of disease causation and stage of progression in Tibetan medicine

metabolic activity, and swiftness to processes and responses to transformative influences. *rLung*, though technically neutral in terms of its hot/cold nature, has an intensifying effect on any baseline influence – it metaphorically fans the flames of a fire thereby worsening *Tripa* imbalances; likewise, it exacerbates the cooling qualities of *Béken* imbalances just as a wind transports heat from a lake assisting it to freeze. Despite the potential antagonisms between the *Causal Factors* during imbalances, they integrally work together when balanced to sustain body functions and health [Figure 1].

Form and function conferred by the *Causal Factors* are not isolated and static. They are constantly in flux, producing quantities and activities of the respective bodily constituents and excrements. Each has a particular developmental and maintenance pathway that the respective *Causal Factors* facilitates. Bodily constituents that incur improper development in structure, amount, function, respective pathway, or location in the body result in disease. In general, in health, the *Three Causal Factors* restrict each other and their products and pathways dynamically through certain changes in quantity or position, similar to the maintenance of homeostasis within and across body systems from the Western medical perspective. The chapter on the specific causes of disease in the *Four Medical Treatises* describes, “The specific causes are the three mental afflictions of attachment, aversion and delusion that arise from fundamental ignorance, which then produce the *Three Causal Factors* of *rLung*, *Tripa* and *Béken*. The balanced state of *rLung*, *Tripa* and *Béken* then become the proximate causes for disease since they are susceptible to disorder and imbalance. They provide the potential basis that manifests as the nature of disease and causes harm and suffering to body and life.”<sup>[4]</sup> These three factors interact through dependence, restraint, and balance maintenance of the organism.<sup>[9]</sup>

The paradigms of maintaining balance among the *Three Causal Factors* in Tibetan medicine, along with the integration of

perspectives on such balance not just for the human organism, but for the greater external environment and its inhabitants, align well with the theory of *Yin* and *Yang* in TCM and its approach to maintaining health only when these aspects of the body and context are in a balanced state. The concept of balance for both medical traditions directs not only understandings of disease formation, but also treatment approaches. To understand the specifics of the pathways, functions and regional predominances for the *Three Causal Factors* in Tibetan medicine in greater detail, see Table 1. This concept of balance provides a useful reference for clinical approaches to treatment<sup>[6,10-12]</sup> and emphasizes principles of ecological balance critical for contemporary biomedical models.

## ETIOLOGICAL UNDERSTANDINGS INTEGRATING MIND, BODY, AND ENVIRONMENT

Causation pathways of disease in Tibetan medicine draw on a paradigm in which the body is in dynamic relationship with the external environment and its internal ecology. The seven bodily constituents and three excrements comprise the body's material foundations; the five vital and six vessel organs provide its major functional structures; and the *Three Causal Factors* link constituents, excrements, organs, fluids, pathways and intersections of its materio-energetic complex. These *Three Causal Factors*, in turn, have expressions in the external environment, similar to that in the internal body system.

The integral relationship between the external and internal environment in Tibetan medicine is illustrated by an allegorical tree<sup>[13]</sup> described in the *Four Medical Treatises* that details the physiological conditions that support health and wellness, and the pathological conditions that drive disease. Allegorical trees are used to illustrate various classifications used in Tibetan medical theory,<sup>[13]</sup> and a formalized series of medical paintings including such depictions were commissioned in the 17<sup>th</sup> century CE to support Tibetan medical education.<sup>[14]</sup>

The *Three Causal Factors* also have integral relationships with mental and emotional factors, which animate, induce, and provide parameters for the physical functions of the *Causal Factors*. Table 1 details some cognitive aspects of the major functions for each *Causal Factor*. Mental and emotional factors can drive imbalance, disorders and disease through psychoneuroimmunological pathways and biochemical cascades in the body of their cognitive stimuli. Tibetan medicine characterizes the root cause of all illnesses as ignorance, defined as not realizing intrinsic reality as comprising a lack of an inherently existent, self-sustaining form of a self. Not realizing this view is understood to drive individual conduct in such a way that the individual continually engages in disease-producing behaviors, contexts, relationships, and responses. This unrealized view also causes one to remain unaware of subtleties of cause and effect between the lived world, individual experience, and the impermanent nature of all phenomena. As such, cognitive impulses of desire, greed, aversion, anger, jealousy, and inattention

become inculcated in such a way that they seem congenital, persistent and unchangeable, an aspect of the nature of the human condition instead of a malleable form in the body and activity of the mind. Yearnings to hear praise, greed for material wealth, lust for another's sexual body, anger upon receiving criticism, hate when encountering difference and so on, become subtle, momentary flickerings of events in the mind, driving micro-movements of *rLung* and activating numerous responses in the body. The simple mechanics of stress, anxiety, and fear in driving physiological stress responses in the body dampen the immune system and causes persistent cellular damage in chronic forms, revealing the significant repercussions of seemingly simple emotions on the body. This relationship also points to the role of the mind in supporting greater physical health over the life course as well.

