

A Review of Qigong Therapy for Cancer Treatment

Kevin CHEN and Raphael YEUNG

Dept. of Psychiatry, University of Medicine and Dentistry of New Jersey (New Jersey, USA)

Abstract: Research studies of Qigong therapy for cancer for the past 20 years in China were reviewed from three different categories: clinical study on human cancer patients, in-vitro study of cancer cells, and in-vivo study of cancer with Qigong therapy, in an attempt to understand the role Qigong therapy plays in cancer treatment. There is a lot of evidence suggesting that Qigong therapy has an inhibitory effect on cancer growth, both *in vitro* and *in vivo* studies, as well as in clinical observation (often there was room for improvement in these studies and some studies require replication in order to verify their findings). Qigong therapy for cancer is an area that is often neglected by mainstream medicine and research, and it should be seriously examined and considered as an important supplement to conventional cancer treatment.

Keywords: Qigong therapy, cancer, clinical trial, in-vivo, in-vitro study, inhibitory effect.

1. Introduction

It is generally known that Qigong practice is beneficial to our health and can prevent disease, but it is less known, even in China, that Qigong may be an effective way to treat various diseases, including cancer. Although most Qigong styles bring some health benefits, medical Qigong is the one that has been specifically developed for the purpose of treatment and cure of disease.

Medical Qigong refers to the Qigong forms used by TCM practitioners to utilize vital energy (Qi) in diagnoses and treatment of various diseases. Although Qigong is mainly a self-training method, external Qigong therapy (EQT) has always been part of the medical Qigong practice. EQT refers to the process by which a Qigong practitioner directs his intention, or emits his Qi energy, to help others break Qi blockages and induce the sick Qi out of the body so as to alleviate the pain, abate the disease, and balance the flow of Qi.

Although there might be some cases of cancer recovery reported in many Qigong forms, most Qigong schools or clinics in China generally do not openly take patients with cancer due to their high mortality rate. However, two Qigong forms in China have publicly challenged cancer: Guo-Lin New Qigong¹⁾ and Chinese Taiji Five-Element Qigong.^{2,3)} In an official assessment meeting held in 1996 by Chinese government, Chinese scholars and experts in medicine and science examined a number of cancer cases and the results of scientific research with Taiji Five-Element Qigong. They affirmed the positive anti-cancer effect of this Qigong and concluded that it was “an effective therapy to treat cancer.”^{4,5,6)}

Media reports on cancer recovery by Qigong have caught the attention of many scientists. Can Qigong practice really have a therapeutic effect on cancer? It is well known that some cancer patients may experience spontaneous remissions without any therapy. How do we discern spontaneous remissions from Qigong induced remissions? Does Qigong treatment provide merely a placebo, or does it truly provide a therapeutic effect?

Due to considerations of psychological effect and other limitations, most systematic research on Qigong therapy for cancer has been focused on *in vitro* study of different cancer cells, or *in vivo* study where cancer cells were injected into a live animal to observe the inhibitory effect of Qigong therapy.

In an attempt to understand how Qigong therapy affects cancer treatment, this study has reviewed more than 50 research studies (excluding case reports) that have a focus on Qigong therapy for treating cancer. These studies fall into three different categories: clinical study on human cancer patients, *in-vitro* study of cancer cells with external Qigong, and *in-vivo* (animal) study of cancer with EQT. Hopefully, such a review will attract the interest of more scientists in this ancient therapy and, as a result, a greater number of well-designed researches will be implemented on the therapeutic effect of Qigong therapy for cancer and other chronic diseases.

2. Methods

This review utilizes two major sources of literature: 1) Qigong Database by the Qigong Institute,⁷⁾ which collected more than 1600 abstracts and publications from various conference proceedings and publications; 2) the accessible publications in Chinese, including some conference proceedings in Chinese. Most of this literature has never been published in English.

Direct correspondence to: Dr. Kevin Chen, Dept of Psychiatry, UMDNJ – RWJ Medical School, 671 Hoes Lane, Piscataway, NJ 08854 (USA). Email: chenke@umdnj.edu

Even though there are numerous publications on Qigong for cancer in China, few of them truly adhere to western academic standards regarding research design and reporting format. Some were not written for academic exchanges. Consequently, incomplete data reports have been a problem in our review. To fully take advantage of the literature for future research in this area, we used the following three criteria for selecting studies to be included in this review: 1) it should be a research study with systematic data collection for the purpose of understanding clinical improvement or differences between Qigong and control group, not simply case reports or testimonies; 2) it involved specific cancer or carcinoma cells with quantifiable results, not just an exploration on the mechanism of Qigong therapy with biological means or general assumption of Qigong therapy for cancer; 3) it is clinical research with an identifiable baseline tumor description or cancer identification and compatible results, not just an obscure outcome study.

3. Major Studies and Their Findings

3.1. Clinical Studies of Human Patients

Not many clinical studies have been done on Qigong therapy for cancer patients. Most research articles on cancer patients were based on observational studies, often without a compatible control. A total of 19 clinical studies were reviewed with number of observations ranging from 42 to 1,883. A large proportion of them were based on clinical studies that used Guo-Lin Qigong with other therapies. Although no double blind clinical trial was found, many studies did have a control group. A summary table of all studies is available upon request. Following are summary descriptions of some of these studies.

The largest clinical observation of Qigong therapy for cancer treatment is probably the one conducted by Zhang et al.⁸⁾ at Beijing Miyun Capital Tumor Hospital. They combined "Self-Control Qigong" (a modified form of Guo-Lin Qigong) with other conventional methods in the treatment of 1,648 patients with various cancers over a period of 8 years. This experiment achieved showed significant improvement for 32.4% patients, some effectiveness for 59.2%, and only 8.4% reported no effect at all. More than 500 of their cancer patients survived 5 years or longer (> 30%). This is a much better result than other tumor hospitals in China that have not used Qigong in their treatment. Although they also collected a lot of data on patients' physical health, improved immune functions and other biological indicators, no control was used in this hospital-based observation, which makes it less possible to discern how well Qigong therapy benefits cancer patients in comparison to others. **Table 1** presents the results of major immune indicators among 30 of their cancer patients before and after Qigong therapy⁹⁾. These data provides some insight into how Qigong works for cancer patients.

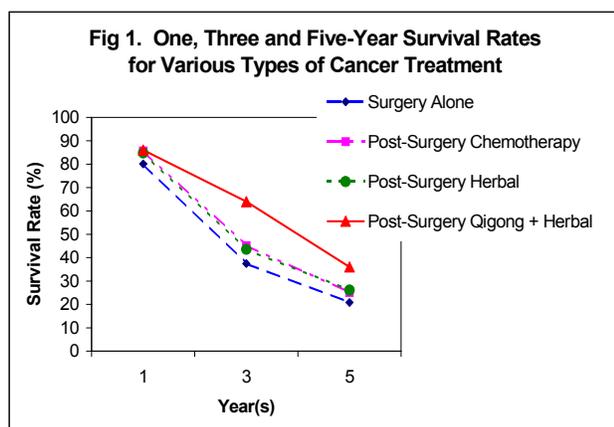
Table 1. Changes of immune indicators among 30 cancer patients after Qigong therapy

<i>Indicators</i>	<i>Before</i>	<i>After</i>	<i>P value</i>
Chemotactic movement	1.75 mm	2.35 mm	< .01
Phagocytosis of neutrophils	32.5%	51.3%	< .01
Nbt positive rate	23.1%	40.2%	< .001
Lymphocyte transform rate	54.3%	64.5%	< .01
C ₃ b rosette rate of RBC	8.4%	12.4%	< .001

