



## Project Portfolio

 **Helfgott**  
RESEARCH INSTITUTE



## Contents

- 3 Introduction
- 5 Nutrition and Herbal Medicine
- 10 Detoxification and Environmental Medicine
- 12 Mind-Body Medicine
- 15 Balneotherapy and Physical Medicine
- 15 Social Medicine
- 16 Acupuncture and Chinese Medicine

## Introduction



Greetings from the Helfgott Research Institute at the National College of Natural Medicine! We're glad that you found us! As one of the few research institutes that serves a college of naturopathic and Chinese medicine, we're often asked about the scope of the research that we conduct. This brochure is designed to introduce you to the breadth of studies conducted at the Helfgott Research Institute. It is not a complete list, but we hope that it will whet your appetite and encourage you to learn more about us.

The Helfgott Research Institute was formed in June 2003 through a generous donation from Donald Helfgott. With the goal of contributing to the evidence base for integrative medicine, Helfgott investigators set to the task of designing basic, clinical and applied studies to evaluate natural therapies. Students enrolled at the National College of Natural Medicine quickly joined the research teams. Together, investigators and students designed and conducted a diverse collection of studies.

As student interest in research continued to grow, we committed to formally training students in research. Thus, we launched a Master of Science in Integrative Medicine Research (MSiMR) program. This degree is a combination of a Master of Public Health and a Master of Clinical Research with Integrative Medicine as a subject area. Several student research projects are included in our brochure. Although these projects are often smaller in magnitude, they are no less important, as they provide the foundation for larger studies.

We're proud of our investigators, students, and the research we perform. We think that you'll agree that the studies are both interesting and scientifically rigorous. As we move forward, we will continue to conduct studies that are relevant to the clinical practice of naturopathic physicians and Chinese medicine practitioners. Enjoy reading about the research conducted at Helfgott!

Sincerely,

A handwritten signature in black ink that reads "Heather Zwickey". The signature is written in a cursive style with a long horizontal flourish at the end.

Heather Zwickey, PhD  
Director, Helfgott Research Institute  
Dean of Research and Professor of Immunology,  
National College of Natural Medicine



# Nutrition and Herbal Medicine

## Immune Herbs

Traditionally, naturopathic physicians use combinations of herbs rather than individual herbs for treating infections. Researchers at Helfgott have launched a series of studies that examine individual herbs as well as herbal combinations and their effects on the immune system. These studies attempt to identify different immunological pathways affected by each herb and whether the combinations elicit synergistic effects.

Echinacea, Astragalus and Glycerrhiza were tested individually and in combination, and compared to a placebo control in one pilot study. The effect of these herbs when ingested for seven days was measured by cell activation using the cell protein marker CD69. The results show that all the herbs stimulated immune cells as evidenced by increased CD69 expression on CD4 and CD8 T cells. The herbal combination had a larger effect than any of the individual herbs. This research demonstrates why it may be advantageous to use herbal combinations rather than single herbs.

Echinacea has the seemingly contrary property of being both pro- and anti-inflammatory. Pilot research by NCNM graduate Julie Brush, ND, shows that Echinacea can stimulate both Th1 CD4 T cells and T regulatory CD25+ CD4 T cells (Tregs). Tregs are cells known to be involved in suppressing autoimmunity. Dr. Brush's results are exciting because this is the first time that Echinacea has been shown to stimulate Tregs. This preliminary research suggests that Echinacea can increase Tregs in a healthy population. If Echinacea can stimulate Treg activity in people with autoimmune disease, it could be an important treatment for these complex conditions.

## The Anti-Inflammatory Diet

Specialized diets and dietary recommendations are commonly used in complementary and alternative medical practice. Although the relationship between diet and inflammation is of great interest, the science behind it is not well understood. One frequent recommendation to patients is to follow an anti-inflammatory (AI) diet. The Helfgott Research Institute recently conducted a study looking at the health effects of an AI diet versus a diet based on the American Diabetic Association recommendations in participants with type 2 diabetes and pre-diabetes.

AI diets are generally designed to reduce inflammation by eliminating inflammatory and allergenic foods, and promoting anti-inflammatory foods. The specific foods that are excluded or emphasized in AI diets can vary, depending on the practitioner and the condition being treated. The diet used in this study was developed by naturopathic

physicians in collaboration with the bionutrition unit at Oregon Health and Science University (OHSU). The diet excluded foods thought to either stimulate an inflammatory response in the gastrointestinal tract, or act as an allergen in certain individuals. These foods include wheat, corn, soy, dairy, nightshade vegetables and citrus fruits. The diet emphasized foods believed to reduce inflammation, including those high in essential fatty acids or anti-oxidants.

During the six-week study, participants were provided with all their food and were allowed to consume only items provided by the study. Levels of inflammatory cytokines, C-reactive protein (CRP), glucose and cholesterol were measured throughout the study. Thirty participants were enrolled and 26 completed the full six weeks of the study. The results of the study were promising and suggest that additional research needs to be completed. The intention of this small preliminary study was to show that conducting this type of dietary research is possible. Having demonstrated this, the next phase of research will test the diet for clinical effects.

## Tart Cherry Research Literature Review

Tart cherry juice has garnered attention lately for its potential health benefits. Tart cherries are rich in numerous compounds with promising health benefits. Helfgott recently conducted a review of scientific articles to identify the depth and breadth of peer-reviewed medical literature on tart cherries. The review determined that there is evidence to support some of the health claims made for tart cherries.

Laboratory tests have confirmed that tart cherries have antioxidant activity and contain a number of compounds that fight free radicals. These include anthocyanins, quercetin, potassium, fiber, vitamin C, carotenoids and melatonin. In vitro studies have demonstrated that cherries inhibit enzymes involved in pain pathways and may also have anti-carcinogenic effects. A 2005 animal study determined that anthocyanins from cherries have potential anti-inflammatory and anti-oxidative effects on adjuvant-induced arthritis. A U.S. Department of Agriculture study found that supplementing the diets of healthy men and women with cherries reduced inflammatory markers.