From the Tibetan medical perspective, the emotion of anger causes experiences in the body that increase blood flow and volume and aggravate *Tripa* pathways causing stress on the liver and gallbladder. Anger is an intense emotion that arises as a significantly uncomfortable or hostile response to a perceived threat, provocation, or harm. During such experiences, body temperature increases, the complexion reddens, and cognition narrows to focus on the perceived threat. The characteristics of anger such as heat, burning, sharpened attention, and enraged response metaphorically relate to the qualities of *Tripa* as sharp, hot, swift, and sensorially offensive and pungent. As anger incites *Tripa*, *Tripa* imbalances also lay the causal grounds for hot illnesses, fevers, and epidemics. Inattention and delusion comprise cognitive aspects related to *Béken*. The cognitions are characterized by blunted awareness, coarse engagement with the world and a heavy numbing to the qualities of the perceptual world. Such characteristics relate metaphorically to the definitional aspects of *Béken* being heavy, dull, thick, devoid of activity and slowed by inertia. Common organs in which *Béken* disease occurs are the stomach, intestines, kidneys, and spleen. Desire, craving, and attachment are terms to express emotions of intense longing or yearning for a thing, person, outcome, or gain. There is a quality of excitement related to the expected outcome, a resistance to its unattainment, a stickiness or grasping to keep the desired, and a greed for more. Unachieved desires can likewise fall into the other emotions of anger and rage. Desire and attachment metaphorically share similar qualities to *rLung* in that there is significant movement to attain the desired, rough or coarse qualities to the conduct, hardness or resistance to its unattainment, and an ease of falling into anger for the unattained or delusion in grasping at the desired, just as *rLung* can fan the flames of *Tripa* fire and solidify the ice of *Béken's* cool earthy liquid components.

*rLung*, *Tripa*, and *Béken* are potential internal causes of disease when no harm is inflicted to create physical or emotional lesions so to speak; and become direct drivers of pathology when harm occurs.<sup>[15,16]</sup> Developing mental habits of attentiveness and nondistracted concentration, warm-heartedness, and care toward others, less self-clinging and self-interest, and a greater acceptance of the impermanence of our thoughts, emotions,

and experiences will foster greater habits and perspectives supporting wellness and flourishing health. Cognitive factors such as emotions and mental events are central to pathogenesis, and conversely, also critical in reestablishing balance to health.

At the same time, the emergence of disease is also integrally affected by the role of external factors. External factors include three types: progressive conditions, which cause the disturbance of the internal balance of constituents and pathways through excess, deficiency and adverse qualities of environment, seasons, climate, exposures, social-relational dynamics, sensory objects, and the related lifestyle responses. The accumulated manifesting conditions cause the accumulation of constituents and activities of the prevailing *Causal Factors* causing aggravation of that pathway and its organ systems leading to pathologic states. These conditions arise from interactions between an individual's physiological and psychological constitution, prevailing diet and lifestyle and qualities of the environment that amplify, conflict, or pacify influences from the seasons, climate and overall geography. Such influences cause the *Causal Factors* to accumulate, manifest, and subside, respectively. The actual arousing conditions are the primary drivers of external factor influences on the development of disease. These include direct climactic, weather, and seasonal influences; external afflictive influences that result in environmental exposures and mental disturbances; poisons, toxins, and pathogens; and adverse dietary and lifestyle consumption. These tend to align with many Western medical perspectives on disease vectors [Figure 2].

