

LIVING SYSTEMS: AN ENDOBIOGENY PERIODICAL

BLOOD

VOL. 1, ISSUE 2, JANUARY 2023



Editor-in Chief

Kamyar M. Hedayat, MD

Managing Editor

Vasiliki Delengos

Editorial Assistant

Brigita Hedayat, MD

Section Editors:

- *From the Files*: Edited, translated by Kamyar M. Hedayat, MD
- *Conversations with Innovators*: Kamyar M. Hedayat, MD
- *Clinical Pearls*: Dr. Augusto Fronza
- *Medicinal Plants*: Anna Betz, MCPP, Dip.SW
- *Nutrition and Lifestyle*: Kamyar M. Hedayat, MD and Lizzie Johnson, Health Coach
- *Practitioner Spotlight*: Kamyar M. Hedayat, MD and Rachel Koenig, L.Ac
- *Book Review*: Dr. Adam Johnson
- *Outside Contribution*: Kellyn Adams, ND, L.Ac

Manuscripts

Manuscripts should be sent to: livingsystems@learnendobiogeny.com.

We are accepting contributions for all upcoming issues.

Volume 1 Editorial Calendar, 2022-2023

- Issue 1 (September, 2022): Integration
- Issue 2 (February, 2023): Blood
- Issue 3 (May, 2023): Our relationship to the Universe: Cosmobiology and Circadian Rhythm

About this journal

Living Systems: An Endobiogeny Periodical is a quarterly publication of Learn Endobiogeny (www.learnendobiogeny.com), an educational project of Systems Biology Research Group (SBRG). The periodical is dedicated to advancing discussions and applications of complex living systems and integrative physiology based on the theory of Endobiogeny. Our goal is to develop a community of knowledge and collective intelligence that improves the practice of medicine, the art of healing, and the lives of individuals and the planet.

About the cover

Each issue of Living Systems features artwork by an Endobiogenist or a patient who has benefited from Endobiogeny. This issue features the work of endobiogenist Dr. Adam Johnson. *Early October in the Teton Valley*, oil on canvas, 2012. Adam states, "This was a [mostly] *plein air* near my home and then 'touched up' in the studio. My life has been perpetually drawn to the liminal, those transient moments of beauty that you wish would last forever, while knowing that their beauty is precisely because these moments don't last forever. In this composition, I capture a state where two moments of transition are in synchrony: sunset and autumn. My favorite time of year is when an early snow dusts the mountain tops and the valley below has erupted in brilliant color. The focus of this composition is the flame willow. The heavy gesso underlayer was intentionally trying to add a dimension of texture reminiscent of the veins on the back of your hand, because these liminal periods help me feel particularly alive in the moment."

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EDITORIAL: BLOOD IS THE LIFE

Historically, blood has been the domain of religion, viz. “The life of the flesh is in the blood.”¹ It has also been an interest in esoteric philosophy. For example, in 1934 Alice Baily noted that the endocrine system, autonomic nervous and blood are determining factors in disease, observing that “All the subsidiary organs of man are effects; they are not pre-determining causes (of disease).”² This was the time in which Hans Selye was only beginning his experiments that led to the characterization of the relationship of hormones with adaptation. However, it is the scientific study of blood that is of interest to us here and now.

Blood has been well-studied, but, has it been well-appreciated? We characterize its chemistry, physics (viz. fluid dynamics), content, and mechanical actions (viz. perfusion pressure). It is considered to be *a* fluid—one of many—from which biomarkers can be obtained. Even then, it is the narrow pursuit of indicators of a specific pathology, often dissociated from the whole of pathophysiology. It is donated and transfused. It can be depleted, modified or enhanced...but all this is the ecology and economy of blood. It is the structure and function, the what and how of blood. It says nothing of teleology.

The existence of cardiopulmonary circulation and the role of oxygenation in the “vital spirit” of blood was not recorded until the 13th century. The Arab polymath Ibn Nafis, at the age of 29 (1242 CE), wrote in his commentaries on 11th century Ibn Sina’s *Cannon on Medicine*,

“The blood after it has been refined in the [right ventricle], must be transmitted to the left [ventricle] where the [vital] spirit is generated. For the penetration of the blood into the left ventricle is from the lung, after it has been heated within the right ventricle and risen from it...”³

This significant observation was overlooked until Englishman William Harvey, in the 17th century, and only towards the end of his life after much doubt, came to the same conclusions. The 19th century was a ripe time for discoveries in the chemistry of blood and its cellular elements. In his introduction to the collected scientific papers of Dr. L.C. Wooldridge, Victor Horsley observed back in 1893:

“No story in science is older than the fact that an observer who has the very rare gift of looking at old questions with an impartially scientific and original mind is not only unlikely to receive assistance from those who profess special knowledge of the subject upon which his experimental observations are made, but, on the contrary, will most certainly meet with resistance born of prejudice...The real difficulty which presents itself is that many who are selected to act as arbiters of the value of any fresh idea have little ability to recognize that all scientific progress lays bare some new fact which, while constituting an addition to our knowledge, or (putting it more correctly) a certain diminution of the previous degree of our ignorance, must necessarily be in opposition to preconceived notions.”⁴

This observation aptly applies to the discoveries of Dr. Christian Durauffourd, originator of the theory of Endobiogeny. In the 1980’s he presented a revolution in the understanding of blood-based biomarkers and the possibility of modeling human physiology. He called this modeling system the *biology of functions* (BoF), meaning “functional lab analysis” in a more precise translation of the French. The BoF analyzes blood markers through the use of ratios and meta-ratios that turn biomarkers into *metamarkers* of integrative physiologic function. It is a qualitative analysis of the relative capabilities of promoting actions relative to restraining actions, of catabolic relative to anabolic actions. No different than the resistance that Wooldridge met, or Joule when he presented his observations that heat is equivalent to work, the

appreciation of Dr. Durauffourd's genius insights into blood remains underappreciated and over-looked. What is worse from the spirit of science, is that it is often doubted or dismissed without serious consideration and reflection.

The theme of Volume 1, issue 1 of *Living Systems: An Endobiogeny Periodical* was the nature of complex living systems. In this issue, the theme is blood, for a living system, such as the human being, depends on blood for its very existence. Life is ceaseless movement, and the ceaseless movement of blood is the means of life's individual expression. Blood contains the means and outcome of its movement. The means of movement are neuroendocrine factors that regulate cardiac function, viz. acetylcholine, adrenaline, cortisol, thyroxine, etc. These factors also regulate metabolism thanks to their ubiquitous distribution in blood. The circulating levels of leukocytes, platelets, electrolytes, proteins and enzymes in blood carries evidence of the outcome of metabolism. Thus, blood is the means by which the meta-phenomenon of life can be quantified, understood and communicated by rational, mathematical means. The biology of functions offers a method of numerically evaluating the evolution of the terrain impossible through the phenomenological aspects of medical history and semi-subjective method of physical examination. That is why this system is worthy of consideration.

The periodical begins with a new section, *From the Files*, which are verbatim discussions of Dr. Durauffourd with his students. In this issue, Dr. Durauffourd explains the rationale by which indexes of the BoF were developed. In *Conversations with innovators*, I interview the co-developer of the endobiogenic teachings, Dr. Jean Claude Lapraz. We discuss the history of development of the biology of functions (BoF). In *Clinical Pearls*, Dr. Augusto Fronza discusses the additive benefits of using the BoF in clinical practice.

In the blood one finds not only the elements for but also those results from metabolism, viz. waste products. When emunctories, such as the liver and kidney, cannot sufficiently filter waste (or environmental toxins), there is a risk of intoxication. The following two sections address the use of depurative plants to cleanse the blood. In *Medicinal Plants*, Anna Betz, MCPP, Dip.SW reviews the actions and applications of cleavers (*Gallium apernine*) and nettles (*Urtica dioica*). In *Nutrition*, Lizzie Johnson presents practical recipes incorporating blood cleansing plants.

In the inaugural section of *Practitioner Highlight* we interview Rachel Koenig, L.Ac. Learn about Rachel's journey to Endobiogeny and her rich clinical experience using endobiogeny, including the biology of functions, in her Chinese medicine practice. In *Book Reviews*, Dr. Adam Johnson reflects on a sweeping history of blood in cultural, economic, scientific and medical terms. Finally, in *Outside Contributions*, Dr. Kellyn Adams discusses a Chinese perspective on blood.

Currently and for the foreseeable future, blood-based biomarkers will remain an essential tool of the physician in assessing aspects of physiology and metabolism impossible to characterize by other methods. The theory of endobiogeny, with its scientific approach to complex systems and integrative physiology, and its humanistic approach that places the person at the center of the medical evaluation, is a profound and powerful framework incorporating the analysis of blood in a functional, dynamic method. Thanks to the modeling tool, the biology of functions, which uses blood-based biomarkers to build *metamarkers* of clinical significance, blood remains the primary fluid of investigation. This issue of *Living Systems* is a map for your journey through the theoretical and clinical relationship we endobiogenists have to blood.

Kamyar M. Hedayat, MD
Editor-in-Chief, *Living Systems: An Endobiogeny Periodical*

About the Editor

Kamyar M. Hedayat is co-founder of Systems Biology Research Group, a private research company dedicated to promoting research, education, publication, product formulation and development of commercial clinical tools based on the theory of Endobiogeny. He was trained by the co-developer of the Endobiogenic teachings, Dr. Jean Claude Lapraz, and is a leading international proponent of integrative physiology and Endobiogeny. He is the author of the definitive four-volume series [*The Theory of Endobiogeny*](#).

FROM THE FILES



Christian Durauffourd, MD; Source: Jean Claude Lapraz, MD

NUMERATION OF BIOMARKERS: REGARDING FOR FORMATION OF SOME INDEXES

A discussion by Christian Durauffourd on 16 April, 1999

Introduction

Biomarkers testify at every moment to the metabolic activities which relate to life itself, to its basic functioning, to the vigilance and constant efforts of the organism to face each event, to respond to each request. The fluctuations of the constants which manifest the adapted reactions of our organism to each of these solicitations take place within two types of references.

BASAL AND ADAPTATION STATES

The first marks out the basal metabolic state, a common expression of the structural functioning specific to each person. Its evaluation requires either specific conditions for collecting the humoral environments (schedule, rest, meals, etc.) or a

permanent adjustment of the ranges separating the lower limits from the upper limits. Intended to establish, in an artificial way, the border between two states: that of good health and that of disease, the normal values indicate only the visible result of the global metabolic activity.

The second determines *the zones of tolerance outside the basal state* (emphasis by author) and in the face of stimulations of all kinds likely to lead to recognized modifications in the levels of circulating metabolites. Schedule, rest, meals, orthostatism, decubitus, stimuli of all kinds, listed, recognized, diagnostically exploited are all factors authorizing a new adjustment of the ranges of values. The following are also sources of accepted or tolerated differences: age, sex, period of the menstrual cycle, sports activity, certain pathologies, and certain

treatments. Paradoxically, and although they clearly testify to variable modalities in physiological activity from one individual to another, these variances have never been studied in an attempt to understand, explain and exploit their effects. Fundamental differences. Yet it is in the particular way of each individual to maintain, against all odds, this biophysiological constancy in which resides the crux of pathogenicity of each organic structure, of each terrain.

By pathogenicity, we must clearly understand the notion of a source of disease and therefore the responsibility for our difficulties in functioning and in permanently maintaining this level of balance. This implies that all the biochemical parameters, measurable in the serum, remain within the so-called normal range, which have been methodically defined. These parameters bear witness to the effect resulting from the multiplication of the organism's reactogenic resources in the face of its own chromosomal weaknesses. Understanding the permanent solicitation of disorders of which each individual is the object constitutes without any doubt the surest means of access to a true etiology and consequently to a real prevention.

Highlighting the permanent consequences of endogenous deviations from the functional exploitation of our genetic heritage constitutes the means of screening for pathogenic risks, their imminence and their chronology. It constitutes one of the most reliable means of controlling evolution, be it spontaneous or under applied therapies.

The successive evaluation of the thresholds of progression in the distortion of the factors involved makes it possible to establish the zones of particular fragility, of potential breaking points under the effect of supernumerary aggression. It makes it possible to predict the location of this rupture in the face of a non-specific, massively supra liminal aggressive event. It also makes it possible to recognize the location of preferential target organs, places of weakness where the threshold of fragility is particularly low and can at any time break the

precarious balance that characterizes it under the action of a specific aggressor.

These notions of threshold and potential are fundamental to understanding any notion of functionality.

BIOMARKERS AND NORMAL RANGES

...Like medicine, (the science of) biomarkers is entirely oriented towards pathology. Routing disease in its beginnings or at its initial origin is certainly laudable, and nevertheless an obligatory objective. Can we still nowadays be satisfied with this binary limitation of the consideration of the meaning of biomarkers as indicating health or disease? The cost of disease is too high for us not to focus on early detection by focusing on identifying the biological regulatory modifications that inexorably lead to disorders. The clinical encounter can be a valuable means if the physician is attentive to all the details of the expression and evolution of each person's behavior. It requires time, attention, deepening and synthesis of all the conscious and unconscious signs that can be detected after a complete consultation. In the eyes of the majority (of physicians), it retains a subjective and intuitive character which limits its probative value. (In contrast), The numerical, quantified expression of simple measurements has an *a priori* objectivity to facilitate the transmission of methods and techniques of field study and its corollary, which is functionality.

Two important notions are at the origin of the current use of biomarkers to determine the terrain, evaluate its functional movements, understand, manage and correct its activity. The first, already mentioned, is the permanent or eventual fluctuation of any measurable biological parameter. The second is, in the same individual, the constancy of the level of the structural parameters within the reference ranges and outside of all pathological reasons.

THE EXAMPLE OF LEUKOCYTES

In **pathology**, its variation indicates:

1. a more or less important mobilization to face, in a process of combat, a "foreign" cell population that the body must annihilate and eliminate (microbial agent, most often cellular debris), *or*
2. a phenomenon of congestion calling for an immediate concentration of leukocytes and associating a release into the circulating blood of cells enclosed in the reservoir zones (e.g., peri-hepatic) and a reduction in the circulating blood volume (hemoconcentration) in ischemic phenomena, for example, *or*
3. an anomaly of bone marrow production, in excess (leukocytosis), in deficiency (aplasia)

In **physiology**, its variation meets in multiple circumstances escaping any randomness:

1. particular to the phase of life:
 - a. **an initial rapid evolution** during the first days, months and years of life, during major events of hormonal transformation,
 - b. **unique events** (puberty, genital pauses and their general repetitions)
 - c. **repeated events** (menstrual cycles, cycles seasonal, cell cycles, tissue cycles),
 - d. **single or repeated events** (pregnancy, amenorrhea, polymenorrhea)
2. **evolution of daily cycles and their chronology** (hormonal, neurovegetative, social, food)
3. **relational events of daily life** or in all its daily, weekly, monthly and annual automated rhythms and rites (acute or chronic manifest stress, single or repetitive), according to the alternations of rest and effort, according to their opportunity or habit characters.

The activation or deactivation of leukocytes, their mobilization and production to face various situations come under the same principle of functional adaptation of the subthreshold of minimal leukocyte activity. This threshold, defined by standard normal ranges, is surpassed during an increase in mobilization of leukocytes by a pathological situation which requires (a greater number of leukocytes). This context, outside the norm, is however only a visible manifestation of normality. It testifies to the physiological reaction to fight against a disease which involves the leukocytes and not to a physio-pathological reaction to a disease against which they are fighting.

The extension and misuse of this context of non-standard normality leads to abnormality, a pathogenic state, and ultimately to disease.

The maintenance of leukocyte recruitment, in a given situation, becomes a manifestation of a leukocyte pathology. It arises from phenomena of adaptation of the medullary system (of bone), according to modalities of intensity and duration that are inappropriate (pathological adaptability).

Linked to changes in the internal balance, the physiological variations of leukocytes are therefore subject to conditions. Their circulating rate is governed by a set of factors of which it testifies to the resulting effect. These factors are quite naturally (that is to say, as for any circulating element, whether metabolite or figurative) of three orders: production, concentration and consumption...

Some examples of the use of physiological variations in leukocytes:

- their **absolute value** testifies to their mobilization according to the needs of the body. It represents at all times
 - the result of the level of bone marrow production
 - the only representative of the hormone responsible for it

- the mobilization of reserve elements in the immediate and mediate adaptability phase, representative of the general adaptation factors.

Apart from its diagnostic interest, it only has a relative orientation value on the basic functional level judged on the intensity of the response with regard to the seriousness of the responsible condition. It also gives a first argument on the cause state or on the consequence state.

On the other hand, their **relative value** compared to another biomarker which corresponds to the same methods of adaptation and mobilization makes it possible at any time to consider the relative share of mobilization and the degree of production and its level of participation in the maintenance, term or adaptation and restoration; basic restore and reserve pool replenishment.

ERYTHROCYTES AND PLATELETS

The first testifies to these phenomena of adaptive regulation, obviously the other figurative elements of the blood. The first order of importance is red blood cells (c.f. [Shen resides in the blood by Kellyn](#)

[Adams in this issue of Living Systems](#)). Their production is under the primary control of androgens.

The Genital (Androgen/Estrogen) Ratio, calculated from red blood cells (RBC in units $10^3/\mu\text{l}$) divided by the total number of white blood cells (WBC in units $10^6/\mu\text{l}$), is a very good indicator of the relative share of total androgens and estrogens in the functioning of the structural maintenance of our bodies: Genital Ratio = RBC / WBC. The normal range for women is 0.7-0.85, for men 0.8-0.95.