A 2009 study at OHSU measured pain reduction among runners participating in the annual Hood to Coast Relay. Results showed that runners who drank tart cherry juice reported significantly less pain than those who took a placebo.

Tart cherries may also have important beneficial metabolic effects such as decreasing sugar, fat and insulin levels in the blood. They may improve sleep and show encouraging positive effects against cancer such as reducing tumor burden in parts of the gut and slowing tumor growth. Despite promising preliminary data, additional studies are needed to validate health claims for cherries and cherry juice concentrates.

## Strontium for Bone Health

The mineral strontium is attracting a great deal of interest as a potential treatment for osteoporosis. Osteoporosis is a disease that causes bones to become fragile and more likely to break. Bone fractures associated with osteoporosis can occur anywhere, but are most frequent in the spine, wrist and hip. In 2005 there were more than two million fractures related to osteoporosis—costing nearly \$17 billion to treat. By 2025, annual fractures and treatment costs are projected to rise by almost 50%.

Strontium belongs to the same chemical family as calcium and magnesium and has properties similar to calcium. Ninety-nine percent of the strontium in the human body is in the skeleton. Studies in the United Kingdom have shown that strontium ranelate (a pharmaceutical composed of two strontium atoms and one molecule of ranelic acid) slows bone loss while increasing the amount of new bone that is being made. Current pharmaceuticals are only able to do one or the other, but not both. Strontium appears to play a crucial role in bone remodeling, as it tends to migrate to sites where active bone remodeling is taking place.

While strontium ranelate is not currently available in the U.S., strontium citrate is available as a dietary supplement. Assistant professor Jill Edwards, ND, is currently writing a review article that will discuss the safety and clinical application of using strontium in its various forms for

treating osteoporosis. Since strontium is a heavier molecule than calcium, adjustments in interpreting bone density must be made. A second article will give clinicians the necessary tools to be able to interpret osteoporosis test results after patients have taken strontium.

## Effects of Hibiscus on Risk Factors for Diabetes and Heart Disease

Diabetes is at epidemic proportions in the U.S., with more than 47 million individuals affected. It is estimated that 75% of those with diabetes also have metabolic syndrome, a form of insulin resistance. Metabolic syndrome comprises a group of risk factors known to increase the risk of diabetes, heart disease and stroke. There is some evidence to suggest that the herb *Hibiscus sabdariffa* may help reduce some of these risk factors, including reductions in glucose, total cholesterol and blood pressure.

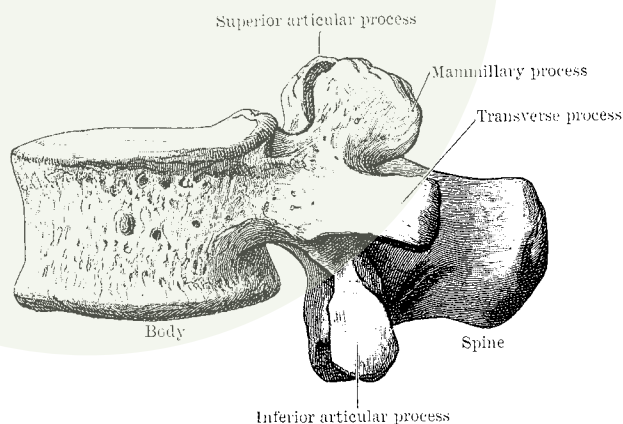
Hibiscus is common in many herbal teas—it is the ingredient that often imparts a deep, rosy red color. It is also drunk as a cold beverage in Mexico. Historically it has been used medicinally for heart and nerve diseases. Previous clinical studies indicate that Hibiscus may reduce glucose and total cholesterol, raise HDL (the good cholesterol) in patients with metabolic syndrome and lower blood pressure.

The Helfgott Research Institute recently completed a randomized, controlled trial of *Hibiscus sabdariffa* in 76 individuals with metabolic syndrome. Study participants took either an encapsulated liquid extract of *Hibiscus sabdariffa* or a placebo capsule for 30 days. Study data is currently being analyzed and results will be available soon.

## Probiotics for Mothers and Infants

Probiotic foods and products are advertised as having health-promoting benefits. Many studies have been performed using specific strains, attempting to define a possible connection between the establishment of healthy-type gastrointestinal flora in infants and consumption of probiotic bacteria, potentially influencing health issues in growing children. Helfgott recently conducted a review of scientific literature on the use of specific probiotic strains during pregnancy and infancy.

Studies have demonstrated that probiotics can improve infant response to some vaccines, reduce the incidence and severity of infectious and febrile diseases, improve digestion and assimilation of nutrients, and reduce colic. They have also shown that growing infants may be less likely to gain excessive weight when both the mother and infant are supplemented with certain species of probiotics. In addition, pregnant and breastfeeding mothers have improved outcomes with gestational diabetes and postpartum weight loss when consuming certain strains of probiotics and eating a healthy diet as compared to eating a healthy diet alone.





Not all probiotic studies have shown beneficial effects for mothers or infants. Many that have shown benefit need follow-up studies to be conclusive. However, a number have shown that selective use of specific probiotics may be beneficial. NCMN students and investigators are creating a compilation of recent research in order to help clinicians better understand the evidence behind various uses of probiotics.

## Research Literature Review on Medicinal Mushrooms

Medicinal mushrooms have a long history of use in CAM due to their ability to modulate the immune system. Helfgott is currently conducting a series of literature reviews on five common medicinal mushrooms that examines the body of research conducted on direct immunological markers. The mushrooms discussed are *Ganoderma lucidum* (Reishi), *Agaricus blazei*, *Grifola frondosa* (Maitake), Cordyceps and *Coriolus versicolor* (turkey tail). Each of these mushrooms has a distinct effect on the immune system and there is evidence for their use in the treatment of some cancers, inflammatory bowel disease, allergic diseases, brain degenerative processes, infections and for general immune stimulation.

