

The Newsletter of the Office of Cancer Complementary and Alternative Medicine

In this issue:

- 1**
Feature
- 3**
A Conversation with
- 5**
News from the Field
- 6**
Funding Opportunities
- 8**
Research Resources
- 8**
Research Highlights
- 10**
CAM Information
- 11**
Meetings
- 12**
Featured Scientific Meetings

Conference Convened on Collaboration in Cancer CAM Research

If the history of science has taught us anything, it's that teamwork is the way to go.

"Nothing new that is really interesting comes without collaboration," James Watson once said after the double helix discovery with Francis Crick back in the 1950s.

The National Institute of Cancer's (NCI) Office of Cancer Complementary and Alternative Medicine (OCCAM) couldn't agree more.

In October 2007, OCCAM hosted the Cancer Researchers and CAM Practitioners: Fostering Collaborations; Advancing the Science conference to bring together people who work with everything from apoptotic cancer cells to acupuncture. The goal was to facilitate one of the most important factors in science: teamwork.

OCCAM has long recognized that building and sustaining strong

interdisciplinary partnerships is a critical factor in the success of some cancer complementary and alternative medicine (CAM) research endeavors. To promote this, OCCAM Director Dr. Jeffrey D. White and his staff organized a two-day conference at the National Institutes of Health's (NIH) Natcher Conference Center for over 100 participants from all over the world.

"Many seem to agree that the quality and impact of research can be improved through greater dialogue and collaboration between experienced CAM practitioners and cancer researchers," Dr. White said. "However, there has been very little examination or discussion of the factors that lead to productive dialogue and effective collaborations. We envisioned this conference as one step in a process toward a better understanding of these issues and the ways in which OCCAM can be helpful."

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Conference participants discuss their interests.

from previous page

For the first day of the conference, participants gathered to learn the importance of collaborations and how to build and sustain successful ones from researchers and practitioners in the CAM field.

The purpose of the first session, “Why collaborate?”, was to assemble individuals who could represent the diverse perspectives regarding cancer CAM research: cancer researcher, CAM practitioner, NIH program officer, and patient advocate. Each panelist provided a short statement on why collaboration is important to the further advancement of CAM research. The four panelists included Dr. Keith Block of the Block Center of Integrative Therapies, Dr. Wayne Jonas of the Samuelli Institute, Dr. Barbara Sorkin of NIH’s National Center for Complementary and Alternative Medicine (NCCAM), and Dr. Loice Swisher, a family advocate who used alternative therapies to help her cancer-stricken daughter.

“Collaboration, simply put, advances research in clinical care,” Dr. Block said during his time on the panel.

Later in the day, the sessions shifted to the topic of how to make a successful collaboration happen.

During the “How to develop relationships and prevent issues” session, Ellen Goldstein, program manager at the Clinical Translational Science Institute of the University of California, San Francisco, presented “Are you a good date or bad date?” Goldstein compared picking a collaborator to picking a significant other. “Such a relationship starts by choosing partners carefully,” Goldstein said, “taking time to get to know each other, and clarifying the prenuptial agreement.”

Although developing a good collaboration is a big part of

advancing the science, the divide that can exist between the traditional and conventional world should be addressed.

“Conventional health care is an intimidating institution, and professionals working within it are largely unaware that there is a viable health care culture outside their domain,” said Pamela Miles, a Reiki practitioner from New York. “More mechanisms are needed to bridge the gap between conventional health care and traditional healers.”

To show that this can be accomplished, the conference presented some existing collaborations.

Dr. Gwen Wyatt, a professor at Michigan State University College of Nursing, and Barbara Brower, a certified foot reflexologist of the Branch Reflexology Institute, spoke about their experiences during the “Examples of successful collaborations” session.

“A project will not be successful without the contribution from the scientist and practitioner,” said Dr. Wyatt, who has been working with Brower for almost 10 years. “Barb and I agree that mutual respect for each other’s role is critical. We live it everyday, and it is critical.”

Other sessions on the first day included “How to sustain relationships and conflict resolutions” and “Aspects of successful collaborations.” The audience heard from Dr. Jeanne Drisko of the University of Kansas School of Medicine and Dr. Lawrence Kushi of Kaiser Permanente, to name a few.

The second day was divided into four different breakout sessions.

The “Developing CAM for Cancer: U.S. Regulations” session was chaired

by Dr. Freddie Ann Hoffman of HeteroGeneity, LLC, and included presentations by Dr. Qin Ryan, Dr. Wei Chen, and Dr. Jinhui Dou of the Food and Drug Administration (FDA), who elaborated on the FDA regulations for natural products.

OCCAM’s Practice Assessment Program (PAP) director, Dr. Farah Zia, and PAP coordinator, CDR Colleen Lee led the “Understanding & Designing Clinical Case Reports” session with the aid of Dr. Janet Kahn of the Integrated Healthcare Policy Consortium. This breakout focused on understanding and designing clinical case reports.