The second most important (after RBC's) are platelets. Their production is under the primary control of the pituitary: ACTH/FSH dyad. The sequestration of platelets depends on the production of androgens. Their liberation depends on the sympathetic beta system (adrenaline).

The ratio of platelets to leukocytes (allows us to derive the) leukocyte mobilization index, which measures the relative share of leukocyte mobilization in relation to their production. The ratio of platelets to red blood cells (allows us to derive the) platelet mobilization index, which measures the relative part of the mobilization of red blood cells in relation to their production. *

About the Author

Christian Duraffourd, MD (1943-2017) was the founder of the theory of Endobiogeny. He graduated from Paris V University in 1970 and began practicing general medicine in Paris, France. He co-authored numerous articles and books re-defining the notion of physiologic terrain and approaches to expanding the therapeutic arsenal of physicians. He introduced his approach to functional biology, *the Biology of Functions*, in 1980.

CONVERSATIONS WITH INNOVATORS



Drs. Jean Claude Lapraz and Christian Durauffourd

Source: Jean Claude Lapraz, MD

INTERVIEW WITH JEAN CLAUDE

SUMMARY: In this interview, editor Kamyar Hedayat interviews his mentor in Endobiogeny, Dr. Jean Claude Lapraz. The origination and development of both the theory of endobiogeny and the functional biomarker analysis tool, the biology of functions are discussed. A vision for the future of the biology of functions is discussed.

KMH: For those who are unfamiliar, how did you first meet Christian Durauffourd, the founder of the theory of Endobiogeny?

MEETING CHRISTIAN DURAFFOURD

JCL: In 1970 I started practicing medicine as a general practitioner after completing my studies at the Faculty of Medicine in Paris. During my medical practice, I quickly encountered the same problems that any doctor faces, namely the side effects of conventional treatments, recurrences and relapses of diseases for which the patient came for

consultation. I was also confronted with the difficulty of establishing a precise diagnosis of patients with symptoms that would be considered psychosomatic by my colleagues. Faced with these difficulties, I wondered about the meaning of my practice and I began to seek if there were less aggressive treatments, better adapted to the physiology of the patient than the chemical ones that medical science had taught us.



Drs. Lapraz and Duraffourd at work.

This is how at the beginning of 1972, during my search for less iatrogenic products and a more physiological approach, I came to know Christian Duraffourd who had also just started to practice medicine in 1971. His father, Paul Duraffourd, was a pharmacist-biologist (Editor: A pharmacist who specializes in prescription and analysis of blood work). Paul worked with Dr. Jean Valnet, a former military surgeon, known to the general public for his works on plants. Dr. Valent introduced us both to the empirical use of plants. We then began to prescribe his symptomatic and empirical formulas, each in our personal medical offices.

FROM SYMPTOMATIC TO TERRAIN-BASED USAGE OF MEDICINAL PLANTS

At the same time that I was wondering about the limitations of symptomatic usage of medicinal plants, Christian began to develop a broader vision of their use. He integrated this vision into a notion of the terrain which he had perceived of from the start of his medical studies. It was a particular vision of the disease in the context of the patient, not dissociated from the patient.

When he was a medical student, during courses on pharmacotherapy, he was surprised at the simplistic vision of his professors. In the morning they taught the complexity of the multiple physiological mechanisms involved in a particular disease, and in the afternoon, they prescribed all patients with that

disease the same standard pharmacological treatment regardless of the patient's particular state of their terrain. This corresponded to what Christian called "the therapeutic funnel": the same hat for everyone, whether their head is small or large. However, every day, all doctors observe that patients given the same treatment react differently. One heals quickly, another doesn't and a third has side effects. There is therefore a need for the doctor not to approach the patient in a simplistic vision aimed at making the symptom disappear without taking

into account the particular characteristics of its expression and therefore excluding the specificity of the patient's terrain on which the symptom is expressed. Illness.

DEVELOPMENT OF THE THEORY OF ENDOBIOGENY

KMH: How did the theory of Endobiogeny develop, and what was your role in it?

JCL: I had many discussions and exchanges with Christian for more than three years. What appealed to me were his ideas concerning the notion of the terrain. His vision broadened the understanding of the patient's state in the face of his illness. Gradually, he began to talk to me about his particular neuroendocrine approach to the terrain of the patient, which I gradually grasped with each passing conversation. In 1980 we decided to settle together in the same office to develop his original approach to the terrain. At the same time, we formed a working group of doctors meeting every two months. Christian led these discussions, expressing and developing his theory more and more each time.

RESEARCH, TEACHING AND PUBLICATIONS

His teaching was to engage us in a collective work that occupied us for more than thirty years and which allowed the public emergence of his theory. The first works made it possible to define clinical

phytotherapy and to gradually develop physiology from the angle of the relationships that connect symptoms to neuroendocrine functions. We organized seminars, staffs, and congresses in France and various foreign countries. We published several works together to bring to the attention of doctors and pharmacists the progress of our work in the field of clinical phytotherapy in relation to endobiogeny.

KMH: What were these various works about?

JCL: There was *Cahiers de Phytothérapie Clinique* (Notes on Clinical Phytotherapy) in 1982. It was a series of publications actually on various disorders. It was well received and republished in 1986. Next we published *Les Feuillettes d' Oncobiology: Clinique chirurgicale générale et oncologique du Professeur J.Reynier, Hôpital Boucicaut* (Pamphlets on oncobiology in the general surgical and oncological clinic of Professor J. Reynier, Boucicaut Hospital), in 1989. I'll speak more about the importance of our work with Professor Reynier later. This was also well received and republished in 1996.

In 1997, with our Tunisian colleague Professor R. Chemli of Monastir University, we published *La plante médicinale, de la tradition à la science*, (Medicinal plants: from tradition to science). In 1998 we published *ABC de Phytothérapie dans les maladies infectieuses* (The ABC's of phytotherapy in infectious diseases). Then, our master work on the subject was *Traité de Phytothérapie Clinique* (A Treatise on Clinical Phytotherapy) published in 2001. Many other works remain unpublished but would be worthy of regard.

KMH: A treatise on Clinical Phytotherapy was the first and only time that Christian wrote about the biology of functions. Is that right?

JCL: That's correct.

ELABORATING HIS THEORY

KMH: But that work was published in 2001. The development of the biology of functions occurred long before that, didn't it?

JCL: It goes back to at least 1989, again, relating to Professor Reynier. However, I need to explain how the theory of Endobiogeny developed in order to explain how the biology of functions developed. Their specific development and extension gradually emerged from the group discussions he led. This work would occupy us for more than ten additional years so that his theory could be fully fleshed out.

KMH: Why would you say it took so long to develop the theory?

JCL: We had to rethink the whole of the pathology, physiology and treatment given the profundity of the of the integrative vision Christian proposed. Christian was a visionary, but he wasn't an educator. Perhaps within his own mind there was a period of evolution of his theory of terrain. However, what he elaborated to us was not systematic or organized. He held discussions on various topics. We presented cases and he would comment. It was through diligent discussion amongst the group, pouring over transcripts of everything Durauffourd said that we formalized his theory. He approved everything, of course, but didn't give us the theory *per se*.

FROM A GENERAL THEORY OF TERRAIN TO ENDOBIOGENY

KMH: Tell us about the theory of terrain that preceded the theory of Endobiogeny. What brought about this theory? What were its salient features? Did this involve the use of biomarkers initially?

JCL: Christian laid down the first principles of his approach to the terrain, initially called the "neuro-endocrine theory of terrain" in the book *A new medicine* that we co-wrote and published with Doctor Valnet in 1978 by Les Presses de la Renaissance. Here's an excerpt from that book summarizing the constituent elements of the terrain and the basic reasons for the choice of the title he gave to his theory:

“Constituent elements of the terrain”

It seems to us that this regulation of the internal balance can only be conceived through ubiquitous, interdependent systems, permanently managing the body as a whole.

Two systems meet these criteria:

- **The autonomic nervous system:**

through the antagonistic action of the sympathetic and parasympathetic (branches), it takes part in all levels of the life of an organism. It is an information and control system. It reacts immediately and then transmits its reactions in return.

- **The endocrine system:** through feedback it also responds instantaneously, and information reaches it from throughout the body through circulating hormones. It is in close and permanent relationship with the previous [autonomic nervous system].

“These two systems form a closed circuit whose design means that the smallest unit of information received by one is instantly passed on to the other. They therefore represent the two fundamental elements used to maintain the balance of the internal environment. Regulators themselves, they are also regulated by the action of the central nervous system which oversees and governs them. It is this that opens the door of relations between the conscious and underlying structures. Thus, when attacked, the body will necessarily respond by mobilizing these 3 systems, at times and to varying degrees depending on the intensity (of the attack). But this reaction is necessary for the maintenance of the organism as a whole. We see that only this group of 3 systems has the means and the qualities required to meet all the criteria that we have mentioned both in the description of the disease and in that of its expression, then of the body's reactions. When an illness breaks out, we will be all the better prepared, as we know the terrain of our patient. It will be necessary to determine precisely the affected organ. Is it a typically affected organ? A preferentially targeted organ? Or, is it an unusual organ revealing a deeper imbalance? It is also necessary to determine the type and severity of disease. Is the body giving in to repetitive aggression, or, no longer controlling its reaction after the aggression has stopped? Or, is it changing level of functioning of the terrain to better cope with the aggression?”

There is no fundamental difference between the neuroendocrine theory of terrain and the theory of endobiogeny. It's actually the same theory. Only the name changed in 1980 when it had to be qualified by a neologism to save it from the confusion that reigned in France at that time. We were dealing with the alternative medicine craze and everyone was talking about the terrain and hormones. This word *endobiogeny* challenged the reader, leading him to inquire about what the neologism meant. What he read then clearly showed him that a new way of thinking was emerging: a patient-centric approach, based on an overall conception of the role of the neuroendocrine system different from that used by official medicine in the specialties of endocrinology and neurology. This neologism also made it possible to get out of the risk of confusion that the name neuroendocrine theory of terrain could generate vis-à-vis the standard approaches of neurology and endocrinology. Finally, it made it possible to develop the originality of this new thought which makes the endocrine system the global manager of the terrain.

In short, the theory of endobiogeny is not a new theory, and, if he had wanted to, Christian could have kept the name “the neuroendocrine terrain theory” and made the same developments without changing its name to endobiogeny. This is a new term that for historical reasons Christian chose. It was only after this name change, in 1980, that he began to present the first algorithms that gradually gave birth to the biology of functions.

THE USE OF BIOMARKERS IN THE THEORY OF ENDOBIOGENY

KMH: I see. Thank you. There was some history that I was not aware of before. So, can you explain how biomarkers came to be used in the theory of endobiogeny? What was the value Christian saw in integrating them into his theory of terrain?

JCL: The data provided by a blood test, for example, the number of circulating red or white blood cells, is the result of how the body functions in terms of its general metabolic activity. Indeed, the body must be understood as a coherent whole which

binds in a global functionality all the parts which constitute it. Everything being connected in such a system, the slightest modification made to one of the elements that constitute it will have consequences on the functioning of the whole. Thus, step by step, through the inter-relationships which link the organs to each other, according to increasingly hierarchical levels, each of which functions in an integrated manner, the overall functionality of the organism and therefore life can be assured.

KMH: And for those who are not familiar, how does this view of biomarkers relate to the endocrine system?

JCL: The neuroendocrine terrain theory posits that only the endocrine system is able to meet all the requirements needed to be a true manager. It has the ability to manage itself and metabolism. It is dynamic. It operates coherently from the most elementary level of biological organization to the whole of the being. The hormonal system ensures an incessant, chronological, sequential, qualitative and quantitative link between the whole organism and each of its parts. The hormonal structures that regulate these mechanisms are made up of a system that is schematically divided into 4 axes. Each of these axes participates in the management of the metabolism by sequences which operate in permanent loops in the following order: corticotropic, gonadotropic, thyrotropic, and somatotropic. This sequence makes it possible to ensure the coherence of the succession of catabolic and anabolic phenomena which ensure the production of substances found in the circulating blood.

In the same way that a factory is managed according to a vertical diagram (the nature of the orders sent) and horizontal (the sequence of execution of the orders at the level of the production lines) the endocrine system as a manager works on a similar model. But this diagram applied to the organism is much more complex: not only does the information circulate from top to bottom and from bottom to top (vertical route) from left to right and from right to left (horizontal route following the logical

sequences of succession catabolism and anabolism) as well as diagonally (radially) but also in a volumetric space where everything functions in feedback in an incessant dynamism.

KMH: Just to be clear, then, the neuroendocrine system manages metabolism. And, biomarkers are the metabolic output of various tissues and organs. Therefore, if you directly measure biomarkers, you can indirectly infer how the neuroendocrine system managed the metabolism that resulted in the circulating level of biomarkers?

JCL: Exactly. That's the relationship between the upstream neuroendocrine regulators and the downstream output of biomarkers.

KMH: It sounds like the need to evaluate biomarkers was a logical extension of the theory of endobiogeny as an approach to integrative physiology and systems theory.

JCL: Completely. The theory of endobiogeny proposes a biological simulation model based on data from modern physiology which permanently takes into account this dynamic networked and multi-scale reality and dynamic sequences of regulation. And this is what we call *la biologie des fonctions*.

KMH: It was literally translated as "the biology of functions." But, it would be more accurately translated as "functional biomarker analysis." It took me a long time to understand this because in the Anglo tradition of medicine, we do not have a specialty called "medical biologist", which is a medical doctor who specializes in biomarkers, but is not a hematologist.

Anyway, let's return to the discussion at hand. What did the biology of functions bring to the theory of endobiogeny?

JCL: It makes it possible to understand the significance of the Neutrophil to Lymphocyte ratio, which Duraffourd called "genito-thyroid index." In the numerator you have neutrophils. It is under the influence of estrogen activity in the gonadotropic

axis. In the denominator you have another element, lymphocytes. It is under the influence of TSH in a different hormonal axis, the thyrotropic axis. Individually, they do not provide much information. Doctors look at these values a million times throughout their 30 years of practice and never think much about it if the values are normal. But, when you relate them together, it shows the relative activity of one function of the gonadotropic axis in relation to another one of the thyrotropic axis. A link between one of the elements measured in the blood is linked with its endocrine manager is thus clearly visualized by the figure given by this ratio. It is then possible by proceeding in this way with other elements of the circulating blood reported to their endocrine manager to establish an endocrine biological mapping of the metabolic functioning of the subject and therefore of its endocrine manager. In my opinion, [our clinical research article](#) on this ratio in patients with chronic heart failure clearly explained what these relationships are. It takes researchers beyond the superficial association of a high ratio being associated with inflammation and higher risk of mortality to a deeper regard into the endocrine elements of adaptation that favor inflammation and a greater risk of death.

THE INSIGHTS BIOMARKERS BRING TO HISTORY AND PHYSICAL EXAMINATION

KMH: Christian's earliest teachings, be it the neuro-endocrine theory of terrain or the theory of endobiogeny, were based on a comprehensive anamnesis and physical examination—what you call semiology in French. Right?

JCL: That's correct.

KMH: So, what insights did Christian find biomarkers brought to the theory of endobiogeny that were not found in anamnesis and semiology? Did he seek to replace some aspect of clinical evaluation with biomarker analysis?

JCL: Our era has given birth to numerical medicine, whose objective is to quantify everything, even that which pertains to the most personal inner

psychological domain. When this approach came to medicine, the doctor increasingly lost his clinical sense and very often he was no longer able to make a subtle semiological assessment of the patient before them. Focusing more and more on numerical data and approaching the patient only through increasingly sophisticated tools, he distances himself from the patient whose body contains all the information, none of which should be overlooked or ignored. Neglecting the initial and primordial stage of listening and clinical examination, or even completely eliminating it, is an insult to the personal reality of each individual.

THE DANGER OF GOING DIRECTLY TO LAB ANALYSIS WITHOUT THE CLINICAL EVALUATION

JCL: Going directly to lab analysis without examining the patient opens the door to partial or even false diagnoses. This is why, in a vision that approaches the patient as a whole, we have spent so many years focusing on the search for clinical signs and their relationship to physiology. But it would also have been a considerable shortcoming not to provide doctors with a tool capable of evaluating the functionality of the biological systems at work in the patient's body. The contribution of functional biomarker analysis has represented a fundamental step in the development of endobiogeny, complementing the clinic to shed light on it and enrich its understanding and meaning.

BIOMARKERS EVALUATE WHAT CANNOT BE QUALIFIED

KMH: Would you say, then, that functional biomarker analysis permits the physician to estimate levels of physiologic function not possible through history and physical exam? Or, is it that the numerical nature of biomarkers and indexes created by biomarkers offers an objective language through which physicians can communicate with each other and their patients?

JCL: I would say both. For example, there may be evidence of mitochondrial insufficiency for

producing ATP that could be deduced through clinical evaluation, but not very precisely. Being easily fatigued after exertion, or, prolonged infections, could be related, but so could many, many other factors as well. There are several lines of neuro-endocrine and cellular dysfunctions that leads to mitochondrial insufficiency. A functional biomarker analysis, through this multi-scaled method of analysis suggests if there is mitochondrial insufficiency and if so, to what degree, and which elements are most responsible for it. The same is true for other physiologic and pathophysiologic functions which are not possible for the patient or the physician to quantify or even qualify.

