Pueraria mirifica: Just for Menopause or the *Herb of the Decade?*

An Interview with Dr. Garry Gordon — Part 1

By Richard A. Passwater, Ph.D.

Dr. Richard Passwater is the author of more than 40 books and 500 articles on nutrition. He is the director of research and development for Solgar Vitamin and Herb, Inc. And he has been WholeFoods Magazine's science editor and author of this column since 1985. More information is available on his Web site at www.drpasswater.com.

During the past several years, many physicians have chosen to move away from drug therapy for perimenopause and menopause, and many women have sought alternative natural therapies. As a result, I have received countless calls from my friends and colleagues concerning perimenopause, the natural transition leading to menopause. The calls have been mostly from men whose wives were suffering through this natural cycle of life. Menopause is not a disease although its many perimenopausal or menopausal symptoms can be alleviated by restoring nutritional and biochemical balance with nutrients and herbs.

Common sense tells us that menopause is a natural event just as puberty is. Neither is a disease. The National Institute of Aging and the North American Menopause Society agree with this common sense assessment. Puberty is the advent of natural hormone increase and menopause is the advent of natural hormone decline and imbalance. However, menopause is not an estrogen-deficiency disease as some would have us believe. As the baby boomers age, about 2 million American women enter this transition each year, and their menopausal issues can last for years.

The men who called—sometimes they were frantic calls—not only were feeling the discomfort of their wives' symptoms, but they were—shall we say—affected by their wives' sudden mood changes. The men were often near tears and they pleaded desperately, "Isn't there *something* that will help? Isn't there something that will help relieve the severity of the symptoms at least during the worst times?" I promised them that if I ever learned of a safe and effective dietary supplement that would help their wives through perimenopause and menopause, I would surely let them know.

When I finished chatting with my longtime friend, Dr. Garry Gordon, about fish oil, I had intended to move on to his research with genetic switches and RNAi. However, Dr. Gordon casually mentioned the outstanding results he was achieving with menopause using a rediscovered Thai herb. He told me how safe it was and how extremely effective. I said, "Hold everything! Tell me more!" as I remembered my promise to so many of my friends.

Garry F. Gordon, M.D., D.O., M.D.(H), received his doctorate of osteopathy in 1958 from the Chicago College of Osteopathy in Illinois. He received his honorary M.D. degree from the University of California Irvine in 1962 and completed his radiology residency from Mt. Zion in San Francisco, CA in 1964. For many years, he was the medical director of Mineral Lab in Hayward, CA, a leading laboratory worldwide for trace mineral analysis.

Dr. Gordon is co-founder of the American College for Advancement in Medicine (ACAM). He is founder/president of the International College of Advanced Longevity (ICALM) and a board member of the International Oxidative Medicine Association (IOMA). In addition, he is associated with the Gordon Research Institute, located in Payson, AZ.

Passwater: *The last time I interviewed you, we spoke mostly about fish oil and blood viscosity. I was, as always, impressed with the depth of your understanding of all health matters, regardless of whether we were discussing the latest medical technology or natural alternatives to mainstream treatments. I admit that fish oil was fairly basic, but your in-depth knowledge, as demonstrated in your best-selling book on fish oil (The Omega-3 Miracle—The Icelandic Longevity Secret, written with Herb Joiner-Bey, Freedom Press, 2005) required me to interview you on the subject for the benefit of our readers.*

I was planning to next chat with you about your state-of-the-art revolutionary research using nutrients to turn off the "bad" genes that cause various diseases. But, out of nowhere, you casually introduced me to an all-natural, hormone-bio-similar herb that I had never heard of. Tell me about it.

Gordon: The plant is called *Pueraria mirifica* (PM) or Thai kudzu. There are records going back at least 700 years to a time when locals in Thailand's Northern Kingdom brought PM to the most revered monks, for clarity of thought and to allow long life. The monks recorded the virtues of PM on palm leaves (please see Figure 1 below), in Lanna (the language of the Northern Kingdom).

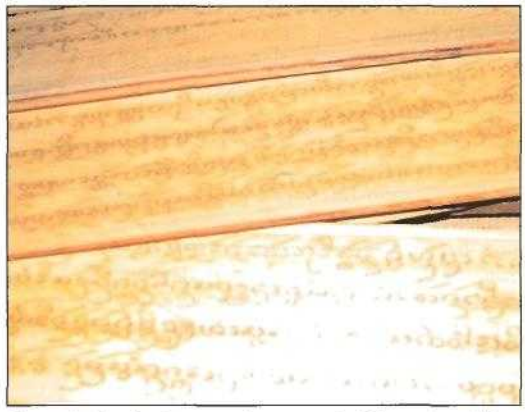

Figure 1. The first known written record of *Pueraria mirifica* was etched on these palm-leaf manuscripts by Thai Buddhist monks.

In 1931, these palm leaves were translated into modern Thai by Luang Anusarnsoondhorn. He wrote: "If aging men take this medicine that person will become strong like a young man." And went on to warn, "The ingredient in the medicine is very easy to find, but the specification of the right plant, is very difficult."

Passwater: *How did you come to first know about this remarkable plant?*

Gordon: I deliver a lecture every year to alternative medicine physicians in Japan. And after one particular seminar, I continued on to Bangkok to attend the birthday party of an old friend, Dr. Sandy Schwartz. You may remember meeting him at an American Academy for Medical Preventics seminar back in the '70s.