“The session was very educational for attendees, specifically CAM practitioners,” Dr. Zia said. “They not only heard about the cases we invite for presentation, but also the important basic aspects about effectively putting cases together for submission to NCI’s Best Case Series program.”

Dr. Phil Tonkins, a former OCCAM scientific program analyst, chaired the “Funding Sources: Federal and Non-federal” session. Dr. Tonkins was joined by Dr. Sorkin of NCCAM, Angela Webster of the Lotte and John Hecht Memorial Foundation, Matthew Fritts of the Samuelli Institute, and Dr. Gail Mallory of the Oncology Nursing Society Foundation.

The “Research Basics and Training Opportunities for CAM Practitioners” breakout session was chaired by Dr. Drisko with help from Dr. Block and Dr. Charlotte Gyllenhaal of the Block Center of Integrative Therapies, as well as Pamela Miles.

In between these breakouts, participants had the opportunity to present their cancer CAM research projects or details about their CAM practices during the conference’s two

poster sessions. This gave people the opportunity to interact, learn about other projects in the field, and possibly begin planting seeds for future collaborations.

“Collaboration alone invites possibilities,” said Elizabeth Warson, a professor in the Graduate Art Therapy Program at Eastern Virginia Medical School. “As I presented my poster (art therapy workshops for American Indian cancer survivors) for an audience that appeared to be

uninformed about art therapy, I began to realize that although the language may be a bit different, we shared similar ideas.”

Overall, the conference allowed participants to learn that effective communication is a skill needed to develop successful projects. The conference also put some misconceptions to rest about CAM practitioners and cancer researchers and gave everyone a chance to network with their peers to hopefully

facilitate future collaborations.

“It was the most constructive cancer CAM conference I’ve attended to date,” said Heather Greenlee, a naturopathic physician and assistant professor at the Mailman School of Public Health, Columbia University. “I think this was because the focus was on...doing good science, working in collaborative relationships, and keeping an open mind to what CAM may or may not do.” 🌱

To view sessions from OCCAM’s *Cancer Researchers and CAM Practitioners: Fostering Collaborations Advancing the Science* conference, visit the OCCAM’s Web site at www.cancer.gov/cam/news/conference2007.html.

A Conversation with:
Staff Scientist, Cancer and Inflammation Program
Laboratory of Molecular Immunoregulation
Center for Cancer Research
O.M. Zack Howard, Ph.D.



Dr. O.M. Zack Howard

Q: What projects are you currently working on?

I work on tumor immunology. That is a fancy way of saying I’d like to find out how an individual’s immune system gets hijacked by a tumor. Currently, I’m pursuing projects related to CAM. We are looking at an inflammatory breast tumor model called 4T1. It’s a mouse tumor that is transplanted into another mouse and induces a cell type called a myeloid immunosuppressive cell – or MIC – that suppresses the immune system.

These MICs have a particular phenotype, and they cause T-cells – which should kill the tumors by any number of mechanisms – to stop proliferating and to become non-functional. The MICs do some other interesting things. They produce prostaglandins that cause a lot of physiological effects downstream ranging from pain to initiating a general inflammatory response.

MICs are very potent inhibitors of the immune system in tumor bearing individuals.

The CAM modality that we’re studying at the moment involves Sheng Qi Formula (SQF), a Chinese herbal decoction that is commonly used in China to decrease the side effects of chemotherapy and as a stand-alone therapy. It’s a hot water extract of two plant roots. SQF has a potent inhibitory effect on MIC number and function.

Q: Is SQF a traditional Chinese medicine (TCM)?

It is based upon TCM. The original formula was an extract of milkweed vetch root and the other component is Chinese ginseng root. The SQF concoction is delivered orally to the animals and to Chinese patients. In China, it is used to decrease the side effects of chemotherapy such as cisplatin and drugs of that nature

that are used to treat late-stage lung and other cancers.

In China, the SQF concoction is also believed to cause an enhancement of the chemotherapeutic effects in patients. We have not yet seen that effect in the mice, but we probably chose the wrong model for the initial testing. We have tested SQF in combination with taxol in this inflammatory breast cancer model. Because it is an inflammatory breast cancer, taxol is not the most efficacious therapy. We will repeat this study probably at the end of February 2008 with a different chemotherapeutic agent gemcitabine that will probably be more efficacious.

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We've accomplished two things in the current study of SQF. First, we have a verification of the efficacy of this TCM agent in a mouse model. Second, we have identified the agent's immune effect in this model, and that effect is to reduce the level of MICs. Following implantation of the 4T1 tumor, the MIC levels in a mouse can go up by 70%. The SQF formula can decrease MICs by at least one-half the elevated levels after implantation. SQF treatment reduced the tumor volume by 30% at 21 days following 4T1 implantation. So we have both an immunological and a therapeutic effect. We think we're heading in the right direction.

Q: How did you become interested in CAM?