KMH: Would necrosis, membrane permeability and redox balance be examples of this?

JCL: That's exactly right. And, of course, the psychological indexes that you developed.

WHY THE BIOLOGY OF FUNCTIONS IS THE OUTCOME OF ENDOBIOGENY AND NOT THE REVERSE

KMH: The trend in medical research has been what I call "statistical fishing," which is the pooling of large quantities of data to deduce some fact of disease or physiologic function. The data comes first, and then a theory is constructed. Why was it important that the biology of functions be the outcome of the theory of endobiogeny rather than its starting point?

JCL: The reality of the complexity of life that medicine approaches in an essentially analytical and symptomatic mode has led us to the need to rethink the approach to the patient in an integrative mode. The specificity that each patient expresses the "same" disease according to their own characteristics required an understanding of the reason for this specificity. It was therefore necessary to decipher the mechanisms capable of explaining the differences between patients.

The theory was derived from clinical observations. Gradually, the idea emerged that it was necessary

to find out how the managing mechanisms involved in this specificity and this disparity of clinical signs functioned. For Christian, the endocrine system was the true manager of the physiology at work in the patient's body and underpinned the expression of signs. This is why the theory took its roots in the reality of the living while developing increasingly elaborate concepts. These concepts are all based on understanding the link between clinical signs and their physiological justification. It is not a question of a direct binary vision, but of the search for the links between the signs, the organs, the functions, the systems up to the globality of all the relations integrated in the global vision of endobiogeny. We had to find a system that adapts to this global vision of life and to clinical data. The biology of the functions, which makes it possible to quantify this clinical data, has imposed itself on the theory. This type of integrative biology could only be constituted in a global theoretical vision of the living being initiated from the clinical practice which is its foundation.

KMH: Then, what was the importance of starting with a complete blood count with differential and platelets (CBC)? As studies have shown [c.f. [Blood biomarkers, in the mainstream medical community and endobiogeny by Dr. Augusto Fronza in this issue of living systems](#)], most physicians find a CBC to be of little value except to confirm acute infections or specific blood disorders such as anemia or blood cancers.

JCL: The advantage of starting with a CBC is that it is commonly ordered and inexpensive. The most basic level of information it provides is quantitative abnormalities of the bone marrow figured in a CBC, such as anemia (low red blood cells) or polycythemia (high red blood cells). It also shows the immune system's response to a bacterial infection (neutrophilia) or a viral infection (lymphocytosis), or, risk of purpura from low platelets. It's rather straightforward and binary to read the results and come to conclusions. But a CBC also presents the fruits of metabolism at work. The endobiogenic approach to biomarkers implies the need for an upstream look at the figures, namely to

identify on which physiological functions they depend.

KMH: So, when you say “fruits of metabolism and looking upstream,” you mean that at another level of analysis, the CBC is the downstream metabolic output of how upstream regulators of metabolism changes the levels of activity within reference tissues. Is that correct?

JCL: Absolutely correct. And, thanks to the use of algorithms derived from key circulating blood elements, it is possible to evaluate the activity of their upstream managers. The CBC, then, is able to provide much more information than only a look at quantitative disorders of the bone marrow and immune function.

HOW INDEXES OF THE BIOLOGY OF FUNCTIONS WERE CREATED

KMH: So then, how did Christian create these algorithms, these ratios of biomarkers, that represent indexes of physiologic function?

JCL: In 1989, we were invited by Professor Jacques Reynier to participate in clinical rounds in the general surgical and oncology clinic of Bouçicaud Hospital in Paris. This hospital was part of the public assistance network of hospitals in Paris.

KMH: The one you mentioned earlier, right? With whom you published the pamphlets on oncobiology.

JCL: Yes, it was him. Our work rounding on oncobiology patients, thanks to the support of Dr. Reynier, prompted Christian to apply an algorithmic approach to biomarkers that he was already using on his own patients. It was from the data provided by a simple blood count that he began his research from the start of his work as a general practitioner.

THE GENITAL RATIO: RBC/WBC

Christian created an index that he called “the genital ratio.” It’s obtained from the ratio of red

blood cells divided by white blood cells measured in the patient’s circulating blood. This 1st algorithm, the genital ratio index, that he had designed and used in his personal practice, provided new information that made it possible to evaluate the relative activity of androgens compared to that of estrogens. Science teaches us that these two types of blood cells are made in the bone marrow, and, that red blood cells are under the control of androgens, and, white blood cells under control of estrogens. There are numerous publications that have clearly demonstrated these actions. Thus, starting from particular elements contained in the circulating blood, here the number of red and white blood cells, a look upstream makes it possible to consider the activity of the particular hormonal manager which regulates the activity of the cells manufacturing these blood cells in the bone marrow and makes it possible to evaluate quantitatively without directly measuring it in the blood the relative functional activity of androgens compared to that of estrogens.

THE GENITO-THYROID RATIO: NEUTROPHILS/LYMPHOCYTES

Coming from the same understanding of endocrine regulatory mechanisms as those of the genital index, the neutrophil-to-lymphocyte ratio (*Editor’s Note:* it is called “genito-thyroid index” in Endobiogeny) was the second algorithm created from the complete blood count. It makes it possible to evaluate the relative activity of estrogen compared to that of the thyroid gland in its management of immunity. As early as 1989, we observed that patients hospitalized for breast cancer and who had a high number of this index developed metastases and recurrences of their cancer more frequently than those in whom it was low. Two months before metastasis, these same women had been considered cured during the discharge from the oncobiology ward. An increase in the number of neutrophils reflecting an increase in the activity of estrogens whose effects on DNA replication, which allows tumors to grow more quickly. At the same time, a reduction in lymphocytes relates to a reduction in immune capacity. This [ratio](#) makes it possible to understand

which women are more at risk than others of metastasis of their cancer. Thus, the physiological functional reality specific to each patient explains the difference in risk between the two groups of women. It was decades later that oncologists started publishing data that associated a higher NLR with a greater risk of mortality in all sorts of cancer types.

EXPANSION OF INDEXES DERIVED FROM A CBC

KMH: How many indexes was Christian able to derive from a CBC?

JCL: He generated about 25 other indexes from a complete blood count alone. Each presents a new regard on the patient's endobiogenic physiological functioning. For example, there's the cortisol index as an expression of catabolic, corticotropic activity when a patient is subjected to an aggression. Others evaluate the reactive and compensatory anabolic response from the gonadotropic axis. Still others quantify immune activity, such as the evoked histamine index. It models circulating histamines without measuring histamine directly. The role of the locus coeruleus can also be modeled. This is where noradrenaline, the neurotransmitter for alpha-sympathetic originates from.

With a simple blood count, in a matter of seconds by computer analysis, the doctor has new and original information on the deep functioning of the patient, even when the individual biomarkers in the CBC are within normal range. The general theory of endobiogeny does not only apply to defining the links between clinical history and physiology. It also applies to biomarkers. It is thanks to an integrative and functional view of biomarkers that the doctor can comprehend their patient in a way that is broad and deep.

TEACHING THE BIOLOGY OF FUNCTIONS AND INCORPORATION OF NEW BIOMARKERS

KMH: As a developer of new indexes, I've observed that the more indexes one makes, the easier it becomes to make additional indexes. It's an additive

and combinatorial process. One of the challenges is in explaining to others how one derived a formula, or how established indexes composing a new one reflect increasingly complex or abstract functions. How did Christian begin to teach the indexes of the biology of functions to his students?

JCL: The teaching of the biology of functions was done in a very progressive way, based on clinical cases. Christian gradually introduced new algorithms by incorporating other biomarkers beyond a CBC. For example, [LDH, CPK and osteocalcin](#).

KMH: And what was the purpose of these other biomarkers?

JCL: It was to better define the complex endobiogenic state of patients. A CBC is well adapted to describe immediate and mediate adaptation responses and the neuroendocrine factors that modify the circulating levels of cellular elements. The addition of these other biomarkers was much more helpful in describing more complex functions, such as insulin and growth hormone activity. And, it allowed us to model sub-cellular activity such as mitochondrial function or free radical generation.

Finally, we were able to precisely quantify the data provided by the endobiogenic clinical evaluation of the patient and correct errors the students made in interpretation of clinical data. It improved both the questions they asked, the depth of their examination and ultimately it improved their diagnostic skills. The more elaborate integrative vision they thus obtained enabled them to better identify the complexity of the physiological mechanisms at work in the patient's body and to more precisely orient their therapeutic choices.

I mentioned earlier how the endobiogenic model of integrative physiology divides hormones into 4 main functional axes: corticotropic, gonadotropic, thyrotropic and somatotropic. And, I mentioned three levels of endocrine regulation: vertical, horizontal and radial. They work in a dynamic hierarchical fashion. And the expanded biology of

functions made it possible to better understand these axes of function, and the endocrino-metabolic and endocrino-tissular state of the subject at all levels of the body, and, to establish a precise endobiogenic diagnosis.

KMH: ...because it's not possible to determine from history and physical examination these levels of information, is it?

JCL: Typically, it is not possible.

KMH: And even if one could determine this, it's a question of how to objectively express these levels of activity to our colleagues. That's why, for me at least, the numerical representation of these complex and admittedly abstract concepts is so helpful.

JCL: I agree. And, the longitudinal monitoring of the evolution of terrain is only possible with a numerical representation of physiologic activity.

KMH: So, Christian didn't present a didactic course on the biology of functions?

JCL: No. Christian was not a didactic teacher. In fact, before the teachings you and I developed in English, the biology of functions was not taught at all in our courses.

REACTIONS TO THE BIOLOGY OF FUNCTIONS AND THE VALUE OF QUANTIFICATION

KMH: How did the students react to the introduction of the biology of functions?

JCL: It is sometimes difficult for doctors to make an accurate assessment of the functional state of the individual's terrain, hence there are possible errors of interpretation. The historical or clinical approach alone is not sufficient. This is why when Christian began to present the first indexes to the group, everyone was enthusiastic: they now had a tool that provided them with objective data. They could quantify an activity or a level of function, which they were not able to do before with the clinic alone.

Here's a good example. Thanks to the clinical approach it is possible to recognize that a patient presents signs indicating a very strong activity of his alpha sympathetic nervous system with adrenal insufficiency. But it is an immense additional step to be able to quantify objectively and numerically the exact level of sympathetic excess and adrenal collapse. Moreover, this quantification, which is no longer the result of a purely subjective clinical assessment, provides objective information that can lead the physician to reconsider his clinical assessment. The advantage is that a numerical value makes it possible to define the level of a particular state and to follow its evolution precisely. It's one thing to say "yes, his alpha sympathetic is lower and his adrenal has improved a bit from the treatment I prescribed him," but it's quite another to see that his leukocyte mobilization index (an indicator of alpha-sympathetic function) decreased from 1.37 to 1.16 (normal 0.85-1.15) and his adrenal cortex index increased from 0.58 to 1.3 (normal 2.7-3.3).

QUALIFICATIONS FOR USING THE BIOLOGY OF FUNCTIONS

KMH: Did Christian feel that training in endobiogeny was necessary to start working with functional biology?

JCL: Yes, training in endobiogeny was not only necessary, but essential. Christian's teaching was initially clinical and has always integrated the signs into the overall functioning of the body. He taught his students to collect the most complete anamnestic and clinical information possible. He then asked them, on the basis of these data alone and whatever the disease or symptom presented by the patient, to try to define what his functional state was: for example, to assess precisely the level of overall activity of his thyroid and to explain whether this level was more of central or peripheral origin, to determine whether or not the activity of his T3 was predominant compared to that of his T4, to assess whether his androgens were more adrenocortical origin than genital, to establish if the oozing character of his eczema reflected the

predominant role of his parasympathetic or of his thyroid or of his pancreas, and in what relative proportions, if the congestion of his liver was more of an active or passive nature and what consequence this had on the reactivity of the exocrine function of the pancreas. For years he applied himself to widening the doctor's gaze, going back and forth between the sign, its relations with other signs and its links with physiology.

He quickly realized that very often the opinions of his students were contradictory because they misinterpreted the meaning of a clinical sign. They did not have a correct understanding of it because they considered it only in itself without relating it to the existence of other signs whose presence should have led them to correct their erroneous interpretation.

This is why he created the biology of functions to give them a tool that enlightens them on the quantified reality of the clinical assessment they were trying to make. Indeed, the biology of functions requires learning clinical endobiogeny which is the foundation of the practice. Clinical endobiogeny is the basic core that teaches the overall approach to be used to approach a patient: integrative clinical semiology, integrative physiology, study of the relationships between the two in an integrative study. Functional biomarker analysis must be gradually integrated as the teaching progresses and from the very beginning because it cannot be separated from either the clinic or physiology. It sheds light on the data provided by one and the other and objectively quantifies the reality of the elements in the field that participate in the operation and overall management of the patient's terrain.

It then constitutes a coherent whole allowing the doctor to establish a synthesis ranging from the clinic to physiology, physiopathology and classical biomarker analysis and crowned by that truly integrative approach of the biology of functions. It constitutes a vital complementary tool, but one which cannot be dissociated from the sick person in flesh and blood that we have in front of us and whom we must treat. This is why it can be a serious

error to delve into the results of functional lab analysis without having the clinical knowledge of the patient, and to consider in "absolute terms" the numerical figures it provides without associating them with the reality of the patient whom, unfortunately, many doctors nowadays no longer take the time to listen to or even examine.

DIDACTIC INTEGRATION OF THE BIOLOGY OF FUNCTIONS

KMH: I'd like to come back to the question of didactic teachings. Before the 2010 course that you and I developed for the American Society of Endobiogenic Medicine and Integrative Physiology (ASEMIP), the biology of functions was never formally taught as part of the endobiogenic teachings. Since then, the research group we formed, Systems Biology Research Group (SBRG), is the only group teaching Endobiogeny, that offers [teachings of the biology of functions](#). Why do you think that is?

JCL: The biology of functions was never formally taught as part of the teachings because Christian never established a structured teaching of his discoveries. He always proceeded in stages according to the evolution of the theory and the request of the doctors of the group who worked with him. The doctors who taught within the framework of the French Society of Endobiogeny and Medicine (SFEM) from 2004 to 2010 provided a first level of physio-clinical teaching of the theory of endobiogeny validated by Christian. But, no doubt for fear of making mistakes or distorting or betraying his thinking and due to a lack of understanding of what he brought, they did not subsequently set up a formalized teaching of the biology of functions. The information concerning this new approach was partial and scattered. They were only found through the study of numerous clinical cases spread over fifteen years. We made transcripts of every teaching, but there was no written synthesis of it. Christian's teaching was done exclusively within the group, illustrated by explanations of very detailed patient cases but not synthesized in a publishable corpus.

It was from 2008 within the framework of the SIMEPI (the non-profit association of Endobiogeny physicians) in France during in-person case studies with live patients that we organized that and I began to give examples of the contribution of the biology of functions to clinical cases.

The same thing started from 2012 in Tunisia. And it was in 2016 that I made, still within the framework of teaching in Paris (SIMEPI), a general presentation of the biology of functions and showed how the algorithms derived from a CBC makes it possible to obtain information on the functioning of the 4 hormonal axes as formalized by endobiogeny. But at that time the biology of functions did not feature in any of the courses in the various fields of pathology.



Drs. Hedayat and Lapraz in Paris, October 3, 2018

HOW KAMYAR AND JEAN CLAUDE MET

And, it was in 2007, during a seminar that I was leading in Pocatello, a small American town in Idaho, that I met you. I never imagined that this meeting would constitute a turning point in my professional life, as important as the one I experienced 35 years earlier following my meeting with Christian Duraffourd. You were 37 years old at that time. A doctor trained at Stanford University in critical care and head of pediatric intensive care and integrative medicine somewhere in the southern United States.

KMH: It was in Shreveport, Louisiana. I resigned my position just to be able to attend that conference even though I really had no idea what Endobiogeny was. There was almost nothing on the internet and no published books or research articles. I was just convinced that I had to meet you. And, I had no idea what a turning point it would be in my life.

JCL: The first question you asked me was “where is the scientific evidence for your work? What bibliographic data do you have?”

KMH: I did and still respect a scientific approach to medicine. Not that rational evidence is the only

proof possible. But, there should be a link to rational, scientific inquiry and *valid* experimental studies if integrative physiology and the theory of endobiogeny are to be accepted one day by the medical establishment.

JCL: Your question plunged me into great perplexity. Indeed, in the more than 35 years that I worked with Christian Duraffourd, in spite of all our efforts, we had not succeeded in convincing our hospital colleagues of the contribution of our research nor succeeded in convincing them to perform research with us. A kind of ideological constraint in the country of Pasteur and Descartes weighed on us. We faced a closed system protected by scientific certainties, closed minds and the desire for power and notoriety. As a result, no door has opened before us during all these years.

This is why your question appealed to me so much. During this meeting, you showed a real interest in the content of the seminar and particularly in this approach to biomarkers. And right away, you proposed we begin research on critical illness in children. You wanted to see with your own eyes the information that a CBC could provide in intensive care. Within weeks you started using the biology of functions on a series of 20 patients, and, faced with the relevance of the information provided by these algorithms, you were immediately convinced of the scientific validity of the endobiogenic approach.