Passwater: *Yes, he was with Dr. Bob Atkins at the Atkins Medical Group then.*

Gordon: Yes. Well, Dr. Schwartz relocated to Asia 18 years ago, after his wife's passing. When he settled in Thailand, he instinctively knew there was something there for him to bring to people in need. Don't forget: Thailand is a paradise in itself.

Dr. Schwartz had had meetings with the Thai Ministry of Health and the Secretary General of the Thai FDA, Dr. Pakdee Potisiri, an American-educated former chairman of CODEX. Dr. Schwartz found that PM enjoyed great support from the ministry at every level. The more Dr. Schwartz learned about PM, the more convinced he became of its need to be made available to help others. We spent most of the time talking about PM and health, and Dr. Schwartz arranged for me to meet with many of these same people.

Exploring further, I found that the lowest rate of breast cancer in the world was in Thailand's northern region, where PM is taken by many of its people daily. (Please see Table 1 below) I simply had to learn more.

With my first discussions, I knew there was something great here. I also learned that Dr. Alex Schauss was working as a consultant to the Thai officials and had made nine trips there. I've now returned three more times, and I continue to learn that there's more and more that this miracle plant can do.

Table 1: Cancer incidence in Selected Registries in Asia, 1983-1987

COUNTRY		JAPAN	CHINA	HONG KONG	SINGAPORE			THAILAND	PHILIPPINES
REGION		OSAKA	SHANG	ALL	C	M	I	CHANG MAI	MANILA
ESOPHAGUS	M	8.4	14.9	18.1	10.9	1.2	3.2	4.1	3.1
	F	1.8	6.4	3.6	2.7	0.9	3.4	2.7	2.3
LUNG	M	41.5	53.0	78.7	69.7	34.0	20.7	40.5	53.4
	F	11.7	18.1	32.6	21.9	12.1	5.2	29.5	16.3
STOMACH	M	73.6	51.7	22.1	34.7	6.4	15.9	11.6	13.5
	F	32.7	21.9	11.2	15.6	5.4	7.5	6.0	8.1
COLON/ RECTUM	M	26.5	17.8	36.5	35.4	15.1	15.8	9.9	18.7
	F	16.4	15.6	26.0	28.6	12.1	16.9	7.7	15.0
BREAST	F	21.9	21.2	32.3	30.6	23.2	34.0	13.7	49.7
PROSTATE	M	6.6	1.7	7.6	7.6	9.0	11.0	4.0	16.9

Passwater: *The difference in breast cancer rates is indeed striking. In the United States, it is more than 10 times (141.1) that of the Chang Mai Province in Thailand (13.7), where PM is widely consumed. It's been used for more than 700 years and still very few outside of Asia have ever heard of it. How is it that it's been kept a secret until now?*

Gordon: Well, as I told you, the development of this plant as a viable product has been handled by Dr. Schwartz and Smith Naturals, the company he founded in Bangkok. "Smith" is actually a Thai word meaning "success." Dr. Schwartz has been working with Bio-Botanica to manufacture a world-class standardized extract. Until the completion of a Phase I and Phase II trial, and under Dr. Schauss' direction, toxicity testing and more, they opted to keep it quiet, until it was ready. Dr. Schwartz said, "We're 8,000 miles from anyone who even understands what we're doing, so that was relatively easy."

A standard toxicity test is called LD50. This is the dosage that would kill 50% of laboratory animals given that dose for 14 days. The number is expressed as a weight of material given (usually expressed in grams for safe substances such as water) per kilogram of body weight. The LD50 for water is 16. For *Pueraria* root, the LD50 of the dried powder is 7. When the same root was made into this standardized extract, the LD50, done in that same Thai Ministry of Health lab, the LD50 exceeded 40, with *no* animal deaths.

At first, Thai researchers and business people sold all of the crude material they could find into the Japanese market, and Smith Naturals wanted to keep well-distanced from those crude products. Not only was the material not standardized, there were no constraints on the mixing in of other species. Since miroestrol cannot be properly measured by HPLC, only the other phytoestrogens were quantified, and unsatisfactory results were noted. Breast enhancement cream, in particular, was marketed in the United States without standardized PM, and the market stayed small.

Figures 2 and 3. *Pueraria mirifica* identification can be made only during the two weeks when it flowers (left). The key feature is hairy pods (right); only PM with the blue flower has hairy pods.

Passwater: *Does this plant grow anywhere other than Thailand?*

Gordon: No. It grows only in high elevations in two provinces (Chiang Mai and Sararaburi) in Thailand, and studies by the Thai government have shown that transplanted roots transmutate to a different non-active Thai kudzu species, of which there are at least 13. Only PM has a unique phytoestrogen, miroestrol. Miroestrol is bio-similar to estriol, a female hormone that is much weaker than estrogen (17ß estradiol). Miroestrol is only found in true PM, which can be identified only two weeks out of the year, when it flowers (Please see figures 2 and 3). Much of the product being used is misidentified and has none of the benefits of PM.