Over the years, I started looking at ethno-botanicals that had anti-inflammatory activity. We were looking to inhibit chemokine receptors. Back then, the pharmaceutical companies just ignored chemokine receptors. The companies were just interested in inflammation. They had COX-2 inhibitors, so they didn't care about new ethno-botanicals. Actually, that's not a bad approach in some cases, because it's a regulatory circle. The COX-2 inhibitors suppress chemokine receptors, and if you suppress chemokine receptors, you don't get cells migrating into other sites in the body as occurs with inflammation.

I searched for a source for natural products whose effects were specific to the chemokine receptors. It's obvious that mankind over a period of thousands of years has evolved side-by-side with local environments. The ethno-botanicals found and used during the long histories of

traditional medicines have given us things as obvious as aspirin and less obvious things such as Shikonin. Shikonin is the Asian version of aspirin. It has almost the same profile of efficacy as aspirin.

We looked at these natural products for a number of years. Eventually, "Big Pharma" got involved in research on finding chemokine antagonists, and they took the "rational drug development approach". They have identified some things that are actually efficacious in animal models. A few of these agents have also made it to human testing. Basically, the question of whether chemokines are a good target has been addressed, and the answer is "yes".

The answer is less clear about whether chemokine-antagonists can be used to prevent or treat cancer. However, the initial data suggest that some of the chemokines are intimately involved in the progression and survival of individual cancer cells. At that point, we decided that as tumor immunologists maybe we need to look and see if there is a way to use the same ethno-botanicals in TCM for regulating tumors.

Q: Do you see any specific future research opportunities in TCM or any other kinds of CAM interventions?

I'm really excited about our SQF research. I think this program still has another 5-10 years to run, because we don't really understand the role of the MICs.

Regarding the field of CAM, we barely understand the mechanisms for many interventions. That's not unusual for Western medicine either. For example, I recently attended a seminar on vaccine research. Vaccines

in this country have been the focus of empirical and hypothesis-driven research since 1893. Despite that, the scientist leading the recent seminar admitted that we still don't understand the basic mechanisms of how they work!

I think we're going to learn a lot about the way the human body works by investigating the use of these CAM approaches. In addition, in recent years we went from being very isolated from these traditional Eastern medicines to now being exposed to TCM and being able to mix and match CAM with Western medicine. If we don't understand what we're doing – and we don't – we will have innumerable, unfavorable effects.

For example, I was at a meeting earlier this year where one of the presentations was about a dietary supplement that is available in a popular nutrition store and is reported to have a positive effect in women. The researchers gave it to male rats with prostate cancer in a controlled system and discovered the agent made the prostate cancer worse! That's just one example of the necessity of fully understanding when and to whom a CAM therapy should be given; this knowledge will give us a better understanding of how CAM therapies interact with each other and in combination with Western medicines. I think it is going to take us 25-50 years of additional research to begin to figure it out. All of that research and experience is going to benefit humanity, because it's going to allow us to better understand our bodies and ourselves.

For more information on Dr. Howard, please visit <http://ccr.cancer.gov/staff/staff.asp?profileid=6249>.

Applications Invited for MSKCC Integrative Oncology Fellowship

In the Winter 2007 issue of NCI CAM News, OCCAM announced that the first NCI T32 training grant in integrative oncology research was awarded to Memorial Sloan-Kettering Cancer Center (MSKCC). The Integrative Medicine service at MSKCC is now inviting applications for its fellowship in integrative oncology. This 2 or 3-year NCI/NIH fellowship program will teach clinical and research skills. An applicant must be a U.S citizen and have a medical degree. Board Certified/

Board Eligible internists, anesthesiologists, oncologists, pain and palliative care physicians, or specialists in other related areas are invited to apply. This program will develop the future leaders in complementary therapies and botanicals research in oncology. Applicants must intend to pursue academic work following completion of the fellowship.

To apply, please submit a letter of interest and curriculum vitae to:

Dr. Barrie Cassileth
Memorial Sloan-Kettering Cancer Center
Integrative Medicine Service
1429 First Avenue
New York, NY 10021

Please see related story in *NCI CAM News, Winter 2007, Vol. 2, Issue 1* at <http://www.cancer.gov/cam/newsletter/2007-winter/home.html>.

NCI Intramural Program Finds Grape Skin May Prevent Prostate Cancer

NCI press release date August 31, 2007

<http://www.cancer.gov/newscenter/pressreleases/ProstateGrapeMuscadine>

Laboratory experiments show that an extract of the skin of muscadine grapes can inhibit growth of prostate cancer cells in the laboratory. Investigators from NCI and their research partners also show that muscadine grape skin extract (MSKE) does not contain significant amounts of resveratrol, another grape skin component that has been widely studied and shown to be of potential benefit in preventing prostate cancer growth. The results appear in the September 1, 2007, issue of *Cancer Research*.