Sun and Zhao¹⁰⁾ from Guang-An-Men Hospital conducted a clinical study on various advanced cancers. Among the 123 patients (mean age = 47, 60 males and 63 females) all were diagnosed pathologically with malignant cancer, 70 were in stage III and 53 in stage IV. The Qigong group (n=97) was treated with conventional drugs plus Qigong exercise (2 hours daily for 3 months), while the control group (n=30) was treated with the same drugs alone. At the end of the treatment they found that, among the Qigong plus drug group, 82% regained strength, 63% improved appetite, and 33% were free of diarrhea or irregular defecation, while the rates for control group were 10%, 10% and 6% respectively ($p < .01$). They also found that, 50.5% in the Qigong group gained 3+ kg in body weight as compared to 13.3% in the control group; only 5.4% in the Qigong group lost 3+ kg while 30% lost weight in the control group ($p < .01$). The blood tests of the two groups indicated that in the Qigong treated group the mean phagocytic rate of macrophages increased from the previously tested result of $34.7 \pm 8.9\%$ to $47.0 \pm 8.2\%$ after the treatment (a 35% increase); the phagocytic indices were 0.45 ± 0.11 and 0.63 ± 0.13 respectively before and after the therapy. The mean phagocytic rate in control group did not elevate, but decreased by 7.8%, the phagocytic indices changed from previous 0.63 ± 0.18 to 0.50 ± 0.14 after the therapy. In addition, 24% of patients in the Qigong group had normal erythrocyte sedimentation, and 21% had normal hepatic function, however, they constituted only 10% and 6.7% in the control group, respectively. In sum, the results suggest that Qigong therapy has some beneficial effect in ameliorating the symptoms, improving the appetite, strengthening constitution and increasing the self-healing ability.

Fu et al.¹¹⁾ of Henan Medical University observed 186 post-surgery patients of cardiac adenocarcinoma (155 males and 31 females; mean age = 59.8) over a period of 3 years. Among them, 7.5% were in stage I, 24.7% in stage II and 67.8% in stage III of various cardiac adenocarcinoma; 44.5% had lymph metastasis. The patients were randomly assigned into four treatment groups: surgery only (control; N=48), chemotherapy only (N=42), Chinese herbal therapy only (N=46), and Qigong plus

herb therapy (N=50). This last required the patients to practice specific Qigong everyday for a specific period of time. The post-surgery chemotherapy was the standard EAP protocol, two courses in the first year, two courses in the second year, and one course in the third year. After more than 5 years of follow-up study, they found that the one-, three- and five-year survival rates for the control group (surgical only) were 80.1%, 36.5% and 20.8%; for chemotherapy group there were 85.7% 45.2% and 25.1%; for herbal group there were 84.5%, 43.5% and 26.1%; and for the Qigong plus herb group 86.0%, 64.0% and 36.0%, respectively. The difference between the Qigong plus herb group and the control group was statistically significant ($p < .01$) (See Fig 1). The half survival period was 30 months for the control group, 36 and 36.5 months for chemotherapy and herbal groups, and 48 months for Qigong plus herb group. Unfortunately, the herbs and their combination were not specified in the report.



Zheng RR et al.¹²⁾ of Shanghai Qigong Institute applied a comprehensive Qigong therapy (Qigong technique not specified) to 100 various late-stage cancer patients, and compared their survival rate with those who had other therapies but no Qigong therapy in the same hospital. They found that one- and five-year survival rates were 83% and 17% for lung cancer patients (the control was 7% in 5 years); 83% and 23% for stomach cancer (the control was 12% in 5 years). The median survival period for liver cancer patients was 20.7 months in Qigong group, in comparison with 3.5 months in the control ($p < .01$). Ni Rongwen and colleagues at Jiangxi Medical School also applied Qigong with conventional therapy to 20 cancer patients, and reported a much better three- and five-year survival rates among these patients (80% and 45%) than the average of the similar patients in that hospital (65% and 34%)⁴⁾.

Ye Ming et al.¹³⁾ of the Shanghai Qigong Institute studied the effect of Qigong exercise on unscheduled DNA synthesis (UDS) of the peripheral blood lymphocytes in a clinical trial of 65 various cancer patients, plus a normal control. The cancer patients were randomly as-

signed into either Qigong (n=33) or chemo (control) group (n=32) after surgery. After baseline measures were taken, the Qigong group practiced Guo-Lin Qigong for 3 months before the follow-up measurements were taken. Table 2 presents the results of UDS rates before and after the treatment. The Qigong group had significant improvement in their DNA repair rate ($p < .001$) while the control (chemo) group had no change at all. Although both cancer groups had lower UDS rate than a normal group, the UDS rate of the Qigong group was significantly higher than the control group after the 3-month treatment period ($p < .01$).

Table 2. Effect of Qigong Therapy on the UDS

Group	N	Mean age	UDS Rate (%)	
			Before	3 Ms later
Normal control	34	36.3	76.9	76.6
Cancer control	32	48.5	27.5	27.1 *
Cancer w/ QG	33	48.2	27.5	42.1 * #

* $p < .001$ compared to normal control

$p < .01$ compared to cancer group and before treatment

Luo Sen et al.¹⁴⁾ of the Zhejiang Institute of TCM conducted a clinical trial with 80 cancer patients, who were at stage I or stage II of the disease and had previously received radiation or chemotherapy. The patients were randomly assigned to Qigong (n=30), chemo (n=25) or Qigong plus chemo groups (n=25). The count of RBC, WBC, serum hemoglobin and T-lymphocyte were measured pre- and post treatment. "Vital Gate" Qigong was used in this study. After 60 days of treatment, only the Qigong group had a significant rise in WBC, RBC and serum hemoglobin ($p < 0.01$), while the results of the control group were significantly reduced ($p < .01$). In the Qigong plus chemo group, the patients had an elevation of serum hemoglobin, RBC and platelet count ($p < 0.01$), but WBC levels remained the same. A similar finding was reported by Wang et al.¹⁵⁾ in their trial of 60 late-stage cancer patients: 29 of the 32 patients in chemo + Qigong group had improved health with stable WBC count, while 12 of 30 patients in chemo only group reported worsen health with more symptoms, and all control reported a decline in WBC ($< 4 \times 10^9/L$) ($p < .05$).

Wang¹⁶⁾ of the Teaching Hospital of Nanjing College of TCM explored the anti-tumor mechanism of Qigong therapy in a study of 104 different cancer patients (mainly comprised of esophagus cancer, stomach cancer, rectum cancer and lung cancer). These patients were taught to practice Qigong during their in-patient care, and continued doing so after surgery and leaving the hospital. The duration of Qigong practice ranged from 6 to 24 months before the follow-up exam. The protein levels (AAG, AAT and CER) were studied among 46 patients, and the cell immune function (LAI and ANAE) was studied among 58 patients before and after Qigong. The

study showed that sugar protein (AAT & AAG) had a dramatic drop after Qigong ($p < 0.01$), but CER increased after Qigong treatment ($p > 0.05$). As to immune indicators, LAI (Leucocyte adherence inhibition test) decreased ($p < 0.01$) while ANAE (alpha-naphthyl acetate esterase) increased after Qigong practice ($p < 0.05$).