KMH: Very quickly—perhaps too quickly—I started speaking with my colleagues and trying to get them to do research with us. Of course, I also met with a lot of resistance at first, but that’s a discussion for another time.

JCL: I recall. And, our long common adventure led, 13 years later, to the publication in [4 volumes](#) of *The Theory of Endobiogeny* by Elsevier editions. The magnitude of the work represented by our desire to introduce this theory into the heart of current medicine led you to devote yourself entirely to endobiogeny.

KMH: I quit my position as head of critical care to meet you and I left hospital medicine a year after I started studying with you to fully devote myself to endobiogeny. In fact, the four volumes we wrote grew out of an article we wrote about endobiogeny—the first published in a peer reviewed scientific journal. And, that article grew out of my personal notes seeking to understand the biomarkers Christian chose for the indexes of the biology of functions. I honestly didn’t know what alkaline phosphatase did, even though it appeared in every complete metabolic panel. I had to understand both the basic purpose of these biomarkers as well as their relationship to various hormones and disorders.

A NEW SYNTHESIS OF ENDOBIOGENY AND THE BIOLOGY OF FUNCTIONS

JCL: But what you did was more than just write about the biology of functions. I would say that you conceived an entirely new teaching, reorganizing and synthesizing what we taught before, but this time integrating semiology, clinical examination, physiology, classical biomarker analysis and the biology of functions into a single, coherent teaching. And, you applied this systematically to various disorders. This led to the creation of the first professional medical association of endobiogeny in the US, ASEMIP. ASEMIP presented a new pedagogical method different from those we used in France and that with Doctor Duraffourd we had disseminated from the 1990’s in England,

Mexico and Tunisia within the framework of the SFPA and SFEM then SIMEPI.

But even more than synthesizing what came before, I would say that your contributions to the theory of Endobiogeny itself are considerable. Even though we started working together in 2009, you never met Christian, who died in 2017. Despite this, you are the source of a new synthesis based on Duraffourd’s vision. You not only placed Christian’s biology of functions within the framework of complex systems biology, but also created new algorithms that model physiology and psychology, broadening the scope of the biology of functions. You established a new phenotypic classification of certain neuropsychiatric and cognition pathologies and integrated chronobiology and cosmobiology into the theory of endobiogeny. You also brought new uses for medicinal plants, mushrooms and amino acids.

KMH: That’s kind, Jean Claude. I could not have gone as far as I did without your patient teachings and generous sharing of time and knowledge. It’s interesting...years later as I studied the transcripts of Christian’s teachings, I was surprised to learn that he also elaborated on chronobiology, cosmobiology, and psychology, but didn’t formally elaborate them. It made me feel more reassured that I was, as you say in French, “in a good way” with my thinking.

THE FUTURE OF THE BIOLOGY OF FUNCTIONS

KMH: As we wrap up our discussion today, I’d like to ask you what you see for the future of the biology of functions? More broadly, how can we advance Christian’s vision of Endobiogeny?

JCL: The task is immense and will require the joint efforts of the entire scientific and medical community. It can only be done with the help of public and private funds. Such requirements impose the need for a charter of endobiogeny and a unified teaching at the international level and based on validated scientific work. This is important for the future of patients. With all those who have become aware of it, we are determined to continue this

work resulting from the thought of doctor C. Duraffourd, initiated more than 50 years ago.

As for a better use of the biology of functions, I think that the work you recently launched with the [GEMMA](#) expert system is a good step in that direction. You present new indexes that you developed, not available in prior expert systems. But perhaps more importantly, you have expanded on Christian's definitions of indexes, offering more useful information on interpretation and treatment selection. Ironically, the prior versions of the biology of functions on line were exclusively available in English even though the system was developed in France. But with GEMMA we decided to make it available in English and French, which I believe will help the French speaking users in Europe and Tunisia.

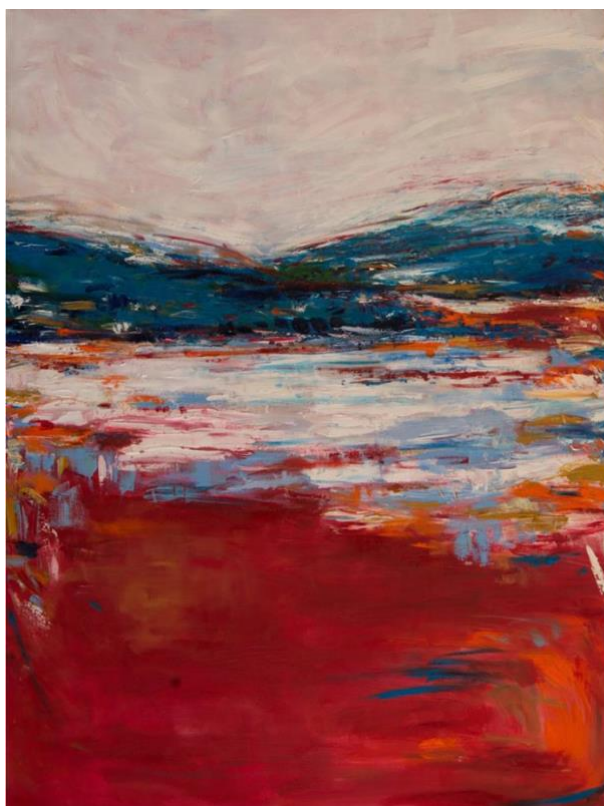
I should say that I very much appreciate this concept of "panels" that you developed. Grouping related indexes for a specific disease or pathophysiology from across several axes of function immediately demonstrates to doctors and patients the clear trends and realities of the terrain. Before the development of panels, it took a great deal of concentration and notation to remember which indexes are related to which other indexes for a particular tendency, such as inflammation, or disease such as autoimmune thyroiditis. In fact, even for me, viewing relevant indexes together rather than scattered across various axes demonstrates the reality of a specific aspect of terrain in a patient.

The articles we published validating the association of indexes in certain diseases, such as chronic heart failure, cancer and acute myocardial infarction will go a long way in gaining acceptance for Endobiogeny and the biology of functions. And the work you started in machine learning holds promise. The language of artificial intelligence presents concepts that have captivated the interest of scientists and physicians and could serve as a more acceptable entry point of Endobiogeny into official medical circles.

KMH: Jean Claude, my friend, I cannot thank you enough for taking time to share your wisdom with the present and future community of endobiogenists. We could not have come this far without you and the other endobiogenists around Christian. You translated his vision and shared it with us.

JCL: Thank you, my dear Kamyar. I've enjoyed seeing you advance Endobiogenic science and clinical practice. Thank you for the time *you* have shared with the world for the sake of Endobiogeny. I entrust the future of Endobiogeny to you and your students. The work of science is never completed, only refined. ✱

CLINICAL PEARLS



Source: "[Somewhere...Feeling Energetic](#)" by Kajal Zaveri

BLOOD BIOMARKERS, IN THE MAINSTREAM MEDICAL COMMUNITY AND ENDOBIOGENY

SUMMARY: A brief comparison and analysis of the mainstream medical approach and the endobiogenic approach in the utilization of blood biomarkers and their contextualization of overall human physiology.

Introduction

As physicians, lab work is considered key for proper assessment of disease states. We view biomarkers as direct indicators of glandular output disorders, e.g., hypothyroidism, or, tissue pathology, such as an elevated liver enzyme. It helps us in diagnosis and longitudinal assessment of response to treatment in conventional medicine.^{1,2,3} The endobiogenist goes beyond this. Biomarkers

evaluate the terrain—the pre-pathophysiologic environment that allows disorders to develop. It's not a question of what labs are ordered—though there is that—but also how the labs are interpreted.

Consider andropause. From a standard perspective, a great number of biomarkers are usually ordered: free and total testosterone, IGF-1 (insulin-like growth factor-1), TSH (thyroid stimulating hormone), SHBG (sex hormone binding globulin),

LH (luteinizing hormone), etc. However, results do not necessarily correlate with the clinical picture, leaving the practitioner wondering where the error is: the testing method, the lab results, their thought process or an incorrect differential diagnosis.⁴ For an endobiogenist, 20-30 biomarkers can be used to evaluate innumerable disorders, and more importantly, the terrains that engender these disorders. So, for example, in evaluating andropause, the endobiogenist orders labs that model, or, estimate, the rate of androgen production, if it's coming from the adrenal cortex, gonads, or both, if it's more active in tissue metabolism or gene transcription, how androgens are adjusting themselves to estrogen, thyroid and growth factors.

The core group of biomarkers are a CBC with differential and platelets, TSH, fT3, fT4, osteocalcin, creatine phosphokinase (CPK), lactate dehydrogenase (LDH), total serum calcium, potassium and alkaline phosphate with isoenzymes. These labs are sufficient to evaluate the functional, tissue-level activity of major hormones without making the tenuous association between quantitative serum levels of hormones and their functional activity, accounting for receptor subtypes, second messenger response, nuclear transcription efficiency, etc.⁴ Androgens, estrogens, progesterone, cortisol, DHEA, MSH, ACTH, growth hormone, insulin and others can be modeled in structural (basal) and functional (adaptation) metabolism with respect to the global function of cells, tissues, organs and their inter-connectedness.

When viewed through the lens of the current medical paradigm, the claims of the endobiogenist seem quite astounding. Let's understand how Endobiogeny developed this approach. The CBC with differential and platelets is the foundation of the endobiogenist's modeling of physiology, which for most practitioners is regarded as basic and hardly insightful. Where does the difference of perspective come from? Even though this is the most commonly ordered test, there seems to be a misuse of its total applicability as shown in a study

executed in 2020 by Ahmed et al., where 217 physicians revealed that only three out of the 11 parameters were used more than 80% of the time.⁵ Similarly, another study conducted in 2012 indicated that only four parameters were used more than 85% of the time.⁶ This is a pattern that has been observed since the early 2000's.⁷ It occurs due to the supposition that with the CBC not much information regarding the overall health of the patient can be obtained, except for anemia, infections, hematological cancers, bleeding tendencies, allergies or response to treatments of these disorders.⁸

For an endobiogenist, 60% of the key biomarkers are derived from a CBC. The reason for this lies within the fact that each and every parameter has its own unique importance and meaning behind it, where one can evaluate not only the highlights pointed before, but also how major hormones are being used, their relation and consequently all their ramifications. For example, red blood cells represent the functional tissular activity of androgens, because androgens stimulate the proliferation of red blood cells. Another example is the relationship between white blood cells and estrogens. Estrogens stimulate proliferation of leukocytes. When biomarkers are related to each other in indexes, even more complex and qualitative relationships can be elucidated. And this approach can prove more insightful than standard methods alone.

For example, Braukylienė et al demonstrated that just by using a CBC and troponin, risk of two-year mortality could be demonstrated in patients with first time acute myocardial infarction. The CBC was used to derive the Cortisol index, which models the functional activity of Cortisol. That study also measured serum cortisol, but found that it was not as predictive of two year mortality as the calculated, functional cortisol modeling.⁹ In another study, Hedayat et. al showed that this same cortisol index was a better indicator of risk of in-hospital death in SARS CoV-2 patients than CRP.¹⁰ These are just a

few notions of what can be expected from a simple blood count.

The Theory of Endobiogeny, volume 1, released in 2015 presented a major breakthrough in new ways of assessing functional thyroid activity without measuring TSH, free T4 or free T3.¹¹ For an Endobiogenist, the main role of the thyroid axis is to regulate the energy requirement for the body's overall function, thus proper ATP production is required. The main pathway for its production is the oxidation of glucose through the Krebs cycle, which depends on the conversion of pyruvate to Acetyl-CoA. The enzyme lactate dehydrogenase (LDH) correlates directly to the rate of glucose conversion to pyruvate. When the thyroid is not able to adapt cell metabolism for ATP production, another enzyme, creatine phosphokinase (CPK) can be used to phosphorylate ADP to ATP. Thus, CPK is inversely correlated with thyroid efficiency. In this way, a thyroid index can be created as follows: LDH/CPK. This takes the notion of evaluation of hypothyroidism with TSH and free T4 to functional thyroid insufficiency, which evaluates how effective these hormones have been at the cellular level.¹²

There hasn't been any major shift regarding the assessment of thyroid function in the mainstream community since then. The mainstream medical community still uses free T4 and TSH as the main or only indicators of thyroid function,¹³ and few mainstream scholars are observing holes in the actual consensus.¹⁴ This dates back to the 1970's when use of immunoassays were of low quality.¹⁴ Even with third generation ultrasensitive TSH assays, there is inconsistency in the literature regarding the log-linear relation between TSH and T4.¹⁵

What's key to understand about the Endobiogenic approach to biomarkers is that quantitative output of hormones does not necessarily equate to the

functional effects of those hormones at the tissue level. Thus, for a better understanding of thyroid function, yes, TSH and FT4 are informative markers—if you are seeking to understand the responsiveness of the thyroid to stimulation and the amount of T4 excreted. But they alone do not provide us with all the information necessary to fully evaluate the *efficacy* of thyroid hormones within cells. Therefore, when markers such as CPK and LDH used as markers of the functional efficiency of thyroid hormones for production of ATP,¹² we start to see that determining the optimal dose of levothyroxine has to go beyond the levels of TSH and T4. They have to consider the efficacy of T4 for metabolism. This explains why the clinical status of patients with hypothyroidism can be decoupled from blood levels of thyroid hormones.

Endobiogeny has begun making a larger impact on the scientific community^{16,17} in the last few years so it is hoped that more researchers and practitioners will come to appreciate this theory in due time. The unique approach to biomarkers used in the biology of functions can have a great impact in determining the best conduct with regards to the patients terrain and not a one size fits all approach, as well as the real understanding of the impact of a particular supplement or drug in all levels of the physiology, hence it can also be greatly used by the scientific community and drug companies as a tool to check possible side effects regarding any substance; another point is to check the efficacy of the treatment in real time; endobiogeny can be greatly used to determine the true cause of the disease in a systematic level; potential comorbidities of each individual and consequently appropriate preventive actions, less costs to health insurance companies in regards to the amount of blood markers usually solicited, a better prognosis of survivability in hospitalized patients and a precise course of action in death-threatening cases. ✱

About the Author

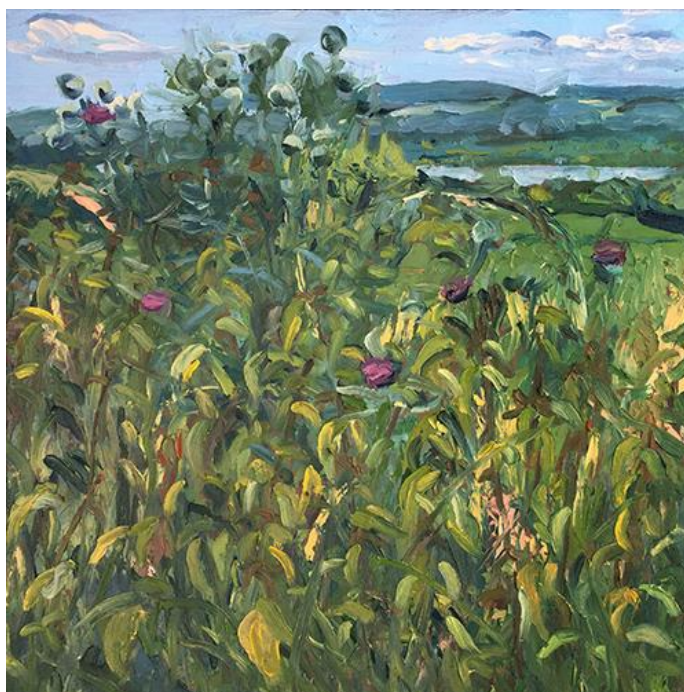
Augusto Barbosa Fronza, born and raised in Brazil, still a bit young in age, and a great proponent of the use and spread of endobiogenic teachings, began studying and applying endobiogeny in his daily practices about a year and a half ago. Now any new case that comes his way becomes an investigative tale which has made daily practice much more fun and interesting to have.

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MEDICINAL PLANTS



Source: [Nettles and Thistles](#) by Stuart Nurse

HERBS THAT MOVE, CLEANSE AND NOURISH THE BLOOD

Anna Betz, MCPP, Dip.SW

SUMMARY: Nettle and Cleavers are discussed in this article, two medicinal plants found in abundance in most parts of the world. They are easy to identify, have gentle and effective blood purifying properties and are very versatile in use. For their cleansing and blood purifying properties they can both be used as food as well as medicines, on their own or together. The key differences are that cleavers stimulates lymph flow, while nettle stimulates the detoxifying action of the liver and supports the cleansing action of the kidneys. Thus, they work together synergistically.

Introduction

Nettles and Cleavers are known for nourishing and cleansing our blood. Both are best picked in spring or during the second growth in autumn. They make useful companions both out in nature as well as in our bodies where they complement each other's

many functions related to creating movement and flow.

- Why is it important to stimulate movement and flow?

Stimulating movement and flow of body fluids including blood and lymph helps the body's internal environment to integrate its diverse activities, i.e. exchange of materials between the environment

and cells, metabolize foods, clear metabolic waste and prevent infections and other diseases including cancer. The inability to integrate these diverse activities effectively leads to stagnation, congestion and disease.

- What are some adverse consequences of stagnation?
 - Fluid retention & swellings
 - Bacterial overload
 - Inability to clear cancer cells
 - Accumulation of metabolic waste that result in disease or disorders

CLEAVERS VS. NETTLES

What is the difference broadly speaking between cleavers and nettles?