Using a series of human prostate cancer cells, representing different stages of prostate cancer progression, the researchers showed that MSKE significantly inhibits the growth of cancerous, but not normal, prostate cells, primarily by inducing a process called apoptosis, or programmed cell death. Programmed cell death is one of the mechanisms the body uses to rid itself of cells with unrepaired genetic damage before those cells can duplicate themselves. In contrast, resveratrol seems to act by blocking the cell cycle, a sequence of steps that

a cell passes through when it grows and divides into two identical cells. Both mechanisms are used by the body to prevent the development of cancer.

According to Jeffrey E. Green, M.D., chief of the Transgenic Oncogenesis and Genomics Section in NCI's Center for Cancer Research (CCR), "These results show that MSKE may have potent antitumor activities in the lab that differ from the effects of resveratrol. Further studies of MSKE will be necessary to determine if this extract has potential as a chemopreventive or therapeutic agent."

The fact that all of the cells studied, which cover the different stages of prostate cancer tumor progression, responded to MSKE suggests that the active compounds in this extract potentially may inhibit tumor development at very early stages.

The muscadine grape (*Vitis rotundifolia*) is distinct from the more common red grapes used to produce red wines, a major source of resveratrol. The chemical constituents of muscadine grapes



Carl Hunter @ USDA-NRCS PLANTS Database / USDA SCS. 1991. *Southern wetland flora: Field office guide to plant species*. South National Technical Center, Fort Worth.

differ from most other grape varieties, as they are richer in chemicals called anthocyanins. Anthocyanins, which produce the red and purple colors of the grapes, have strong antioxidant activity and have shown several antitumor effects,

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including inhibition of DNA synthesis in breast cancer cells, of blood vessel growth in some tumors, and of enzymes involved in tumor spread. Muscadine grapes can be found growing wild from Delaware to the Gulf of Mexico and westward from Missouri to Texas.

While previous studies suggested that anthocyanins might suppress the cancer process, no rigorous study of the mechanisms underlying these effects has yet been done. Resveratrol, by contrast, has been widely examined. Although earlier

studies showed that it can induce programmed cell death in prostate cancer cells, resveratrol did not significantly induce cell death in the prostate cell model system used for this muscadine study. The results of this study suggest that resveratrol may activate different antitumor mechanisms than MSKE.

Even though MSKE had significant inhibitory effects on the prostate cancer cells studied, it did not alter the growth rate of the normal human prostate cells in the lab, which served as controls. Ongoing studies of MSKE in animals will help to determine the underlying

mechanisms of MSKE's inhibitory effects in prostate cancer cells. The researchers hope that the lab effects of MSKE will be reproducible in testing on cancerous and normal prostate cells in animals. Should MSKE move on to trials in humans, Green says that since "muscadine grape products, including grape juice and grape wine, have been used in human studies without reported side effects, they may be relatively safe for use in clinical trials."

For more information on Dr. Green's research at NCI, please go to <http://ccr.cancer.gov/staff/staff.asp?profileid=13662>. 📌

Inhibition of prostate cancer growth by muscadine grape skin extract and resveratrol through distinct mechanisms. Hudson TS, Hartle DK, Hursting SD, Nunez NP, Wang TTY, Young, HA, Arany P, and Green JE. *Cancer Res.* 2007; 67(17).

Funding Opportunities

NCI Invites Investigators to Study Diet-induced Changes and Colon Cancer

The National Cancer Institute currently accepts grant applications in response to two program announcements (PA) both titled "Diet-Induced Changes in Inflammation as Determinants of Colon Cancer." The first announcement PA-06-283 uses the R21 grant mechanism, and the second PA-07-186 uses the R01 mechanism. The goal of both PAs is to foster innovative research that will identify and characterize diet-induced changes in inflammation and colon cancer risk.

The increased risk of developing colon cancer in patients with ulcerative colitis and the observed benefits of anti-inflammatory drugs in retarding intestinal tumors provide rather compelling evidence that inflammation is involved with cancer at this site. Several epidemiological and preclinical studies reveal that specific bioactive food components

can suppress colonic inflammation as well as reduce colon cancer risk. Nevertheless, it remains unclear whether these diet-induced shifts in the inflammatory process account for their antitumorigenic properties. The lack of mechanistic information serves as the basis for this funding opportunity.

Specific goals of these initiatives are as follows:

- identify and characterize diet-induced changes in anti- and proinflammatory mediators that modulate colon cancer risk,
 - define genetic polymorphisms that modify the response to specific bioactive food components with regard to colon cancer inhibition, and
 - unravel the physiological effectiveness of dietary components in terms of concentration, activity, duration of exposure, degree of stability, chemical forms, and binding affinity to receptors in inflammatory colonocytes.
- Examination of any association(s) between the inhibition of pro-inflammatory mediators (e.g., TNF- α , NF- κ B) with the efficacy of resveratrol and curcumin and colon cancer cell growth rates;
 - Evaluation of whether anti-inflammatory mediators (e.g., TGF- β) might account for the effect of dietary butyrate on colon tumor growth inhibition;

Possible research topics include, but are not limited to, the following examples:

- Evaluation of whether polymorphisms in anti- or proinflammatory genes might explain the differential responsiveness among individuals to dietary n-3 fatty acids with regard to colon cancer inhibition;

- Examination of whether the modulation of reactive oxygen species (ROS) and/or reactive nitrogen species (RNS) might explain possible associations of green tea polyphenols and selenium with reductions in colon cancer incidence; and

- Examination of whether the production of prostaglandin E2 (PGE2) and/or nitric oxide (NO) might be influenced by dietary conjugated linoleic acid and/or associated with colon cancer risk.