Some of the most compelling research has been conducted on the use of medicinal mushrooms for cancer. For instance, it has been found that *Agaricus* increases the efficacy of certain drugs used in chemotherapy through changes in gene signaling. In both animal and human subjects, certain mushroom components work to prevent the decrease in white and red blood cells seen with chemotherapy. Compounds called polysaccharides that are found in mushrooms appear to prevent decreased blood cell counts and kidney damage from certain medications, decrease tumor growth, decrease new blood vessel formation around tumors and regulate immune cells that are responsible for the destruction of tumors.



While mushrooms have been studied as adjunctive treatment for cancer for the past two decades, it has only been in the last five years that these studies are moving out of the laboratory and into clinical models of care. Much more study is needed to fully understand dosage, extraction methods, safety and specific mushroom's affinity for different types of cancer and chemotherapeutic medications.

## Immunological Effects of Ashwagandha

Ashwagandha (*Withania somnifera*) is an Ayurvedic herb that has been used for centuries in India. It is one of thousands of herbs that are thought to have immunological effects, but very few have been rigorously studied. While they were students, naturopathic doctors Jeremy Mikolai, Andrew Erlandsen and Andrew Murison embarked on a program of research on Ashwagandha that took them from the lab bench to national conferences.

Analysis of their initial pilot study data showed that participants' immune cells were significantly more activated after four days of taking the herb. Results from this study were published in the *Journal of Alternative and Complementary Medicine* and presented at multiple conferences across the U.S. The student investigators won multiple awards, including "Best Student Research" at the American Association of Naturopathic Physicians' annual conference and first place at the 6th annual Natural Supplements Conference, sponsored by the Scripps Center for Integrative Medicine.

## Gymnema sylvestra for Polycystic Ovarian Syndrome

Researcher Ashley Haywood, ND, LAc, conducted a study investigating the use of *Gymnema sylvestra* as a natural treatment for polycystic ovarian syndrome (PCOS). PCOS is a common health problem affecting approximately four



to six percent of reproductive-aged women. It can cause irregular menstrual cycles, infertility, facial hair, obesity, acne and elevated insulin levels. Gymnema, an herb from India that has been used for diabetes for centuries, has been gaining popularity as a natural treatment for blood sugar dysregulation. Several studies have demonstrated the efficacy of insulin-sensitizing compounds such as Metformin in reducing elevated insulin and diminishing endocrine and metabolic abnormalities found in women with PCOS. Gymnema may work in a similar way, and could be used as an alternative to Metformin.

The double-blind placebo-controlled pilot study took place over eight months and included generally healthy women with PCOS. Participants learned to track their menstrual cycles and took capsules of either Gymnema or a placebo twice a day for six months. Hormones, menstrual cycles and markers of insulin metabolism were measured. Results from this study will be used to help design larger clinical trials looking at the role of blood sugar regulation and its effects on fertility in women with PCOS. This study takes advantage of the collaborative relationship between NCNM and OHSU to conduct highly integrative research in the field of women's health and widely used CAM therapies.

## Guava—A Remedy for Infectious Disease?

Infectious diarrheal disease caused by lack of clean water is a major public health concern throughout developing countries. It can lead to dehydration, failure to thrive, malnutrition and death. It is a leading cause of death in children from infancy to age five. Anti-parasitic drugs are commonly used to treat these infections, but their safety is a concern. They are potentially carcinogenic when used in the high doses and with the frequency common in tropical countries. They also have questionable safety when used in children and during pregnancy. New strategies are needed to safely and effectively address these common infections.

Guava leaves and stems (*Psidium guajava*) are traditionally used by native Nicaraguans to treat diarrheal disease. Guava is ubiquitous in many tropical and subtropical countries. There is substantial research to suggest that guava could be an effective treatment for infectious diarrhea. Helfgott recently conducted a thorough scientific review of guava, its usage, implementation and potential economic impacts for impoverished communities. If found to be effective, it may provide a safe and cost-effective remedy for people throughout the developing world.

## An Herbal Supplement for Fertility

Infertility affects as many as one in seven couples. While there are many causes of infertility and subfertility, ovulatory disorders caused by hormonal imbalances can frequently lead to subfertility in women. Several herbs, including Red Clover, Chasteberry, Siberian ginseng and Ginkgo biloba are thought to have an effect on hormone balance and may treat subfertility. By regulating progesterone and menstrual

## Whole Systems Research on Naturopathic and Traditional Chinese Medicine

A recent study broke new ground as the first study of whole systems of complementary and alternative medicine to be funded by the National Institutes of Health. The study evaluated the use of naturopathic and Traditional Chinese Medicine for the chronic jaw pain known as temporomandibular joint dysfunction (TMD)—a common condition that affects up to one third of adults.

Whole systems research examines an entire system of care, rather than one specific treatment. Naturopathic medicine and Traditional Chinese Medicine are both examples of whole medical systems. Due to the variation and complexity of the methods and modalities used in these systems, research of this type is only just beginning.

It is challenging to design research that is both faithful to the practice of the medicine in terms of tailoring treatment to the individual, while still being scientifically rigorous and reproducible. This study

sought to overcome these challenges and develop methods for studying these complex systems. Multiple institutions were involved with the design and execution including the Helfgott Research Institute, Oregon College of Oriental Medicine, Kaiser Permanente Northwest and the University of Arizona.

The study involved 160 women who had been referred for TMD treatment. Participants were randomly assigned to one of three treatment groups—Traditional Chinese Medicine, naturopathic medicine or specialty care. Results showed that both Chinese and naturopathic medicine provided participants significantly more relief from their worst pain than specialty care. Chinese and naturopathic medicine were similar in their effectiveness for severe pain. This study also demonstrates that whole systems research is feasible and has great potential for understanding complementary and alternative medical systems and identifying effective treatments.



cycle length, these herbs may optimize fertility and result in successful conception.