Table 3. Comparison of Cell Immune Function in Cancer Patients Before and After Qigong Therapy

Indicators	Normal reference	Pre-treatment	Post-treatment	
Protein content (N=46)				
AAG	40.7 mg	48.9 mg	36.6 mg	$P < .01$
AAT	187.6mg	204.4 mg	179.3 mg	$P < .01$
CER	21.6 mg	29.3 mg	34.4 mg	$P > .05$
T-cell function (N=58)				
LAI	42.0 %	75.3 %	62.4 %	$P < .01$
ANAE	68.8 %	39.4 %	47.1%	$P < .01$

Xu Hefen and her colleagues at Jiangsu Provincial Institute of TCM also conducted a series of studies to explore the mechanism of Qigong anti-tumor therapy. In one of the studies¹⁷⁾, subjects were randomly assigned to one of 5 groups: 1) healthy people using Qigong ($n=72$); 2) healthy people not using Qigong ($n=50$); 3) people who keep bees ($n=50$); 4) cancer patients using Qigong ($n=50$) and 5) cancer patients not using Qigong. All of the malignant tumors were identified and confirmed by pathological biopsy. A blood sample was drawn from each person to test their T-lymphocyte level by ANAE (alpha-naphthyl acetate esterase) staining. The value of ANAE determination ($\bar{X} \sim SD$) in the 1st group was 74.9% 11.6%, vs. 65.6% 8.9% in the 2nd group ($p < 0.01$); and the 4th group was 69.2% 12.8% vs. 42.8% 7.1% for the 5th group ($p < 0.01$). The 3rd group (a special control group) was 76.8% 11.1%. The people who had practiced Qigong (whether they were healthy or a cancer patient) had significantly higher levels of ANAE than those who did not. In another study¹⁶⁾, they measured the Cupro-Zino Superoxide Dismutase (Cu-Zn SOD) activities in the red blood cell (RBC) among 229 cancer patients (124 in Qigong, 105 in control group) by color immunological plate reacted to the enzyme. They reported that Qigong practice raised the Cu-Zn SOD activity: after practicing Qigong, the Cu-Zn SOD activity in RBC is 399.7% 48.3ug/gHb vs. 356.8% 22.3ug/gHb without practicing Qigong ($p < 0.001$).

Recently, Cai et al.¹⁸⁾ of Shanghai Fangyi Hospital reported changes in the immune indicators and physical health among 1,883 cancer patients after practicing Guo-Lin Qigong. After practicing Guo-Lin Qigong for 2 months, a blood sample was drawn from each patient; the RBC and WBC count, immune protein IgG, IgA and IgM levels, NK cells and different CD cells counts were measured. They reported that most patients showed remarkable improvements in these categories and their im-

munity levels were raised after Qigong practice, especially WBC, CD20, IL-2 and NK activities ($p < .01$). In addition, 40.8% patients reported improvement in sleep, and 36.8% reported improvement in appetite.

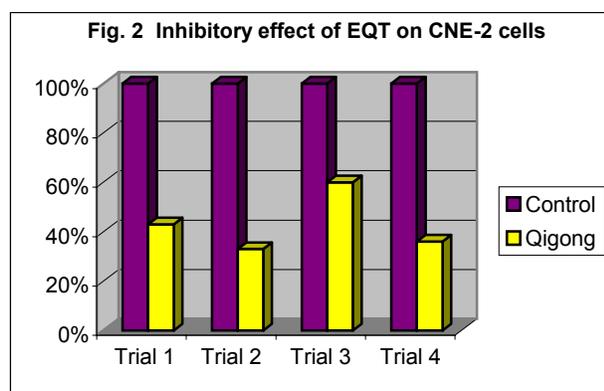
Among the clinical studies reviewed, although some lacked a valid control group, it seems that there is a consistent tendency that the group treated with Qigong therapy in combination with conventional methods had a more significant improvement and/or a better survival rate than those treated with conventional methods alone. Some studies reported complete remission from late-stage cancer or metastasized cancer, which is considered an impossible result through the use of conventional medicine alone. More extensive reviews of *in vitro* and *in vivo* studies of Qigong therapy for cancer may change our stereotype on this ancient energy therapy.

3.2. In Vitro Studies with EQT

To exclude the potential psychological effect of Qigong therapy in cancer treatment, scientists in China have paid special attention to the *in-vitro* study of various cancer cells with the application of EQT in order to understand how Qigong treats various cancers. The typical *in-vitro* study has involved randomly dividing the laboratory-prepared cancer cells or other cultures into different groups with at least one group being treated with EQ by Qigong, plus one or two control groups. Sometimes, one group was treated by sham Qigong for the same amount of time. The cancer cells being studied varied tremendously, including human breast cancer cell lines, erythroleukemia (K562), promyelocytic leukemia, nasopharynglioma, nasopharyngeal carcinoma (CNE-2), SGC-7901 gastric adenocarcinoma, spleen cells of mice, lung tumor cell line (LA-795), etc.

Feng Lida and her colleagues at China Immunology Research Center is the first to conduct studies on effects of the EQ by Qigong on human carcinoma cells. They used the techniques of tissue culture, cytogenetics and electron microscope to study the effect of EQ on the Hale cells and SGC-7901 human gastric adenocarcinoma cells. They repeated the same Hale cells experiment 20 times under the identical conditions (treatment sample exposed to EQ for 20 minutes), and found that the survival rate of the Hale cells in the Qigong group was an average 69.3% to that of control group, i.e. 30.7% of the cells were killed in the 20 minutes exposure to external Qi. The electron microscope showed that degeneration and swelling took place in some of the cells exposed to emitted Qi. The experiment with human gastric adenocarcinoma cells was repeated 41 times under the same condition (1 hour exposure to EQ by Qigong), in which the average survival rate of the SGC-7901 cells was 74.9% of that in the control, i.e. the average destruction rate was 25.02% ($p < .01$). The total abnormality rate of the chromosomes in the Qigong group (5.39%) was significantly higher than that of the control group (1.40%)^{19,20)}.

Chen Xiaojun and her colleagues²¹⁾ from Zhongshan University of Medicine have involved many studies in this area. In one of their studies a Qigong practitioner was invited to emit EQ toward the human Nasopharyngeal Carcinoma cell line (CNE-2) to observe the cell growth inhibition and H³-TdR incorporation inhibition. Compared with the non-treatment control, the inhibitory rates for the CNE-2 growth in four separate Qigong experiments were 43%, 33%, 60% and 36% ($p < .05$) (See Fig 2). The H³-TdR incorporation inhibitory rates in 6 different experiments of EQ ranged from 22% to 53% ($p < .01$). They have subsequently repeated this line of both *in vitro* and *in vivo* research and have had similar findings in^{22,23)}. These data suggest that EQ can inhibit the cell growth and DNA synthesis of the CNE-2 cells. Cao et al.²⁴⁾ from Cancer Institute of the same university replicated Chen et al.'s findings on inhibitory effect of EQ on CNE-2 growth. They compared the number of CNE-2 cells cloned after three types of treatment: EQ only, Gamma ray only, and EQ + G ray; and found that the number of cells cloned in G-ray + EQ group were 9.2 ± 2.5 , significantly lower than the G-ray alone group (15.8 ± 2.4 ; $p < .001$). The kinetic study showed that a number of cells cloned in EQ group were 16.5 ± 2.2 , close to the level of G-ray group, but it had started to increase after 48 hours, while the G-ray group continued to declining after 48 to 96 hours of cultivation.