The expiration date for both PAs is September 8, 2008. Applications must be submitted electronically through Grants.gov (www.grants.gov) using the SF424 Research and Related (R&R) forms and the SF424 (R&R) Application Guide.

For more information on these PAs, please visit www.cancer.gov/cam/research_funding_pa.html.

Contact Information

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Bethesda, Maryland 20892

ncioccam-r@mail.nih.gov

<http://cancer.gov/cam>

Active Program Announcements

The Office of Cancer Complementary and Alternative Medicine offers a list of active program announcements that are relevant to cancer CAM on its Web site. For more information on the announcements below, please visit www.cancer.gov/cam/research_funding_pa.html.

PA Title	PA Number	Expires
The Bernard Osher Foundation/NCCAM CAM Practitioner Research Career Development Award (K01)	PA-07-003	01/03/2010
Basic and Preclinical Research on Complementary and Alternative Medicine (R01) & (R21)	PA-07-007 PA-06-315	09/02/2008
Pathogenesis and Treatment of Lymphedema and Lymphatic Diseases (R01)	PA-07-165	12/31/2009
Prioritizing Molecular Targets for Cancer Prevention with Nutritional Combinations (R01)	PA-07-100	11/02/2009
Mechanisms, Models, Measurement, & Management in Pain Research (R01) (R03) & (R21)	PA-06-544 PA-06-543 PA-06-542	09/02/2009
NCCAM-Exploratory /Developmental Grant for Clinical Studies of Complementary and Alternative Medicine (R21)	PA-06-510	09/02/2008
Diet, Epigenetic Events, and Cancer Prevention (R01) (R03) & (R21)	PA-07-175 PA-06-414 PA-06-413	09/02/2009
Studies of Energy Balance and Cancer in Humans (R01) & (R21)	PA-06-404 PA-06-405	05/09/2009
Exploratory Grants for Behavioral Research in Cancer Control (R21)	PA-06-351	05/02/2009
Methodology and Measurement in the Behavioral and Social Sciences (R01) (R03) & (R21)	PA-07-060 PA-06-344 PA-06-343	05/02/2008
Developmental Projects in Complementary Approaches to Cancer Care (R21)	PA-06-400	02/02/2009
Clinical Cancer Therapy and Prevention Research (R01)	PA-07-356	05/08/2010

Cancer CAM Research Grant FAQs

The Office of Cancer Complementary and Alternative Medicine often receives questions regarding the grant funding process. To assist investigators, a few of the more frequently asked questions are answered below.

Q: Is my project appropriate for this Funding Opportunity Announcement (FOA)?

A: The research objective and the mechanism of support sections of the FOA generally explicitly define the type of research that will be

considered for funding. However, it is often useful to touch base with the responsible program director about topics not specifically identified as relevant.

Q: What is the payline?

A: The payline represents the cutoff, above which an application will be funded, as determined by its scientific review and priority scores. For the NCI, the payline is determined by the Institute's Executive Committee (EC). The payline is established based on the

number of expected applications and the available funds designated for competing grants. This means that the payline can change throughout the year as NCI can more accurately assess the number of incoming applications and available resources. The current payline for RO1's is 14 percentile.

For further information visit the following page:

<http://deainfo.nci.nih.gov/grantspolicies/FinalFundLtr.htm>.

Research Highlights

Coenzyme Q10 Studied for Relief of Fatigue in Breast Cancer

Coenzyme Q10 (also called CoQ10) – a naturally occurring compound that helps produce energy in the body's cells – is being tested for use in relieving fatigue symptoms in breast cancer patients who are undergoing aggressive chemotherapy after surgery.

“We have been interested in the problem of cancer-related fatigue for nearly a decade,” noted the study's Principal Investigator Glenn Lesser, M.D., Wake Forest University Comprehensive Cancer Center. Wake Forest Cancer Center is designated as a research base for NCI's Community Clinical Oncology Program (CCOP), focusing on research into symptom management – fatigue, anorexia, and cognitive dysfunction – and cancer prevention and control.

CoQ10 has been previously tested in congestive heart failure and shown to improve cardiac function and

improve some of the symptoms experienced with advanced stages of heart failure, including “cardiac fatigue,” Dr. Lesser explained. In addition, small studies have produced data showing that CoQ10 reduces heart damage caused by the anticancer drug doxorubicin.