Passwater: *The term "kudzu" has been used a few times to describe several plants. It comes from the Japanese word for "vine." Do people generally understand the difference between those kudzus and Thai kudzu, which is so rare?*

Gordon: No. In fact, in the United States what we commonly call "kudzu" is viewed as a weed that is hard to get rid of. Although common American kudzu is being researched for reducing the craving for alcohol in alcoholics, it has absolutely no miroestrol and thus absolutely none of the estrogenic effect we have been discussing. The Thai kudzu again has many

Kwao Krua	
Scientific classification	
Kingdom:	Plantae
Subkingdom:	Tracheobionta
Division:	Magnoliophyta
Class:	Magnoliopsida
Subclass:	Rosidae
Order:	Fabales
Family:	Fabaceae
Subfamily:	Faboideae
Genus:	*Pueraria*
Species:	***P. mirifica***
Binomial name	
Pueraria mirifica	

Table 2: Scientific classification of *Pueraria mirifica*.

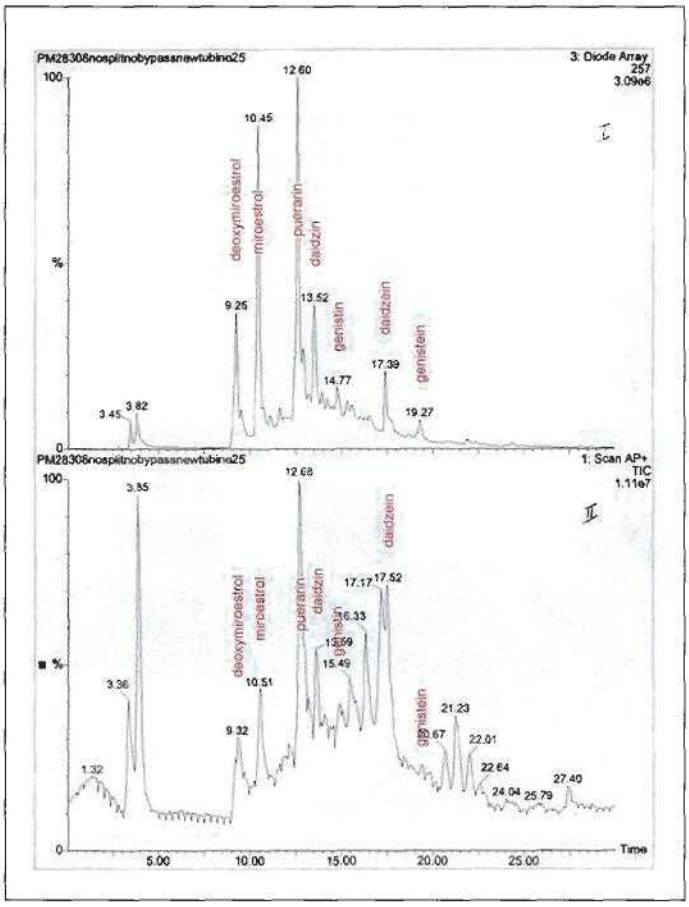

Figure 4. Validation of PM miroestrol content by LC/MS/MS. In Chromatogram I, a photodiode array detector is used and is most suitable for quantitating the different compounds after first achieving positive identification of each peak using the mass detector at atmospheric pressure with the chemical ionization in the positive mode (AP+). Chromatogram II is then obtained by mass fragmentation of each peak. This shows the molecular ion of miroestrol to be 359.85 and the molecular ion of deoxymiroestrol to be 343.85. Note: the mass fragmentations of the different compounds are not given for simplicity. Courtesy of Dr. Youssef Mirhom and Bio-Botanica.

varieties, and *only* the variety called *Pueraria mirifica*, which contains miroestrol, offers the unique benefits I am describing (please see Table 2, page 48).

Kudzu covers the entire species of *Pueraria*. Kudzu as we know it in the U. S. is *P. lobata (Pueraria montana* var. *lobata)*. There are hundreds of *Pueraria* species globally. In Thailand alone, there are the following 13; 1. *Pueraria alopecuroides* Craib; 2. *Pueraria candollei* Graph. Ex. Benth;

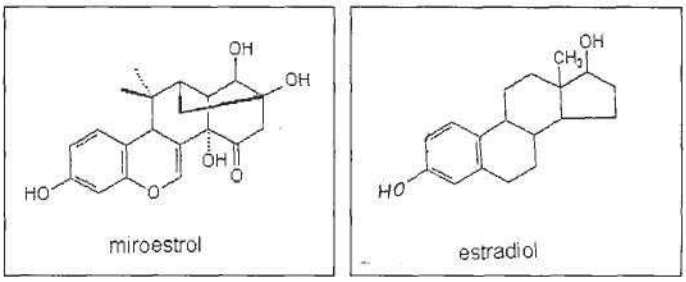

Figure 5. Chemical structures of miroestrol and estriol.

3. *Pueraria candollei* var. *mirifica* A Shaw. & Suvat.; 4. *Pueraria imbricata* van der Maesen sp. nov.; 5. *Pueraria lobata*; 6. *Pueraria lobata* var. *ontana*; 7. *Pueraria lobata* var. *thomsoni*; 8. *Pueraria* var. *phaseoloides*; 9. *Pueraria* var. *Javanica*; 10. *Pueraria* var. *subspicata*; 11. *Pueraria wallichii*; 12. *Pueraria rigens*; 13. *Pueraria stricta*.