The framework of the three types of external factors, also translated as inciting influences or conditioning causes, illustrates an etiological perspective in Tibetan medicine that links health threats from the external environment, psychological responses to perceived threats and experiences, physical processes of disease genesis in the body, and the dynamic interrelationship across all three. This paradigm underlies all aspects of causal theory of disease in the Tibetan medical theoretical framework and is used to expound human physiological function, pathological changes, and disease diagnosis and treatment. This academic point of view has important reference value that could be used to deeply inform and refresh paradigms for contemporary biomedicine and the study of psychosomatic medicine. For example, research on "unemployment" as a source of social stress has shown greater elevation of inflammatory biomarkers among unemployed populations compared to employed, as well as among populations experiencing greater racial stigma.<sup>[17,18]</sup> Other studies have shown that psychological stress has certain correlations with changes in immune function, such as the level of CD4 cells and the ratio of CD4/CD8 cells, concanavalin A reaction and phytohemagglutinin reaction.<sup>[19,20]</sup> At the same time, individuals with worse economic status have higher psychosocial pressure and significantly lower levels of Epstein-Barr virus (EBV) antibodies.<sup>[17,21]</sup> EBV antibody is also an indirect biomarker reflecting cellular immune

function, which can reflect the changes of immune function in the process of psychological stress.<sup>[17,21]</sup> Therefore, Tibetan medicine has important clinical value in explaining the role of psychological factors in psychosomatic medicine from the perspectives of life course health and flourishing, the role of the mind in healing processes and therapeutic approaches that integrate the biopsychosocial nexus of care.<sup>[21,22]</sup>

## ETIOLOGIC PROGRESSIONS AND STAGES OF DISEASE

Tibetan medicine divides disease into four stages.<sup>[23]</sup> The first stage is the baseline stage of dormancy representing the initial conditions before disease initiation inside the body or adventitious entrance from outside. The internal and external causes as well as conditioning influences of disease have certain time periods of action and intensities of influence. An abetting context is required before disease can commence and this is the state the dormant stage encompasses. The second stage is a stage of initiation, also described as accumulation, where internal factors assemble toward pathological outcome. The third stage is the developing stage, which occurs when enough factors have assembled to give rise to the initial manifestation of disease pathways and presentation. The final stage is a ripening stage into full maturation, where the manifestation of the disease presents its definitive symptomatology. The three types of external factors outlined above primarily determine if and how a disease progresses through these stages, if it can naturally recover from these external factors, and to what degree medicinal and therapeutic intervention are needed. The four actual arousing conditions of season, external afflictive influences, diet and lifestyle are commonly the most significant among these external factors. These lead to the greatest fluctuations in time and severity of body health, and the dynamics of greater experiences of ease and wellness in one's body, mind and social relations.

In order to determine which external factors are influential for a given case, and the degree of influence in the pathology, Tibetan physicians use diagnostics that rely on observation, palpation, and consultation primarily, as well as any other available data. Urinalysis and pulse assessment significantly inform differential diagnostics. During the initial stage of disease, the cause of the disease enters or initiates from within the body. It inflicts or results from an excess, deficiency or disturbance in *rLung*, *Tripa* and/or *Béken*. After disease initiation but before symptoms fully appear is the prelude to the full expression of disease, and disease onset is when the symptoms of the disease manifest and the disease presentation can be differentially diagnosed. During disease maturation, disease pathways further develop and can enter a period of greater threat, severity or chronicity. Tibetan medical diagnostics focus on diagnosing disease at its earliest stage and providing timely treatment to prevent its development and maturity. For physician as embodied instrument,<sup>[24]</sup> diagnostic nuance, accuracy, and prognosis requires perceptual means at each stage of disease progression. Embodied diagnostics of Tibetan medicine alongside biomedical diagnostics of identical

conditions and the related etiological understandings of disease development would provide a rich area of research across both medical traditions to investigate prevention and early diagnosis of disease, and the role of expertise and cultivated skill among even biomedical physicians to support patient care. Treatment paradigms in Tibetan medicine also draw upon disease stage, and focus on integrative practices of both health maintenance and stability as both preventative and recovery approaches. Understanding treatment approaches for disease stages in Tibetan medicine can inform research paradigms with important clinical value as well as basic etiological significance.