However, until now there have been no well-designed clinical trials involving large numbers of cancer patients. “CoQ10 is also a well-known agent in the CAM world,” Dr. Lesser continued. “Cancer patients can buy it in health food stores and supermarkets and are taking this agent for its purported benefits for fatigue and for other reasons.”

The study, which began in 2004, has enrolled 202 women who were randomly assigned to receive either CoQ10 (100 mg) or placebo pills 3 times daily for 24 weeks. Both groups also received Vitamin E

which increases the absorption of CoQ10. The participants underwent detailed quality-of-life assessments throughout the study period to determine levels of fatigue, depression, and other symptoms.

Dr. Lesser is seeking permission from NCI to reopen the study to enroll an additional 36 patients in part to make up for higher than expected rates of women dropping out of the study. Preliminary data indicate the drop outs were not caused by toxicity or adverse effects of CoQ10, he noted. Instead, patients undergoing aggressive breast cancer treatment often become overwhelmed and frustrated and may decide to forgo the extra burden of an experimental treatment that may not benefit them, he said. In addition, nausea associated with their chemotherapy sometimes causes patients to cut back on taking other oral medications including drugs like CoQ10.

Most participants “were quite attracted to a study like this using a natural compound with some potential or theoretical benefit in conjunction with their more standard chemotherapy,” Dr. Lesser said. If proven effective, CoQ10 “may be an additional strategy to

Phytonutrients Shown to Inhibit Cancer Stem Cells from Regrowing Tumors

Scientists in NCI’s Center for Cancer Research (CCR) are finding early evidence that some phytonutrients – specifically EGCG, a green tea extract, and resveratrol, a compound isolated from grapes and red wine – can inhibit or eliminate cancer stem cells (CSCs) which are increasingly viewed as the driving force behind relapse and chemotherapy resistance in many cancers.

A growing body of evidence has identified CSCs as being the major cause of tumor progression, explained William Farrar, Ph.D., CCR principal investigator for the phytonutrient/chemical study which is supported by OCCAM. CSCs are distinct from the cancer “progeny cells” which are created by CSCs and make up the bulk of most tumors. Current cancer treatments focus on destroying the progeny cells “but in many cases, even after the tumor is reduced or seemingly eliminated, it grows back and becomes resistant to further treatment,” he added. Many researchers now believe that the CSCs often survive initial treatment and act like “evil seeds” that regrow new, more treatment-resistant progeny cells.

Dr. Farrar is head of CCR’s Cancer Stem Cell Section laboratory. One of the initial challenges faced was due to the miniscule numbers of CSCs found in tumors. “The very first time we extracted CSCs we came up with only 280 cells in the sample!” Dr.

combat the problem of fatigue in breast cancer patients,” he added.

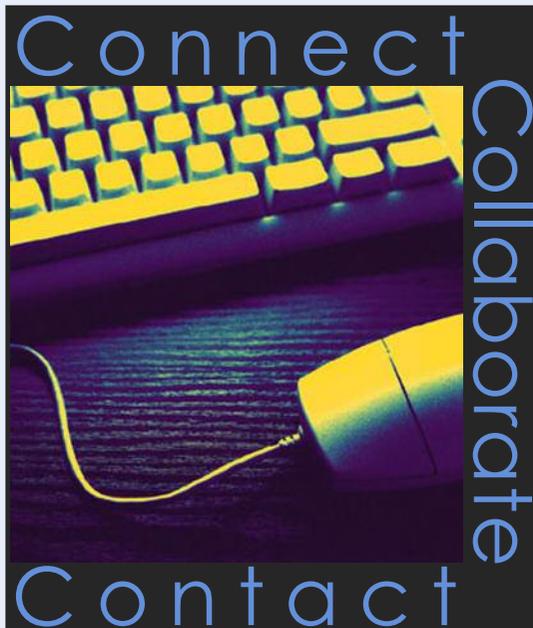
For more information on Coenzyme Q10, please read the PDQ® summary at www.cancer.gov/templates/doc.aspx?viewid=0E5B4097-610C-4A49-844F-D935F1D7BB07&version=0.

Farrar recalled. In contrast, high-throughput screening methods typically produce millions of progeny cells for study and analysis. Dr. Farrar and his colleagues focused first on developing tools for extracting and analyzing the small populations of CSCs from tumors.

“Phytochemicals (plant-derived compounds) have a long history demonstrating their cancer preventive properties,” he continued. However, the natural compounds had not been studied specifically for their effects on CSCs until now. Dr. Farrar’s lab winnowed down 22 potential phytochemical compounds “into what I call our short list.” They ultimately decided to first study EGCG and resveratrol in lab cultures of CSCs from breast and prostate cancer tumors and in xenografts of human CSCs.

“The good news is our studies confirm that CSCs are not invulnerable to treatment as some have been concerned,” he reported. Both of the phytochemical compounds were shown to prevent proliferation and block tumor formation by CSCs. They were also effective against cancer progeny cells and did not trigger drug-resistance responses in the tumor cells.