Only PM has both a miroestrol and a deoxymiroestrol peak. They can't be detected and measured using only a simple HPLC analysis. It requires a more sophisticated validation by LC/MS/MS and using a photodiode detector (please see figure 4 at left).

Passwater: *You mentioned that miroestrol is "bio-similar," to estriol. By "bio-similar" do you mean that miroestrol has the same natural biochemistry as estriol, as opposed to miroestrol being identical in chemical structure as estriol?*

Gordon: First, I have to give credit for this information to Dr. Youssef Mirhom, professor emeritus, pharmacognosist and chief scientific officer at Bio-Botanica. Estriol itself is not a hormone secreted by the ovary, but a deactivation product of estrone and estradiol in the human liver by 16-alpha-hydroxylation. Miroestrol is a phytoestrogen (a plant estrogen), and has the same chemical properties, as well as physiological properties as estriol; however, it has a weaker estrogenic effect. And Professor Sayan Sawatsri, M.D., gets the credit for the following valuable bit of information—*miroestrol has about 3,000 times the estrogenic activity of soy isoflavones* (please see figure 5 above).

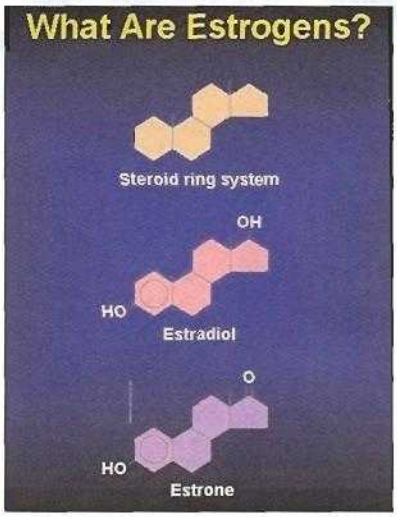

Figure 6. Chemical structures of typical estrogens, estradiol and estrone. Estrogens share a common steroid ring structure.

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Nature's Herb Co.
Since 1915
Culinary Brand
Summer Field
Spices
San Francisco
Natural Tea
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• Loose Herbs & Tea Bags
• Bulk Botanicals, Bulk Teas
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Passwater: *I have just read in a 1960 issue of Nature, one of the scientific journals on PM that you gave me, along with the PM efficacy studies, that PM is much more than 100 times as rich in estrogenic activity as red clover—perhaps as much as 1,000 times more powerful ("Miroestrol: An estrogen from the plant Pueraria mirifica." Cain, James C. Nature Dec 3 1960 v158, p774). Let me ask: How does miroestrol affect estrogen receptors?*

Gordon: It occupies the estrogen receptors more safely. If the estrogen level is high, miroestrol will compete with receptors weakening the effect of the hormones. If the estrogen level is low, miroestrol will exert its estrogenic effect of potentiation (please see figure 6 above and figure 7 on Page 58).

Continued on Page 58

 Continued from Page 50

Passwater: *That could explain PM's effect on reducing breast cancer incidence, making Thailand, particularly in the north, a country with the lowest known breast cancer incidence. It is well known that some types of breast cancer are very estrogen-responsive, and in the United States today, women with breast cancers have their tissues examined for estrogen responsiveness.*

What effect does miroestrol have on natural hormones produced in the body?

Gordon: None. The effect is only with the estrogen receptor.

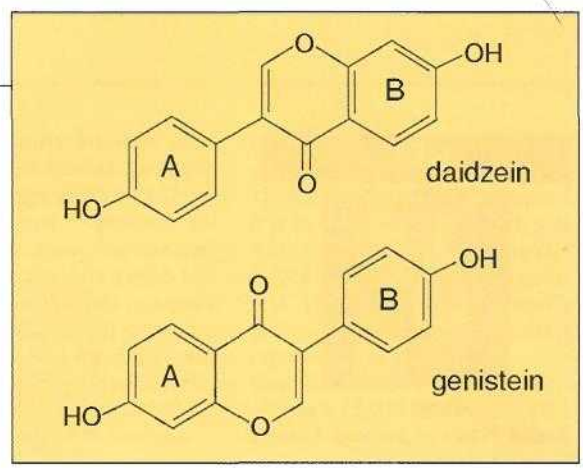

Figure 7. The chemical structures of the flavonoids genistein and daidzein. These compounds have ring structures, but not the same ring structures common to estrogens.

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Passwater: *So, the miroestrol in PM acts to balance or moderate estrogen effects, not by altering the amount of estrogen or other hormones in the body, but by miroestrol interacting with the estrogen receptors in tissues to normalize estrogenic effects. It seems to me that this could explain why studies show PM is so helpful for both perimenopausal and menopausal women.*

If I may, I'd like to take a minute to discuss the distinction between menopause and perimenopause. Menopause is considered by some to be defined as having occurred one year after the last menses (amenorrhea). There is no other independent biological marker for menopause. The phrase, "going through menopause" is common, but that really describes "perimenopause." The proper description for menopause is "reached menopause." Perimenopause, another natural change before the natural "change of life," is a variable, but lengthy, transition period leading up to menopause in which hormone levels fluctuate and the regularity of the menstrual cycle begins fluctuating.