- **Cleavers** support the lymphatic system in its cleansing and immune work. Its used for treating swollen lymph glands, lymphatic congestion and swollen breasts, as well as for glandular fever, post-viral fatigue and tonsillitis.^{1,2,3}
- **Nettles** stimulate the detoxifying action of the liver and support the cleansing action of the kidneys through their diuretic action. They also inhibit inflammation that can trigger seasonal allergies by blocking histamine receptors and stopping immune cells from releasing chemicals that trigger allergy symptoms.²⁰

Due to its high mineral content, including iron, nettles make for a good iron tonic.

Nettles are also useful in the treatment of arthritis, diabetes, urinary tract infections (UTIs), kidney stones, enlarged prostate and allergies like hay fever.

When would you combine them?

- For spring cleansing, bloating, sluggishness, brain fog
- For inflammatory conditions and swellings with overload of toxins and allergies.
- For the treatment of bladder infections, prostatitis, breast cancer, prostate cancer.

When would you use them separately?

- Cleavers for lymphatic swelling and drainage, states of acidity, disorders of accumulation such as cataracts and loss of hearing
- Nettles for conditions that affect joints, kidneys, prostate, allergies, anaemia, diabetes

What are the complementary plants that help them work better?

Arctium lappa, Rumex crispus, Smilax ornata, Berberis aquifolium, Achillea millefolium, Apium graveolens, Serenoa repens, Betula pubescens, Taraxacum folium, Taraxacum Radix

CLEAVERS

Latin name: Galium aparine L.

Family: Rubiaceae

Common Names: Cleavers, Sticky Willy, Skyscraper ass rièble, Goose Grass, Lady's Straw, Bedstraw

Velcro also owes its existence to Cleavers

"It is a good remedy in the Spring, eaten (being first chopped small, and boiled well) in water-gruel, to cleanse the blood, and strengthen the liver, thereby to keep the body in health, and fitting it for that change of season that is coming." p.52, *The Complete Herbal*, Nicholas Culpeper, 1814, Richard Evans Publishing (London).

Cleavers are known as the bristly plants that easily hook on to our clothing as we walk through the

countryside or do gardening. The plant uses its hooks to help it climb and to disperse its seeds. Both cleavers and nettles can be found thriving together on derelict land or rubbish dumps where cleavers often use nettles to climb many feet high. In our bodies their actions complement each other in their toning and cleansing actions.



Cleavers Image: with permission from [Botanica Health](#)

Active Principles

Cleavers are saturated with minerals and bioactive plant compounds that detox and nourish the blood. Active ingredients include; phenols, tannins, alkaloids, anthraquinones, coumarins, iridoids asperuloside, alkanes, flavonoids and saponins. Cleavers are also rich in nutrients including chlorophyll, calcium, potassium, and chloride.

The young leaves and stems (before the plant becomes impregnated with silica and becomes too hard) have a taste reminiscent of pea shoots and can be eaten raw (in salad, juice, pesto) or preferably cooked in soups to remove the rough texture. They are rich in Vitamin C.

According to Kamyar Hedayat, the general spirit of the plant is as follows: *"It defines the whole so as to disperse the extrinsic and strengthens functioning of what is intrinsic."*⁴ Kamyar goes on to further explain, *"It means that cleavers act systemically to communicate through the non-neural fascial and interstitial matrices for the global organism to have a sense of its toxic burden. Then, based on this, it coordinates actions that expel toxins and fortify intrinsic regulatory and buffering actions."*⁴ Every one of its varied actions is derived from this notion.

MODERN HERBALISM

In modern herbalism cleavers is used in aiding the lymphatic system to cleanse the body's tissues and treat chronic skin problems including eczema, acne, urticaria and psoriasis. Cleavers' ability to support the lymphatic system's ability to flush out toxins, decrease congestion and reduce swelling also enhances the function of the immune system.

Cleavers' slightly bitter taste stimulates the flow of bile, aids the liver in its detoxifying work and improves digestion, especially of fats. Research has demonstrated its hepato-protective effect;⁵ it may be helpful in hepatitis and mild constipation.

As a lymphatic, cleavers help to soften and normalize hardened, swollen lymph nodes, especially in the upper part of the body including breast tissues. They have a particular affinity for the spleen, assisting the organ with waste removal and acting as an alternative to help "cleanse" the blood.^{6, 7, 8, 9}

TRADITIONAL APPLICATIONS

Folk herbalists also like to use cleavers as a cooling herb to help clear heat and stagnation and to increase flow. When making the seasonal transition from winter to spring, cleavers' energy can be a useful force in stimulating the lymphatic system.

Cleavers has a cooling and cleansing action on the whole system making it a good herb for fevers. It is especially valuable in the treatment of inflammatory urinary conditions and suppressed urine. It is used in the treatment of enlarged lymph nodes and lymphadenopathy, where infection is suspected it works best when combined with anti-infectives. It has a reputation to aid in weight loss and cellulite.

Fresh or dried, cleavers also have anti-coagulant effects when eaten, and may also help lower blood pressure. Fresh cleavers can be juiced or added to a green smoothie.

Based on Kamyar's work, the following can be said about *Galium aparine* and its actions on cleansing and detoxification:

ENDO BIOGENIC ACTIONS

ORGANS: Improves trans-capsular communication of integrity and integrity disruption through networked paracrine intracellular diffusion, facilitates and increases the speed of capsular-cortical communication through neurochemical feed-forward and veno-lymphatic feedback loops.

DRAINAGE:

- *Ground matrix:* stimulates a "sweeping action" that accelerates the movement of small molecules through the extracellular fluid,
- *Lymph nodes:* capsular drainer, restores integrity of inner portions,
- *Lymphatics:* strengthens the lymphatic wall, stimulates repair of dysfunctional valves,
- *Veins:* improves venous drainage in areas of hypoperfusion through anti-coagulant activity,
- *Hepatorenal:* Indirect through its anticoagulant activity,
- *Hepatobiliary:* secondary to improve gallbladder wall integrity

GI: Cleanses the gastric rugae, reduces gastro-duodenal mucosal irritation

ENDO BIOGENIC USAGE

Buffering Capacity: Use in all states of intoxication or need for blood purification (+ *Urtica* ssp. +/- *Arctium lappa*), all states of musculo-tendinous rigidity (+ Magnesium +/- *Uncaria tomentosa*, + *Sequoia gigantea* GM for those 40 years and older), as a general revitalizer (+ *Urtica dioica* + *Betula pubescens* GM or sap)⁵

ID: Recurrent infections, Chronic infections

Dosage:

Cleavers tincture and tea are most widely recommended by herbal practitioners.

- Tincture (1/2–1 teaspoon or 3–5 ml) can be taken three times per day.
- Tea is made by steeping 2–3 teaspoons (10–15 grams) of the herb in 1 cup (250 ml) of hot water for ten to fifteen minutes. People can drink three or more cups per day.

NETTLES

Latin name: *Urtica* (*Urtica dioica* & *Urtica urens*)

Family: Urticaceae

Common Names: Stinging Nettle & Dwarf Nettle
Parts used: Leaves, roots, flowers, seeds

Urtica dioica (Stinging nettle) and *Urtica urens* (Dwarf nettle) are native to Eurasia, and are considered therapeutically interchangeable¹⁰. Few people will have avoided the childhood initiation of falling into a nettle patch—and so it is generally a well recognised plant. The term nettle is used here to refer simultaneously to stinging and dwarf nettle.

Urtica prefers wet, rich soil and tends to grow in large patches. Stinging nettle is taller than dwarf nettle and is perennial; dwarf nettle is an annual.

Both plants have fleshy, drooping, serrated, roughly heart-shaped leaves. The leaves and stems are covered with stinging hairs (dwarf nettle leaves are smooth and more delicate).

Both produce inconspicuous green-white flowers in late spring or summer. The leaf, flower, seed, and root of nettle are used differently and contain different chemical constituents. In this article we focus on actions and therapeutic uses of Nettle leaves and roots related to their detoxifying and tonifying actions.



Nettle Image: from Pixabay Kapa6

Active Principles

Nettles are rich in micro-nutrients, phytochemicals, minerals and vitamins including vitamins A and C, and minerals particularly iron, silica and potassium. With their astringent, expectorant, diuretic, antihistamine, anti-inflammatory and antioxidant effects, all parts of the nettle can be used as medicine.

Leaf: Acids (carbonic, caffeic, chlorogenic, formic, silicic, citric, fumaric, malic, oxalic, succinic), Amines (Ach, betain, choline, lecithin, histamine, serotonin), lignans, flavonoids (quercetin, kaempferol, and rutin), Nutrients (Vitamins A, B2, B5, C, K+, Ca+, silicon), chlorophylls a and b, dietary

fibre & protein, nitrates, sterols, tannins, glucoquinones

Root: Polysaccharides, lectin, lignans, coumarins, triterpenes, sterols, tannins, phenolic acid

Medicinal actions

Leaf: Anti-inflammatory, anti-septic, mild hypoglycaemic ^{11,12}, diuretic, anti-haemorrhagic, haemostatic detoxifier, vasodilator, circulatory stimulant, hypotensive, nutritive, galactagogue, astringent, expectorant, anti-allergic, reduces BPH (benign prostatic hyperplasia), anti-rheumatic. ¹³

Urtica increases urine output and increases the removal of uric acid. The diuretic action of Urtica makes it useful in the treatment of oedema, arthritis with swollen joints, and congestive heart disease.

Nettle leaves should not be used after flowers or seeds appear. Once the nettles have started to flower, the leaves are traditionally no longer used - they are said to contain insoluble calcium carbonate crystals that are hard to flush out of the body, can build up in the kidneys and cause kidney/back pain, particularly in people prone to kidney problems. In addition, when they flower, all the 'goodness' and energy of the plant is now directed to creating the best flowers and seeds they can, and the leaves are now neglected, dry, tough and stingy.

Root: It is indicated in BPH and uterine haemorrhages. It is specific for nervous eczema. It's tonifying actions will strengthen and support the whole body. It plays an important role in chronic and degenerative condition of the musculoskeletal system such as RA, OA, gout, joint pain and myalgia.

MODERN HERBALISM

Nettle leaf is used for allergies and remineralization as well as chronic inflammatory conditions affecting the joints while the root is used as a depurative

(PURIFYING AND DETOXIFYING EFFECTS) and to treat disorders of androgen excess, such as prostatic adenoma.^{13,14}

Studies have demonstrated that nettle has powerful antioxidant activities which explain its reputation as a rejuvenative. The leaf and root have anti-inflammatory actions by preventing prostaglandin formation. They also have immuno-modulating effects and may inhibit the inflammatory cascade in inflammatory and autoimmune diseases like rheumatoid arthritis. Its analgesic effect contributes to its positive effects here. Studies have found that nettles can decrease free radical concentrations in both the cerebellum and frontal lobe of the brain which could prove beneficial in preventing cognitive decline as we age. Nettle could also be helpful in prevention of other immune and endocrine problems including low thyroid function and cancer.¹⁵

The root has long been used in treatment of urinary problems, prostatitis and benign enlargement of the prostate. It contains lectins and certain types of complex sugars which, according to much modern research, are probably the major components contributing its benefits which come about through their ability to affect hormones and proteins that carry sex hormones in the body. The anti-proliferative effect of stinging nettle roots extracts has been observed with an inhibitory effect on the growth of the lymph node carcinoma of the prostate.

TRADITIONAL APPLICATIONS

Stinging nettle has been used for hundreds of years as a nutritive and gentle detoxing herb, to treat painful muscles and joints, eczema, arthritis, gout, and anaemia. It has been used traditionally as a 'blood tonic' as it contains many beneficial minerals, particularly iron, magnesium and calcium, for replenishing the body's post-winter depleted stocks.

Nettle has a long history of use for modulating the body's inflammatory pathways and supporting upper respiratory health. In the first and second centuries, Greek physicians Dioscorides and Galen reported the use of Nettle leaf for its diuretic and laxative properties and for the treatment of respiratory issues.¹⁶ Nicholas Culpeper, a renowned 17th-century herbalist, recommended a Nettle-honey preparation for wounds and skin infections, and as a gargle for throat and mouth infections.¹⁷

From an Ayurvedic perspective nettle has light, dry and penetrating qualities with astringent, bitter, sweet and salty tastes. It is considered particularly useful for removing excess *kapha* after winter and reducing *pitta* in preparation for the increased heat of spring and summer. It is an excellent rejuvenative and nourishing tonic, increasing *ojas*, clearing *ama* and excess *pitta* and *kapha* from the *rasa* and *rakta dhatus*.

A good way to take it is by using the fresh nettle tops in nourishing **soups**: Add chopped nettles at the end of cooking for just a few minutes to break down the stings and gain all the goodness!

Dosage:

Nettle tincture and tea are widely recommended by herbal practitioners.

- Tincture (1/2 – 1 teaspoon or 3 -5 ml) can be taken 3 times a day
- Tea is made by steeping 2-3 teaspoons of the dried herb in 1 cup (250ml) of hot water for 10-15 minutes. People can drink three or more cups per day.

ENDOBIOGENIC ACTION: NETTLE LEAF

IMMUNE: anti-allergic (inhibits mast cell degranulation, COX-1, COX-2 and prostaglandins)^{10, 18}

Metabolic [SIPF, powder ONLY]:²⁰

Revitalizing (Fe, Si, Mg, Ca, Cu, Zn, K, S, B2, B5, Folic acid), stimulates growth of hair and nails;

DERM: Purifier of skin,

RENAL: Diuretic (volumetric, chloruretic, uricosuric)

ENDO BIOGENIC USAGE

Hair and nail weakness, allergies, diabetes, osteoporosis, osteochondritis, juvenile arthritis, acne; anaemia (50 g [5 tbsp])

METHOD: FRESH plant: decoct 10 min in 4 c. water, drink in 3-6 even doses/d)

ENDO BIOGENIC ACTION: NETTLE ROOT

IMMUNE: anti-allergic (inhibits mast cell degranulation, COX-1, COX-2 and prostaglandins)^{10,18} anti-proliferatives; anti-inflammatory, anti-rheumatic (inhibits formation of inflammatory agents), stimulates T-cells;

RENAL: Diuretic (volumetric, chloruretic, uricosuric)

DETOX: Purifier, astringent

ENDO BIOGENIC USAGE

All states of over-growth or accumulation, all inflammatory states of burden, such as: Prostatic hypertrophy, prostate cancer, androgenic alopecia, hypertension, congestive heart failure, rheumatic congestions;

METHOD: 3-5 tbsp dry root in 4 cups water; decoct 3 min AND steep 10 min, drink in 3 even doses per day;

“The buffering system is the elements in reserve that are typically not immediately used, but available for any type of acute, subacute, chronic or existential demand for survival. For example, you could consider medicinal plants that are rich in vitamins and minerals. like Urtica dioica leaf, which is stinging nettle, or equisetum species or horsetail. There are plants that help the buffering system through enzymatic regulation.” Kamyar M. Hedayat, MD. ¹⁹
✱

About the Author

Anna Betz, MCPP, Dip.SW, is a medical herbalist, co-founder of Endobiogenic Society UK and member of the professional governing body for qualified Medical Herbalists in the UK. She practices Endobiogenic medicine in conjunction with herbal medicine, dietary, life-style and wellness coaching, utilizing systemic family therapy and narrative approaches. For the National Health Service of the United Kingdom, she pioneered a 'brainfood project' to optimize brain health and to prevent or slow down cognitive decline.

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Disclaimer: I have no financial conflict of interest with any of the companies or associations mentioned in this article.

NUTRITION AND LIFESTYLE



Source: *Wasteland* by Denise Peat

BLOOD CLEANSERS IN THE KITCHEN

Lizzie Johnson, certified Health and Life Coach
Kamyar M. Hedayat, MD

SUMMARY: We review the concept of blood toxicity, how it occurs and the general approaches to addressing it. Simple tips on how to forage, prepare, and consume stinging nettle, dandelion, and cleavers are presented, with kitchen-tested recipes.

Introduction

Blood is the river of life. Blood is the sewage system of life. Therein lies the dialectic. Orders of complexity of biological life require a method of intaking, distributing and removing waste products. The focal point of this process is the blood.

Blood toxicity is the net accumulation of waste products that have not been sufficiently

metabolized and excreted by the emunctory organs. The primary emunctories of blood cleansing

are the liver and kidneys as they are the filtering organs. The lung stands as a secondary emunctory as it does not filter, but it does allow for the removal of CO₂ for acidity regulation. The hollow structures: gallbladder, intestines, bladder and lymphatics are tertiary organs as their function is as a conduit of waste removal. Finally, there is skin,

having served as the primordial emunctory, it now is the emunctory of last resort.

Thus, it is no surprise that most blood cleansing plants act on one or more of the organs or channels mentioned. The key to selecting blood cleansing plants is to first identify the existence of blood toxicity. It presents as a general feeling of heat and the exposure of tissues to toxins, for example the skin (e.g. rashes, urticaria), joints (e.g. arthrosis), or hollow organs (e.g. sterile cystitis, sterile meningitis).

The second step is to identify the dysfunctional emunctories. Thus, skin disorders implicate the liver, gallbladder and intestines, whereas joint disorders imply the kidney and liver.

