

## Lecture Series

---

# The Systemic Theory of Living Systems. Part IV: Systemic Medicine—The Praxis

José A. Olalde Rangel, Meyer Magarici, Francis Amendola and Oswaldo del Castillo

Adaptogenic Medical Centers, Calle del Arenal c/c Luis de Camoes, La Trinidad, Caracas 1080, Venezuela

This fourth lecture illustrates the praxis and results of Systemic Medicine (SM) in various therapeutic applications. SM's success has made it popular throughout Venezuela and Puerto Rico. The treatment of over 300 000 patients by 150 orthodox MD's, trained and qualified in SM, in 35 medical establishments with above average results corroborate its effectiveness as an *eCAM* in chronic degenerative diseases. Herein we provide a synopsis of results obtained in four such pathologies—the journal's necessary space restrictions somewhat limiting content—as well as clinical and photographic evidence. The validity of any medical theory is substantiated by its degree of effectivity and success. The workability of evidence-based SM corroborates Systemic Theory's transcendence.

**Keywords:** adaptogen – diabetes – negentropy – polycystic ovarian syndrome – psoriasis – synergetics – systemic medicine – systemic theory – varicose ulcer

---

## Past and Present Naturalists . . . Tomorrow's Systemics?

Recent past and even present successful naturalists and phyto-therapeutic practitioners share a long and honorable tradition of knowledge and pride in the cure of illnesses, which goes back to written history and beyond. These qualities have been substantiated by the success of Chinese (1,2), Kampo (3,4), Ayurvedic (5), Chumash (6) or Mayan (7) among many other traditional medicines. These traditional medicines have 'demonstrated that every culture is capable of understanding and "inventing" the meaning of disease and its cure, even when it is different from our modern medical views' (7). The variability and extent of cultures to provide answers—traditional medicines—to pathologies are embedded in the curiosity and observational capabilities of the human race. There are collective factors such as 'a background of extensive family in traditional medicine' (8) which play an important role in the transmission and survival of medicinal plant

knowledge among ethnic groups. A potential issue, though, is the possible curtailment of the wisdom—and therapies—of traditional medicines within geographical and ethnic boundaries. In any case, the amount of plants, potential formulations or properties are a massive concern for any given individual caregiver or group to understand, store and transmit.

But, perhaps, it may be possible to set up a system or periodic table where plants and other natural remedies could, according to their properties, be arranged to produce specific formulae that provide well-being for a given pathology. Some exceptional individuals seem to have come by this ability. One of these gifted health care practitioners was Maurice Messegue, whom Mistinguet and Konrad Adenaur—among his famous patients—swore that only he could treat their illnesses. More recently, both, Dr. Rusudan Lomidze, using the Georgian Kohlkian traditional medicine, and Lonrig Dangar, a Tibetan physician who applied the rich Tibetan traditional medicine have also obtained significant success. These gifted individuals have shown that traditional medicine is a successful medicine. But a question still hangs in the air? Might a theory be devised by which regular practitioners, health care specialists devoid of the naturalists' extensive background, might formulate natural organic therapeutic protocols?

---

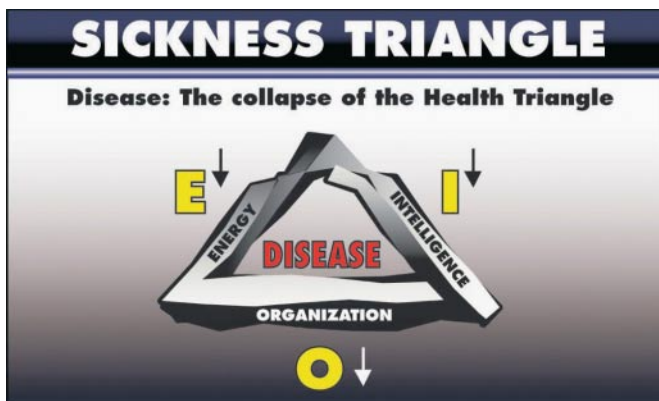
For reprints and all correspondence: José A. Olalde Rangel, Adaptogenic Medical Centers, Calle del Arenal c/c Luis de Camoes, La Trinidad, Caracas 1080, Venezuela. E-mail: corpgov2004@yahoo.com

© The Author (2005). Published by Oxford University Press. All rights reserved.

The online version of this article has been published under an open access model. Users are entitled to use, reproduce, disseminate, or display the open access version of this article for non-commercial purposes provided that: the original authorship is properly and fully attributed; the Journal and Oxford University Press are attributed as the original place of publication with the correct citation details given; if an article is subsequently reproduced or disseminated not in its entirety but only in part or as a derivative work this must be clearly indicated. For commercial re-use, please contact [journals.permissions@oxfordjournals.org](mailto:journals.permissions@oxfordjournals.org)



**Figure 1.** The Health Triangle is born out of the system's Intelligence that generates Organization and produces Energy.



**Figure 2.** Entropy increase brought upon by physical, chemical, biological and emotional impacts bring about the system's collapse.

The Systemic Theory is set forth herein to provide an answer to this crucial question.

Systemic Theory postulates that Health (H) is directly proportional to the integrity of a living system's Energy (E), Bio-Intelligence (I) and Organization (O) as shown in Fig. 1. Systemic Theory also establishes a common denominator to all sickness (Fig. 2) and ascertains the cause of all disease to be an entropy increase: 'disorder augmenting within the biologically open system, stemming from ergo-informational and organizational impacts, either of external or internal nature' (9–11). Therapeutics should then include a negentropy supply to enhance the system's energy–work capacity (E), its informational potential (I) intelligence, and finally structure and functional organization (O).

Systemic Medicine's (SM) treatment strategy is based on identifying and prescribing superior herbs—tonic or adaptogenic—or any nutraceuticals or medicine with potential to strengthen E, I, O by providing ergo, informational and organizational aid to the overall network of intelligent cells and cell systems that constitute the body. The main premise proposes that when all three factors are brought back to ideal levels patients' conditions begin recovery to normal health.

**Table 1.** Synopsis of SM treatment results in diabetic foot

Number of patients	Clinical improvement	QoL improvement	Treatment tolerance	Other
110	80.9% (89 patients)	86.36% (95 patients)	97.27% (107 patients)	Amputation avoided in 80% of cases diagnosed for surgery

## Evaluating the Praxis of Systemic Theory: Systemic Medicine

To corroborate the validity of the Systemic approach, we examined the results of its clinical application in chronic degenerative diseases (CDD) through retrospective studies carried out at the Adaptogenic Medical Centres located in Venezuela and Puerto Rico. Also included in the studies, were patients attending the following public hospitals (in Venezuela): Dr Domingo Luciani Hospital, Caracas; Dr Raúl Leoni Hospital, San Félix; and the Rehabilitation Center of the Venezuelan Social Security Institute, Caracas. Three parameters were compared, ante and post-SM treatment, and these factors were as follows: Clinical results; Quality of Life (QoL) (12); and Tolerance to treatment. All patients included in these studies had formerly received orthodox treatments without any success in preventing disease progression. Thus, SM became the first choice treatment or even the unique alternative therapy. The complete studies of the pathologies included in this lecture as well as other CDD studies may be found at [www.adaptogeno.com](http://www.adaptogeno.com).