In future studies, Dr. Farrar’s lab will expand its library of phytonutrients and isolate CSCs to determine the effectiveness of phytonutrients for other cancers (i.e., pancreatic, lung, skin). 



Cancer CAM Researcher Directory

Now cancer CAM researchers can easily connect with others in the field. Sign-up for OCCAM’s free online research directory and:

- Search for experts in specific areas of CAM research
- Receive access to research news and updates
- Discover collaboration opportunities
- Learn about meetings and events
- Post job openings
- Connect with the National Cancer Institute

To join or find out more, please visit: <http://occamdirectory.cancer.gov/Index.aspx>.

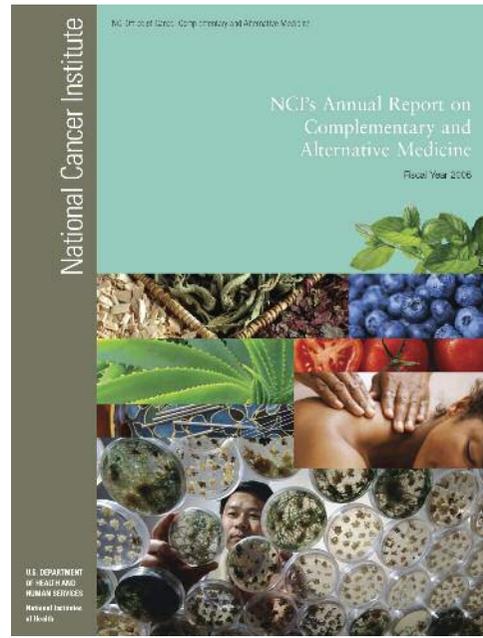
NCI's CAM Second Annual Report for Fiscal Year 2006 Now Available

The National Cancer Institute recently released its second annual report on CAM activities, NCI's Annual Report on Complementary and Alternative Medicine: Fiscal Year 2006. The report covers, in detail, the CAM-related research achievements and ongoing projects that NCI supported in fiscal year 2006. In addition to write ups about extramural and intramural research, the report highlights the Institute's training, conferences, communications activities, and contributions to the field of cancer CAM research made by OCCAM.

Examples of articles in the report include:

- Antioxidants and Chemotherapy: Help or Hindrance?
- Studies Suggest Exercise Improves Colorectal Cancer Outcomes
- Tai Chi Chih Effects on Insomnia Studied in Breast Cancer Patients
- Exploring the Role of Cooked Red Meat in Cancer Risk

Dr. Jeffrey D. White, OCCAM director, says this about the report, "Our first report was well-received by the research community, cancer advocates, and NCI staff members. This year's report further demonstrates NCI's continued efforts in the emerging field of CAM."



To view this report, please visit the OCCAM Web site:
www.cancer.gov/cam/attachments/CAMAnnualReportFY2006.pdf

Inaugural NIH Yoga Week Planned for May

The Office of Cancer Complementary and Alternative Medicine will be participating in NIH's first annual Yoga Week this May 19-23, 2008. Highlighting the science and practice of yoga, this five-day series of events will serve NIH employees and the public, allowing participants to learn about the benefits of yoga and experience

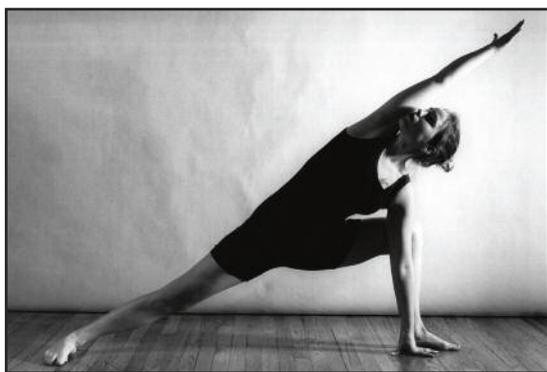
them first-hand through stretching and practice.

The week will include presentations by leading yoga instructors, lectures by current NIH grantees conducting research on yoga, including Dr. Lorenzo Cohen, director of the Integrative Medicine Program at The University of Texas M.D. Anderson Cancer Center, and a discussion of NCI's yoga research portfolio by OCCAM Director Dr. Jeffrey D. White. Yoga classes will be taught by local instructors throughout the week.

Rachel Permuth-Levine, Ph.D., MSPH, acting director for the Office of Strategic and Innovative Programs at the National

Heart, Lung, and Blood Institute (NHLBI), who originated the idea of NIH Yoga Week explains, "Yoga is a fun, energizing activity that offers many health benefits. While people are more aware of yoga and its benefits, many people haven't had the opportunity to give it a try or explore the many reasons to incorporate yoga into their lifestyle." To Permuth-Levine, NIH seemed like a great place to bring people together to share their knowledge about yoga, especially since NIH supports research in this topic area. "Whether you're a novice or experienced student, we encourage you to learn from and enjoy the activities during Yoga Week," says Permuth-Levine.