Helfgott is conducting a double-blind, randomized placebo controlled trial to study the efficacy of a fertility supplement for women. Women with self-reported subfertility or infertility are being randomized to take either the supplement or a placebo. Women participate in the study for 6 months or until they become pregnant.

## Can Green Vegetables Affect Women's Hormone Levels?

Diets high in vegetables from the cabbage family, such as brussel sprouts and kale, have been shown to reduce the risk of breast and other cancers by changing how the body processes the hormone estrogen. Estrogen metabolism results in the formation of two primary compounds. One of these compounds, 16-alpha-hydroxy-esterone is considered a "pro-estrogen" and has been associated with an increased risk of estrogen-sensitive cancers such as breast, cervical and prostate cancer. An "anti-estrogen" that does not have this association, however, is 2-hydroxy-estrone. Shifting metabolism from one estrogen compound to the other may help reduce the risk of developing estrogen-linked diseases.

A recent study conducted by Helfgott tested the effects of a dried cruciferous vegetable supplement against a placebo in healthy menstruating women. The goal of the study is to determine if dried cruciferous vegetable supplements alter estrogen breakdown favoring the production of the "healthier" compound. The preliminary data from this pilot study did not show a change in estrogen levels with use of the cruciferous supplement when used for two months at this dose. However, it is important to note that this was a preliminary study and additional dosing studies are needed to establish whether a supplement of this type could have an effect on estrogen metabolism.

## Effects of Bacopa on Memory, Anxiety and Depression in Healthy Older Adults

*Bacopa monnieri* is an herb with a long history of use in Ayurvedic medicine. It is known to improve memory and learning, act as a sedative and anti-epileptic, either alone or in combination with other herbs. It is frequently seen in freshwater aquariums and goes by the common name water hyssop.

Former Helfgott researcher Carlo Calabrese, ND, conducted a study to evaluate the effects of a standardized extract of Bacopa on cognitive function, anxiety, depression and safety in healthy elderly participants. This was a randomized, double-blind, placebo-controlled clinical trial that took place over 12 weeks. Fifty-four participants, age 65 or older, were randomly assigned to take either Bacopa or a placebo.

Participants taking the Bacopa supplement had improved memory test scores when compared to the placebo group.

Scores for depression, anxiety and heart rate decreased in the Bacopa group but increased for the placebo group. No effects were found on measures of attention or blood pressure. The supplement was well tolerated and few adverse effects were reported. This study shows that Bacopa may be a safe method to enhance cognitive performance in aging adults and its use should be further studied.

## Effects of Soy Infant Formula on the Development of Adult Soy Allergies

Allergies are one of the most common chronic conditions, however little is known about why certain individuals develop them. Helfgott researcher Kim Tippens, ND, LAc, conducted a survey to determine if there is a relationship between adult soy allergies and use of soy formula in infancy. Results showed that 60% of soy formula fed infants went on to develop adult soy allergies or intolerance compared with 17% of those who did not consume soy formula. This indicates that there may be an association between the use of soy formula in infancy and the development of soy allergies in adulthood.

Researchers theorize that this increase in allergies may occur because the early introduction of complex proteins stimulates a certain type of immune response that results in the development of adult allergies. This small pilot study was conducted among students at NCM, so additional research is needed to determine if the same effect is seen in larger populations.





Photo Credits: Michael Privorotsky and Wally Gobetz

## Detoxification and Environmental Medicine

### Visual Environment, Stress and Heart Rate Variability

The influence of environmental factors such as light and sound have been shown to have significant effects on health. This has led to interest in the design of optimal healing environments. One prominent factor in this type of research is the presence of plants, which have been shown to positively influence health. Helfgott researcher Kurt Beil, ND, LAc, MPH, is studying the influence of plants on heart rate variability (HRV) and other measures of stress. Heart

rate variability measures the electrical activity of the cardiac system and is widely recognized as an important marker of psycho-neuro-physiological stress and overall health status.

In this pilot study, 24 participants were exposed to a room in which a variety of houseplants were either present or absent. Participants were “blinded” to the purpose of the experiment—they were not told that their response to the presence or absence of houseplants was being measured. To create a standard baseline stress level, all participants initially watched a 10-minute slide show of mild to moderate stressful images. They were then taken to a “recovery” room

to monitor their reaction to the stressor. HRV was measured throughout their visit. Mood, vitality and concentration were also measured before and after the study.

Data from this study are currently undergoing analysis. If the study hypotheses hold true, participants in the houseplant group will show greater reductions in stress than participants in the control condition. This has implications for the design of common indoor settings where stress can contribute to health status, including hospitals, nursing homes, offices and schools.

## Tampons and Vaginal Inflammation

Tampons are used by up to 70% of menstruating women in the U.S., yet there are new concerns about their use. Tampons are typically made of cotton, rayon (a synthetic fiber made from wood pulp) or a blend of the two fibers. Low levels of chemicals commonly found in these fibers (including dioxins and chlorine dioxide) may cause vaginal inflammation. Inflammation is the body's initial response to injury and is a result of activating the immune system. Chronic inflammation has numerous long-term health ramifications including links to the development of cancer, cardiovascular disease, obesity and other chronic illnesses.

Even trace amounts of chemicals present in tampons are cause for concern because the vagina is one of the most absorbent tissues in the body and the frequency of tampon use creates a high level of repeated exposure. The effects of some of these chemicals can be cumulative and may be measurable decades after exposure.

Helfgott is conducting a randomized controlled trial to examine the effect of organic cotton versus rayon blend tampons on vaginal inflammation. Our investigators hypothesize that women using organic cotton tampons will have less vaginal inflammation than those using rayon tampons. This study will help to determine if organic cotton tampons are safer than rayon or rayon blend tampons and will provide data for a larger study on tampon safety.