Outcomes of these as well as other studies have been presented at several scientific events such as 8th International Electrotherapy Congress in Nanning, China, September 2004; First International Neurobiotelekom Congress, in Saint Petersburg, Russian Federation, December 2004; First International Systemic Medicine Congress in Caracas, Venezuela, January 2005; Latin American Center Symposium on Environment and Health: Exploring Natural Products, UCLA, April 2005; First International Congress on Complementary and Alternative Treatments in Cancer, in Madrid, Spain, May 2005; and finally at the Science Information and Spirit Seminar in St Petersburg, Russian Federation, June 2005.

## Clinical Study I: Diabetic Foot. Summary of Outcomes and Comparative Photographic Evidence

The therapeutic outcome is examined in 110 patients with diverse degrees of diabetic foot (13) through a retrospective, multicenter, descriptive 2 year long study (14). This treatment clinically improved 80.9% of the total diabetic foot population studied ( $P < 0.00001$ ). SM prevented amputation in 40 patients (80%) of all cases diagnosed for surgical removal of limbs (50 patients). There was a significant improvement in QoL—86.36% of all diabetic foot cases ( $P < 0.00001$ ). Tolerance to treatment was found to be excellent (Table 1).



Figure 3. Photographic evidence of diabetic foot remissions, including length of treatment between photos.

Results (Fig. 3) suggest that SM is the best therapeutic option for patients affected with diabetic foot.

**Clinical Study II: Severe Psoriasis. Resumé of Results and Illustrative Before and After Case Contrast**

The outcome on the effects of SM in 123 patients with severe psoriasis was examined through a retrospective, multicenter, descriptive 2 year long study (15). Improvement in clinical remission was observed in 77.23% of patients ( $P < 0.00001$ ). Almost two-thirds of all patients achieved clinical improvement in <46 days. QoL improvement is observed in 82.93%

Table 2. Synopsis of SM treatment results in severe psoriasis

Number of patients	Clinical improvement	QoL improvement	Remission time: ≤45 days	Treatment tolerance
123	77.23% (95 patients)	66.3%	82.93% (102 patients)	100%

of patients ( $P < 0.00001$ ). This therapeutic formula was particularly effective in severe varieties of this pathology. Treatment tolerance was excellent (Table 2). Results confirm a high remission rate, without side effects, in patients treated with SM. This suggests that SM is a superior therapeutic tool (Fig. 4).



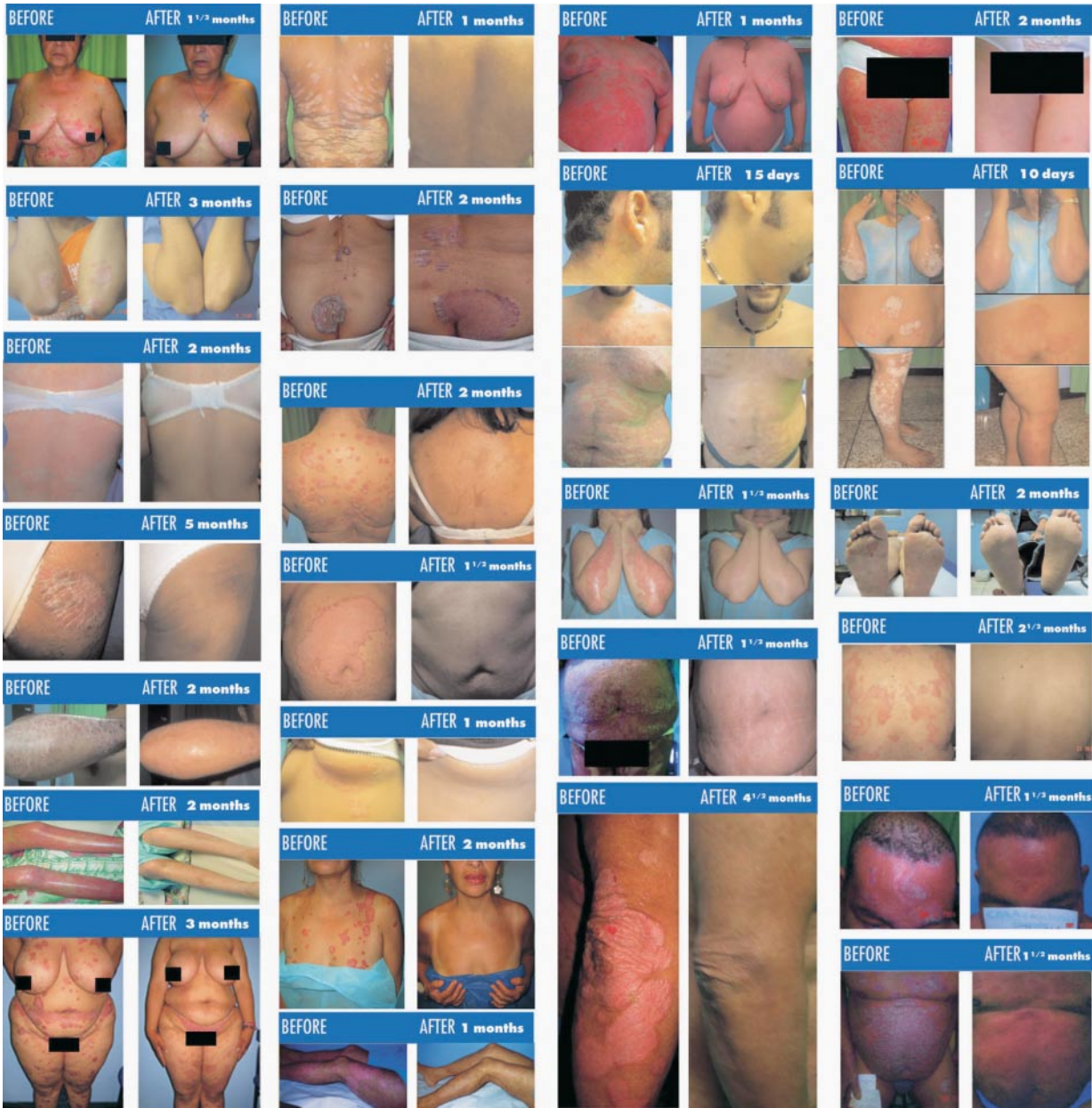


Figure 4. Photographic evidence of severe psoriasis remissions, including length of treatment between photos.

Table 3. Synopsis of SM treatment results in varicose ulcer

Number of patients	Clinical improvement	QoL improvement	Treatment tolerance	Remission time
129	79% (102 patients) <i>P</i> < 0.0001	81.35% (105 patients) <i>P</i> < 0.00001	99.22% (128 patients)	2 months in 21% of all patients

**Clinical Study III: Varicose Ulcer. Synopsis of Results, Before and After Photo Comparison**

SM protocol was evaluated in 129 patients with chronic varicose ulcers through a retrospective, multicenter, descriptive 2 year long study (16). This treatment improved ulcers in

79% of the population. A remission of 21% of all patients was achieved in only 2 months. Systemic treatment also significantly improved the most frequent symptoms (cramps 71.4%, pain 78% and edema 88.7%) (Table 3). About 105 patients had QoL improvement. Some examples of results are seen in Fig. 5. The tolerance was excellent.