### Distinct Diagnostic System of Urinalysis

Urinalysis is a distinct system of diagnostic methods in Tibetan medicine. It draws from detailed understandings of nutritional essence separation from waste products in the digestive system and the metabolic products produced and transmitted throughout the body in related processes. Dietary intake enters the body with a given constitutive profile comprised of dynamic properties of the five elements.<sup>[25,26]</sup> Those elemental dynamics drive the transformation of the dietary intake into the seven bodily constituents and three excrements. Urine is one of the three excrements. Urine characteristics and its component excreted products provide indications of underlying health states as well as pathological processes specific to organ, physiological system, *Causal Factor* drivers, elemental dynamics and bodily constituents.<sup>[27]</sup> For diagnostic urinalysis, nine urine characteristics are assessed over three observational periods.<sup>[4]</sup> The three periods comprise: (1) when the urine is still freshly warm after excretion, (2) when the odor dissipates and the urine is cooling; and (3) when the urine is completely cold. When freshly warm, the urine characteristics of color, steam, odor, and bubble production are assessed. When the odor dissipates and the urine is cooling, specific excreted products in urine called “*kuya*,” or sedimentation, and the superficial scum are assessed. When the urine is cold, the rate of transformation, mode of transformation and post-transformative state are assessed.

Analyzing the macroscopic characteristics and transformative qualities of the urine reveal underlying subtle processes that indicate the nature, location and prognostics of a given disease. Such methods substantiate differential diagnostics, direct

treatment trajectories and caution therapeutic contraindications of the disease.<sup>[28]</sup> Tibetan medical urinalysis was included in the first batch of preserved practices for the national intangible cultural heritage expansion project list in 2008.<sup>[29]</sup> It plays a critical role as primary diagnostic technique in the Tibetan medical clinic. It also provides an important data source to assess patients who cannot visit the doctor in person, whereby family members can bring urine samples to the physician for a direct proxy of observation and analysis. Often physicians provide diagnostic assessments of a patient directly with just medical history assessment and diagnostic urinalysis. In a geographic setting, such as the Qinghai-Tibet Plateau where sparse populations are widely distributed, these diagnostic methods provide practical relevancy for health care access and implementation.<sup>[30]</sup> In the Tibetan medical classic *Medical Arts of the Lunar King*, urine diagnosis is even prioritized over pulse diagnosis. The *Four Medical Treatises* describes the importance of urinalysis as the most important diagnostic technique to distinguish hot and cold disorders. It determines the appropriate pharmacologic compounds and therapeutic applications for treatment protocols, providing an indispensable clinical tool.

### DISTINCTIVE TIBETAN MEDICAL THEORY: POTENCY CHARACTERISTICS IN MATERIAL PROPERTIES

From the perspective of Tibetan medicine theory the five elemental dynamics and *Three Causal Factors* maintain constant, balanced, and coordinated interactions of the related constituents, pathways, and activities in the body, animating, parameterizing, and dynamically complementing each other during functional states to ensure the normal physiological activities of the body for sustained health and sustenance. Their relationship of interdependence, synchronization, and restriction [Table 2] cultivate the relative balance of the body, yet when intervening influences disturb this balance, the afflicted *Causal Factors* drive disordered processes. Disturbances to *rLung* manifest erratic effects predominantly on the nervous system, mind and neuroendocrine signaling. Disturbances that aggravate *Tripa* manifest as increased heat systemically or in specific pathways. Disturbances to *Béken* create greater stagnation, inertia, structural changes, and restricted fluid functions in the body causing an effect characterized as “cold”

**Table 2: Defining features and characteristics of therapeutic and contraindicated compounds for the *Three Causal Factors* in Tibetan medicine**

<i>Three Causal Factors</i>	Definitional Characteristics	Nature	Therapeutic Compounds Characteristics	Disease-Generating Compound Characteristics
<i>rLung</i>	Rough, light, cold, subtle, mobile, and hard	Neutral	<i>rLung</i> disorders are treated by smooth, heavy, warming, oily and stabilizing compounds	<i>rLung</i> disorders are induced by rough, light, cold and nutrient-lacking compounds
<i>Tripa</i>	Oily, sharp, hot, light, odorous, purgative and moist or shearing	Hot	<i>Tripa</i> disorders are treated by cold, dull, cooling, unconcentrated and drying compounds	<i>Tripa</i> disorders are induced by warming, sharp and oily compounds
<i>Béken</i>	Oily, cool, heavy, dull, smooth, stable, and sticky	Cold	<i>Béken</i> disorders are treated by drying, hot, light, sharp, and rough compounds	<i>Béken</i> disorders are induced by heavy, oily, moist, cold and dull compounds