## Examining Detoxification Diets

Detoxification diets (detox) have become popular in recent years, with reported claims of health benefits such as weight loss and improved energy. The term "detox" often refers to the process of removing toxins from the body, as in drug and alcohol abuse. In the alternative health field, a detox may be used to improve sleep, energy and weight management. Research is needed to understand the mechanisms, safety, indications and contraindications of detoxification regimens.

Helfgott has completed three pilot observational studies to examine the symptoms and side effects of detox diets. The first pilot study included a survey involving 390 NCNM students. Participants were asked to report the type, duration, and motivation for up to five detox experiences. In the second study, 15 adults, who had completed various

detox regimens in the past (3-40 days in length), were interviewed regarding their motivations, symptoms, and side effects. In a third study, 11 NCNM students were asked to report the symptoms and side effects of a seven-day detox.

Analyses were compiled to assess trends from the surveys and questionnaires utilized in each study. Tremendous variability was observed in the motivation and experiences of people who undergo detox diets including differences in the protocols followed, the length of the regimen, side effects and perceived results. There were enough side effects—both positive and negative—to warrant further investigation of both safety and symptoms. Certain trends were associated with physical changes that occurred during detox. Further investigation is needed to see if there are biological markers that correspond with these physical changes. More research is needed to understand the biochemical effects of detox programs and determine markers for tracking changes. The results of further research will contribute to how detoxification programs are prescribed clinically.

## Environmental Settings and Health Effects Study

Health is affected by many factors, including unconscious levels of stress that are influenced by our surrounding environments. Evidence shows that the sights and sounds of our world create measurable changes in physical and mental markers of health and overall well-being. Over time these changes can significantly influence health status.

Helfgott researcher Kurt Beil, ND, LAc, MPH, recently initiated a study to investigate the effect of three different environmental settings on various measures of stress, health and well-being. Participants spent 20 minutes in a forested nature park, a downtown urban plaza and a windowless indoor auditorium. Participants experienced each setting one week apart in random order. Physical measures of stress were collected before and after arriving at each location, including the stress hormone cortisol, mood scales and a memory test. Ambient light, noise, and temperature levels were also collected at each location.

This study demonstrated a measurable difference in how the environment can influence health and well-being. The natural setting was shown to decrease feelings of tension, fatigue and distraction. In contrast, the windowless indoor setting increased feelings of tension, anger and distraction. No significant changes resulted from the urban setting. A larger study is now in the planning stages. It is hoped that these studies will broaden the concept of "natural medicine," expanding from the doctor's office to the realms of public health and urban planning.



## Mind-Body Medicine

### Meditation and Heart Rate Variability

Meditation is used by nearly 10 percent of the adult U.S. population for improving or maintaining health. Studies have shown that meditation may be effective for anxiety, depression, chronic pain and other health conditions. It may also positively affect brain and immune function and reduce stress. However, the concept of “stress reduction” can be difficult to study scientifically. How do you measure stress? One method may be with a measurement called heart rate variability (HRV).

HRV is derived from the electrocardiogram and refers to the beat-to-beat variation in heart rhythms. These changes can serve as an indicator of health by revealing underlying physiologic resiliency and adaptability. NCNM student (now graduate) Andrew Litchy, ND, and Helfgott investigator Agatha Colbert, MD, conducted a 12-week study to evaluate the effects of a Samatha-Vipassana (loving kindness) meditation on heart rate variability in participants who were previously non-meditators.

The study included 10 two-hour group meditation training sessions, plus 20 minutes of individual meditation per day. Results showed promising improvements in outcomes including an increase in heart rate variability and improvement in stress and mood. Results also demonstrated higher rates of parasympathetic nervous system activation with meditation. In general, the more people meditated, the better the improvement of heart rate variability and other health benefits as measured by surveys. More research is needed to further elucidate the complex interactions of meditation, physiology and stress.

### Examining the Placebo Effect Using a Mouse Model

It's long been known that a person's expectation of a pill or therapy working can influence their response to it. We call this phenomenon the “placebo effect.” Classical

conditioning can be used to model the placebo effect in animals. In a collaborative study with OHSU, mice with autoimmune encephalomyelitis (EAE) were conditioned to heal themselves.

In mouse EAE, mice develop paralysis starting at the tail and working its way up the body. The condition is similar to MS in humans. The mice with EAE were first treated with alpha-lipoic acid (ALA), a component of fish oil that treats autoimmune encephalomyelitis in mice. The ALA was administered along with saccharin-flavored water for three days. Saccharin tastes bitter to mice and served as a conditioning signal. The mice were then given saccharin alone (without ALA) and they continued to heal. The implications of this study are profound, as they suggest that even animals can undergo a placebo effect.

### The Effects of LENS Neurofeedback on Stress, Anxiety and Cognitive Function in Medical Students

Stress and anxiety are endemic problems in Western societies and have negative effects on health, well-being and cognitive function. The low energy neurofeedback system (LENS) is a form of neurofeedback with promising clinical reports supporting its use in addressing these problems. However, the research literature on LENS is extremely limited and no randomized controlled studies had been conducted previously.

In order to assess potential outcome measures, test compliance and evaluate a novel blinding procedure, the Helfgott Research Institute conducted a double-blind, placebo controlled exploratory study of LENS. Twenty participants were randomized to either a treatment group or placebo group and received six true or sham neurofeedback sessions over a period of seven weeks. Stress, anxiety and cognitive function were measured and compared between groups.

The stress and anxiety measures evaluated show promise as sensitive tools for measuring outcomes in future large-scale studies, while the tests utilized to assess cognitive function were likely not sensitive enough for our highly functioning study population. Study compliance and the blinding procedure were both successful, indicating that this would be an appropriate setup for future studies. No significant between-group differences were found.

## The Psychologic and Physiologic Effects of Binaural Beat Technology

Binaural-Beat Technology (BBT) products are sold as tools to reduce stress and anxiety, and increase focus, concentration and creativity. Binaural beats are “sounds” perceived when the ears receive two different sound frequencies between 90 and 1000 Hz, and that differ from one another by no more than 35 Hz. Listeners “hear” a beat at a frequency that is equal to the difference between the frequencies of the two sounds.