**Clinical Study IV: Polycystic Ovarian Syndrome. Results, Before and After Graphic Differences**

Thirty-five patients with polycystic ovarian syndrome (PCOS) were included in a retrospective, multicenter, descriptive 2 year long study to evaluate their response to a systemic protocol



**Figure 5.** Photographic evidence of varicose ulcer remissions, including length of treatment between photos.

**Table 4.** Synopsis of SM treatment results in PCOS

Number of patients	Clinical improvement	Total cyst disappearance	QoL improvement	Treatment tolerance
35	100%	82.85% (29 patients)	100%	100%

designed to improve their condition and/or obtain remission to the aforementioned pathology (17). SM improved pelvic pain in all 20 symptomatic patients ( $P < 0.00001$ ); menstrual disorders (amenorrhea, dysmenorrhea, menorrhagia, metrorrhagia, oligomenorrhea) in all 22 symptomatic patients ( $P < 0.00001$ ); asthenia and cephalgia in all 17 symptomatic patients ( $P < 0.0001$ ); as well as acne and hirsutism in 8 out of 9 (89%) symptomatic patients ( $P < 0.0133$ ). Pelvic

econograms revealed that 29 patients (82.8%) experienced a total disappearance of cysts, whereas 6 patients (17.2%) showed decrease in cyst size (Table 4). QoL improved in 100% of patients ( $P < 0.0001$ ). Tolerance to treatment was outstanding (100%). To conclude, evidence-based results in PCOS treatment, with SM, suggest a remarkable CAM therapy (Fig. 6).

### E, I, O Classification of Superior Medicines

Adaptogens, tonics and nutraceuticals, in SM, are classified according to their E, I, O potential, i.e. as Ergoceuticals, Infoceuticals and Organoceuticals. Examples of these by category are in Table 5.



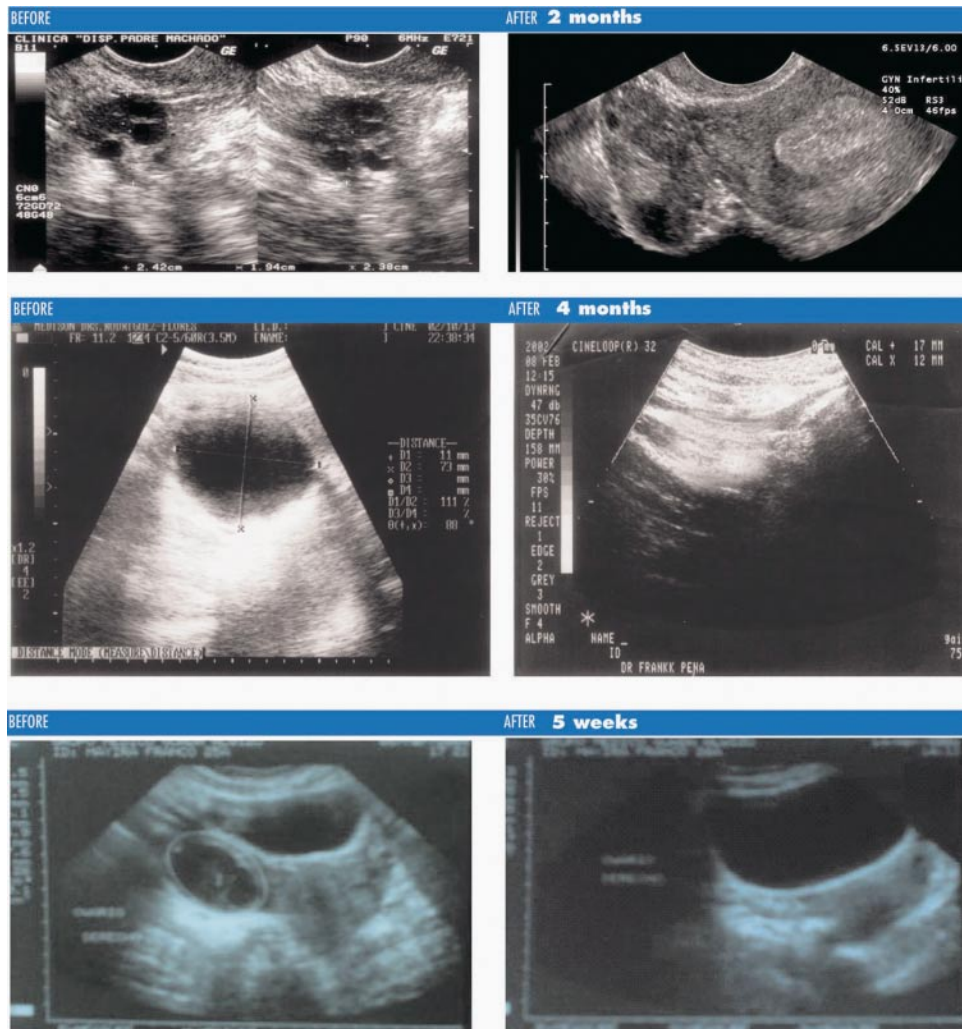


Figure 6. PCOS before/after echosonographic comparison. Interval between echosonograms: 2 months.

### Systemic Protocol for Diabetic Foot

A complete description of each systemic protocol exceeds the scope of this article; however, a summarized example for diabetic foot is illustrated below.

*E*↑: *Leuzea carthamoides*

Ecdysone phytosteroids activate enzyme synthesis pro-cellular ATP synthesis (27,30).

*I*↑: *Ganoderma lucidum*

Ganoderan B and dozens of other polysaccharides and beta-glucans stimulate neuroendocrine intelligence and cell immunity (46,47,105,106). Glycans' path for immune enhancement is not certain but Chihara *et al.* (107) have proposed a likely model modified by Kidd (108) (Fig. 7).

*O*↑: *Gingko biloba*

Flavonolglycosides, bioflavonoids, ginkgolides and bilobalides increase vascular flow (77,78).

### The Healing Law of Synergetics

Healing potential, negentropy gain, is directly proportional to synergetic contribution (SC) (11). SC is exponentially proportional to the number of contributive active principles ( $n$ ) in a formula—ergo in a protocol. The Healing Law of Synergetics is thus derived: Remission in chronic degenerative diseases,  $\Delta S \gg 0$ , depends on  $(n^2 + n)/2$ . Figure 8 demonstrates the exponential number of SC as  $n$  increases.

This law is valid as long as genetic functioning is minimally intact. The greater the SC is, the greater the probability of recovery. Thus all therapeutic formulations should in consequence include as many E, I, O nutraceuticals as possible.