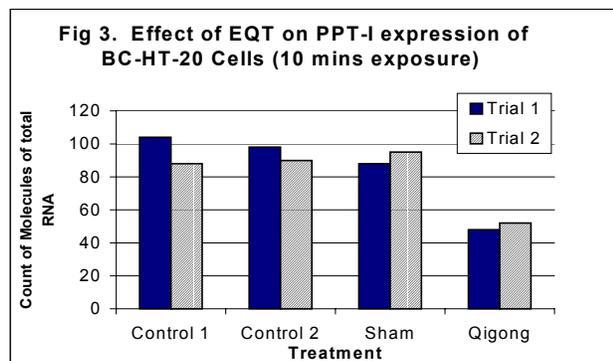


Yang and Guan²⁵⁾ from Guangzhou College of TCM used similar techniques -- ³H-TdR incorporation and tissue culture -- to study the effect of emitted Qi on the growth of human lymphocytes and tumor cells (erythro-leukemia, K₅₆₂). They found that the same EQ had different effects on the two kinds of cells. The emitted Qi promoted the growth of normal human lymphocytes (cpm 6032.4 ± 4937.0 in Qigong group and $3970.4 \pm 37.22.7$ in the control group, $p < .05$); but inhibited the growth of K₅₆₂ cells (cpm 9340.8 in Qigong group vs. 10760.2 in control, $p < .01$). Yu, et al.²⁶⁾, of the First Central Hospital of Tianjing, also used ³H-TdR incorporation and tissue culture methods to study malignant mice lung tumor cell line (LA-795) and normal cell (L-929) in mice and

found that the malignant cells were markedly destroyed or killed after exposure to EQ. Compared with the control group, the killing rates in 2 EQ groups ($n = 6$ each) are $26\% \pm 6.9$ and $21\% \pm 8.5$ ($p < 0.01$ in both studies); while the normal cells that had undergone the same treatment remained intact.

Chen YF of Shanghai Institute of TCM studied the effect of EQT on human liver cancer cell line (BEL-7402) and lung cancer cells (SPC-A1). Level of ATP and AFP of the cancer cells were measured 24 hours after EQ treatment to determine the activity of the cancer cell lines as compared to their activity after sham treatment. Compared to the sham-treated group, the level of ATP in the EQ group increased significantly. Meanwhile, the AFP levels in the EQ group decreased. Repeated experiments confirmed similar results for EQ effect: AFP levels decreased.²⁶⁾ Examination under the electron microscope found that, compared with the sham control, the EQ group had some interesting changes, such as the vacuolated in cytoplasm became increased, some light points in the cytoplasm and the nucleus, cell membranes broke down, the cell nucleus disappeared, and many cells swelled and died. In general the SPC-A1 in EQ group lost the characteristics of cancer cell^{26,27)}.

Recently, we conducted a pilot study at UMDNJ to explore the effects of EQT on PPT-I expression in four types of breast cancer cells by inviting Qigong healer to work with us. In our study four breast cancer cell lines (BC-123; BC 125; BC-HT-20; BC-T47D) were grown to confluence in four 6-well plates, one plate for each treatment condition: EQT treatment, sham treatment, incubator control, room temp control. The Chinese Qigong healer emitted Qi directly to the cell culture plates for 10 minutes. The "incubator control" plate was kept in an incubator, and the "room temp" plate was left on a lab bench in the same lab; while the sham treatment was performed by an individual who had no training in Qigong, but imitated the movements of the Qigong healer. After the designed treatment, all plates were re-incubated for 16 hours. Total RNA was extracted by using the standard procedure and then it was used in quantitative RT-PCR to determine the levels of beta-PPT-I. The results showed no significant difference between the two control groups, whether the sham treated cells and the other controls groups. However, there was a consistent and obvious downward trend among the BC cells treated by Qigong. Except for the BC-T47D cells, Qigong treated cells have consistently lower cell growth rate than any other groups. Compared to sham-treated cells, the closest control in this design, in all 8 observations (4 different BC cells in two separate trials), the Qigong-treated cells had the slowest growth. This could have occurred by chance only at $p = 0.0038$ in a cumulative binomial probability distribution. Fig. 3 presents the result of four treatments for BC-HT-20 cells in two separate trials.



Other similar *in vitro* studies of EQT on cancer cells include Cao et al's study to examine the effect of EQT on IL-2, IFN-r, LT from spleen cells of C57BL mice²⁸⁾, Hu et al's study²⁹⁾ of the effect of EQT on human promyelocytic leukemia cell line (HL-60), and Ye et al.³⁰⁾ study of EQT killing rate of human peripheral blood lymphocytes. Due to the limitations of the space, we are not going to discuss these *in-vitro* studies in detail. In short, most of the *in vitro* studies have used the similar design as reported above, and demonstrated the significant inhibitory effect of external Qigong on the growth of the studied cancer cells in comparison with the control and sham-treated groups. This strongly suggests that the effect of Qigong therapy for cancer is not purely psychological.

3.3. *In Vivo (Animal) Studies of Qigong for Cancer*

The *in-vivo* (animal) studies of Qigong therapy for cancer treatment are more sophisticated and more closely resemble those of human application. The typical study of this type involved the injection of tumors or cancerous cells into mice or rats; then randomly dividing the experimental animals into various groups with one group being treated by Qigong for a set period of time. The control group could be either non-treatment or sham treatment. The major results of these studies were concentrated on the survival rate of the animal itself or the rate of tumor size reduction. A summary table of findings from 18 published *in vivo* studies are available upon request. In general, most studies reported that the Qigong-treated group often had significantly reduced tumor growth and/or longer survival lives among the cancer-infected animals.

One of the largest studies of this type was conducted by ZhaoTongjian and his colleagues from Xuanwu Hospital of Capital Medical College³¹⁾. They chose gliomas of mice (G_{422} , a very stable and malignant tumor model) as the experimental model, and conducted a total of 25 trials or studies. Each had a treatment and a control group and utilized 11 Qigong healers, 2 non-Qigong practitioners, and 494 mice with induced gliomas. In most trials, the mice were transplanted with gliomas before they were randomly assigned into either Qigong treatment or a con-

trol group. The mice were sacrificed around 12 days after the transplantation in order to remove the tumors for various examinations. Among the 25 separate studies, they observed the inhibitory effect of the Qigong group in 16 (64%). Of these, 11 had an inhibitory rate greater than 20%, 4 had inhibitory rate greater than 40%. However, in 8 of the 25 studies, the Qigong treated group had a larger tumor than the non-treatment control, including 5 studies with Qigong healers, and 3 with non-Qigong practitioners. The studies with increased tumor growth usually had a shorter period of time being exposed to EQ (3 to 10 minute a day instead of 60 minutes a day in other studies), and a different style of Qigong (different healers or non-practitioners). This result suggests that not all Qigong can produce the same inhibitory effect on tumors, and that the amount of time exposed to Qigong may play a significant role in the healing (dosage effect).

Funded by the National Science Foundation (China), Li Caixi et al.³²⁾ at Xiyuan Hospital of China Academy of TCM also examined the gliomas in mice (G_{422}) with EQT. In their studies, tumor-implanted mice were divided into 4 groups: normal control, tumor control (no treatment), EQ 1 and EQ 2. Eight different Qigong healers emitted EQ to different mice once a day. After 11 days of Qigong treatment, mice were sacrificed in order to weigh the lymphnodes and spleens; blood samples were obtained, lymphocytes suspensions prepared, and the activities of NK and K cells were measured. They found that the tumor growth in EQ groups was significantly slower than that in the control ($p < .05$); the NK cell and K cell activities in the normal control and the EQ groups are significantly higher than the tumor control group (See **Table 4**).