During perimenopause, women are often caught off guard by the results of their hormone fluctuations. PM could supplement the action of the reduced levels of estrogen in the receptors without increasing the levels of estrogens. When the estrogens are high, PM could dilute the amount of estrogen entering the receptors, thus normalizing the women's estrogen receptor activity even as the actual estrogen levels oscillate between low and high.

This being said, Dr. Gordon, let's get together again next month to discuss the clinical and safety studies that have been done with PM and menopause. **WF**

Garry Gordon, M.D., D.O., M.D.(H)

Pueraria mirifica: Just for Menopause or the *Herb of the Decade?*

An Interview with Dr. Garry Gordon — Part 2

By Richard A. Passwater, Ph.D.

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Last month we discussed that the lowest rate of breast cancer in the known in the world was in Thailand's northern region, where the herb *Pueraria mirifica* (PM) is widely used. Only PM has the unique phytoestrogen (plant estrogen), miroestrol. Miroestrol is bio-similar to estriol, an estrogen (female hormone) that is much weaker than the body's predominant estrogen, 17ß- estradiol. Miroestrol occupies the estrogen receptors more safely. If the estrogen level is high, miroestrol will compete with receptors weakening the effect of the hormones. If the estrogen level is low, miroestrol will exert its estrogenic effect of potentiation. PM also contains several other phytoestrogens including genistein, daidzein, hydroxymiroestrol and isomiroestrol.

This month, we will discuss how PM has been shown to be safe and effective in relieving the discomforts of the "change of life" leading to menopause.

Garry F. Gordon, M.D., D.O., M.D.(H), received his doctorate of osteopathy in 1958 from the Chicago College of Osteopathy in Illinois. He received his honorary M.D. degree from the University of California Irvine in 1962 and completed his radiology residency from Mt. Zion, in San Francisco, CA, in 1964. For many years, he was the medical director of Mineral Lab in Hayward, CA, a leading laboratory worldwide for trace mineral analysis.

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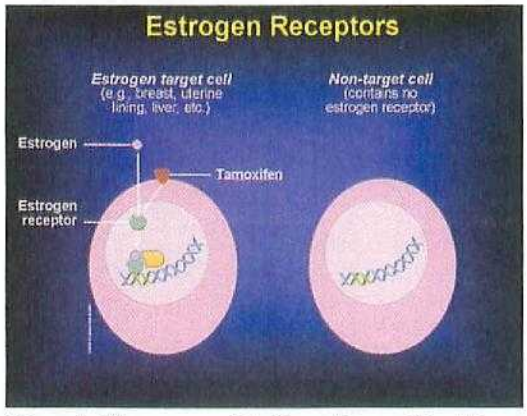

Figure 1. The estrogen-blocking of tamoxifen. Figure courtesy of the National Cancer Institute.

Passwater: *We have discussed that estrogens are a group of steroid compounds, named for their importance in the estrous (reproductive) cycle, and function as the primary female sex hormone. While estrogens are present in both men and women, they are usually present at significantly higher levels in women of reproductive age. The three major naturally occurring estrogens in women are estradiol, estriol and estrone. From menarche to menopause the primary estrogen is 17ß-estradiol.*

What is the effect of the digestion process on miroestrol? Do breakdown products such as heterocyclic phenols more closely resemble estrogens than miroestrol itself resembles estrogens?

Gordon: The estrogenic hormones effective by mouth are either methylated at position 3 of the ring, like mestranol (which serves as the estrogen component in several combinations of oral contraceptives), or they have an alpha ethinyl group at *position 17*, like *17 alpha ethinyl estradiol*. In miroestrol there is a methylene bridge between *carbon 12* and *17*, which may exert a similar stabilization effect in the digestive tract.

Passwater: *Phytoestrogens naturally occur in some plants and are compounds which have estrogenic effects in animals, including humans. That is to say, phytotrogens mimic and supplement the action of the body's own estrogen hormones. Phytoestrogens mainly fall into the class of flavonoids: the coumestans, prenylated flavonoids and isoflavones are three of the most potent in this class. The most-researched are isoflavones, which are commonly found in soy and red clover. Lignan has also been identified as a phytoestrogen, although it is not a flavonoid.*

Women know that other phytoestrogens offer some menopausal symptom relief but in most cases simply don't do as well as desired. A study called "The Isoflavone Clover Extract (ICE) Study," published in the Journal of the American Medical Association (JAMA) on July 9, 2003, concluded that "neither supplement had a clinically important effect on hot flashes or other symptoms of menopause." One study may not be conclusive, but the results were not encouraging.

More recently, a study of black cohosh published in the December 2006 Annals of Internal Medicine was also discouraging [145:12; 869-879 (19 Dec 2006)]. The study's lead author, Dr. Katherine Newton, concluded: "Black cohosh used alone or as part of a multibotanical supplement shows little potential as an important therapy for relief of hot flashes. The yearlong study of 351 women suffering from hot flashes and night

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sweats found that those given black cohosh got about the same amount of relief as those who took a placebo. That's just one study, but it is not encouraging.

Both of these recent studies are discouraging, but the body of scientific evidence does include other studies that suggest that these other phytoestrogens may have some benefit for some women over placebo effect. A more recent meta-analysis was published in January (Maturitas 55: 203-211 (2007), by Drs. L.G. Howes, J.B. Howes and D.C. Knight. This meta-analysis of several previous studies reported a statistically significant, although clinically modest effect. This study has limitations in that changes in the severity of hot flushes were not considered, only changes in the number and frequency of the flushes. Additionally, this study did not measure the effect of isoflavones on other climacteric symptoms.