### Analysis

There is probably greater potential in developing formulations of synergetic natural supplements than in synthetics for CDD. The potential '... to introduce these compounds in the treatment of human diseases in order to raise public awareness on the richness and diversity of natural products that could be

**Table 5.** Superior medicines E, I and O classification

E		I		O	
Ergoceuticals that enhance mitochondrial ATP synthesis and resynthesis		Infoceuticals that enhance bio-intelligence on cellular, neuroendocrine and immune levels		Organoceuticals that specifically enhance organ function and structure	
Names	References	Names	References	Names	References
<i>Acantopanax senticosus</i>	Wu <i>et al.</i> (18), Gaffney <i>et al.</i> (19)	<i>Uncaria tomentosa</i>	Sheng <i>et al.</i> (36), Akesson <i>et al.</i> (37)	<i>Glycyrrhiza glabra</i>	Acharya <i>et al.</i> (66)
<i>Cornu Cervi pantotrichum</i>	Kim <i>et al.</i> (20), Zhang <i>et al.</i> (21)	<i>Aloe vera</i>	Kim <i>et al.</i> (38)	<i>Curcuma Longa</i>	Chainani-Wu (67)
<i>Ilex paraguariensis</i>	Gorgen <i>et al.</i> (22)	<i>Andrographis paniculata</i>	Matsuda <i>et al.</i> (39), Puri <i>et al.</i> (40)	<i>Ulmus fulva</i>	Brown <i>et al.</i> (68)
<i>Lepidium meyenii</i>	Lopez-Fando <i>et al.</i> (23)	<i>Astragalus membranaceus</i>	Wang <i>et al.</i> (41), Shao <i>et al.</i> (42)	<i>Angelica sinensis</i>	Mei <i>et al.</i> (69), Yin (70)
<i>Ocimum sanctum</i>	Agrawal <i>et al.</i> (24)	<i>Croton lechleri</i>	Risco <i>et al.</i> (43)	Chondroitin/ glucosamine	Haupt <i>et al.</i> (71)
<i>Panax ginseng</i>	Yang <i>et al.</i> (25)	<i>Echinacea purpurea</i> and <i>E. angustifolia</i>	Randolph <i>et al.</i> (44), Cundell (45)	Chitin fiber	Jing <i>et al.</i> (72)
<i>Panax quinquefolius</i>	Wang <i>et al.</i> (26)	<i>Ganoderma lucidum</i>	Kohguchi <i>et al.</i> (46), Jiang <i>et al.</i> (47)	<i>Crataegus oxyacantha</i>	Rigelsky and Sweet (73), Lacaille-Dubois <i>et al.</i> (74)
<i>Pfaffia paniculata</i>	Kotsiuruba <i>et al.</i> (27), Tashmukhamedova <i>et al.</i> (28)	<i>Grifola frondosa</i>	Odama <i>et al.</i> (48), Lin <i>et al.</i> (49)	<i>Dioscorea villosa</i>	Shealy (75), Ladrerie <i>et al.</i> (76)
<i>Prychopetalum olacoides</i>	Siqueira <i>et al.</i> (29)	<i>Hydrastis canadensis</i>	Rehman <i>et al.</i> (50)	Plants enzymes	Popiela <i>et al.</i> (77)
<i>Rhaponticum carthamoides</i>	Kutuzova <i>et al.</i> (30)	<i>Morinda citrifolia</i>	Su <i>et al.</i> (51)	<i>Equisetum arvense</i>	Blumenthal <i>et al.</i> (78), Fleming (79)
<i>Rhodiola rosea</i>	Maslova <i>et al.</i> (31), Spasov <i>et al.</i> (32)	<i>Petiveria alliacea</i>	Ruffa <i>et al.</i> (52), Malpezzi <i>et al.</i> (53)	<i>Ginkgo biloba</i>	Kubota <i>et al.</i> (80), Pepe <i>et al.</i> (81)
<i>Schizandra chinensis</i>	Antoshechkin (33)	<i>Sutherlandia frutescens</i>	Bence and Crooks (54), Jang <i>et al.</i> (55)	<i>Gotu kola</i>	Incandela <i>et al.</i> (82)
L-arginine	Gupta <i>et al.</i> (34)	<i>Tabebuia avellaneda</i>	Planchon <i>et al.</i> (56), Li <i>et al.</i> (57)	<i>Sargassum fusiforme</i>	Ji <i>et al.</i> (83)
Ubiquinone (Coenzyme Q10)	Baggio <i>et al.</i> (35)	<i>Valeriana officinalis</i>	Dietz <i>et al.</i> (58)	<i>Harpagophytum procumbens</i>	Chrubasik <i>et al.</i> (84)
		<i>Vitex agnus castus</i>	Kobayakawa and Sato-Nishimori (59), Ohyama <i>et al.</i> (60)	Vitamins	Carrero <i>et al.</i> (85)
		<i>Lentinus edodes</i>	Borchers <i>et al.</i> (61), Wasser and Weis (62)	Minerals	Hercberg <i>et al.</i> (86)
		<i>Coriolus versicolor</i>	Sun and Zhu (63), Sun <i>et al.</i> (64)	<i>Ptycopetalum olacoides</i>	Bucci (87), Siqueira <i>et al.</i> (29)
		<i>Cordyceps sinensis</i>	Leu <i>et al.</i> (65)	<i>Pygeum africanum</i>	Freeman and Solomon (88), Santa Maria Margalef <i>et al.</i> (89)
				<i>Rhamnus purshiana</i>	Ma <i>et al.</i> (90)
				<i>Ruscus aculeatus</i>	Redman (91), Bouaziz <i>et al.</i> (92)
				<i>Salix alba</i>	Chrubasik <i>et al.</i> (93)
				<i>Sena alejandrina</i>	Franz (94)
				<i>Serenoa repens</i>	Goldmann <i>et al.</i> (95), Iguchi <i>et al.</i> (96)
				<i>Silibum marianum</i>	Halim <i>et al.</i> (97), Chungoo <i>et al.</i> (98)
				<i>Smilax china</i>	Lee <i>et al.</i> (99)
				<i>Tribulus terrestris</i>	Hong <i>et al.</i> (100)
				<i>Vaccinium myrthillus</i>	Zaragoza <i>et al.</i> (101), Savickiene <i>et al.</i> (102)
				<i>Viburnum</i> spp.	Calle <i>et al.</i> (103)
				<i>Zingiber officinalis</i>	Young <i>et al.</i> (104)