Helfgott researcher Helane Wahbeh, ND, led a study to gather data on the psychologic and physiologic effects of BBT. The study assessed the effects of daily BBT use for 60 days in eight healthy adults. Participants completed questionnaires on depression, anxiety, mood and quality of life. They also submitted blood samples for evaluation of hormones, neurotransmitters and other physiologic markers.

Study results showed a decrease in anxiety, an increase in quality of life and a decrease in insulin-like growth factor-1 and dopamine between the pre- and post-study measurements. The researchers conclude that BBT may have a positive effect on psychologic measures, especially anxiety. However, additional research is needed to confirm those findings.

## Relaxation and Visualization Therapy for Breast Cancer Patients

Women who undergo radiotherapy for breast cancer often experience significant fatigue and skin reactions, including considerable burning of the skin leading to debilitating pain. Patients undergoing radiotherapy or chemotherapy for cancer often use natural medicine to treat the side effects. Natural medicine may alleviate the pain and nausea caused by chemotherapy or radiotherapy. Relaxation and visualization have also been shown to improve fatigue and psychological distress.

The Helfgott Research Institute, in collaboration with OHSU, is studying if relaxation and visualization therapy can reduce the intensity of side effects experienced by women undergoing radiotherapy for breast cancer. This study was initiated by five NCM students who have since graduated and are now naturopathic physicians: Nadene Neale, Kristian Flores, Ashley Boudet, Abby Laing and Khivan Oberoi. Radiotherapy patients at OHSU’s Tuality Center received either daily guided imagery or an educational session following their radiation treatment for six weeks.

While this project was highly successful with participants, additional funding is needed to continue and expand the program. It is planned that students in NCM’s new Master of Science in Integrative Medicine Research program will continue running this project. If the mind-body approach is effective for reducing pain and radiation burn, its use could dramatically improve standard breast cancer care.

## Does Personality Correlate with Health?

Ancient medical systems consider the influence of both mind and body on health and often include personality traits in predicting and treating illness. Historically, assessment of personality was as important as health history in patient diagnosis. In 2006, students at NCM conducted a study among 100 of their peers to determine if personality can be correlated with health. Finding these correlations could assist patients and physicians in preventing and treating disease.

Study participants completed questionnaires regarding their health history, health-related quality of life and personality inventory, along with culturally traditional measures such as the Enneagram, Ayurveda, Chinese



and Western astrology. Astrological readings were also generated from participants' birth dates. The study revealed that certain "types" were represented in greater numbers among NCM students. The next step is to seek statistical correlations between the models to determine whether similar traits are statistically related. These results will be used to better understand the relationship of specific personality factors with measures of health and disease.

## Expectancy and Effects of Socioeconomic Status in the Treatment of Metabolic Syndrome and Obesity

In this collaborative study with OHSU, Helfgott researchers studied the role of expectancy on weight loss in 100 obese men and women with metabolic syndrome. The goal of the study was to see if participants' weight loss results differed based on their expectancy of receiving a weight loss supplement.

During the 12-week pilot study, participants were randomly assigned to one of three groups. One group was told that they were taking an active weight-loss supplement. The second group was told that they had a 50% chance

of receiving either an active or placebo weight-loss supplement. The third group received only lifestyle education. All participants took part in an education program taught by a naturopathic physician to improve their food choices and increase their exercise levels. No significant differences in weight loss were found among the three groups. However, participants in the groups that received capsules showed decreased weight loss self-efficacy. Participants in the education only group showed increased weight loss self-efficacy.

In conjunction with the main study, a sub-study was conducted to explore the relationship between socioeconomic status and weight-loss success. The study showed that socioeconomic status, education and occupational status were associated with the types of barriers experienced. Individuals with lower incomes were more likely to report having more physical barriers such as physical limitations to exercise, excessive hunger and food cravings. Those with higher educational levels were more likely to report increased psychological and emotional barriers—motivation, willpower, stress, difficulty in changing habits. Those with lower status occupations were more likely to report increased environmental barriers such as weather and neighborhood obstacles.



# Balneotherapy and Physical Medicine

## Magnets and Carpal Tunnel Syndrome

One to three percent of Americans suffer from carpal tunnel syndrome. Many patients treat themselves with over-the-counter therapeutic magnets—in the U.S. more than \$350 million is spent on these products annually. Basic science studies suggest that static magnetic fields could treat carpal tunnel syndrome by enhancing nerve growth and blocking the sensory nerves that cause pain. However, few studies have tested whether magnets actually relieve pain or improve function. Available results are often contradictory.

Dr. Agatha Colbert recently conducted a randomized, double-blind, sham-controlled clinical trial to evaluate the safety and effectiveness of magnet therapy for people with carpal tunnel syndrome. This was a first step toward conducting larger trials on magnets for other chronic painful conditions. In the study, 60 men and women were randomized to receive one of two magnet strengths or a non-magnetic disk. They then wore the device every night for six weeks.

The study found no differences between the three groups in symptom severity, function or electrical evaluation of the median nerve. However, there were symptomatic improvements in all the groups. One possible explanation for these results is that the magnets acted as splints, restricting wrist movement and reducing symptoms in all groups. Additional studies are needed to resolve issues with the use of sham magnets and determine the optimal magnet “dose.”

## Social Medicine

### An Evaluation of Naturopathic and Conventional Care for Type 2 Diabetes

Dr. Kim Tippens is leading a project comparing the treatment approaches provided by naturopathic versus conventional providers in treating patients with type 2 diabetes. Findings from this study will help identify best practices from both medical models, informing the future of integrative diabetes care and potentially improving diabetes care in the future.