When addressing active disorders, the use of plants in medicinal strength preparations (tisanes, tinctures, etc.) is most efficient. (For a monograph evaluation of these three plants and their endobiogenic applications, please see Anna Betz's article: [Herbs that move, cleanse and nourish the blood](#)). However, for general health or prevention of seasonal flare ups, alimentary consumption of blood cleansers is a good choice. It is efficient, but also empowers the patient to have agency over their *health* rather than just their *illness*.

There are many possible plants that could have been proposed. We chose three that are common throughout the world and easy to forage or purchase. The first is stinging nettles (*Urtica dioica*). The leaf is a hepatobiliary and hepatorenal drainer, and is anti-allergic. The root acts as a stronger depurative and renal drainer than the leaf. The second is dandelion (*Taraxacum officinalis*). It has a stronger action than nettles, and is more oriented towards toxicity that affects the emunctories themselves, e.g. gallstones, kidney stones, etc., as well as joint disorders. The third is cleavers (*Galium aparine*). Cleavers great focus is on cleansing the ground matrix (the extracellular space) and the lymphatics, with secondary hepatobiliary and hepatorenal drainage. It can be used as a general drainer and revitalizer, especially in combination with other depuratives and drainers. Turmeric

(*Curcuma longa*) and burdock (*Arctium lappa*) are undeniable for their efficacy as blood cleansers. However, given their general popularity and availability, we chose to spotlight other excellent plants. With the recipes below, you can begin experimenting with the cleansing powers of these restorative plants.

STINGING NETTLE

If you have spent time hiking mountain trails or walking along streams, you most likely have encountered the touch of the stinging nettle. This perennial herb is found in most places around the world and in some places is considered to be a noxious weed. The sting of the *Urtica dioica* or Stinging Nettle is usually just a mild irritation on the skin, which is why most people try to avoid finding it. However, with a slight shift of perception, this proliferous herb can become a thrill to find when out strolling along the streams of meadows and hillsides.

Once you discover the earthy taste and the rich green color, this once annoying weed becomes a culinary delight. Foraging for Nettle is not only an opportunity to enhance your nutrition, it is also a unique way to spend time adventuring outside. Invite a beloved friend or family member with you and the hunt becomes a splendor to the senses. Bring some gloves, scissors, and a light weight bag so you are prepared. Gathering Nettle is easy. You might decide the sting is tolerable and perhaps even exciting because it means you have found the appropriate plant!

Where to Find It

The stinging nettle prefers damp and fertile soil which is why it can often be found along small streams or near well watered gardens. Look for them along hedgerows, in fields, woodlands, and meadows.

Harvesting and Prepping

The ideal time to harvest Stinging Nettle is early Spring BEFORE it flowers. Once the flowers have blossomed, it is best to wait until late Fall to harvest again. Using young, smaller leaves is the ideal choice.

Once you have brought the nettle home, a quick rinse in a colander will take the sting away and blanching it in boiling water for 3 minutes is a great way to begin adding it to soups, sauces, smoothies, tea, and maybe even baked goods.

The Nettle plant is best consumed when it is fresh. An easy way to preserve fresh Nettle leaves is to blanch them in boiling water for 1-3 minutes, blending them into a puree, and freezing them in individual serving sized containers. Using an ice cube tray is a great way to store individual sized servings that can be added to smoothies and teas.

If harvesting Nettle is not available to you, purchasing dried Nettle is also a good option. A simple tea made with dried Nettle can be a great addition to a detoxifying diet.

Practical Application

Think of this like it is spinach. How do you use spinach?



STINGING NETTLE SOUP WITH ZUCCHINI/COURGETTE

Ingredients:

2 cups (480ml) fresh nettle, washed, thick stems removed, and blanched in water for 3 minutes.

2 cups/480 ml of nettle water, set aside

2 TB (30 ml) grass fed butter or ghee

1 medium sized yellow onion, chopped

1/4 cup (60 ml) white wine

2 stalks celery, chopped

6 medium sized zucchini /courgettes cut into 1 inch pieces.

1 tsp. (8 grams) dried rosemary

1 tsp. (8 grams) fine sea salt

1/4 tsp (2 grams) black pepper

1 tsp. (8 grams) Herbs De Provence (thyme, rosemary, fennel, lavender)

water, or broth, if needed to thin the soup

Blender or food processor

Directions:

1. Blanch the washed nettle for 3 minutes in boiling water.
2. Drain the nettle and measure 2 well packed cups of cooked nettle.
3. Reserve 2 cups (480ml) nettle water and set it aside.
4. Heat the butter or ghee in a large soup pot.
5. Saute the chopped onion in the butter until soft and translucent.
6. Add the chopped celery, zucchini, rosemary, salt, and pepper.
7. Slowly add the wine and let it simmer with the vegetables until the vegetables are tender.
8. Pour in 2 cups (480ml) reserved nettle water and simmer until the vegetables are soft.
9. Pour the cooked vegetables into a high power blender or blend with an upright hand blender until smooth and bright green.
10. Add water or vegetable broth to thin if necessary.
11. Place the blended soup back in the pot, if using a blender.
12. Simmer for 15 minutes on medium/low heat.
13. Add the Herbs De Provence.
14. Add additional salt and pepper to taste.

Serves 6

Serving Suggestions: Serve with crusty sourdough bread. Enjoy!!



STINGING NETTLE PESTO

Sliced sweet potato, boiled

Nettle pesto

Dandelion greens

Sliced tomato

Broccoli sprouts

Mint leaf on top

Ingredients:

- 2 cups (16 oz.) stinging nettle blanched, drained, and packed
- 5 TB green pepitas/pumpkin seeds (unsalted)
- 4 TB hemp seeds
- 2 TB pine nuts
- 1/2 cup fresh parsley
- 1/4 cup fresh mint or basil
- 4 garlic cloves
- 1 tsp sea salt
- 1/4 tsp black pepper
- 3 TB fresh lemon juice
- 1 tsp. Lemon zest
- 1/2 cup olive oil

1/2 cup grape seed oil

1/4 cup fresh shredded Parmesan cheese

Food processor

(Optional pomegranate molasses to drizzle on the top)

Directions:

1. Wash, blanch and measure nettle.
2. Add all ingredients to the food processor and blend until all ingredients are incorporated and large chunks are gone.
3. Store in a glass jar with a lid for up to 5 days.

Serving Suggestions:

Serve on top of a sandwich. This goes well with crusty sourdough bread or on top of sliced and boiled sweet potato as seen in the image above. This is also good as a dip for crackers and cut vegetables.



CLEAVER

Where to Find It

Sometimes referred to as Goosegrass, these weeds can be found in moist or grassy places, such as along riverbanks. They are often found twined through hedges and shrubs producing long sticky stems that can stick to clothing. They often grow close to Stinging Nettle.

Harvesting

Similar to their friend, the stinging nettle, harvest young plants in the Spring. It is ideal when they begin to grow small white flowers on them. Be mindful to keep the flowers on the plant when you harvest these. That means cutting above the flower. Leaving the flower behind allows the plant to go to seed and germinate, creating more cleaver plants in the future.

Harvesting cleavers is healthy for the mind and the body. Take note of the surrounding plants and the sounds of the birds around you. An expression of gratitude can be an encouraging gesture for the plant to thrive within you and continue to grow around you. Harvesting in itself can be healing.

Practical Application

Juicing the Cleavers in a juicer is a great way to extract the vitamin rich liquid from the leaves. Once you have the juice, store individual servings in the freezer and defrost when ready to use. Simply adding 3 oz. of the juice to a 4 cup pitcher of water is a great way to prepare a nutrient rich drink.

The juice can also be added to hot water for tea and also to soups and smoothies.

Blending cleavers with a little water in a blender is another way to prepare cleavers for later use. Store the puree in ice cube trays to add to smoothies, soups, teas.

Cleavers taste good sauteed with garlic and grass fed butter.

Chopping the leaves small, they can be treated as an herb to toss into a salad, marinade, or soup.

DANDELION

Dandelion leaves are another great addition to your blood cleansing pantry.

The spicy taste of the leaves resemble the taste of arugula. The entire plant is edible, including the flower, leaves, and roots.

Where to find it

Found most often in lawns, this broadleaf perennial weed can thrive in almost any kind of habitat. Look for them in the openings of deep woods, rocky hillsides, and fertile garden areas. Dandelions can also thrive indoors, in a pot.

Harvesting

Dandelions taste best when they are harvested before they bloom in the Spring and after they are finished blooming in the late Fall.

When harvesting wild dandelion leaves, be certain they have not been exposed to pesticides, herbicides, or chemicals sprayed on them. If you are uncertain about what the plants have been exposed to, growing them yourself, purchasing them from your local farm or market is the best way to enjoy the healing taste of the dandelion leaves.

To enjoy the whole plant, dig below the roots and gently pull them with roots intact.

Practical application

These thick and richly green leaves are a beautiful addition to any simple salad or as a topping for a sandwich, toast, or pizza. Another simple way to prepare them is by sautéing them in garlic with grass fed butter or Ghee. The simplest way to add them to your diet is to toss them in a smoothie or enjoy a cup of dandelion tea.

Dandelion roots can be dried, chopped, and steeped to make a rich and brown dandelion Coffee. The flowers make beautiful garnishes and can also be sautéed or fried.



DANDELION KALE SALAD WITH TURMERIC CARROT DRESSING

Ingredients:

- 1 bunch dandelion greens
- 1 bunch Kale
- 1 sweet potato, washed, diced, skin left on
- 2 fresh beets, washed and diced
- 1 parsnip, washed and diced
- 2 TB avocado oil (or oil of choice)
- Sea salt
- Goat cheese

For the Dressing:

- 2 medium carrots, chopped or grated (about 1 1/4 cups)
- 1/2 cup (120ml) filtered water
- 1/2 cup (35 grams) raw macadamia nuts or cashews
- 1/4 cup (60 ml) extra virgin olive oil
- 3 Tb (45 ml) freshly squeezed lime juice
- 3 inch piece scallion, white and light green parts only, coarsely chopped
- 1 garlic clove

1/2 tsp. Fine sea salt, plus more to taste

1 tsp tamari, plus more to taste

One 3 inch (7.5 cm) piece fresh turmeric, peeled and chopped

Directions for Salad:

- Preheat the oven to 400 F.
- Wash and chop the root vegetables into 1/2 inch cubes.
- Place the root vegetables on a cookie sheet or roasting pan, drizzle with 1 TB olive oil.
- Roast the root vegetables 30 minutes or until fork tender.
- Wash and dry the greens.
- Chop the kale and dandelion into small pieces and place in a serving bowl.
- Drizzle 1 TB oil over the greens and sprinkle sea salt to taste.
- Massage the greens with washed hands until they soften.
- Prepare the carrot turmeric dressing as directed below.

Directions for Carrot Turmeric Dressing:

1. Combine the carrots, water, nuts, olive oil, lime juice, scallion, garlic, salt, tamari, and turmeric in an upright blender
2. Blend until completely smooth (about 1 minute)
3. Scrape down the sides with a rubber spatula and blend again.
4. Use immediately or store in a glass jar for up to 3 days. Shake well before using.

(The dressing will thicken a little in the refrigerator. Use a little water for thinning it, if desired.)

Dressing Credit: Amy Chaplin *Whole Food Cooking Every Day*, 218-219



DETOX SMOOTHIE

Using dandelion, clever, and nettle

Ingredients:

- 1 cup brewed and cooled clever and nettle tea (1 tsp of each steeped in 8 oz. cup hot water for 5 minutes)
- 1 cup water
- 1 apple cut into quarters
- 1/4 of a cucumber cut in half
- 1/2 of a lemon cut in half, with the rind included
- 1 TB green pepitas (pumpkin seeds)
- 2 TB hemp seeds
- 1 tsp. Flax seeds
- A handful of dandelion greens
- 4 fresh mint leaves
- Ice (optional)

Instructions:

1. Combine all ingredients in a high powered blender.
2. Process until smooth.

DANDELION, CLEAVER, NETTLE MINT TEA

½ tsp. dried cleavers

½ tsp. dried nettle

½ tsp. dried dandelion leaf or root

4 mint leaves

8 oz. water

honey optional

Instructions:

Place the dried plants into a tea strainer and steep in hot water for 5 min.

Option to serve with honey.

Conclusion

Each of these complimentary plants play an important role in blood health and there are simple ways to use them regularly. With a little encouragement they can become a staple ingredient to support a clean diet.

As with any change, it is important to remember that transformation happens when we get rid of the old and bring in the new. This is possible when we discover ways to add one new plant at a time, adopting it into the systems and rituals already in place. For example, if someone already enjoys a particular smoothie recipe regularly, encourage them to add one of these plants to their already beloved smoothie.

From a practical standpoint these plants will not find their way into the routines of people unless they are able to see simple shifts they can make in a system they already have in place. ✱

About the Author

Lizzie Johnson is a mother of 4 children, a professional Health and Life Coach, a Fitness Trainer, and a Social Worker (BS). She lives in Jackson Hole, Wyoming, USA with her husband Adam. She is passionate about listening, rhythmic living, and holistic eating. Her coaching practice is devoted to helping clients create personalized systems that move them towards healthier ways of living.

CONFLICTS

No conflicts of interest.

PRACTITIONER SPOTLIGHT



Source: *For the Listener* by Shawn Dulaney, with permission of the artist

ADVENTURES IN MEDICINE: A NEW LANGUAGE OF HEALING

Introduction

Rachel Koenig, L.Ac is founder of [Aurora Healing Arts & Emerald Apothecary](#). She has been in practice for 34 years, and applying endobiogeny for 13 years. She sat down with *Living Systems* editor, Kamyar Hedayat to discuss her practice in Endobiogeny.

TELL US ABOUT YOURSELF

I am a licensed acupuncturist and herbalist practicing family medicine in New York since 1989. What began with a special focus in women's health, evolved into fertility, pediatrics, and now a general family medicine practice. I studied homeopathic medicine with the late Dr Edward Whitmont, with Dr R.N.Talukdar, and with Alize Timmerman,

founder of the Hahnemann Institute in the Netherlands. I have been mentored in Endobiogeny by Annette Davis, CN, and you for over a decade. In 2012, I graduated as a Certified practitioner of Endobiogeny and became a Fellow of the American Society of Endobiogenic Medicine and Integrative Physiology.



Examining baby Rose, born after using essential oils to treat her mother's infertility, circa 1990.

Credit: Melissa Tardiff

HOW DID YOU FIRST LEARN ABOUT ENDOBIOGENY?

The Taoist physician, Dr Jeffrey Yuen, under whom I apprenticed beginning in the late 1980's, was and is a great advocate of the use of essential oils. Jeffrey encouraged us to apply channel theory to the use of essential oils on acupuncture points, according to Classical Chinese Medicine. In the early 1990's, The French physician/acupuncturist Dr Yves Requena, author of *Terrains and Pathology in Acupuncture* was teaching from time to time in New York City. He was buddies with Dr Michael Smith, with whom I had studied acupuncture detoxification. I was given an introduction and subsequently arranged for Dr Requena to teach a seminar on the

use of essential oils for acupuncturists. Through him, I learned of Drs Lapraz and Duraffourd. Yves greatly encouraged me to read Lapraz's works, as he attributed much of what he knew and taught about the medicinal use of essential oils to him. These were the days well before the internet, but I managed to have one of my French patients traveling to Paris on holiday locate Lapraz's *Cahiers*—a word Yves had scribbled in my notebook, alongside words like "*sympatholytique*," "*vagotonique*" and "*spasmophilie*"... I also was gifted by Yves my first highly potent essential oils from France—Melissa, Clary Sage, high altitude Lavender and Savory—these precious gifts were their own vehicles of transmission! Let us not forget that all of us adventuring in medicine were in a cauldron of the plants themselves! And some of us, are still!

The (subject-specific series of publications) *Les Cahiers de Phytothérapie* (Phytotherapy Notebooks) were very practical medical manuals on clinical herbalism and aromatherapy. I resonated deeply with the terrain theory contained in their dense and serious pages, recognizing clinical truths and wisdoms that I was eager to put into practice. I was fascinated by the concept of safely utilizing essential oils internally. I began taking some myself and with a colleague we embarked on a journey with Rose Essential Oil, taking it in honey 3 days on 3 days off for 100 days (Jeffrey's suggestion of rhythm) to create a change at the (epigenetic and energetic) level of *Jing*. It was a profound physical and spiritual experience for all three of us.

Soon after, I bought a steel lipstick mold from a cosmetic manufacturer and began to hand make suppositories for my patients suffering from stubborn infections and infertility, utilizing oils I had studied in the *Cahiers*. This worked so brilliantly,

even without an “aromatogram”¹, which the French Physicians were utilizing, and which I dreamed of being able to do. I did the best I could, integrating Lapraz’s approach and herbal wisdoms into my cases whenever I could, monitoring my successes with pulse reading and with results backed by successful pregnancies, cleared infections, and pediatric cures. Yet, I longed to experience the teachings in a more direct and embodied way, the way I learned best.