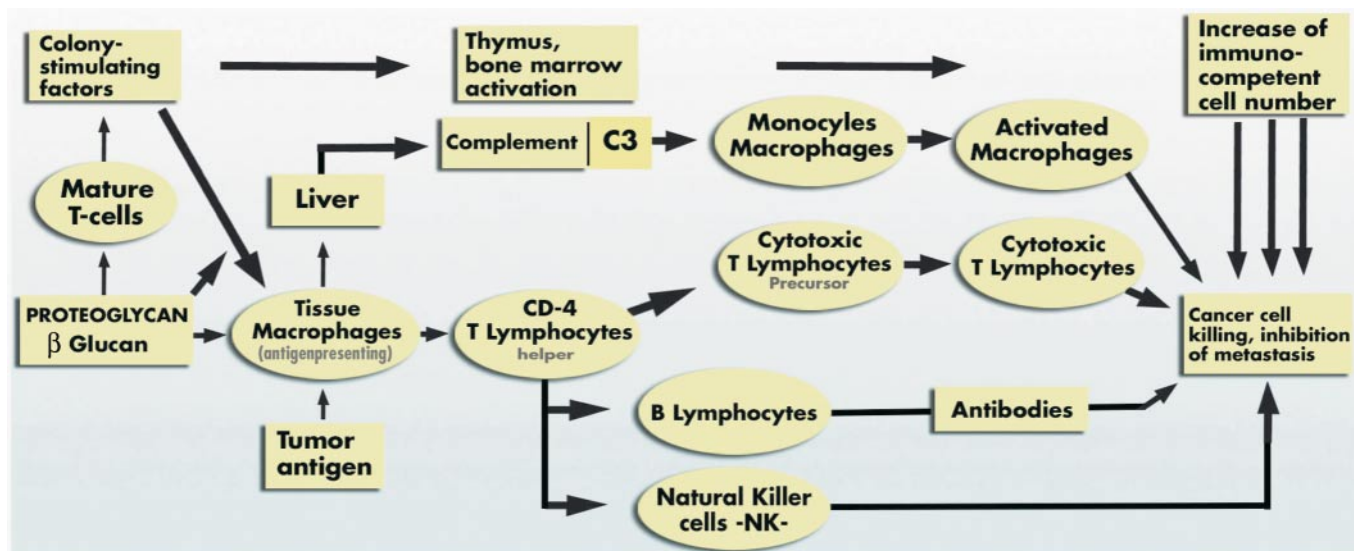


Figure 7. Mushroom proteoglycans' likely immune enhancement pathway.

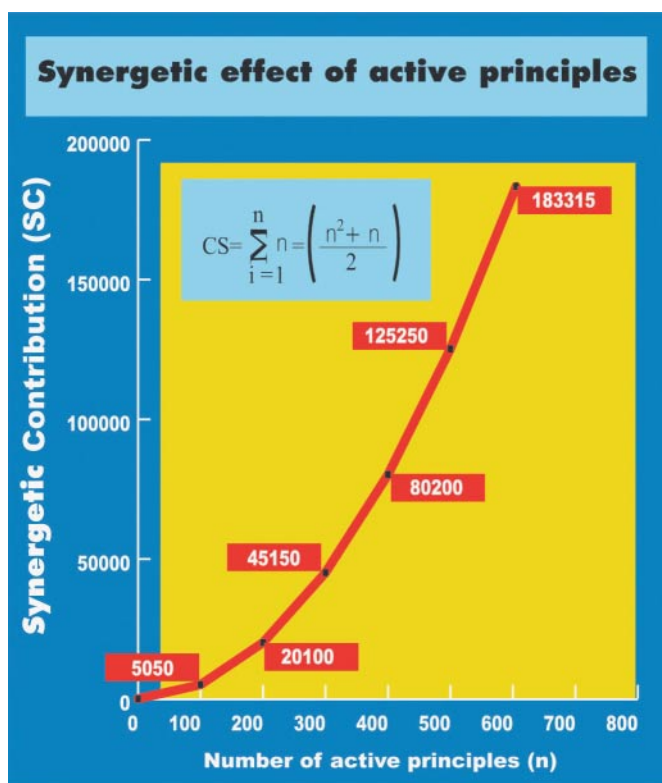


Figure 8. The Law of Synergetics is depicted by an exponential curve that provides a measure of the healing potential of the contributive active principles.

carefully harvested for the benefit of mankind' as Cooper points out, is enormous (109).

## Conclusion

Based on the Law of Synergetics future therapeutics should consist of thousands of potentially active E, I, O active

principles from all organic sources available. This opens up a huge potential—hitherto ignored—for humanity.

## Acknowledgements

We express sincere appreciation and gratitude to Professor Edwin L. Cooper for his invaluable support in making possible the four publications of the Systemic Theory and Praxis.

## References

1. Wago H, Deng H. Chinese medicine and immunity. In: Cooper EL, Yamaguchi N (eds). *Complementary and Alternative Approaches to Biomedicine*. New York: Kluwer Academic/Plenum Publishers, 2004, 167–79.
2. Chen CF, Shum YC, Yang SP. The modernization of traditional Chinese medicine in Taiwan—past, present and future. In: Cooper EL, Yamaguchi N (eds). *Complementary and Alternative Approaches to Biomedicine*. New York: Kluwer Academic/Plenum Publishers, 2004, 35–42.
3. Terasawa K. Evidence-based reconstruction of Kampo medicine: part I—is Kampo CAM?. *Evid Based Complement Alternat Med* 2004;1:11–6.
4. Yamada H. New scientific approach for natural medicines. In: Cooper EL, Yamaguchi N (eds). *Complementary and Alternative Approaches to Biomedicine*. New York: Kluwer Academic/Plenum Publishers, 2004, 27–33.
5. Naik Gh, Priyadarsini KI, Satav JG, Banavalikar MM, Sohoni DP, Biyani MK, Mohan H. Comparative antioxidant activity of individual herbal components used in Ayurvedic medicine. *Phytochemistry* 2003;1:97–104.
6. Adams JD, Garcia C. The advantages of traditional Chumash healing. *Evid Based Complement Alternat Med* 2005;1:19–23.
7. Pena JC. The concept of illness and kidney disease in Nahuatl medicine. Synthesis of Mesoamerican and pre-Columbian medicine. *Rev Invest Clin* 2002;54:474–81, (in Spanish).
8. Vandebroek I, Van Damme P, Van Puyvelde L, Arrazola S, De Kimpe N. A comparison of traditional healer's medicinal plant knowledge in the Bolivian Andes and Amazon. *Soc Sci Med* 2004;59: 837–49.
9. Olalde J. The systemic theory of living systems and relevance to CAM: part I: the theory. *Evid Based Complement Alternat Med* 2005;1: 13–8.