due to diminished activities in the related pathways. Cold and hot influences can coexist, conflict, or transform each other in the body under certain conditions. The clinical manifestations are single type, dual-combined type, and comprehensive triad type of the possible combinatorial aggravations to *rLung*, *Tripa* and *Béken*. Pharmacological properties in Tibetan medicine are also characterized as cooling, heating, or neutral. Hot disorders, such as fevers, are treated with cooling compounds, while cold disorders, such as various digestive conditions, are treated with warming compounds. This is a paradigm in Tibetan medicine that characterizes how potency influences material properties and responses. Understandings of potency derive from that of elemental dynamics in a given mass or material that characterize *Causal Factor* activities in living forms. Such understandings of potency also characterize the tastes, post-digestive tastes, eight potency characteristics and seventeen potency qualities in materia medica used for compounding medicine and dietary input, as explained in more detail elsewhere.<sup>[31]</sup> Potency theory in Tibetan medicine has wide application. Tibetan medicine basically treats all kinds of diseases caused by imbalances of *rLung*, *Tripa* and *Béken* according to the properties of the elemental dynamics that describe activities of mass and energy flows in and out of the body.<sup>[32]</sup> This perspective characterizes etiological understandings of disease as well as directs therapeutic efficacy in Tibetan medicine.<sup>[21]</sup>

The Seven Essential Practices for Cultivating Medicinal Quality<sup>[4,31]</sup> are methods for cultivating potency and medicinal qualities in harvested herbs and other materia medica as well as during compound formulation. Proper ecology, contextual environment, time, and conditions shape these qualities. Aspects of toxicity are removed from specimens and the different types of materia medica are prepared, processed and combined in such a way to “smooth” the potency, making the formulation easier to digest and targeting the specific pathway, organs and bodily constituents desired by the formula. It also minimizes undesired effects on aggravated *rLung* that may create resistance to the formulation through immune, allergic or other adverse response. The part of the plant that is collected also determines the function of the medicine. First descriptions of this approach are in the *Eighteen Auxiliary Branches* collection<sup>[33]</sup> and they are further summarized in the *Four Medical Treatises*. For example, the roots of the plant are generally used to treat skeletal conditions, branches are used to treat vascular and connective tissues disorders, outer bark is used to treat skin diseases, leaves are used to treat vessel organ conditions, flowers are used to treat disorders of the sensory organs, and fruiting bodies are used to treat the vital organs.<sup>[4,34]</sup>

In summary, Tibetan medicine exhibits theory-praxis principles similar to TCM in emphasizing concepts of entirety, external-internal interconnectedness, balance and multi-layered conditioning of etiologic roots. However, the distinctions are significant. Different intellectual histories, though conversant, have generated distinct theoretical and applied paradigms for each medical tradition. The elemental dynamics in Tibetan

medicine of earth, water, fire, wind, and space characterize dynamic properties of solidity, cohesion, heat, motility, and interactive space, respectively, for materio-energetics of living animate and non-living inanimate forms, but also include aspects of mind, cognition and consciousness. In TCM, wood, fire, earth, metal, and water comprise five phases used to explain physiological function, pathological changes, and clinical diagnosis and treatment in the same way the five elemental dynamics do so for Tibetan medicine; however, they do not integrate mental qualities similarly. The concept of *Yin*, *Yang* and *Qi* in TCM compared to that of the *Three Causal Factors* in Tibetan medicine, describe distinct pathways and disease causation, and even direct distinct applied treatments in the two medical traditions. Though comparable by analogy, they represent distinctly different theoretical and clinical applications of medicine. Tibetan medicine places greater emphasis on the inner emotional world where cognitive events, emotional cascades, and mental expressions animate physiologic processes and their pathological deviations in the body. Interdependence, opposition, restriction, and transformation characterize the relationships among *rLung*, *Tripa* and *Béken*, rather than the view of balancing of *Yin* and *Yang* in TCM. In Tibetan medicine, the external and internal systems merge as a unified whole, where the five elemental dynamics characterize materio-energetic exchanges between the broader and local ecologies of individual body and natural world, as well as social relations, mental affects, and contextual conditions. The causal origins of disease are explained through a combination of afflictive mental factors, physiologic imbalances, and disturbing conditions from the natural world, such as environmental toxins, pathogens and exposures. Of these three, afflictive mental factors are particularly emphasized as important etiological conditioning influences. The etiology, genesis and progression of the four stages of disease development delineate causal conditioning influences -that of baseline, initiating, developing, and maturing. Each stage has an explicit therapeutic paradigm for treatment, recovery and health maintenance demonstrating a distinct theoretical framework for Tibetan medicine specific to individual body context, particular disease etiology, and constitutionally-directed unique pharmacology and host metabolism. Such characteristics provide a distinctly different medical model approach compared to that of TCM, and both in distinction to Western medicine.