Table 4. NK and K cell activities in Lymphoid cells of mice with Gliomas, measured by Hb-ERA Method

Group	N	NK cell activities	K cell activities
Normal control	6	62.1	18.2
Tumor control	6	54.8	12.2
Qigong 1	6	66.0	47.5 *
Qigong 2	6	68.9	19.7

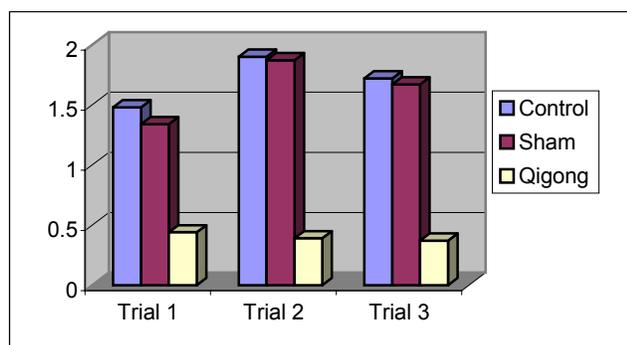
* $p < .01$ compared to tumor control group.

In the studies of Qian et al.³³⁾ to examine the effect of EQ on cancer growth, metastasis and survival time of the host, tumor models were formed in 114 mice by transplantation of U27 or MO_4 cells into their subcutaneous tissues. The tumor-infected mice were randomly divided into two treatment groups in three separate studies – Qigong group (exposed to EQ 10 to 30 minutes daily for a period of time) and control group (no treatment). In study 1, mice in both groups were sacrificed on day 20 after the transplantation. The average tumor volume in the Qigong group was significantly lower than that in control (2.25 ± 5.35 vs. 6.32 ± 10.02 cm^3 ; $p < .001$). In study 2,

the mice were sacrificed on day 23 and all armpit lymph nodes and the lungs were taken out individually to be examined histopathologically for metastasis. The metastatic rate in the Qigong group was significantly lower than the control group (1/16 vs. 6/15; $p < .05$). In study 3, the mice were not sacrificed but were allowed to live out their lives and the time of death was recorded for each. The average survival time in Qigong groups ($n=10$) was significantly longer than that of the control group (35.4 vs. 30.5 days; $p < .01$). The same authors performed similar studies in different settings and they each reached the same conclusion.^{34,35)}

To explore the effect of external Qigong emission on transplanted hepatic cancer in mice, Chen et al. at Zhongshan University of Medicine investigated the anti-cancer efficacy of EQ from the master of Taiji Five-Element Qigong on transplanted liver cancer in mice³⁶⁾. The setting: 30 mice that have been injected with hepatocarcinoma were randomly assigned into three groups: the control (no-treatment), the sham (a non-Qigong person imitating the Qigong master's movement) and the Qigong group (treated by Qigong master). The Qigong treatment involved the Qigong master emitting EQ towards the mice at a distance of 10-15 cm for 10 minutes from day 3 of transplantation, every other day, for a total of four sessions. The mice were then sacrificed on day 10 or 11, the liver cancer was separated out, measured and weighed in a blind fashion. The results of three repeated experiments of this description are presented in Fig 4. Compared with the control group, the tumor growth-inhibitory rates of Qigong treated group were 70.3%, 79.7%, and 78.7%, respectively ($p < 0.0001$). The inhibitory rates of the sham treated group were 9.5%, 2.6%, and 2.5%, respectively ($p > 0.05$). Morphological alterations in Qigong treated mice include decreased cell volume of most cancer cells; nuclear condensation, nuclear fragmentation; decreased ratio of nucleus and cytoplasm; swollen mitochondria with poorly organized mitochondrial cristae, some vacuolated; many apoptotic bodies in extracellular space. These results indicate that Chinese Taiji Five-Element Qigong inhibited the growth of transplanted hepatocarcinoma in mice.

Fig 4. Inhibitory Effect of EQT on Hepatocarcinoma in Mice



In addition to the consideration of psychological effect in Qigong therapy, another major problem in the previous Qigong research has been the repeatability. Many Qigong healers could not effectively repeat what they did in a prior study, which raised the concern on the reliability, and sometimes the validity, of the effects or differences observed in Qigong research. The Chen et al.³⁶⁾ study achieved very good stability and repeatability. The three separate experiments showed very similar results, which confirm the objective existence and inhibitory power of Qigong therapy for cancer.

Lei XF et al. at Tongji Medical University examined the *in vivo* anti-tumor effect of EQT on the immunologic functions of tumor-bearing mice (TBM)³⁷⁾. They investigated the effects of both EQT and cyclophosphamide (CY), and their influence on the splenic NK activities, macrophage-mediated tumor cytotoxicity (MTC) activity and interleukin-2 (IL-2) production level of different groups of TBM. The TBMs inoculated with EAC or S-180 were randomly divided into 4 groups: tumor control, Qigong only, CY only, and CY plus Qigong. When Qigong group exposed to EQT twice a day for two weeks, the CY group were injected of CY daily at 40mg/kg. Their results show that EQT had significant tumor growth inhibition rate (TGIR) in both models (Table 5). The NK activity is $17.4 \pm 7.1\%$ for EQ only; $20.1 \pm 5.7\%$ for CY plus EQ, versus $8.4 \pm 3.7\%$ for control ($p < .01$); the MTC activity for CY+EQ is $11.0 \pm 5.6\%$, versus $23.1 \pm 7.3\%$ for the control ($p < .01$). IL-2 levels were $0.34 \pm 0.03\%$ for EQ vs. $0.30 \pm 0.02\%$ for the control ($p < .01$).

Table 5. Inhibitory effects of EQT and/or CY on the tumor growth in Mice

Treatment group	EAC			Ascitic Sarcoms-180		
	N	tumor weight (g)	TGIR (%)	N	tumor weight (g)	TGIR (%)
1. Control	8	1.79	--	8	3.50	--
2. Qigong	8	0.91	49.2	8	1.20	65.7
3. CY	8	0.47	73.7	7	0.65	81.4
4. CY + QG	8	0.35	80.4	7	0.34	90.3

1 vs. 2, $p < .01$; 3 vs. 4, $p < .05$

A similar *in vivo* study of the effects of EQT and chemotherapy (CY) on anti-tumor lymphokines was done by Zhang Li et al. 38 mice induced by cyclophosphamide (CY) were randomly divided into CY groups, CY plus EQ group and a control group. CY + EQ group received Qigong for 20 minutes a day for 8 days. Splenocytes suspensions ($5 \times 10^6/\text{ml}$) were then made into several parallel portions for inducing IL-2, IFN- γ , and LT. After the treatment, the thymus index of CY group was 2.30 ± 0.42 , the control 3.91 ± 0.57 and the CY + EQ 2.97 ± 0.54 . The splenocytes spontaneous proliferation rate in the control and CY group is low, 3062.5 and 3294.0 respectively; but the CY + EQ group was as high as 7261.7

($p < 0.05$). IL-2 activity of CY group was lower than control ($p < 0.025$), but CY+ EQ group is higher than CY or control group ($p < .001$).

There are many more similar *in vivo* studies in the literature. For example, Feng et al. investigated the inhibitory effects of EQT on L1210 cells of leukemia³⁹⁾ and Sarcoma cells⁴⁰⁾ in mice; Cao XT et al.⁴¹⁾ and Chu WZ et al.⁴²⁾ examined the effect of EQT on B16 melanoma tumor cells and lung cancer cells in C57BL mice; Lin Bingsui et al.⁴³⁾ explored the effect of EQT on mammary (MA37) and lung adenocarcinoma in mice; Shao XM et al.⁴⁴⁾ studied the effect of EQT on sarcoma cells (S-180) implanted in mice; and Zhou et al. (1990) inspected the effect of EQT on EAC tumor model in mice in three separate trials. All of them were well-designed *in vivo* studies with valid controls, and each reported significant inhibitory effect or prolonged survival time from EQT among tumor-bearing mice.