10. Olalde J. The systemic theory of living systems and relevance to CAM: the theory (part II). *Evid Based Complement Alternat Med* 2005;2: 129–37.
11. Olalde Rangel JA. The systemic theory of living systems and relevance to CAM. Part III: the theory. *Evid Based Complement Alternat Med* 2005;2:267–75.
12. Grogono AW, Woodgate DJ. Index for measuring health. *Lancet* 1971;2: 1024–6.
13. Wagner FW. The dysvascular foot: a system of diagnosis and treatment. *Foot Ankle* 1981;2:64–122.
14. Olalde JA, Magarici M, Amendola F, del Castillo O. Diabetic Foot Improvement using Systemic Medicine's framework 2005 Jan–Mar. Available from www.adaptogeno.com.
15. Olalde JA, Magarici M, Amendola F, del Castillo O. Benefits of Systemic Medicine in patients with Severe Psoriasis 2005 Jan–Mar. Available from www.adaptogeno.com.
16. Olalde JA, Magarici M, Amendola F, De Arriba C, del Castillo O. Remission of varicose ulcers with Systemic Medicine. 2005; Jan–Jun. Available from http://www.adaptogeno.com.
17. Olalde JA, Magarici M, Amendola F. Effectivity of the Systemic Medicine in patients with Polycystic Ovarian Syndrome 2005 Jan–Jun. Available from http://www.adaptogeno.com.
18. Wu Y, Wang X, Li M. Effect of *Acanthopanax senticosus* on exercise performance under constant endurance load for elderly. *Wei Sheng Yan Jiu* 1998;27:421–4.
19. Gaffney BT, Hugel HM, Rich PA. *Panax ginseng* and *Eleutherococcus senticosus* may exaggerate an already existing biphasic response to stress via inhibition of enzymes which limit the binding of stress hormones to their receptors. *Med Hypotheses* 2001;56:567–72.
20. Kim KS, Choi YH, Kim KH, Lee YC, Kim CH, Moon SH, et al. Protective and anti-arthritis effects of deer antler aqua-acupuncture (DAA), inhibiting dihydroorotate dehydrogenase, on phosphate ion-mediated chondrocyte apoptosis and rat collagen-induced arthritis. *Int Immunopharmacol* 2004;4:963–73.
21. Zhang L, Wang Y, Wang LZ, Gao XM. Immunopotentiating effect of a 'Yang'-promoting formula of traditional Chinese medicine on aged female BALB/c mice. *Phytother Res* 2004;18:857–61.
22. Gorgen M, Turatti K, Medeiros AR. Aqueous extract of *Ilex paraguariensis* decreases nucleotide hydrolysis in rat blood serum. *J Ethnopharmacol* 2005;97:73–7.
23. Lopez-Fando A, Gomez-Serranillos MP, Iglesias I, Lock O, Upamayta UP, Carretero ME. *Lepidium peruvianum chacon* restores homeostasis impaired by restraint stress. *Phytother Res* 2004;18:471–4.
24. Agrawal P, Rai V, Singh RB. Randomized placebo-controlled, single blind trial of holy basil leaves in patients with noninsulin-dependent diabetes mellitus. *Int J Clin Pharmacol Ther* 1996;34:406–9.
25. Yang M, Wang BX, Jin YL. Effects of *ginseng* polysaccharides on reducing blood glucose and liver glycogen. *Zhongguo Yao Li Xue Bao* 1990;11:520–4.
26. Wang BX, Yang M, Jin YL. Studies on the mechanism of ginseng polypeptide induced hypoglycemia. *Yao Xue Xue Bao* 1990;25: 727–31.
27. Kotsiuruba AV, Bukhanevych OM, Tarakanov SS, Kholodova IuD. Modulation of intracellular pools of cyclic purine nucleotides by biologically active oxysterol-ecdysterone and vitamin D3. *Ukr Biokhim Zh* 1993;65:76–83.
28. Tashmukhamedova MA, Almatov KT, Syrov VN, Sultanov MB, Abidov AA. Comparative study of the effect of ecdysterone, turkesterone and nerobol on the function of rat liver mitochondria in experimental diabetes. *Vopr Med Khim* 1986;32:24–8.
29. Siqueira IR, Fochesatto C, da Silva AL, Nunes DS, Battastini AM, Netto CA, Elisabetsky E. *Ptychopetalum olacoides*, a traditional Amazonian "nerve tonic", possesses anticholinesterase activity. *Pharmacol Biochem Behav* 2003;75:645–50.
30. Kutuzova NM, Filippovich IuB, Kholodova IuD, Miladera K. Ecdysterone induces the activity of multiple forms of acid phosphatase and malate dehydrogenase. *Ukr Biokhim Zh* 1991;63:41–5.
31. Maslova LV, Kondrat'ev Blu, Maslov LN, Lishmanov IuB. The cardioprotective and antiadrenergic activity of an extract of *Rhodiola rosea* in stress. *Eksp Klin Farmakol* 1994;57:61–3.
32. Spasov AA, Wikman GK, Mandrikov VB. A double-blind, placebo-controlled pilot study of the stimulating and adaptogenic effect of *Rhodiola rosea* SHR-5 extract on the fatigue of students caused by stress during an examination period with a repeated low-dose regimen. *Phytomedicine* 2000;7:85–9.
33. Antoshechkin A. *The Primary Adaptogens*. Clearwater: Ceptoma Publishing Co., 2001.
34. Gupta V, Gupta A, Saggi S, Divekar HM, Grover SK, Kumar R. Anti-stress and adaptogenic activity of L-arginine supplementation. *Evid Based Complement Alternat Med* 2005;2:93–7.
35. Baggio E, Gandini R, Plancher AC, Passeri M, Carmosino G. Italian multicenter study on the safety and efficacy of coenzyme Q10 as adjunctive therapy in heart failure. CoQ10 Drug Surveillance Investigators. *Mol Aspects Med* 1994;15:287–94.
36. Sheng Y, Pero RW, Amiri A. Induction of apoptosis and inhibition of proliferation in human tumor cells treated with extracts of *Uncaria tomentosa*. *Anticancer Res* 1998;18:3363–8.
37. Akesson C, Lindgren H, Pero RW. An extract of *Uncaria tomentosa* inhibiting cell division and NF-kappa B activity without inducing cell death. *Int Immunopharmacol* 2003;3:1889–900.
38. Kim HS, Kacaw S, Lee BM. In vitro chemopreventive effects of plant polysaccharides (*Aloe barbadensis muller*, *Lentinus edodes*, *Ganoderma lucidum* and *Coriolus versicolor*). *Carcinogenesis* 1999;20: 1637–40.
39. Matsuda T, Kuroyanagi M, Sugiyama S. Cell differentiation-inducing diterpenes from *Andrographis paniculata* Nees. *Chem Pharm Bull (Tokyo)* 1994;42:1216–25.
40. Puri A, Saxena R, Saxena RP. Immunostimulant agents from *Andrographis paniculata*. *J Nat Prod* 1993;56:995–9.
41. Wang RT, Shan BE, Li QX. Extracorporeal experimental study on immuno-modulatory activity of *Astragalus membranaceus* extracts. *Zhongguo Zhong Xi Yi Jie He Za Zhi* 2002;22:453–6.
42. Shao BM, Xu W, Dai H. A study on the immune receptors for polysaccharides from the roots of *Astragalus membranaceus*, a Chinese medicinal herb. *Biochem Biophys Res Commun* 2004;320: 1103–11.
43. Risco E, Ghia F, Vila R, Iglesias J, Alvarez E, Canigual S. Immunomodulatory activity and chemical characterisation of sangre de drago (dragon's blood) from *Croton lechleri*. *Planta Med* 2003;69: 785–94.
44. Randolph RK, Gellenbeck K, Stonebrook K, Brovelli E, Qian Y, Bankaitis-Davis D, Cheronis J. Regulation of human immune gene expression as influenced by a commercial blended *Echinacea* product: preliminary studies. *Exp Biol Med (Maywood)* 2003;228:1051–6.
45. Cundell DR. The effect of aerial parts of *Echinacea* on the circulating white cell levels and selected immune functions of the aging male Sprague-Dawley rat. *Int Immunopharmacol* 2003;3:1041–8.
46. Kohguchi M, Kunikata T, Watanabe H, Kudo N, Shibuya T, Ishihara T, et al. Immuno-potentiating effects of the antler shaped fruiting body of *Ganoderma lucidum* Biosci Biotechnol Biochem 2004;68:881–7.
47. Jiang J, Slivova V, Valachovicova T, Harvey K, Sliva D. *Ganoderma lucidum* inhibits proliferation and induces apoptosis in human prostate cancer cells PC-3. *Int J Oncol* 2004;24:1093–9.
48. Odama N, Murata Y, Nanba H. Administration of a polysaccharide from *Grifola frondosa* stimulates immune function of normal mice. *J Med Food* 2004;7:141–5.
49. Lin H, She YH, Cassileth BR, Sirotak F. *Maitake* beta-glucan MD-fraction enhances bone marrow colony formation and reduces doxorubicin toxicity in vitro. *Int Immunopharmacol* 2004;4:91–9.
50. Rehman J, Dillow JM, Carter SM, Chou J, Le B, Maisel AS. Increased production of antigen-specific immunoglobulins G and M following in vivo treatment with the medicinal plants *Echinacea angustifolia* and *Hydrastis canadensis*. *Immunol Lett* 1999;68:391–5.
51. Su C, Wang MY, Nowicky D, Jensen CJ, Anderson G. Selective COX-2 inhibition of *Morinda citrifolia* (Noni) in vitro. Proceedings of the 7th Annual Conference Eicosanoids and Other Bioactive Lipids in Cancer, Inflammation and Related Disease Nashville USA, 2001.
52. Ruffa MJ, Ferraro G, Wagner ML, Calcagno ML, Campos RH, Cavallaro L. Cytotoxic effect of Argentine medicinal plant extracts on human hepatocellular carcinoma cell line. *J Ethnopharmacol* 2002;79: 335–9.
53. Malpezzi EL, Davino SC, Costa LV, Freitas JC, Giesbrecht AM, Roque NF. Antimitotic action of extracts of *Petiveria alliacea* on sea urchin egg development. *Braz J Med Biol Res* 1994;27:749–54.
54. Bence AK, Crooks PA. The mechanism of L-canavanine cytotoxicity: arginyl tRNA synthetase as a novel target for anticancer drug discovery. *J Enzyme Inhib Med Chem* 2003;18:383–94.