### Financial support and sponsorship

(1) Tibet Science and Technology Department, project type: Tibetan medicine regional collaborative innovation project, project name Tibetan Medicine Sanchensan Chemical Composition Analysis and Antimicrobial Activity Research, Project lot number: 2017XTCX010, Project Leader: Liu Tonghua, Ren Xiaoqiao. (2) National Natural Science Foundation of China (81774448), project leader: Ren Xiaoqiao. (3) National Natural Science Foundation of China (81973697), project leader: Zhao Huihui. (4) Center for Healthy Minds [Project number AAG8698], University of Wisconsin-Madison, project leader Tawni Tidwell.

## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- Jamgön Kongtrul Lodrö Tayé ('jam mgon kong sprul blo gros mtha yas) (18131899). *Gdul zhing snod bcud kyi 'jig rten rim par spye ba* [A Progressive Classification of the Existential World: The Vessel and its Contents]. Rigpe Dorje Institute; 2017.
- Germano, David, and Tournadre N. *THL Simplified Phonetic Transcription of Standard Tibetan*. The Tibetan and Himalayan Library, 2010. Accessed at: [www.thlib.org/reference/transliteration/#!essay=/thl/phonetics/all](http://www.thlib.org/reference/transliteration/#!essay=/thl/phonetics/all). As adapted from Wylie, Turrell. A standard system of Tibetan transcription. *Harvard Journal of Asiatic Studies* 1959, 22: 261–67.
- ShuangJie Y, ZhiYin W, HuiHui Z, XiaoQiao R. Modern research of Tibetan medicine. *World Journal of Traditional Chinese Medicine* 2019; 5:131-138.
- Yutok Yönten Gönpö (G.yu thog yon tan mgon po, fl. 12<sup>th</sup> cent.). *Bdud rtsi Snying po yan lag Brgyad pa Gsang ba man ngag gi rgyud* [The Secret Quintessential Instructions on the Eight Branches of the Ambrosia Essence Tantra]. Lhasa: Bod Ljong mi Dmangs dpe Skrun Khang; 1982.
- Tidwell T. Collapsing cancer: An hermeneutical and praxisbased comparative analysis of cancer and Tibetan medical etiological categories. In: McGrath W, editor. *Knowledge and Context in Tibetan Medicine*. Netherlands: Brill Publishers; 2019. p. 140196.
- Sanzhijia. Understanding of Tibetan medicine on human body ecology. *J Qinghai Med Coll* 2000;31:133135.
- Yutok Yönten Gönpö (G.yu thog yon tan mgon po, fl. 12<sup>th</sup> cent.), Lan Liu Li, Jizu M, Carlo and Shaoling M, editors. Translated. Shanghai: Shanghai Science and Technology Press; 2012. p. 1.
- Yutok Yönten Gönpö (G.yu thog yon tan mgon po, fl. 12<sup>th</sup> cent.). *Four Medical Treatises*. Shanghai: Shanghai Science and Technology Press; 2012. p. 1340.
- Shilin M, Jizu M. *Medical Arts of the Lunar King (Somaratsa)*. Shanghai: Shanghai Science and Technology Press; 2012. p. 160.
- Hui L, Gejia Z. On Tibetan medicine's understanding and treatment of nonalcoholic fatty liver disease. *Chin J Tradit Chin Med* 2017;32:35463548.
- Qingpei SL. On the theory of three causes in Tibetan medicine and the observation of the clinical effect of the treatment of heart disease in Derge Tibetan Hospital. *China Foreign Med Treat* 2018;8:127128.
- Xiaoqiao R, Qingjia R, Lijuan Z, Meng M, Longmei L, Zhiyun D, Cirendeji N. Analysis of the clinical application and promotion of the treatment of leukemia, a distinctive medical techniques in Tibetan medicine. *World Sci Technol J Modernization Tradit Chin Med* 2018;20:453459.
- Yutok Yönten Gönpö (G.yu thog yon tan mgon po, fl. 12<sup>th</sup> cent.). *Illustrated four Medical Books to Understand the Secret of Tibetan Health Preservation*. Shaanxi: Shaanxi Normal University Press; 2006. p. 12.