What is needed, however, is a phytoestrogen with a strong positive effect in nearly all women much greater than any placebo effect. Just how "estrogen-like" are phytoestrogens and just how effective is PM?

Gordon: Well, you are describing PM—it has a strong positive benefit in nearly all women that far exceeds any placebo effect. In the Phase I and Phase II trials I have studied, they used all the climacteric (change of life) parameters, including hot flashes, night sweats, depression, loss of sex drive and 14 more symptoms. In every case, every woman saw immediate positive results, and after six months (the length of the trial), every woman's score was well below the subjective level for climacteric symptoms, in all areas. But, it wasn't until I brought some back to the United States and gave it to women here, with similar immediate results, that I became excited. I can say, after 48 years in medicine, I know a great supplement or herb when I see one. I may go so far as to say, *that PM is definitely the greatest herb of the decade, and perhaps the century, and maybe even all time.*

Passwater: *As you know, Dr. Gordon, I am a biochemist and not an herbalist or physician. In addition to the nearly thousand years experience of hundreds of thousands of people, can you tell us some more about the studies?*

Gordon: Certainly. I wouldn't use PM in my practice if I hadn't evaluated the literature myself. Before clinical studies of the standardized PM extract were conducted, various toxicological studies were performed. Subchronic toxicity studies were carried out by the Medicinal Herb Research Institute, Department of Medical Sciences, Ministry of Public Health.

Here's my file copy of a couple of the clinical studies using the standardized PM extract. Dr. Alex Schauss can provide you with additional toxicological studies and the herbology of PM.

This 2001 study is "Efficacy and Safety of *Pueraria mirifica* (Kwao Keur Kao) for the Treatment of Vasomotor Symptoms in Perimenopausal Women," by Drs. V. Chandeying, S. Lamlertkittikul and A. Schauss. The other researchers beside Dr. Schauss were on the Faculty of Medicine of Prince of Songkla University and the study was conducted at the Hat Yai Center Hospital in Thailand. The clinical trial involved 37 women who took either 50 mg or 100 mg of PM over six months and found that perimenopausal women treated with PM all had significant improvement in the modified Greene climacteric scale and its parameters.

Passwater: *I see that in this study, the climacteric indicators improved (declined) as follows: hot flashes, from 2.5 to 0.5; night sweats, from 1.7 to 0.6; headaches, from 2.4 to 0.8; and mood instability, from 2.3 to 0.9. Sixteen other climacteric indicators also improved accordingly.*

Gordon: In an earlier Phase I safety study, conducted by this research group in 2000 and involving ten women, it was found that, when taking 50 mg/day and 100 mg/day of PM, none of the women suffered estrogenic side effects, including dysfunctional uterine bleeding, irregular menstruation or breast tenderness. The study concluded that the blood biochemistry tests established the safety of the PM. Of course, this is only a small phase-one study, and in a larger population you always expect individual differences in tolerances of anything, as well as optimal dosage, which is largely dependent on body weight. In other words, individual results may vary and any herb should be discontinued if adverse effects are noted.

I always suggest monitoring blood pressure and being alert for vaginal discharge or bleeding.

Passwater: *In this Phase I study, all of the climacteric indicators declined from moderately severe (43.8) to mild (10.9). The hot flashes decreased by 11-fold, and the night sweats declined by more than four-fold, with the most significant drop occurring during the first 30 days. I've never seen this reported in any studies, using any other product.*

So the studies show PM is very effective, but has its safety really been shown?

Gordon: Smith Naturals did Ames mutagenicity studies, acute, subchronic and chronic toxicity testing. And, when Bio-Botanica reviewed them, they further did a GLP (a lab with Good Laboratory Practices certification) toxicity test as well as a GLP Ames test to further support the testing done in Thailand. Every test returned the same result of no toxicity at normal human dosage levels and even up to more 2,000 times that dosage. Back in the '50s, Dr. Pope conjectured from chemical models that miroestrol might enter the adverse effect range above 1 g of miroestrol / dose, but that's still more than 50 times the human dose, and no one has ever confirmed any adverse effects as Pope conjectured from chemical structural models. The standardized PM extract contains 20 mg miroestrol / 100 g. That equates to 0.2 mg / g, and since about 100 mg of PM is used per dose, the end result is 0.02 mg miroestrol / 100 mgs PM. Since Dr. Pope speculated that 1 g of miroestrol could be the start of the adverse effects range, there would need to be 50 doses / day to achieve this level.