4. Discussion

Cancer is one of the leading causes of death among human beings. Most current treatments for cancer are effective in controlling the symptoms or prolonging patient's life to varying degrees, but all come with significant drawbacks, including toxicity, costs and potential harm to both mood and immune function. Therefore, an effective non-pharmacological therapy for cancer with less cost and no side effects could have a major impact on cancer treatment. Qigong therapy from TCM shows promise in treating cancer and preliminary studies report immediate improvement without side effects and even complete remission in patients who engaged in ongoing practice of Qigong⁴⁶⁾. This energy medicine has great potential to become a powerful alternative to or complementary therapy for the conventional treatment of cancer. However, there needs to be more well-designed clinical trials that systematically apply this therapy in human patients so that more people can benefit from it.

It is true that there is a lot of room for improvement in these preliminary studies, and some need to be replicated by more laboratories and clinics in order to verify the findings. Nonetheless, it is not hard to draw a general picture that Qigong therapy for cancer may be a powerful alternative to what we are using today. Unfortunately, this is an area that is often neglected by mainstream medicine and research because many doctors and scientists require a deeper understanding of this mode of therapy.

4.1. Possible Mechanisms

Most studies being reviewed just attempted to prove a principle: Qigong therapy could be effective and more than just a psychological effect. This is an important first step to get more scientists interested in this area. However, some of them also offered scientific explanation for the results, which touch some of the mechanisms between

Qigong therapy and cancer. We are planning a separate review specifically on this topic, especially how Qigong therapy affect human immune system. The following are just an outline of the major scientific findings on the possible mechanisms of Qigong therapy for cancer:

1) *Qigong therapy may improve immune functions.* The human body has a powerful immune system to defend itself, but most cancer patients experience some form of immune deficiency that makes it possible for cancer cells to stay and outlive the normal cells. Many studies suggest that Qigong therapy and/or Qigong practice may help cancer patients increase their immune functions. For example, Feng found that EQ from Qigong healer could enhance the phagocytosis of peritoneal macrophages, and increase the activity of acid phosphatase³⁹⁾. From their clinical studies of cancer patients, Zhang reported that Qigong practice has significantly increased cancer patients' C₃b rate of red blood cells, the rate of lymphocyte transformation, and phagocytosis of phagocytes.⁴⁷⁾ Many studies show that the increase of NK cells and many other components of the immune system can significantly reduce the chances of infection or tumor growth.^{19,17)} Some studies also reported the rise in the level of T-lymphocytes with enhanced immune function after Qigong.^{48,16,30)} Other components of the immune system, such as the activity of the macrophages and bacteriocidal functions of the neutrophils also improved as the patients practiced Qigong. Given the fact that most cancer therapies tend to damage or destroy patient's immune functions, which reduces the patient's overall capability of self-recovery, the indication of improvement in the immune system from Qigong therapy warrants further in-depth research of its therapeutic effect on cancer.

2) *Qigong therapy may increase the microcirculation functions.* Microcirculation refers to the blood circulation between micro-artery and micro-vein (capillary). Qigong practice has been reported to improve the practitioner's microcirculation, changing the viscosity of blood, increasing elasticity of blood vessels, and controlling the concentration of platelet⁴⁹⁾. Jin Wang et al. measured the skin temperature before and during Qigong practice, and found that there's an increase in back part of facial temperature and more infrared radiation from the palm. Another study reported significant increase in microcirculation of nail-wrinkles among 19 subjects, from the mean of 8.2 lines/mm prior Qigong increased to 12.6 lines/mm after Qigong ($p < .001$)⁴⁹⁾. They concluded that, Qigong therapy could adjust the microcirculation function to the optimal state by accelerating blood flow, raising the skin temperature and increasing the number of micro blood vessels, which in turn increases the oxygen and blood supplies to the tissues and cells, strengthen the metabolism, and changes the pathological state to normal biological state to achieve the result of anti-tumor or maximizing the efficacy of chemotherapy. Huang et al.¹⁾ also

reported the increased microcirculation of lung among cancer patients who practiced Guo-Lin Qigong.

3) *Qigong therapy can raise the pain threshold.* From early 1980s, psychologists in China started to explore the possibility of Qigong therapy raising the pain threshold, and they achieved some positive findings. For example, Jisheng Wang et al.⁵⁰⁾ of the China Academy of Science tested the pain threshold at different body locations among 59 cancer patients, and found the pain threshold at the right inner joint increased from 122.2 grams before to 164.07 grams during Qigong practice ($p < .01$), and the pain threshold at the left inner joint increased from 100.0 to 125.76 grams during Qigong practice. Zhang JM et al. at Zhong Shan Medical University also reported the analgesic effect of EQ in a placebo-control study, and they found that external Qigong could increase human skin pain threshold, measured by the method of potassium mediated pain.⁵¹⁾ Yang⁵²⁾ have reported the analgesic effect of emitted Qi on rats, which made the psychological effect on pain less possible.

Many other explanations regarding the interaction between the Qi (vital energy) and physical body have not been completely verified by research. Qigong's therapeutic properties may also lie in its regulation of the respiration system, metabolic system, activity of cerebral cortex, central nervous system, and cardiovascular system, as well as its effect in correcting abnormal reactions of the organs, the massaging effect on the organs of abdominal cavity, and its effect on self-control over the physical functions of one's body.⁴⁹⁾ There is not yet enough research or data to sufficiently document these effects.

4.2. Problems and Limitations

Although Qigong may be a powerful alternative for traditional western medicine and therapy on cancer treatment, current research geared toward Qigong and its therapeutic effect may have many problems and limitations. To recognize the problems is a necessary step of more in-depth investigation into Qigong therapy.

Lack of sophisticated research design and compatible control groups undermines the results of many clinical studies. Observational studies are a good first step to get more doctors and scientists' to focus on this therapy, but they are not enough to determine the actual effectiveness of Qigong therapy for different types of cancer. Although traditional double blind clinical trials may be difficult to apply to Qigong study due to a lack of a compatible "sham" Qigong in reality, a reasonably large sample size with a compatible control is a must for examining such an alternative therapy.

For any scientific study of a new therapy or treatment, a large amount of time and resources are needed for an accurate account of effectiveness, dose response and side effects. However, most studies of Qigong therapy have been done by Chinese scientists who were confronted with the problems that come with a lack of sup-

port and resources. Some studies were actually conducted by Qigong practitioners or amateurs, and some studies were simple-minded and very preliminary due to lack of experience and/or support from health care professionals. Though well intentioned, these studies have often attracted criticisms about their quality and reliability.

As previously pointed out, Qigong comes in many forms, and not all Qigong forms are effective in treating cancer; and not all "Qigong masters" can effectively emit EQ for cancer study. As reported in Zhao et al.⁵³⁾ some Qigong healers produced more tumor growth in treatment than the control group due to their lack of proper technique in the emission of Qi. To add to this complexity, many "Qigong masters" claim their form of Qigong is superior to others in terms of therapeutic effect. Without any physical or biological measurement of Qi and its effects, and the lack of general interest in understanding the Qigong effect from the research community, it is extremely difficult to measure effectiveness or success of one type of Qigong over another. Many studies of Qigong therapy for cancer did not specify what forms of Qigong were used and how they differed from each other, making the reviews and evaluations more problematic. Therefore, it is necessary to pay more attention to what type and format of Qigong is used during the treatment and explore the common and/or various mechanisms for different kinds of Qigong.