- Gyatso J. *Being Human in a Buddhist World: An Intellectual History of Medicine in Early Modern Tibet*. America: Columbia University Press; 2016.
- Limaocairang. On pathogenesis in Tibetan medicine. *Chin J Natl Med* 2010;16:34.
- Lamaocairang. Theoretical basis of Tibetan medicine psychology. *Chin J Ethnic Med* 2017;23:6263.
- Rongrong C. Immune response law and mechanisms of psychosocial stress. *Progress Psychol Sci* 2019;27:821833.
- Hughes, Amanda, McMunn A, Bartley M, Kumari M. Elevated inflammatory biomarkers during unemployment: Modification by age and country in the UK. *J Epidemiol Community Health* 2015;69:673679.
- Xiangrong Z, Changxiao P, Yonggui Y. Negative emotions and psychological defense mechanisms in psychosomatic patients. *J Health Psychol* 2001;9:244245.
- Scanlan JM, Vitaliano PP, Ochs H, Savage MV, Borson S. CD4 and CD8 counts are associated with interactions of gender and psychosocial stress. *Psychosom Med* 1998;60:644653.
- Fagundes CP, Bennett JM, Alfano CM, Glaser R, Povoski SP, Lipari AM, *et al.* Social support and socioeconomic status interact to predict EpsteinBarr virus latency in women awaiting diagnosis or newly diagnosed with breast cancer. *Health Psychol* 2012;31:2012:1119.
- Linghui D. Psychosomatic medicine and the psychology of traditional Tibetan medicine compared with the modern medical model. *J Tibet Institute Natlities Philosop Soc Sci Edition* 2003;24:69-71.
- Qinghai Academy of Tibetan Medicine, Ed. *A Review of Tibetan Medicine*. Beijing: Ethnic Publishing House; 2015. p. 9.
- Tidwell T. *Imbibing the Text, Transforming the Body, Perceiving the Patient: Cultivating Embodied Knowledge for Tibetan Medical Diagnosis*. Ph.D. Dissertation, Department of Anthropology, Emory University. Atlanta, Georgia; 2017.
- Mingming Y, Xueguang Y, Haochang S. The role of urine appearance in the diagnosis of traditional Chinese medicine. *Herald of Chinese Medicine* 2016;22:114-116.
- Loga Rinpoche. *The magical Tibetan medicine urine diagnosis*. Beijing: Ancient Chinese Medicine Publishing House; 2006. p. 225-226.
- Fukai H. Discussion on Tibetan Medicine Urology Research. *China Tibetology* 2007;3:120-123.
- Xiaowu Y, Shikui X, Xiuying B, Yanqiu L. Overview of the research on the theoretical system of Tibetan medicine urinary diagnosis. *Chinese National Folk Medicine* 2013;22:1-2+4.
- Xiaowen H. Approaching the characteristic urinary diagnosis method of Tibetan medicine. *Health News* 2019-01-30 (005).
- Peng Mao Duojie, Lama Ala. A brief discussion on the understanding of urinary diagnosis in Tibetan medicine. *China Tibetology* 2012;4:189-191.
- Tidwell T, Nettles JH. Conceptions of potency, purity, and synergybydesign: Toward developing a Sowa Rigpa medical theorybased approach to pharmaceutical research. *HIMALAYA* 2019;39:129149.
- Xiaoqiao R, Meng M, Huijuan G, Mingqiang W, Huichao W. Tibetan medicine property theory and its enlightening perspectives to the study of modern medicine property theory. *World Sci Technol J Modernization Tradit Chin Med* 2015;17:19111997.
- Yutok Yönten Gönpö (G.yu thog yon tan mgon po, fl. 12<sup>th</sup>cent.). *Cha lag bco brgyad* [Eighteen Auxiliary Branches]. Ed. Arura, *Bod kyi gso ba rig pa'i gna' dpe phyogs bsgrigs dpe tshogs*, Vol. 25. Beijing: Mi rigs dpe skrun khang; 2005.
- Deumar Tenzin Püntsok (De'u dmar bstan 'dzin phun tshogs, b. 1672). *Shel gong shel phreng* [Crystal Orb and Rosary]. Beijing:Mi rigs dpe skrun khang; 2009.