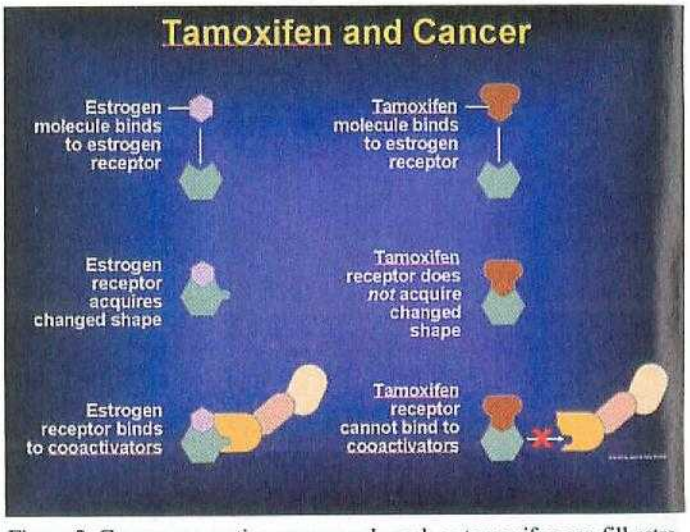

Figure 2. Cancer-preventing compounds such as tamoxifen can fill estrogen receptors without activating cancer-promoting genes. Figure courtesy of the National Cancer Institute.

Passwater: *Although PM has been used safely for about a thousand years by hundreds of thousands of people as an herb to keep skin young looking and help ease the natural menopause (which is a normal event in aging, not a disease) should non-pregnant, adult women take PM without medical supervision?*

Gordon: Quite frankly, the only warning would be for women *not* to take PM before the age of 18. If a menstruating woman takes PM, the recommendation is not to take it during the week of her period. I have never heard of there being any consequence from taking it continuously, but Thai traditional medicine recommends younger women taking one week off. Also, I recommend very few supplements or medicines for pregnant women. There is no need for pregnant women to take PM as they are not menopausal, so I do not recommend PM for pregnant women.

Passwater: *Focusing solely on perimenopausal women, what is the ideal*

daily dosage?

Gordon: 2 mg / kg body weight. For the first month that level can be doubled. So a 150-pound woman would require 136 mg of PM / day, but could take, without any problem, 272 mg (or 3 pills / day). Most women will see relief of symptoms in a week or less. The Phase I and the Phase II trials in Thailand were on Asian women, who are normally smaller than Western women, so the dosages they used were small, compared what Western women might need. A convenient and effective regimen for American women of menopausal age would be to take 80 mg of PM twice a day.

Passwater: *How does taking PM differ from taking so-called estrogen replacement drugs?*

Gordon: A well-known estrogen replacement drug is produced from the urine of pregnant mares. You know how I feel about the conditions used to collect urine from these pregnant mares to make the drug, and you know how I feel about keeping the mares pregnant, year after year.

The major forms of estrogen in this popular drug are estrone (>50%), equilin (3-hydroxyestra-1,3,5,7-tetraen-17-one) (15-25%) and equienin.They are often called "conjugated equine estrogens" (CEE) because the estrogen molecules are generally present with sulfate side-groups attached. Estrone sulfate is readily converted to estradiol. It is not clear if estrogens such as equilin that are foreign to the human body have effects in women that are significantly different from the estrogens like estradiol that are normally made in the human body.

But, when this type of medicine was tested in the largest study ever done, on some 80,000 women, it was called off, as the women taking estrogen had a higher rate of heart disease and cancer than the placebo. PM, and again, standardized PM with 20 mg miroestrol / 100 g, has no side effects. We have preliminary studies on a number of types of cancer and we see PM having only beneficial effects. The same is true for bone health and circulation.

Passwater: *Why would taking PM be safe and effective, whereas taking estrogen-related drugs, such as commonly used HRT, could be questionable?*

Gordon: Simple. While both will alleviate symptoms associated with menopause, PM won't harm you. If anything, it may cause you to live longer and in better health.

Passwater: *How does taking PM differ from taking isoflavones such as genistein and daidzein?*

Gordon: PM also contains substantial quantities of other phytoestrogens, including daidzein, genistein, puerarin, and mirificin. But most importantly, and uniquely, PM contains miroestrol.

Passwater: *Does PM have any effect on breast size or tone?*

Gordon: I assume you're talking about the craze that swept the Internet, promising larger breasts in just two days. This was taken from the true story about PM enlarging breasts by a full cup size in Japan. More than a decade ago, Japanese cosmetic companies flocked to Thailand to purchase "PM" to mix in creams and to be taken orally. After some time, they sought lower and lower prices. The end result was that the wildcrafters simply mixed in less expensive species. Some Thai wildcrafters are eighth generation. They know the market value of real PM. The original breast enhancement study was done in Tokyo by Japanese Prof. Kuramoshi and Thai Assoc. Prof. Yuthana Smitasiri. They showed that 72% of women taking PM exhibited significant increases in breast size. Younger women had a markedly higher rate of success than older women, who lowered the overall success rate. Some years ago, a company in California launched ISIS, a system using real PM. They guaranteed success or your money back and had 96% satisfied customers, not asking for their money back.

Passwater: *From my knowledge of Latin, "mirifica" means "miracle maker." So, what other "miracles" does Pueraria mirifica make?*

Gordon: Well, if PM only relieved problems associated with menopause, within a week, it would already be a miracle, but there will soon be studies to show many more significant benefits from PM. One health benefit, I have already stated earlier, is that in the regions where PM grows, they have the lowest breast cancer rate in the world. Their breast cancer incidence is even 40% lower than Japan, where they consume the highest level of phytoestrogens in their daily diet (Please see Table 2 in Part 1). It's less than 10% of the United States rate. In addition, cell culture studies show that PM is anti-cancer to estrogen-sensitive breast cancer cells. It's even beneficial for men.