Permuth-Levine and her team at NHLBI have partnered with the



Office of Research Services, the National Center for Complementary and Alternative Medicine, NCI, NIH Recreation & Welfare Association, Weight Watchers International, International

Association of Yoga Therapists, Inner Reaches Yoga, and Thrive Yoga.

The kick-off event is on Monday, May 19 from 11am-1pm at the Natcher Auditorium (45 Center

Drive; Bethesda, MD). All events are free and open to the public. For more information, please visit <http://does.ors.od.nih.gov/fitness/yogaWeek.htm>. 📍

Meetings

Declaration of International Cooperation for Traditional Chinese Medicine Research

On November 28-29, 2007, the Ministry of Science and Technology (MOST) the People's Republic of China and other ministries of the Chinese government in conjunction with the World Health Organization held the first "International Traditional Chinese Medicine Conference for Cooperation in Science and Technology" in Beijing, China. This conference assembled over 400 researchers, government officials, and TCM practitioners from various countries around the world to discuss TCM research and the role it can play in human health and well-being.

The main purpose of the conference was to present and adopt the *Beijing Declaration on the International Science and Technology Cooperation in Traditional Chinese Medicine* (Beijing

Declaration), a document which serves as a formal indication of China's interest in soliciting support for international collaboration of TCM research, product development, and practice. The Beijing Declaration was created as an activity of the International Traditional Chinese Medicine Program for Cooperation in Science and Technology, a program instituted by the Chinese government in August of 2006.

The opening session of the conference was given by Vice Premier of China, Ms. Wu Yi, who emphasized the need for greater international collaboration in regards to TCM theory and development. Examples of plenary session topics include the challenges of TCM research, regulatory and globalization

issues of the TCM industry, intellectual property rights, and the progress of acupuncture research.

Also during the conference, the Preparatory Committee of the International Expert Board was formed to establish a group of experts to help advance the TCM field through worldwide collaboration.

OCCAM has identified the exploration of the pharmacopeia of traditional medical systems, such as TCM, for novel anti-cancer therapeutics as a research priority. "OCCAM's presence at this meeting provided an opportunity to interact with world leaders in this area and express NCI's commitment to international collaboration," said Dr. White.

Evidence-based Complementary and Alternative Medicine Conference for Cancer Advocates

On January 10-11, 2008, the Annie Appleseed Project brought together cancer advocates, patients, and CAM health care professionals for the conference "Evidence-based Complementary and Alternative Medicine". The conference, held in West Palm Beach, Florida, had 178 registered attendees who represented organizations from across the United States, Canada, and Australia. The meeting featured 21 speakers who collectively shared their knowledge and experience on a variety of topics including cancer CAM research studies; the history and use of some CAM therapies; and ended with a

discussion of treatment, integrative oncology, and advocacy. In addition, there were 20 exhibitors representing treatment centers, organizations offering educational resources, and manufacturers of natural products.

OCCAM sent two of its staff members CDR (USPHS) Colleen Lee, M.S., CRNP, AOCN®, Practice Assessment Program Coordinator, and Shea Buckman, M.A., Communications and Outreach Coordinator, to the event. CDR Lee said of the conference, "I wanted a more global idea of what patients are seeking in terms of cancer CAM

information. I also wanted to know how patients are incorporating these therapies into the areas of prevention, treatment, and supportive care. The CAM practice community is highly diverse and scattered throughout the country at this time, and the opportunity to interact with this group provided me with insight into their approach to treatment and interest in research."

The Annie Appleseed Project hopes to sponsor another conference in 2009 that will focus on nurses, dietitians, nutritionists, patients, and advocates. 📍

Featured Scientific Meetings

Date	Meeting	Location	OCCAM Staff Attending
April 25-26, 2008	Shanghai International Symposium: Integrative Oncology Theory, Research, and Practice	Shanghai, China	Dr. Jeffrey D. White Dr. Dan Xi
May 14-18, 2008	Oncology Nursing Society*	Philadelphia, PA	CDR (USPHS) Colleen Lee Shea Buckman
May 19-23, 2008	NIH Yoga Week	Bethesda, MD	Shea Buckman Jennifer Frazier Dr. Jeffrey D. White
June 6-8, 2008	Annual Congress of Japan Society for Oriental Medicine	Sendai, Japan	Dr. Jeffrey D. White
August 13-16, 2008	American Association of Naturopathic Physicians 23 rd Annual Convention and Exposition*	Phoenix, AZ	Shea Buckman CDR (USPHS) Colleen Lee
September 17-19, 2008	4 th International Conference on Holistic Health and Medicine*	Lexington, KY	Shea Buckman
November 20-21, 2008	5 th International Conference of the Society for Integrative Oncology*	Atlanta, GA	Shea Buckman

**Indicates that an OCCAM staff member will be at the NCI or OCCAM exhibit booth.*

To obtain a copy of this newsletter or for inquiries on cancer and CAM, please contact
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