55. Jang MH, Jun do Y, Rue SW. Arginine antimetabolite L-canavanine induces apoptotic cell death in human Jurkat T cells via caspase-3 activation regulated by Bcl-2 or Bcl-xL. *Biochem Biophys Res Commun* 2002;295:283–8.
56. Planchon SM, Wuerzberger S, Frydman B.  $\beta$ -Lapachone-mediated apoptosis in human promyelocytic leukemia (HL-60) and human prostate cancer cells: a p53-independent response. *Cancer Res* 1995;55:3706–11.
57. Li CJ, Wang C, Pardee AB. Induction of apoptosis by  $\beta$ -lapachone in human prostate cancer cells. *Cancer Res* 1995;55:3712–5.
58. Dietz BM, Mahady GB, Pauli GF, Farnsworth NR. Valerian extracts and valerenic acid are partial agonists of the 5-HT<sub>5a</sub> receptor in vitro. *Brain Res Mol Brain Res* 2005;138:191–7.
59. Kobayakawa J, Sato-Nishimori F. G2-M arrest and antimitotic activity mediated by casticin, a flavonoid isolated from *Viticis Fructus* (*Vitex rotundifolia* Linne fil.). *Cancer Lett* 2004;208:59–64.
60. Ohyama K, Akaike T, Hirobe C. Cytotoxicity and apoptotic inducibility of *Vitex agnus-castus* fruit extract in cultured human normal and cancer cells and effect on growth. *Biol Pharm Bull* 2003;26:10–8.
61. Borchers AT, Stern JS, Hackman RM, Keen CL, Gershwin ME. Mushrooms, tumors, and immunity. *Proc Soc Exp Biol Med* 1999;221:281–93.
62. Wasser SP, Weis AL. Therapeutic effects of substances occurring in higher basidiomycetes mushrooms: a modern perspective. *Crit Rev Immunol* 1999;19:65–96.
63. Sun T, Zhu Y. The effect of PSP on immune function and living quality in patients receiving chemotherapy for gynecological malignancies. In: Yang Q (ed). *Advanced Research in PSP, 1999*. Hong Kong: Hong Kong Association for Health Care Ltd, 1999, 308–9.
64. Sun Z, Yang Q, Fei H. The ameliorative effect of PSP on the toxic and side reactions of chemo- and radiotherapy of cancers. In: Yang Q (ed). *Advanced Research in PSP, 1999*. Hong Kong: Hong Kong Association for Health Care Ltd, 1999, 304–7.
65. Leu SF, Chien CH, Tseng CY, Kuo YM, Huang BM. The in vivo effect of *Cordyceps sinensis* mycelium on plasma corticosterone level in male mouse. *Biol Pharm Bull* 2005;28:1722–5.
66. Acharya SK, Dasarathy S, Tandon A, Joshi YK, Tandon BN. A preliminary open trial on interferon stimulator (SNMC) derived from *Glycyrrhiza glabra* in the treatment of subacute hepatic failure. *Indian J Med Res* 1993;98:69–74.
67. Chainani-Wu N. Safety and anti-inflammatory activity of curcumin: a component of tumeric (*Curcuma longa*). *J Altern Complement Med* 2003;9:161–8.
68. Brown AC, Hairfield M, Richards DG, McMillin DL, Mein EA, Nelson CD. Medical nutrition therapy as a potential complementary treatment for psoriasis—five case reports. *Altern Med Rev* 2004;9:297–307.
69. Mei QB, Tao JY, Cui B. Advances in the pharmacological studies of radix *Angelica sinensis* (Oliv.) Diels (*Chinese danggui*). *Chin Med J* 1991;104:776–81.
70. Yin ZZ, Zhang LY, Xu LN. The effect of dang-gui (*Angelica sinensis*) and its ingredient ferulic acid on rat platelet aggregation and release of 5-HT. *Yao Xue Xue Bao* 1980;15:321–6.
71. Houpt JB, Mc Millan R, Wein C, Paget-Dellio SD. Effect of Glucosamine Hydrochloride in the treatment of pain of osteoarthritis of the knee. *J Rheumatol* 1999;26:2423–30.
72. Jing SB, Li L, Ji D, Takiguchi Y, Yamaguchi T. Effect of chitosan on renal function in patients with chronic renal failure. *J Pharm Pharmacol* 1997;49:721–3.
73. Rigelsky JM, Sweet BV. Hawthorn: pharmacology and therapeutic uses. *Am J Health Syst Pharm* 2002;59:417–22.
74. Lacaille-Dubois, Franck U, Wagner H. Search for potential angiotensin converting enzyme (ACE)-inhibitors from plants. *Phytomedicine* 2001;8:47–52.
75. Shealy CN. *Natural Progesterone. Safe and Natural Hormone Replacement*. Los Angeles: Keats Publishing, 1999.
76. Ladiere L, Laghmich A, Malaisse-Lagae F, Malaisse WJ. Effect of dehydroepiandrosterone in hereditarily diabetic rats. *Cell Biochem Funct* 1997;15:287–92.
77. Popiela T, Kulig J, Hanisch J, Bock PR. Influence of a complementary treatment with oral enzymes on patients with colorectal cancers—an epidemiological retrospective cohort study. *Cancer Chemother Pharmacol* 2001;47 (Suppl): S55–63.
78. Blumenthal M, Busse WR, Goldberg A, Gruenwald J (eds). *The Complete German Commission E Monographs*. Austin: American Botanical Council, 1998.
79. Fleming T (ed). *PDR for Herbal Medicines*. Montvale: Medical Economics Company, 2000.
80. Kubota Y, Tanaka N, Umegaki K, Takenaka H, Mizuno H, Nakamura K, et al. *Gingko biloba* extract induced relaxation of rat aorta is associated with increase in endothelial intracellular calcium level. *Life Sci* 2001;69:2327–36.
81. Pepe C, Rozza A, Veronesi G. The evaluation by video capillaroscopy of the efficacy of a *Gingko biloba* extract with L-arginine and magnesium in the treatment of trophic lesions in patients with stage-IV chronic obliterating arteriopathy. *Minerva Cardioangiol* 1999;47:223–30.
82. Incandela L, Cesarone MR, Cacchio M. Total triterpenic fraction of *Centella asiatica* in chronic venous insufficiency and in high-perfusion microangiopathy. *Angiology* 2001;52 (Suppl 2): S9–13.
83. Ji YB, Gao SY, Zhang XJ. Influence of *Sargassum fusiforme* polysaccharide on apoptosis of tumor cells. *Zhongguo Zhong Yao Za Zhi* 2004;29:245–7.
84. Chrubasik S, Model A, Black A, Pollack S. A randomized double blind pilot study comparing Doloteffin and Vioxx in the treatment of lower back pain. *Rheumatology (Oxford)* 2003;42:141–8.
85. Carrero JJ, Lopez-Huertas E, Salmeron LM, Baro L, Ros E. Daily supplementation with (n-3) PUFAs, oleic acid, folic acid, and vitamins B-6 and E increases pain-free walking distance and improves risk factors in men with peripheral vascular disease. *J Nutr* 2005;135:1393–9.
86. Hercberg S, Galan P, Preziosi P, Bertrais S, Mennen L, Malvy D, et al. The SU.VI.MAX Study: a randomized, placebo-controlled trial of the health effects of antioxidant vitamins and minerals. *Arch Intern Med* 2004;164:2335–42.
87. Bucci LR. Selected herbals and human exercise performance. *Am J Clin Nutr* 2000;72:624S–36S.
88. Freeman MR, Solomon KR. Cholesterol and prostate cancer. *J Cell Biochem* 2004;91:54–69.
89. Santa Maria Margalef A, Paciucci Barzanti R, Reventos Puigjaner J. Antimitogenic effect of *Pygeum africanum* extracts on human prostatic cancer cell lines and explants from benign prostatic hyperplasia. *Arch Esp Urol* 2003;56:369–78.
90. Ma T, Qi QH, Xu J, Dong ZL, Yang WX. Signal pathways involved in emodin-induced contraction of smooth muscle cells from rat colon. *World J Gastroenterol* 2004;10:1476–9.
91. Redman DA. *Ruscus aculeatus* (butcher's broom) as a potential treatment for orthostatic hypotension, with a case report. *J Altern Complement Med* 2000;6:539–49.
92. Bouaziz N, Michiels C, Janssens D. Effects of *Ruscus* extract and hesperidin methylchalcone on hypoxia-induced activation of endothelial cells. *Int Angiol* 1999;18:306–12.
93. Chrubasik S, Kunzel O, Model A, Conrad C, Black A. Treatment of low back pain with a herbal or synthetic anti-rheumatic: a randomized controlled study. Willow bark extract for low back pain. *Rheumatology (Oxford)* 2001;40:1388–93.
94. Franz G. The senna drug and its chemistry. *Pharmacology* 1993;47 (Suppl 1): 2–6. Review.
95. Goldmann WH, Sharma AL, Currier SJ, Johnston PD, Rana A, Sharma CP. Saw palmetto berry extract inhibits cell growth and Cox-2 expression in prostatic cancer cells. *Cell Biol Int* 2001;25:1117–24.
96. Iguchi K, Okumura N, Usui S, Sajiki H, Hirota K, Hirano K. Myristoleic acid, a cytotoxic component in the extract from *Serenoa repens*, induces apoptosis and necrosis in human prostatic LNCaP cells. *Prostate* 2001;47:59–65.
97. Halim AB, el-Ahmady O, Hassab-Allah S, Abdel-Galil F, Hafez Y, Darwish D. Biochemical effect of antioxidants on lipids and liver function in experimentally-induced liver damage. *Ann Clin Biochem* 1997;34:656–63.
98. Chungoo VJ, Singh K, Singh J. Silymarin mediated differential modulation of toxicity induced by carbon tetrachloride, paracetamol and D-galactosamine in freshly isolated rat hepatocytes. *Indian J Exp Biol* 1997;35:611–7.
99. Lee SE, Ju EM, Kim JH. Free radical scavenging and antioxidant enzyme fortifying activities of extracts from *Smilax china* root. *Exp Mol Med* 2001;33:263–8.