Along the way, I met acupuncturist Dan Kenner (trained in Japan in Japanese medicine), who had shadowed Jean Claude in Paris, and who was working on a book, *Botanical Medicine*, with Dr. Requena. We converged at a conference in Los Angeles, featuring Dr Lapraz, organized by Anne Marie Buhler, the late and beloved and pioneering Swiss pharmacist who was instrumental in bringing aromatherapy, and Jean Claude to America. Jean Claude demonstrated diagnosis and treatment with live patients, according to his theories of the terrain. Each intake took hours. I was mesmerized by Jean Claude’s healing presence, his compassionate and masterful case taking and analysis, his sensitive hands-on diagnostics which were not dissimilar to how my Taoist master, Jeffrey Yuen had taught us, insofar as every part of the patient’s physical landscape had meaning and held relevant history and clues to the often-mysterious development of disharmony in an otherwise naturally harmonious whole. I discovered that weekend that Endobiogeny had a method, a logic and livingness all its own, and yet, rather than detracting from, it greatly enhanced the lineage of teachings I had received from my Taoist master.

Regarding the pharmacopeia of Endobiogeny, I was (and am) passionate about using plants that are indigenous to the places I practice. So, I was so happy to see the prescriptions Jean Claude suggested to the patients, as I was very familiar with them from my Wise Woman Herbal studies. It was

also so wonderful to witness Jean Claude place great emphasis on diet, as I have always believed food is medicine.

Alas, unless one was to move to France, and even if one could, unless one was a medical doctor, it was impossible at that time to study with Dr Lapraz. I continued to work from his writings and from what I had garnered in our short but transformative time together. I sent one of my colleagues, acupuncturist Tu Vi Luong, to Jean Claude for treatment in Paris, and she was very impressed. She had also trained under Jeffrey and being a United Nations translator, she was completely fluent in French. With Jean Claude’s encouragement, Tu Vi and I tried to spread the word about Endobiogeny among physician colleagues on the East Coast. We let physicians we respected know how the group in Paris were treating some cancer and other difficult conditions with great success. Sadly, alternative treatment of cancer in this country has never been met with enthusiasm.

I did keep in touch with Jean Claude, and I saw him occasionally when he came through New York. Perhaps it had been 10 years or so, when I attempted to refer a patient, who had family in Paris, to him for advice. The patient, in his nineties, was being sent to hospice due to a deadly Klebsiella infection. My patients, the dying man’s children, said simply “You must help! It’s not his time!” When Jean Claude understood the patient was located in the U.S, he directed me to contact Annemarie Buhler’s granddaughter, Annette Davis, CN (certified nutritionist) in Idaho. Amazingly, although the patient was located in Florida, Annette agreed to take the case, and he was cured! He came out of hospice and lived another 7 years. When I called to thank Annette, I discovered she had been working in close collaboration with Dr Lapraz since the late 1980’s, and with her generous encouragement and expert case supervision, I finally began my longed-for education in

¹ The aromatogram was a technique developed to test inhibitory concentration estimations, similar to the

microbial sensitivity to essential oils, with minimum antibiotogram.

Endobiogeny. This was 2010. A few years later at a NAHA conference, I was communing with Annette, and walking down memory lane, we suddenly realized we had actually met, nearly 30 years before! She, too had attended the seminar Jean Claude led in Los Angeles, arranged by her grandmother. Her baby son had been one of the demonstrations!

Finally, in 2012, I was invited by Annette, to apply to participate in the first American Fellowship in Endobiogeny. This rigorous training, which, you, Kamyar, led so brilliantly, brought the foundations of Endobiogeny into my very being as a practitioner. The brainy and compassionate community that formed during those crucial years was and is so supportive. When I graduated, becoming a Certified practitioner of Endobiogeny and a Fellow of the American Society of Endobiogenic Medicine and Integrative Physiology. It was truly a dream come true. A long and winding road...

HOW HAS ENDOBIOGENY CHANGED OR DEEPENED YOUR PRACTICE?

It's been over a decade now since the completion of my formal training in Endobiogeny and my introduction to the Biology of the Functions, and yet I still am discovering every day the wonders of the Endobiogenic perspective. For one thing, it is marvelous to be able to share with my patients the dynamic overview of their symptoms and conditions and prognosis, based on the profound and anchored understandings Endobiogeny provides. I find patients of all ages and conditions are very responsive to the self-evident truth of the terrain, they enjoy the logic of the loops and the endocrine axes, which seems to open them to discovering and engaging a new language of healing. Endobiogeny is a space, inside of which we can commune and work together to remediate their highly individual terrain through lifestyle and herbs through healing insight, and even through dreams.

Like the *Cahiers*, the four volumes of [The Theory of Endobiogeny](#) are a massive contribution to our medicine, to medicine in general in our troubled times. I sometimes fantasize about having a sabbatical just to marinate in the teachings! It is so heartening and supportive to read the cases and to know that medical practitioners of your and Jean Claude's caliber and skill actually exist, live, and practice the "art". I draw immense strength from this, strength to face the everyday clinical challenges—because as you know, our cases are clearly becoming more and more complex.

Some years into my practice of Endobiogeny, you and Annette both encouraged me to have my own custom pharmacy (Emerald Apothecary). There is no going back, once you can custom blend, the results are stellar.



Patient intake with her late cat Isis by her side.
Credit: Rachel Koenig

WHAT ASPECTS OF ENDOBIOGENY DO YOU FIND MOST HELPFUL IN YOUR PRACTICE (E.G. HISTORY, SEMIOLOGY, ANALYSIS, BIOLOGY OF FUNCTIONS, MATERIA MEDICA, ETC.)?

I love how Endobiogeny is so suited to family medicine, as I very much enjoy treating whole families. At this point I am treating sometimes four generations in one family, and sometimes both sides! The Endobiogenic model is incredibly helpful in treating intergenerational trauma, and I believe it has much to bring to anyone interested in epigenetics and in healing through the generations. Additionally, as I love pediatrics and pre-conception care, it is wonderful to have gained the Endobiogenic view of development and then to see it come alive in practice! I have learned so much just from capturing labs during, for example, stages of growth in children, or in their puberty. Or to be able to bring into deep consideration their perinatal epoch. Taoist medicine likewise values the perinatal time, though it is described more esoterically. I do love the way these two systems illuminate each other. I would say I have gained a more profound clinical understanding of Asian Medicine through my study of Endobiogeny. The systems are not only compatible but co-creative. Regarding materia medica, Endobiogeny has proven to me the value and potency of small doses. When well prescribed, one may achieve outstanding results with gentle dosing, and this is so valuable in our world wherein patients are becoming more and more sensitive to everything.

IN WHAT WAYS HAS ENDOBIOGENY CHANGED YOUR OR YOUR UNDERSTANDING OF LIFE?

My patients sometimes ask me what they *should* do about this or that and I find myself saying, “*Just be a good mammal.*”

From the perspective of a being a patient, who has been receiving Endobiogenic treatment for my own terrain and evolution over the past decade or so, I would say Endobiogeny has brought me (my

mammal self) so much joy and ease. It has given me a deep well of stamina, and a finer attunement to Life. It has taught me to appreciate and honor the developmental stages I am evolving through, finding new resilience, even now, as a “Granny Healer.” Despite our highly fragmenting and isolating times, especially in Medicine, Endobiogeny has allowed me to accompany my patients through some very challenging and traumatic conditions, still maintaining a compassionate view and a connectedness to the whole.



Recharging in Ireland, circa 2019.

WHAT MIGHT YOU RECOMMEND TO THOSE CONTEMPLATING OR JUST STARTING THEIR LEARNING JOURNEY IN ENDOBIOGENY?

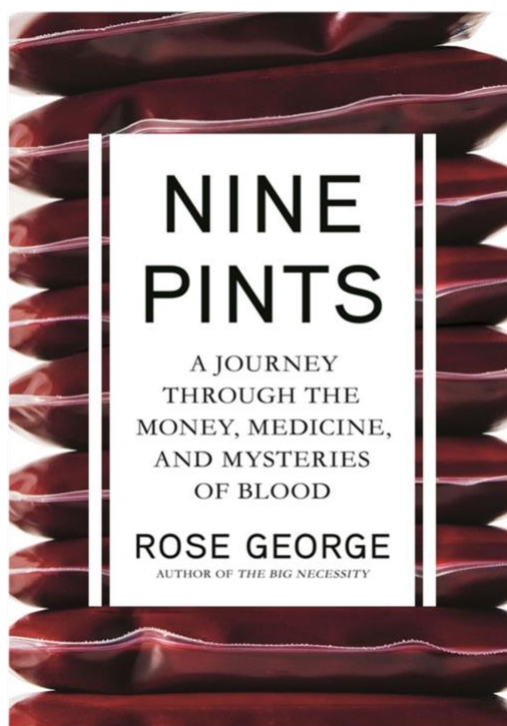
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WHAT WOULD YOU LIKE TO SEE DEVELOP IN ENDOBIOGENY (E.G. TEACHINGS, COMMUNITY OR RESOURCES)?

I would love to see the teachings of Endobiogeny reach more practitioners of acupuncture and herbalism. I can envision it as part of holistic nursing programs, midwifery and doula curriculum, in trauma therapy and for ease at end of life. The new [forum](#) on the Learn Endobiogeny website is a

great resource and I look forward to utilizing it more and more as an evolving space to commune with colleagues of all disciplines internationally. ✱

BOOK REVIEW



Source: [Nine Pints Book](#) by Rose George

NINE PINTS BY ROSE GEORGE

SUMMARY: In this article, Dr. Adam Johnson reflects on the book *Nine Pints*, by British journalist Rose George, and her observations in the book related to the physical and metaphysical significance that blood has had in the history of humanity. He also relates George's observations to his own practice of medicine and the theory of Endobiogeny.

Introduction

My entire professional life has involved blood. Over twenty years ago as a medical student, I was lucky enough to be selected to do an intensive care clerkship at Karolinska Institutet in Stockholm, Sweden. It was during my time there that I first became aware of the race to develop artificial blood products: laboratory synthesized elements of this life-giving substance that would not require living donors with all the infectious and supply limitation concerns that blood donations carry. Today we still

haven't come up with a viable artificial substitute for blood. And while we have a better understanding of individual blood elements and how to safely use this precious resource for life saving procedures and diagnostic purposes, we are still far from understanding the profound mystery of blood retained in the Hebrew etymological roots of the word: soul or Life.

A few years ago, I was working in the emergency department when there was an emergency call to a road construction site just outside of our small

town. Reportedly, a 25-year-old man had his arm caught in a piece of industrial equipment. Anticipating the worst, I advised the helicopter ambulance crew to bring “emergency release” blood to the scene with them. By the time the flight crew arrived, the man didn’t *just* have his arm stuck; his arm had been completely torn off. At the shoulder, no less. There was no tourniquet that could possibly be applied, as his extremity was entirely absent, taking some of the muscles from his chest wall with it. Shortly after the paramedics arrived, the man went into pulseless electrical activity because he had lost nearly his entire blood volume. Blood was administered at the scene, a pulse returned, and the man was flown by helicopter ten minutes away where I awaited in the emergency department. We had more blood ready. *Lots* more blood. We used every last bag of blood product we could have possibly used in our hospital that day on the man, transfusing his entire blood volume more than once as the hemorrhaging was controlled. He went into disseminated intravascular coagulation. I talked to his family about the grim prognosis and probability of eminent demise. He then unexpectedly stabilized sufficiently to be transferred to the nearest major trauma center. The Book of Leviticus reads: “For the life of the flesh is in the blood” (Leviticus 17:11). Equating blood with life is a fundamental biological truth in medicine, at least in my mind that day. Two months later this man came back to our hospital, “never feeling better” (despite being deficient one limb), to thank us for the blood, to thank us for his life, and to give us a one-armed hug.

The red blood cells this man received were all donated. In most of the Western world, blood is freely given and donated, on moral grounds. In her book *Nine Pints*, British journalist Rose George chronicles the history of blood from antiquity to the time that we began to have a scientific basis for our understanding of blood, starting with William Harvey’s revolutionary essay in 1628 describing the discovery of how blood circulated. [Editor’s Note: The Islamic Scholar [Ibn al-Nafis](#) described the circulation of blood in the 13th century. William

Harvey was probably not aware of this scholar’s work] George goes on to trace the discoveries that made blood transfusion possible, the lives saved through the courageous use of this technology during World War II, and the lives lost (from ignorance and later malfeasance within the medical institution) due to transmission of diseases (HIV, hepatitis B and C) to unwitting recipients of blood transfusions.

My current work as an endobiogenist is greatly enhanced by the use of blood. But this time, instead of transfusing it or looking at individual elements measured in the blood, I analyze these elements in relationship to one another using the Biology of Functions to gain insight into the interconnectedness of life. In her book *Nine Pints*, George examines the history, biology, mystique, ethics, and economics of the unique substance we call blood, more precious than gold or oil and laden with enigmatic and spiritual overtones. In reading this book, I became aware that my encounters with blood are so commonplace in my medical practice that my familiarity with this unique substance has obscured the layers of beauty hidden in this unfathomably complex material. In reviewing this book, I hope to highlight some of the ideas George keys in on related to the cultural, spiritual, and biological gravitas of blood in the history of human thought.

THE MYSTIQUE OF BLOOD

The Hebrew etymological roots of the name Adam in the book of Genesis are associated with the words: blood, life, soul, red, clay, earth, beginning, humans, and the simplicity from which complexity arises. George makes connections to the origins of earth and life itself, observing: “The iron in our blood comes from the death of supernovas, like all iron on our planet. This bright red liquid contains salt and water, like the sea we possibly came from.”

In both Judaism and Islam, menstruating women are absolved from canonical prayers and must refrain from vaginal intercourse, as their menstrual

flow is considered a type of ritual impurity. Jewish and Muslim dietary laws forbid the consumption of blood. Both kosher and halal meat requires the draining of the animal's blood during slaughter. Christianity regards the drinking the sacramental wine, symbolic of the blood of Christ, as a bridge to connect with the divine. For example, in The Last Supper, Jesus admonishing his disciples to partake of bread and wine in remembrance of his body and blood. The history of early Christianity is filled with legends of relics that includes bloodstained clothes from martyred saints that was believed to have healing properties.

What is the common thread between viewing blood as a substance of impurity on the one hand and a medium for transcendence on the other? Perhaps impurity and transcendence are just two sides of the same coin. Blood was (and continues to be) a symbol of both life and death—visible only during injury (at times lethal), or during menstruation, miscarriage and childbirth (which sits squarely at the boundary between life and death). George often references this dialectic, which she calls the “two-faced nature of blood.” Returning to the same passage in Leviticus referenced earlier, it continues: “for it is the blood that maketh an atonement for the soul” (Leviticus 17:11). If “atonement” is understood as a method of healing and making reparation, then from a modern biological reflection, this passage in Leviticus is accurate. After all, it is elements in the blood that repair and restore after illness and injury.

For most of human history, little was known about the biology of blood, but the ancients were certain of its importance. George journeys across the globe in her exploration of the cultural and economic impact of one of the world's most vital (and most human) of medical commodities. In other cultures, blood takes on a different significance. For example, in a Hindu village in Western Nepal as well as on certain islands in Polynesia, menstruating women are kept at “a safe distance” so as to not pollute the rest of the community. The Kalasha culture on the boarder between Pakistan and Afghanistan have

menstruating women “retire to a prestigious structure called the bashali, where women hang out, have fun, and sleep entwined,” Georges writes. “In this reading of menstrual seclusion, the woman is prized for her blood, because it means fertility and power.”

THE CULTURE OF BLOOD

Cultural references to the emotional and metaphorical nature of blood seems to withstand scientific advances of our modern understanding of blood: our blood “curdles,” “boils,” or “chills.” We use aphorisms like “trying to get blood from a stone” (do the impossible), “fresh blood” (in reference to new members of an organization to bring fresh ideas and vigor to the group), and “bloodstained” (permanent moral damage from unethical living). Perhaps these expressions reflect a cultural appreciation of how “good blood” and “bad blood” affect psycho-physiologic states.

In pre-modern times, blood-letting and blood consumption were both used to treat conditions where excess blood or insufficient blood were culturally understood as being at the root of the problem. George relates how Gladiators were said to have drunk the blood of fallen opponents. Egyptians saw blood as the carrier of the vital human spirit, and would bath in the liquid as a restorative. Alchemists prepared extracts of it to treat epilepsy, migraines, heart disorders and to revive a person at the time of death.

Despite our modern advances, as George writes, “We fear blood, still, despite our science and understanding, and we look to blood to tell us who we should fear.” We also use blood to tell us who we should love. We still think of blood as our tribal identity, it separates “us” from “them.” This was the logic of Southern slave owners in the US, Nazis, and proud Hawaiians who, typically in a non-derogatory way, call white people “haole” (meaning “without breath”).

ENDO BIOGENIC APPLICATION

Now, more than ever before in history, we have a vast number of analyzable data points that can be readily obtained from a blood sample. Modern advances in experimental physiology has led to understanding much of the physiology that influences these commonly measured elements found in blood. And yet, these data points continue to be analyzed and interpreted in isolation from one another, failing to give a description of the dynamic interconnectedness of the organism.

Suspend judgement for a moment and perform a thought experiment. Presuppose that you understand the primary physiology that influences these biomarkers. Then, using that understanding of the primary physiologic drivers behind biomarkers, you examine theses biomarkers in mathematical relationship to one another. Then, in order to gain further nuance in understanding the physiological landscape, you look at other biomarkers in mathematical relationship that are also driven by the physiology most representative of what you are trying to understand. The result is that you can extrapolate a dynamic, functional physiologic “map” of the terrain of the organism—the Biology of Functions (Editorial note: biology in French also refers to biomarkers, thus “Biology of Functions” means “functional biomarker analysis”). Are there limitations to this approach? Absolutely. First, the “map” is built on the presupposition that the understanding of the primary physiologic divers of the measured biomarkers is correct. Second, the results are numerical but not strictly quantitative. They become an expression of dynamic function of opposing or complementary actions relative to one another. They become a qualitative description of timing, duration, and speed of physiologic processes. Third, the type of results obtained are numerous and challenging to interpret (and in fact, often have several ways to interpret).