If you plan to conduct research on EQT for cancer, be prepared to experience some failures in the beginning of your study. Not all researchers have had positive findings in their Qigong explorations. First, it is hard to locate a qualified Qigong healer to collaborate with you in research since there are much more well meaning but ineffectual "masters" or unqualified Qigong practitioners than the practitioners with real and testable ability. Even if you get some positive findings with the right healer(s), you may not be able to repeat the same result even with the same healer since the results of each study are highly related to a variety of factors such as: the presence of others, the environment, the healer's subjective feeling, or physical and psychological well-being. When discussing EQT, we are talking about the effect of concentrating human intention and subtle energy, which may vary tremendously as different elements come into play. Many of the published studies were the result of perseverance after a number of failures or no significant effects in the previous (unpublished) studies. We actually found some reports on the absence of an effect from EQT in the literature⁵⁴⁾. It is a great challenge to conduct high-quality research on Qigong therapy, especially if you do not have support in funding and resources.

4.3. Conclusions

The very existence of human subtle energy has been a challenge for modern medicine and modern science in general since we really have no effective means to meas-

ure it. So the general tendency of scientific community has been to ignore its existence, sometimes labeling it as placebo effect and avoiding any study of it. However, the therapeutic effect of this subtle energy on cancer may change this tendency. Much evidence suggests that Qigong therapy for cancer is more than just a psychological effect. Studies on Qigong and its curative effect on cancer have demonstrated consistent result for its inhibitory effect on cancer growth and metastasis, in both *in vitro* and *in vivo* studies, as well as in clinical observation. It is possible to reach a general conclusion that Qigong therapy for cancer treatment may be a powerful alternative to what we are using today in treating cancer.

Qigong therapy is an area that is often neglected by mainstream medicine and research. Our review suggests that this therapy should be seriously examined and be considered as an important supplemental to the conventional cancer treatment and other chronic diseases.

Although Qigong research poses difficulties and problems in explanation and replication, qigong therapy can provide an invaluable alternative to modern western medicine. Unlike other alternative medicines, which are only able to cope with symptoms, Qigong therapy focuses on the entire body and its health system. Our review suggests that Qigong therapy may actually stop and prevent cancer growth, and help patients recover from many different diseases at the same time. We hope that more studies and researches will be done in this area, and that this review will serve as an introduction to the world of Qi and Qigong research.

References

- 1) Huang, NQ et.al. Influence of Guo-Lin Qigong on the lung function microcirculation in cancer patients. *Zhongguo Renti Kexue (Chinese Journal of Somatic Science)*. 1996:151. [in Chinese]
- 2) Liao Y. Taiji Five-Element Qigong saved my life from the terminal metastatic cancer. *Zhongguo Qigong Kexue (China Qigong Science)*. 1997 (8): 20-21[in Chinese]
- 3) Shen MX. Qigong is an effective way to defeat cancer. *Zhongguo Qigong Kexue (China Qigong Science)*. 1997 (5): 8-10. [in Chinese]
- 4) Huang GH. A review of scientific research on Qigong anti-cancer therapy. *Zhongguo Qigong Kexue (China Qigong Science)*, 1997 (5): 5-6. [in Chinese]
- 5) Wei BR. Qigong medicine has a bright future. *Zhongguo Qigong Kexue (China Qigong Science)*. 1997 (6): 6-8. [in Chinese]
- 6) Zhang, PY, The experts confirmed the achievement of Qigong anti-cancer therapy: Chinese Taiji Five-Element Qigong is one of effective means to defeat cancer." *Zhongguo Qigong Kexue (China Qigong Sciences)*, 3:: 8-10. 1997. [in Chinese]
- 7) Sancier KM. Search for medical applications of Qigong with the Qigong Database. *Journal of Alternative & Complementary Medicine*. 7(1):93-5, 2001
- 8) Zhang RM. Clinical observation and experimental study of Qigong therapy for cancer. *Zhongguo Qigong Kexue (China Qigong Science)*. 2(8): 24-29, 1995[in Chinese]
- 9) Yu Y, Zhang RM, Huang XQ et.al. Effects of self-controlling Qigong therapy on the immune function of cancer patients. *Proc. of the 2nd World Conf. for Acad Exch. of Med. Qigong*. Beijing, China. 1993:128.
- 10) Sun QZ, Zhao L. Clinical observation of Qigong as a therapeutic aid for advanced cancer patients. *Proc. of the 1st World Conf. for Acad. Exch. of Med. Qigong*. Beijing, China. 1988:97
- 11) Fu JZ, Fu SL, Qin JT et.al. Effect of Qigong and Anticancer Body Build Herbs on the Prognosis of Prostatectomy Patients with Cardiac Adenocarcinoma. *Proc. of the 3rd World Conf. on Med. Qigong*. Beijing, China. 1996:131
- 12) Zhang JJ, Yu WX et. al. Preliminary report on anti-tumor effect of EQ of Qigong. *Proc. of the 3rd Natl Acad Conf. on Qigong*. Guangzhou, China. 1990:58, 76.
- 13) Ye M, Wang Y, Mao CX et.al. The effect of Qigong Exercise on Unscheduled DNA synthesis of the Peripheral Blood Lymphocytes of cancer patients, *Proc. of the 4th Intl Symp. on Qigong*. Shanghai, China. 1992:82
- 14) Luo S, Tong T et.al. Effects of vital gate Qigong on malignant tumor. *Proc. of the 1st World Conf for Acad. Exch of Med. Qigong*. Beijing, China. 1988:126.
- 15) Wang SH, Wang BR, Shao MY et.al. Clinical study of the routine treatment of cancer coordinated by Qigong. *Second World Conference for Academic Exchange of Medical Qigong*. Beijing, China. 1993:129.
- 16) Wang, JM. On the Anti-Tumor mechanism of Qigong. *First World Conference Acad Exch Med Qigong*: Beijing, China. 1988:121.
- 17) Xu HF, Wang GM, Xue HN et.al. An Observation of T-lymphocytes by ANAE staining in the Clinical application of Qigong. *Proc. of the 1st World Conf. for Acad. Exch. of Medical Qigong*. Beijing, China. 1988:52.
- 18) Cai GH, Zhang Y, Zhu QH, et al. The Changes of multiple immune indicators after Guo-Lin Qigong practice among cancer patients. *Proc. of the 8th Intl Symposium on Qigong*. Shanghai, China. 2001:170-172.
- 19) Feng LD, Qian JQ, Chen S. Research on Reinforcing NK-cells to kill Stomach Carcinoma cells with Waiqi (emitted Qi). *The Proc. of the 3rd Natl Acad Conf on Qigong Sciences*. Guangzhou, China. 1990: 58, 75.
- 20) Feng LD. *Xiandai Qigong Kexue (Modern Qigong Science)*. Economic Science Publisher. Beijing, China. 1994.[in Chinese]
- 21) Chen XJ, Gao QY, Jao XR, Zhang JM et.al. Effects of Emitted qi on inhibition of Human NPC cell line and DNA synthesis. *3rd Natl Acad Conf on Qigong Science*. Guangzhou, China. 1990:79, 60.
- 22) Chen XJ, Ye M et.al. . The effect of EQ of Qigong on human nasopharynglioma cell growing in nude mice. *Proc of the 4th Intl Symposium on Qigong*. Shanghai, China. 1992:14.
- 23) Chen XJ, Yi Q et.al. Observations on the effect of the emitted qi on the reversion of nasopharyngeal carcinoma cell line. *Proc of the 3rd World Conf on Medical Qigong*. Beijing, China. 1996:8, 108.
- 24) Cao QY, Li YQ, Cheng CQ et.al. Inhibition of Human Nasopharyngeal carcinoma cells in vitro by the emitted qi