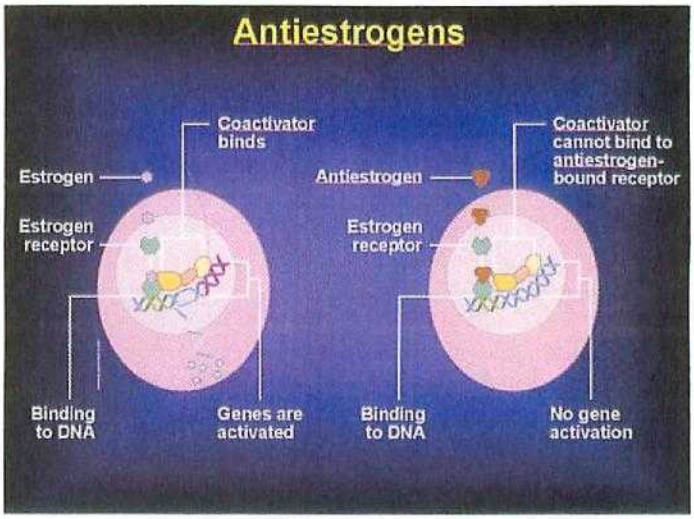

Figure 3. Estrogen receptor-filling compounds can fill the receptor without activating the cancer-promoting genes. Figure courtesy of the National Cancer Institute.

Passwater: *Perhaps, when PM occupies estrogen receptors, it acts in the same manner as the breast cancer preventer tamoxifen in that the receptors are occupied, but not triggered to produce the cascade of chemical reactions that activate the genes that facilitate cancer growth. The mechanism of this blocking action for tamoxifen as proposed by the National Cancer Institute is shown in figures 1, 2 and 3.*

Should PM be taken with any additional supplements?

Gordon: A company I consult with, Longevity Plus, which produces supplements for professionals, has had very positive feedback regarding combining PM with vitamin B-12 and folic acid. I had recommended that they simply add this exciting PM herb into their proprietary B-12 formula, which alone had reportedly provided excellent support to many women, reducing fatigue, depression and irritability. Adding PM to that formula, we find, acts synergistically so that even the most difficult change of life issues that until now nothing has helped, are responding, often within two-to-four weeks. Therefore, I think PM should be combined with B-12 and folic acid.

Passwater: *I note that PM has also traditionally been used to keep skin young looking. What dosage do you recommend for this? Also, I note in the literature you have given me that both men and women are taking PM as an adaptogen. Adaptogenic herbs tend to balance endocrine hormones and the immune system, and they help the body to maintain optimal homeostasis. The mechanism involving the estrogen receptors described above would indicate that PM could help to counteract the estrogen-mimic pollutants, such as dioxin.*

Men eat the PM tuber as a food, and earlier you mentioned that men take PM as well as women. How much? Is the same dosage the same for men and women?

Gordon: Since you're asking about the traditional use, let me cite from a translation of the 700-year-old Thai palm leaves:

• Take the tuberous root of *Pueraria* with big leaves, pound and blend with cow's milk. The benefits of this medicine is to support memory, talk big, and be able to remember three books of the astrology, make the skin smooth like a six-year-old kid, live a very long life and parasite diseases are not able to be of trouble.

• Blend with rice milk by keeping the rice milk until sour, the benefit is to support softening skin, as the skin of the angel.

• Blend with butter cream or honey, the benefits are to support long life, memory and ability to remember three books and the ability for entertaining a thousand customers.

• Blend with yogurt, the benefits are to support long life, dark hair, strong teeth and anti skin wrinkles.

• Bleach with buffalo milk, apply to the hair for support as a hair tonic, the gray hair will become dark, use with sesame oil for the benefits of darkening hair, and support of hair growth, smoothening skin, every type of parasite disease is not able to be of trouble.

Clearly, PM was meant here for men as well as women. The dosage for men is half that of women, so 1 mg / kg body weight. This dosage was first calculated from the dosing of "peppers" as used in Thai traditional medicine. Smith Naturals worked with Dr. Schauss for six months, collecting samples and analyzing the miroestrol levels, to convert the traditional pepper dose into milligram dosing.

Passwater: *Does PM affect male breasts?*

Gordon: I had to think about this, as the male breast has the same estrogen receptors as women. Since men don't have the same amount of mammary tissue, the answer has to be no, or at least not in the same way as PM ha been shown to increase breast size and breast firmness in women.

Passwater: *Does PM have a positive longevity effect or does it just mak people look younger?*

Gordon: The old men and women who've taken it regularly, in the north c Thailand, have natural black hair well into their 80s. Old women enjoy cha ing after their young grandchildren and men still hike in to the mountains, running up hills much like a jackrabbit. These women still have firm breasts and young skin. Men pursue active sex lives. They have great memories and don't remember ever being sick. We interviewed Sam, a man in his 80s, who sleeps through the night and didn't understand why we would ask if he woke to urinate. He said, "no one here wakes up to do that."

Garry Gordon, M.D., D.O., M.D.(H)

Passwater: *Well, Dr. Gordon, you certainly have gotten my attention about the health benefits of the herb Pueraria mirifica (PM). In the meantime, let's take a break and come back to discuss RNAi in a few months. Thanks for sharing your knowledge with our readers once again.* **WF**