While there may be some limitations to looking at physiology through a qualitative lens, the advantages are immense. For example, a serum

testosterone level is interesting (c.f. [Blood biomarkers, in the mainstream medical community and endobiogeny by Dr. Augusto Fronza in this issue of living systems](#)) and has some meaning. But more interesting is how well testosterone is doing its job on the tissues, cells, and organs it is influencing. Testosterone, like a carpenter, is a builder. But I would rather have four master carpenters build a home for me than twenty teenagers who might want employment. Skill and efficiency (quality) are more important in this case than quantity of builders.

Another advantage to viewing physiology through a qualitative lens is that much (arguably most) of life is not quantifiable. It is qualitative: any single potential for action gains a true significance vis-a-vis a comparative relationship to something else. For example, for years I’ve worked in a ski clinic at the base of a world-class skiing destination in Jackson Hole, USA. In this clinic, I care for those who have been injured while skiing on the mountain. As required by the owners of the ski resort, everyone injured on the mountain is interviewed by a member of the ski patrol to get details of the accident. One of the questions asked is: what is your skill level on skis? Most patients (typically those visiting from elsewhere) give an elaborate explanation of their skill level, trying to quantify their skill with a number scale or a “double black diamond” ability rating. But the local skiers know a better way to answer this question. Most local kids are “born with skis on their feet,” and numbers and “black diamond” ratings are meaningless to them. I once overheard a 16-year-old local boy being asked his skiing skill level when he was in the clinic being evaluated for a minor injury. His reply was classic. He simply answered: “compared to who?” That answer gave the ski patroller the information they needed: he was an expert skier. Similarly, when evaluating the role of estrogen, for example, often the most valuable information may not be found in a quantifiable serum estrogen level. It is often found in comparing the qualitative relationship estrogen has with cortisol and with gonadal androgens.

Conclusion

The endobiogenic perspective on blood is aligned with George's observations in that there are both quantifiable and non-quantifiable properties to blood, and that, despite our relative sophistication, we are far from plumbing the depths of understanding we can derive from studying this immensely complex substance that carries essence of Life. The genius of endobiogeny is to see blood similar to the way a musician sees music. There is a quantitative frequency, harmonic, tone (and so fourth) for each note and scale. But there is also a qualitative tempo and dynamic that gives the music an *anima* quality—it's spirit and appeal. A musician does not reject the quantitative part of musical

theory, as this the foundation upon which the qualitative expression of music is built upon. Similarly, the endobiogenist does not reject the advances of modern science, even if the advancements were made through reductionistic methodologies. The endobiogenist embraces these advancements and utilizes the most quantitative and universal language, mathematics, to create a qualitative expression of Life, one perhaps closer to the spirit of our forbearers, but squarely within a scientific paradigm suitable for our contemporary view of modern medicine. And this is all thanks to the analysis of blood, and the genius vision of the founder of the Biology of Functions, Dr. Christian Durauffourd. ✱

About the Author

Adam Johnson, MD is the medical director of [The Linné Institute of Medicine](#), a private medical practice dedicated to endobiogenic consultations, after 15 years of practicing emergency medicine. Prior to attending medical school at the University of Utah School of Medicine, Adam studied literature and philosophy. He lives with his wife and children in the mountains of beautiful Jackson Hole, Wyoming, USA.

OUTSIDE CONTRIBUTION



Source: Yin Yang Fish by Ou-Yang Guo-De courtesy of [Oriental Outpost](#)

SHEN RESIDES IN THE BLOOD: A UNIFIED THEORY OF BLOOD AND THE SPIRIT OF THE HUMAN BEING FROM CLASSICAL CHINESE MEDICINE

Kellyn Adams, ND LAc

SUMMARY: This article explores, as explained by the classical textbooks of Chinese Medicine, a false dichotomy between the physical and spiritual constituents of circulation, blood and shen. By demonstrating the relationship between structure and function within circulation, the truly integrated nature of the two seemingly separate aspects of blood and shen becomes clear, from a Chinese cosmological perspective. Blood and shen are the objective and subjective expressions of spirit within the human being; they are a unification of material and divine that creates the unique position of humanity as standing upright between heaven and earth.

Introduction

“Thus physiology falls into two parts which are not easily separated, i.e., into a physical part and a spiritual part. In reality these are inseparable, but

the researcher in this field may start out from one side or the other and thus lend the greater weight to one or the other. (4, p. 59)”

While the Western biomedical view of blood is strictly physical and objective, the Classical Chinese

Medicine approach is broader, as it includes a subjective and spiritual consideration as well. In the classical Chinese Medical literature, the physical blood would be unable to serve its functions without the presence of the spiritual substance, *shen*, within. The aim of this article is to illuminate the physical and spiritual features of blood leading to conversion rather than diversion of understanding.

A NOTE ON YIN-YANG THEORY

Yin-yang theory is essential to understanding Chinese medicine in particular and Chinese philosophy in general. It can be understood in the following way: each singular concept implies opposite properties of that concept, and both of these diametric conceptual poles exist upon one spectrum of being, inextricably connected as part of a unified whole. This interaction of counterparts gives birth to the complexity of life and generates the patterns of nature that allow for communication and transformation.

PERSPECTIVES ON BLOOD AND SHEN

Shen resides in the blood. Blood provides structure to shen and the ability to communicate with heaven, allowing for a life in harmony with nature. Both the production of blood and its essential function to human physiology rely upon its proper movement through circulation, which is established by shen and the natural patterns of yin and yang to ensure smooth and continuous movement of blood. Spirit is effused throughout the universe, but is only observable when contained. In the case of the human being, the blood is that container. Because blood contains shen, the human being may maintain health by appreciating the rhythms of nature through the movement of yin and yang.

WHAT IS BLOOD?

From Unschuld, Prolegomena:

“We are aware of a widespread hesitation to translate certain anatomical terms, such as *xue* or *gan*, with their English morphological equivalents blood or liver, respectively. The different physiological and pathological functions assigned to these and other fluids and tissues in ancient China have led many to prefer a *pinyin* transliteration over a literal translation. Our approach here takes a different path. If a morphological-anatomical unit has been identified as such in the Chinese text, it is translated with its vernacular equivalent in English. Functions do change over time, and it is to be expected that a reader of a historical text will be aware of this...The ancient Chinese naturalists had a very clear perception of...liver and blood as distinct morphological/physical entities. But even a cursory reading of the text shows that the functions assigned to these entities in the ancient Chinese interpretation of the organism differ from today’s understanding. It cannot be the task of a translation to reflect these dynamics by modifying the morphological terminology. The physiological concepts we associate with blood at the beginning of the 21st century differ greatly from the established knowledge of even as short a time ago as the 19th century. Still, we continue to speak of blood as far as the morphological fact is concerned. The same should apply to a translation of ancient Chinese morphological designations.”ⁱⁱ

Unschuld explains here that although the known functional details of blood have evolved over time in the West through scientific study, the use of the term ‘blood’ is neither incorrect nor misleading when applied to both medieval and modern versions of the term. The same applies to the Chinese concept. Certainly, the “functions of [blood according to an ancient] Chinese interpretation... differ from today’s understanding” but the “morphological designations” remain the same.

A current scientific definition of blood is plasma and cellular elements. The cellular elements are erythrocytes, leukocytes and platelets, derived from bone marrow. Plasma is the extracellular liquid matrix of blood. It carries the cellular elements, most notably in Chinese medicine, erythrocytes, as well as proteins such as albumin, lipoproteins, clotting factors, glucose, electrolytes, amino acids, fatty acids, hormones, and more. These constituents feed the tissues in different ways from the erythrocytes, and maintain the fluid and electrolyte balance through osmotic force and protein reserve. However, the erythrocyte content of blood with the main function of oxygen delivery for cellular energy manufacture serves as both the structural and functional locus of the varying concepts of blood as it has evolved across time and space (in Chinese medicine). All blood elements contribute essential functions, but a narrowed focus upon the red cells within the vasculature to compare Western and Chinese concepts of blood provides clarity without sacrificing accuracy.

According to Chinese theory, the classical concept of blood can be defined in the following way: blood is a red liquid substance that travels within the vessels under the dominion of the heart and along a route and circadian cycle that is established by the natural patterns that emerge from the interaction between the earth and the greater universe. This movement within the human body is reliant upon the inhalation of air and the consumption of foods, along with proper metabolism to distill and construct the blood. Without this proper coursing, essential nourishment cannot be delivered for the purposes of either maintaining health or effective treatment of disease. Therefore, it is precious to the human being and both deserving and demanding of careful attention.

Thus, when the ancients referred to blood in the classics, they were speaking of the same red-colored, viscous fluid that travels in our vasculature to deliver necessary functional material to organs and tissues. It is possible that one reason for this preternaturally accurate understanding was, in fact,

because the Chinese medical authors lacked the technology that allows for microscopic understanding of its various particulate constituents; their concept of blood was not limited by a Western reductionist mindset. This mindset regards only the observable as worthy of study, disregarding spiritual elements. Understanding the microscopic constituents is an essential starting point; how and by what means the constituents interact with their environment must follow, and inevitably requires analysis of unobservable elements or forces. For the Chinese medical authors, the mysterious and unseen aspects of physiology were not seen as limiting, but merely realistic.

THE CHINESE CHARACTER AND ITS DEFINITION

The Chinese language is a symbolic, as opposed to English, which is a phonetic language. This means that representations of words are not made up of pieces of sound, or phonemes, which when strung together in proper order indicate meaning learned through memorization. Rather, Chinese words are written as symbols, representations of meaning that include history and context. The study of the characters themselves can lend vital insight to the development of the concepts being represented.



Xue (also xie): blood

The Chinese character is the symbol for a vase with an added mark above indicating that the vase is used to contain sacrificial bloodⁱⁱⁱ. There are two notable implications here: first, that the blood is represented only not as fluid itself, but as its own container, and second, that the concept of blood is inseparable from the concept of sacrifice to god/spirit. Taken quite literally, the two parts of *xue* mean simply ‘vessel of spirit’.

The Chinese symbol inherently informs the reader that blood functions as a vessel itself. The

representation of blood as both the substance and its containment is another illustration of the concept of blood as the structural vehicle for spirit, and further evidence of the Chinese consideration of its coexistence within the earthly, human, and heavenly realms. The construction of blood, as will be explained in the Classical texts, demonstrates that its very formation is based upon the fusion of physical material with the breath of heaven.

Certainly, the physiological travelling of blood within the vasculature and its interaction with vascular endothelium, capillary beds, and the tissues of the body in a dynamic, nutritive way is an integral aspect of its physical functioning; but the definition of *xue* itself is separate from that of the blood vessels, *mai*. Endothelial interactions are indeed essential to the function of blood as we now understand it, but the Chinese concept of this red-colored ‘vessel of spirit’ was not speaking to anything other than the erythrocytes themselves as the containers of spirit, offering the ephemeral a structure and thus ability to move in the physical realm. The biomedical information about the structure and function of the erythrocyte, containing hemoglobin with an iron core with incredibly efficient oxygen binding and delivery function, fulfills the Chinese definition of *xue* readily and completely. This makes clear that that which makes blood red—erythrocytes carrying oxygen—is the crucible for communication with spirit itself.

WHAT IS SHEN?

From Unschuld, *Prolegomena*:

“It would be futile to search in Chinese for a conceptual equivalent to the European ‘spirit’, as there is no Chinese term that could be used to include meanings ranging from Holy Spirit to methylated spirit.^{iv}”

The primary translation for the Chinese word ‘shen’ in English is ‘spirit’, listed in Harbough’s *Dictionary* are also ‘god’ and ‘soul’; his translation of ‘shen qi’ is ‘miraculous, mystical’. Claude Larre and Elisabeth

Rochat de la Vallee define ‘shen’ as “Spirits. Divinities. The vital principle. Something marvelous.”^v These terms evoke scores of variations upon spiritual and religious themes, the shared property of which is the inexplicable; they rely upon acknowledgement of the unseen, the unknown for their existence. They are subjective experiences of individual human life, not objective data that can be measured and compared.

Paul Unschuld adds a parenthetical to his translation of shen in his *Dictionary of the Huang Di nei jing su wen*; he provides the definition ‘(supernatural/human) spirit’. Unschuld uses the term ‘spirit brilliance’ in his *nei jing su wen* translation to imply manifestation of the obscure, as a reader of a medical text will require observable data to make use of the concept of spirit. The difference between spirit as a concept and the state of physical being that is a result of the interaction between spirit and the human is important; the proper method of assessing this manifestation of spirit within the human body is the theme of the entire text itself.

In their translation of Chapter 8 of the *nei jing ling shu*, Larre and Rochat de la Vallee explain the meaning of the characters for shen and shen ming with a similar differentiating emphasis. They explain spirits themselves: “The alternating expression of natural forces unfolds under the authority of influences from above.

Heaven thus penetrates and instructs all of humankind. The Spirits are Heaven within us. They conduct us and guard us, and we must guard them.” Shen as the motivating force that dictates proper blood flow results directly from this definition. Following this, they describe shen ming as “Luminous radiance of the Spirits. When the Spirits find natural Virtue, they make it shine...The radiant activity of the Spirits is distributed...the result is perceptible in all aspects of life, in virtuous and effective conduct, in bright and clear eyes, and in a fresh pink complexion...” The use of terms such as ‘shine’, ‘radiant activity’, and ‘bright and clear’ are

found on the yang pole of the spectrum of life, where we find shen, and also movement. That shen is observable within the body is stated more specifically here and further reinforces the innate bond between shen and blood.

THE CHINESE CHARACTER AND ITS DEFINITION

神

Shen: spirit, god, soul

Examination of the Chinese reveals the centrality of the manifestation of shen within the character. The symbol on the left translates to 'omen', which means 'revelations' in the context of religious sacrifice. This symbol is itself composed of three markings that signify the three elements of heaven: sun, moon, and stars. These natural phenomena were perceived to reveal the truths of the gods. As a radical in ancient use, it indicated that the associated symbol pertained to ritual ceremonies, worship, or prayer – the human experiences of the divine. In modern use, it has come to indicate an ability to make known, to manifest, to show. The emphasis on divinity has minimized, but the demonstrative aspect is retained.

The symbol on the right is suggestive of lightning. Harbough explains that this symbol represents curved lightning flashes appearing in clouds, which the ancients believed to be a manifestation of god. The form of this symbol evolved into an image of hands girding a pole-like body, representing an extension or statement.

Together, these symbols convey the concept of an extension of the elements of heaven, or in divine terms, a manifestation of God. Perhaps this is why the single translation of spirit will suffice for some, but other translators feel the need to elaborate further; shen within a medical context denotes spirit within human that is witnessed, the branch of heaven that is observed in earthly existence, the manifestation of God within man that gives us our

unique capacity to exist between heaven and earth. The classics reveal that spirit has established and embodies the patterns of nature, and we have very simple and clear tools for assessing and guiding treatment based on these observations of nature.

From the definitions of shen provided by various Chinese scholars, as well as the analysis of the Chinese symbol, an understanding of shen as the subjective expression of spirit is clear. With the knowledge of blood as the objective expression of spirit, the integral relationship between structure and function naturally emerges. Shen is the presence of spirit within the physical, it guides us along the established patterns of nature; blood must follow these natural patterns in a constant, cyclic path to maintain health and prevent disease. This precious function of blood is made possible by the guiding presence of the spirit within the blood to create the necessary movement. As yin is solid stillness and yang is supple movement, blood holds shen within its physicality to allow shen to generate blood's agile mobility, remaining in tune with nature and greater universe.

Conclusion

The Western Biomedical concept of blood is a fascinating study of the constituents of this vital fluid and the individual functions that each serve. In Chinese medicine, the driving forces behind the coursing of the blood through vasculature imbues physical connection to spirit.

Blood contains structure for shen. Shen provides function to blood through guiding its coursing: its precious ability to nourish organs and tissues. To heal the dynamic human being is a result of the patterns of movement and transformation conferred by shen. Shen directs the motions that follow natural law and the patterns of the universe. The universal patterns of movement, change, and growth are the foundation of life, and living a life in harmony with these patterns is the key to health.

Shen resides in the blood. Blood provides structure to shen as a tangible location of the intersection of

the physical with the spiritual. Shen is the manifestation of spirit within the human body, and is held within the material substance of the blood. Blood provides a physical residence for spirit within the human being, without which the human would lack the ability to possess the spiritual connection that allows for appreciation for and resonance with natural patterns that are essential for proper blood circulation.

Identifying constituents and understanding functions enables proper categorization of information, as the Western conception of blood does very well. What this lacks is the spiritual aspect, which provides movement and thus, time. Blood is essential to life and impossible to remove from the concept of life as an ever-changing phenomenon rather than a still-life snapshot that assuredly cannot represent the full totality of functions. ✱

About the Author

Kellyn Adams is a naturopath and Chinese medicine practitioner in Portland, Oregon. She practices primary care medicine with emphases on behavioral change as well as endocrinology. She has studied Endobiogeny with Kamyar Hedayat and has incorporated the concepts and practice as central tenets in her patient care.