Naturopathic care generally emphasizes prevention and lifestyle changes over expensive, technological approaches to health care. Because of this, naturopathic care may be a cost-effective alternative to conventional care for the management of many illnesses. However, there is little data

## Immunological Mechanisms of Constitutional Hydrotherapy

Constitutional hydrotherapy was developed by O.G. Carroll, an early pioneer of naturopathic medicine in the U.S. It was developed in the early 1900s and continues to be used by today’s naturopathic physicians. The therapy uses alternating hot and cold water and electro-therapy to promote wellness. It is believed to increase circulation, stimulate and promote digestion, and aid in the removal of toxins from the body. However, there is little scientific research on the biological effects of hydrotherapy.

A series of studies on hydrotherapy were initiated by naturopathic students, now physicians Kate Wiggin and Michael Gravett. Their initial research demonstrated an increase in circulating immune cells called monocytes following hydrotherapy. Follow-up research compared hydrotherapy to relaxation. In this pilot study, some individuals in both groups showed an increase in monocytes and lymphocytes. Former NCNM student, now physician Lisa Rosenberger decided to build on this research and conducted a randomized, controlled trial of hydrotherapy. Lisa and her colleagues measured immune cells as well as cytokines, proteins in the blood that indicate immune response. This pilot research was not conclusive, however it provides the preliminary data necessary to determine the outcome measures that should be used in future studies and when these should be collected.

on the treatment strategies and outcomes provided by naturopathic versus traditional providers.

This study will also reveal characteristics of the patient populations that chose naturopathic over conventional care—another area where little research has been conducted. An understanding of these populations may influence access and utilization of health care services, medical decision-making and patient satisfaction, and also inform future health services research.





## Acupuncture and Chinese Medicine

### Multichannel System for Measuring Skin Impedance at Acupuncture Points

How does acupuncture work? The basic nature of acupuncture meridians and points remains a mystery despite numerous studies and the popularity of acupuncture as a treatment method. The meridians and points have not been associated with any known anatomic or physiologic systems, but many believe that they are electrically different from the surrounding areas. Studies on this are limited in number and have conflicting results. The Helfgott Research Institute, in collaboration with Miridia Technology Inc., recently developed a prototype system to investigate the electric nature of the points.

It has been theorized that acupuncture points have lower electrical skin resistance than non-acupuncture points. Electrical skin resistance refers to how easily electricity flows through the skin and underlying tissue. Some acupuncturists use screening tools based on this concept for point location and diagnosis. Many believe that the skin resistance at acupuncture points will vary depending on the patient's health and that acupuncture treatments will normalize resistance at the points.

The system developed by Helfgott and its collaborators is an automated, eight-channel system nicknamed "the Octopus." Most devices built to measure skin resistance take just one measurement, but the Octopus takes continuous measurements over time. Using the Octopus, researchers at Helfgott hope to learn more about the nature of acupuncture points, their electrical properties and how they differ from surrounding non-acupuncture points.

### Moxibustion for Fatigue

Moxibustion, like acupuncture, is one of the treatment methods of Chinese medicine. It involves burning "moxa" made from the plant *Artemisia vulgaris* at acupuncture points. This study tested a Fukaya-style moxibustion regimen and its effects on fatigue in preparation for a larger randomized controlled trial. Participants were enrolled in the study if they met the diagnostic criteria for a specific type of fatigue according to Chinese medical diagnosis. Treatments were given by one acupuncturist once per week over eight weeks. The study used standardized questionnaires to determine improvement.

Eleven participants enrolled in the study and nine completed it. Eight of the nine participants who completed the study experienced significant overall fatigue reduction after finishing the treatments. Significant improvement was seen in the energy and fatigue scale of one of the questionnaires. The social function scale of the other questionnaire showed nearly significant improvement. Side effects included temporary worsening of fatigue and itching. While this was an uncontrolled study, the results are promising and further investigation of moxibustion as a treatment for fatigue is warranted.

### Improving Access to Care with the Community Acupuncture Model

Since its introduction to North America in the 1970s, acupuncture has become a widely recognized alternative care option. The most common acupuncture delivery model in the U.S. today involves private consultations and



treatments ranging in cost from \$65 to \$150 per visit. Most insurance does not cover these visits and patients often pay out-of-pocket for their care. The cost and lack of insurance coverage for acupuncture treatments may limit access to a viable strategy for chronic disease management.

Community acupuncture clinics offer low-cost treatments in a group setting. In this model, several patients are treated in the same room, with the acupuncturist moving from patient to patient. Practitioners typically utilize points that do not require disrobing such as those below the knee and elbow and on the head and neck. The cost is often on a sliding scale with treatments ranging from \$15-\$40. Dr. Kim Tippens has embarked on a program of research to assess whether community acupuncture can increase access to and utilization of acupuncture. Her first step was to conduct a survey to characterize patients of community acupuncture clinics and assess their satisfaction with the care they received.

Surveys were distributed to clients at the Working Class Acupuncture clinics in Portland, Ore. These two clinics provide approximately 1,600 acupuncture treatments each month. Of the 500 surveys distributed, 478 were returned. Compared to a nationally representative sample of U.S. acupuncture users, clients at these clinics had higher education levels, lower household income and were more

likely to receive frequent acupuncture treatments, which could have important implications for clinical outcomes of acupuncture. Twenty-five percent reported being uninsured and 81% cited affordability as an “extremely important” factor in choosing community acupuncture. Sixty-five percent of those uninsured indicated that they had “no other option for health care.” Further research will examine the community acupuncture model’s potential to reduce disparities in access to complementary and alternative medicine. Additional studies are needed to assess treatment efficacy and gather data from community acupuncture clinics across the country.

## Effects of Acupuncture on Bereavement-Related Depression, Anxiety, and Stress

Bereavement following the death of a spouse can induce a range of responses including grief, depression, anxiety, insomnia, preoccupation and fatigue. Bereaved spouses are more likely to have mental and physical health problems, declines in immune function, higher disability rates, medication use and hospitalizations. Acupuncture may be a useful treatment method for patients during times of bereavement. Karen Kaufman, PhD, LAc, conducted a study to test the feasibility of delivering a course of acupuncture to bereaved widows and widowers.