100. Hong CH, Hur SK, Oh OJ, Kim SS, Nam KA, Lee SK. Evaluation of natural products on inhibition of inducible cyclooxygenase (COX-2) and nitric oxide synthase (iNOS) in cultured mouse macrophage cells. *J Ethnopharmacol* 2002;83:153–9.
101. Zaragoza F, Iglesias I, Benedi J. Comparative study of the anti-aggregation effects of anthocyanosides and other agents. *Arch Pharmacol Toxicol* 1985;11:183–8.
102. Savickiene N, Dagilyte A, Lukosius A. Importance of biologically active components and plants in the prevention of complications of diabetes mellitus. *Medicina (Kaunas)* 2002;38:970–5.
103. Calle J, Toscano M, Pinzon R, Baquero J, Bautista E. Antinociceptive and uterine relaxant activities of *Viburnum toronis* alive (*Caprifoliaceae*). *J Ethnopharmacol* 1999;66:71–3.
104. Young HY, Luo YL, Cheng HY, Hsieh WC, Liao JC, Peng WH. Analgesic and anti-inflammatory activities of [6]-gingerol. *J Ethnopharmacol* 2005;96:207–10.
105. Miller S. Echinacea: a miracle herb against aging and cancer? Evidence in vivo in mice. *Evid Based Complement Alternat Med* 2005;3:309–14.
106. Takeda K, Okomura K. CAM and NK cells. *Evid Based Complement Alternat Med* 2004;1:17–27.
107. Chihara G, Hamuro J, Maeda YY, Shio T, Suga T, Takasuka N, Sasaki T. Antitumor and metastasis-inhibitory activities of lentinan as an immunomodulator: and overview. *Cancer Detect Prev Suppl* 1987;1: 423–43.
108. Kidd PM. The use of mushroom glucans and proteoglycans in cancer treatment. *Altern Med Rev* 2000;5:4–27. Review.
109. Cooper EL. CAM, eCAM, bioprospecting: The 21st century pyramid. *Evid Based Complement Alternat Med* 2005;2:1–3.

Received September 29, 2005; accepted October 3, 2005