- and gamma-ray. *Proc. of the 2nd World Conf for Acad Exch of Medical Qigong*. Beijing, China. 1993:103.
- 25) Yang JH & Guan HB. Effect of emitted qi of Qigong on human lymphocytes and tumor cells Qi *in vitro*. *Proc. Of the Third Nat. Acad. Conf. On Qigong Science*. Guangzhou, China. 1990:81.
 - 26) Chen YF. A study of the effect of Qigong EQ on the ConA agglutinating reaction of human lung cancer cells(SPC-A) *Chinese Journal of Somatic Science*. 2(2): 63-66. 1992
 - 27) Chen YF. Analysis of the effect of EQ of Qigong on the human hepatocarcinoma cells (BEL-7402) with the flow cytometry. *Chinese Journal of Somatic Science*. 3(4) 151-3. 1993
 - 28) Cao XT, Ye TX, Gao YT. Anti-tumor Metastases Activity of the emitted Qi in tumor-bearing mice. *Proc. of the 1st World Conf for Acad Exch. of Medical Qigong*. Beijing, China. 1988:50
 - 29) Hu ZL, Chen HY et.al. Observation of Chinese Qigong (Lu Ho Kuen Outer Qi) on inducer of Thermal Granulocytic Differentiation of the Human Promyelocytic Leukemia Cell-Line, HL-60". *Proc. of the 2nd Intl Conf. on Qigong*. Xi'an, China. 1989:95.
 - 30) Ye M, Shen JQ, Yang YJ. An observation of in-vitro effect of the emitted qi on human peripheral blood lymphocytes. *Proc. of the 1st World Conf for Acad Exch of Medical Qigong*. Beijing, China. 1988:48.
 - 31) Zhao TJ, Li CX, Lu DY et.al. Investigation on effects of external energy (wai-qi) on gliomas(G₄₂₂) cell in mice. Pp. 42-63 in Hu HC & Wu QY (eds.) *Collected Works of Qigong Science, III.* Beijing: Beijing University of Technology Press. 1991.
 - 32) Li CX, Zhao T, Lu D et.al. Effects of Qigong-Waiqi on Immune Functions of Mice with Tumors. *Proc. of the 3rd Natl Acad Conf on Qigong Sciences*. Guangzhou, China. 1990:67-68, 86.
 - 33) Qian SS, Sun W, Liu Q et.al. Influence of emitted qi on cancer growth, metastasis & survival time of the host. *Proc. of the 2nd World Conf for Acad. Exch. of Medical Qigong*. Beijing, China. 1993:106
 - 34) Qian SS, Shen HX. The curative effect of the emitted Qi on mice with MO4 tumors. *Proc. of the 2nd World Conf. for Acad. Exch. of Medical Qigong*. Beijing, China. 1993:107.
 - 35) Qian SS, Gao CM, Wu YD et.al. A Preliminary Experimental Research of the Curative Effect of "Waiqi" of "Qigong" on the Cancer Growth and Metastasis. *Proc. of 4th World Conf. on Qigong*. Beijing, China. 1998:127.
 - 36) Chen XJ, Li YQ, Liu GC and He BH.. The inhibitory effects of Chinese Taiji Wuxing Qigong on transplanted hepatocarcinoma in mice. *Yazhou Yixue (Asia Medicine)*. 1997,11: 36-38[in Chinese]
 - 37) Lei, XF, Bi AH, Zhang ZX et.al. The Antitumor Effects of Qigong-emitted EQ and Its Influence on Immunologic Functions of Tumor-bearing Mice. *Journal of Tongji Medical University*. 11(4): 253-256, 1991.
 - 38) Zhang L, Yan XZ, Zhou Y et.al. Study of Enhancement in Inducing Anti-tumor Lymphokine by Qigong Waiqi on Immunosuppressed Mice. *Proc. of the 3rd Natl Acad Conf on Qigong Sciences*. Guangzhou, China. 1990: 67-68.
 - 39) Feng, LD; Zhao XZ. A study of effect of Emitted Qi on the L1216 cells of Leukemia in mice. *Proc. of the 1st World Conf. for Acad. Exch. of Medical Qigong*. Beijing, China. 1988:8
 - 40) Feng LD, Liu C, Zhu L et.al. Observation of the effect of emitted Qi combined with antitumor herbs on growth of transplanted tumors in mice. *Proc. of the 3rd World conf. on Medical Qigong*. Beijing, China. 1996: 5-6, 105.
 - 41) Cao XT, Ye TX, Gao YT. The effect of the emitted qi in enhancing the induction in vitro of lymphokines in relation to Anti-tumor mechanisms. *Proc. of the 1st World Conf. for Acad. Exch. of Med. Qigong*. Beijing, China. 1988:51.
 - 42) Chu, WZ, Jiang DL et.al. *Proc. of the 2nd Intl Conf. on Qigong*. Xi'an, China. 1989.
 - 43) Lin BS, Dou GR, Cui ZH et.al. Studies of the Mice Tumors Treated by Qigong Waiqi. *Proceedings of the 2nd Intl. Conf. On Qigong*. Xi'an, China. 1989:72.
 - 44) Shao XM, Liu GC; Zhou QJ et.al. Effects of Qigong Waiqi on the growth and differentiation of implanted tumor cells. *Proc. of the 3rd Nat.l Acad. Conf. on Qigong*. Guangzhou, China. 1990:85.
 - 45) Zhou LD, Wang XZ, Zhang S et.al. Study on the mechanisms of the Anti-tumor Effect of Qigong Waiqi. *Proc. of the 3rd Nat.l Acad. Conf. on Qigong Sciences*. Guangzhou, China. 1990: 69, 88.
 - 46) Zhang RM, Huang XQ, Yu Y, Guo YY, 1997. Clinical observation and experimental studies of the effect of self-control Qigong therapy on 2912 patients of cancer and other chronic diseases. *Dongfeng Qigong(Eastern Qigong)*, 1997(2): 37-40.[in Chinese]
 - 47) Zhang XJ et.al. *Zhongguo Qigong Dadian (Chinese Encyclopedia of Qigong)*. Beijing. 1995:506.[in Chinese]
 - 48) Wan ZC; Shan GX, Fang WZ et.al. A Preliminary Observation on the effect of Qigong Waiqi on the function of making blood. *Proc. of the 3rd Nat.l Acad. Conf. On Qigong Science*. Guangzhou, China. 1990:50.
 - 49) Shen GX, Gao JX .Exploration of the mechanisms of Qigong anti-cancer therapy. *Zhongguo Qigong kexue (China Qigong Science)*. 1995:2(8): 30-31.[in Chinese]
 - 50) Wang JS, Li DZ, Zhao JZ. Experimental study of compound analgesia by Qigong information treating instrument and acupuncture. *Proc. of the 2nd Intl Conf. on Qigong*, Xian, China. 1989:135.
 - 51) Zhang JM, Chen YF, He JH, Xian T & Yi Y. Analgesic effect of emitted Qi and the preliminary study of its mechanism. *Proc of the 3rd Natl Acad. Conf. on Qigong Sciences*. Guangzhou, China. 1990:37.
 - 52) Yang KS, Xu H, Guo ZL, Zhao BG & Li ZH, 1988. Analgesic effect of emitted Qi on white rats. *Proc. of the 1st World Conf. for Acad Exch of Med. Qigong*. Beijing, China. 1988:45.
 - 53) Zhao HM, Bian JN. Curative effect of intelligent Qigong on 122 tumor patients. *Proc. of the 2nd World Conf. for Acad Exch. of Medical Qigong*. Beijing, China 1993:130.
 - 54) Zhang WB. Yu WL. Yang YJ. Absence of an analgesic effect of Qigong "external qi" in rats. *American Journal of Chinese Medicine*. 26(1):39-46, 1998