## Evidence-Based Medicine and Research Training for NCNM Faculty

Evidence-Based Medicine (EBM) is a widely accepted approach to clinical decision making in conventional medicine. In evidence-based medicine, medical decisions are made by identifying, critically evaluating and applying relevant information to patient care. This information is derived from a variety of sources including clinical experience, clinical and laboratory diagnostic measures, patient preference and medical literature.

EBM is a relatively new concept in CAM training and practice. In recognition of this knowledge gap, the National Center for Complementary and Alternative Medicine announced a program to “enhance CAM practitioners’ exposure to, understanding of, and appreciation of the evidenced-based biomedical research literature and approaches to advancing scientific knowledge.” In 2007, NCNM was awarded a Research in Complementary and Alternative Medicine Program (R-CAMP) R25 grant.

The R-CAMP project aims to integrate EBM into NCNM’s naturopathic and Chinese medicine coursework and clinical experiences. This is completed through strengthening and formalizing research and EBM skills in didactic courses. These skills are then incorporated

throughout the clinical part of the program. In order to accomplish this aim, a team of “Vanguard Faculty” have been trained in research content, skills and teaching strategies. These faculty work together to transform key lectures in their courses.

R-CAMP has been very successful, having trained 26 faculty and 386 students in EBM, and disseminated these efforts at local, national and international conferences. New pre-and post-degree research training opportunities for NCNM students and residents have also been developed. Electives developed in the first cycle of R-CAMP culminated in a research master’s degree: Master of Science in Integrative Medicine Research. Through collaboration with OHSU, higher-level research training is available for NCNM faculty via mentored projects, faculty shadowing and advanced short courses in EBM and teaching strategies.

R-CAMP will allow NCNM graduates to better communicate with their conventional medicine counterparts, improve patient care, and foster the skills they need to contribute to the CAM evidence base by collaborating with researchers and collecting data from their own clinics.

The study looked at the effect of weekly treatments delivered over a six-week time period. It assessed participants before and after treatment using standardized questionnaires to measure stress, grief and depression. Inflammatory markers and cortisol were also measured. Exit interviews with participants revealed high satisfaction with the treatments, negligible adverse effects and additional positive outcomes, including reduction of symptoms such as insomnia and reduction in medication use. This preliminary study suggests that acupuncture is a promising intervention for individuals coping with the loss of a spouse. The next step in this course of research would be to conduct a larger study that includes a comparison group.

## The Scientific Evidence for Use of Magnets on Acupuncture Points

Therapeutic magnets are used by acupuncturists and other CAM providers to treat a wide variety of conditions, especially pain. They are also used as over-the-counter or self-care treatments. When used by health care providers, magnets are typically applied to painful areas, “trigger points” or acupuncture points. They may also be applied after acupuncture to prolong the therapeutic effect of the treatment.

Helfgott investigators conducted a review of the scientific literature on magnets applied to acupuncture points to determine if there is sufficient evidence for further investigation. The review included human studies (both in English and Chinese) for a wide range of conditions. Studies in animals and those that included electrical stimulation were excluded. Three hundred and eight studies were identified and 50 met the inclusion criteria. The investigators were able to obtain full text articles for 42 studies. Thirty-one studies were in English and 11 were in Chinese. Translations from Chinese were conducted when necessary. The studies encompassed 32 different clinical conditions and 6,453 patients from 1986-2007. The magnetic devices used, dosing regimens and control devices differed greatly among the studies.

A remarkable result of this review is that of the 42 studies evaluated, 37 (88%) reported therapeutic benefit. This finding should be interpreted with great caution for several reasons: 34 of the reviewed studies were conducted in China, where there is a pronounced bias toward publishing positive results; also, many of the studies were of poor quality or were uncontrolled case series. However, the reviewers conclude that further investigation of the application of magnets on acupuncture points is warranted. This review may be used to help guide the development of future studies and poses specific questions to be addressed in future studies. It is recommended that future research be conducted according to the STRICTA and CONSORT reporting guidelines for conducting and reporting research findings.

## Measuring Electrical Skin Resistance at Acupuncture Points

Clinicians worldwide use the measurement of electrical skin resistance at acupuncture points for both diagnosis and to monitor the effects of their treatments. However, little research has been done on the instruments used to take these measurements, or on the physiologic responses measured.

In collaboration with OHSU, Helfgott investigator Agatha Colbert, MD, measured the skin resistance at 24 acupuncture points over a 24-hour time period in 20 healthy individuals. This was the first study to publish data this topic. The goals of this study were to identify patterns occurring throughout the 24-hour time period, and to investigate if electrical activity at the acupuncture points corresponded to times associated with specific acupuncture channels and organs according to the traditional Chinese clock.

The study results indicate that skin resistance measurements at acupuncture points act similarly to the galvanic skin response, which is one component of polygraph devices (lie detectors). Results also show that skin resistance increases during sleep and decreases on waking. Many new hypotheses were generated from this study. Additional research must be conducted in order to develop and validate the use of skin resistance measurements at acupuncture points as medical biomarkers.

**Thank you for your interest in the projects conducted at the Helfgott Research Institute at the National College of Natural Medicine.**

These studies advance our mission of providing an evidence base for natural medicine. If you would like to keep abreast of our research, we encourage you to check our website for project updates. As you pursue your own health goals, remember that there are many alternatives and the research is under way!

A close-up photograph of several dandelion seed heads. The seed heads are in various stages of maturity, with some showing the characteristic white, feathery pappus. The background is a soft, out-of-focus green, suggesting the presence of leaves. The lighting is natural, highlighting the intricate structure of the seeds and the delicate texture of the pappus.

*Every great advance in science  
has issued from a new audacity  
of imagination.*

*—John Dewey*



049 SW Porter Street  
Portland, OR 97201  
[www.ncnm.edu/research](http://www.ncnm.edu/research)

