

National Institutes of Health
National Center for Complementary
and Alternative Medicine

Blue Ribbon Intramural Research
Strategic Planning Panel

June 5, 2009

Executive Summary

Background

The National Center for Complementary and Alternative Medicine (NCCAM) was established in February 1999, as the 25th independent component of the National Institutes of Health (NIH). Stephen E. Straus, M.D., was appointed as the first Director of NCCAM in October 1999. Josephine P. Briggs, M.D., became Director in February 2008.

The Intramural Research Program (IRP)

To complement the activities of the ongoing extramural research program, the Division of Intramural Research was established in April 2001. Robert B. Nussenblatt, M.D., has served as Acting Scientific and Clinical Director since March 2004, performing these duties in addition to those of his primary appointment as Chief of the Laboratory of Immunology at the National Eye Institute (NEI). As part of his NCCAM duties, Dr. Nussenblatt also serves as the Acting Chief of the Endocrine Section, which conducts laboratory-based investigations defining the effects of endocrine-related complementary and alternative medicine (CAM) agents on normal and neoplastic human prostate stromal and epithelial cells. Dr. Michael Quon, Chief of the Diabetes Unit, is the sole Principal Investigator in the IRP. He directs a research program that seeks to understand how nutritional supplements and functional foods modulate the biological actions of insulin and the molecular mechanisms of insulin resistance as they relate to the pathophysiology of diabetes, obesity, cardiovascular diseases, and their complications. Dr. Ranganath Muniyappa serves as Acting Director of the Complementary and Integrative Medicine Consult Service, which serves the staff at the NIH Clinical Center.

Available Resources

NCCAM has allocated \$12.5 million, approximately 10 percent of its total budget, for the Intramural Research Program. An annual incremental budget of approximately \$6.5 million is available to support a Scientific Director and up to six tenured and/or tenure-track investigators.

A total of 972 square feet of space is allocated in the NIH Clinical Center (Building 10) for the Complementary and Integrative Medicine Consult Service. An additional 2,255 square feet of space is available in Building 10 for the Scientific Director Designee and a second Principal Investigator, and 5,000 square feet of space is available at the Twinbrook campus for five principal investigators, including the sole, currently tenured principal investigator.

The Blue Ribbon Intramural Research Strategic Planning Panel

As the first step in NCCAM's third strategic planning process, Dr. Briggs appointed the Blue Ribbon Intramural Research Strategic Planning Panel to present a report to Council and the Center regarding future directions for the IRP.

Charge to the Panel

Members of the Panel were asked to identify areas of research to pursue that will capitalize on what the NIH intramural environment offers and have the potential to make a significant contribution to the field of complementary and alternative medicine research.

Meetings and Deliberations of the Panel

Members met several times via teleconference in preparation for their face-to-face meeting on the NIH campus on March 16, 2009. To provide context and inform their deliberations, they were given extensive background materials and discussed relevant intramural programs with key NIH Intramural Research Program staff.

Promising Areas for Focused Intramural Research

The Panel identified two research areas that hold promise for making significant contributions to the field of CAM research: herbals research and mind-body research.

Herbals Research

Herbs, botanicals, and dietary supplements (referred to as herbals in this document) are widely used by the American public. Indeed, many patients with chronic diseases have unmet clinical needs to which herbals may contribute. Since herbals are multi-chemical in nature, they may provide benefit in ways that single-chemical pharmacological agents fail to achieve. Yet the role of herbals in preventing and influencing disease outcome is poorly understood.

An herbals research program would focus, for example, on the role of botanicals in maintaining health and wellness and in elucidating their mechanisms of action in chronic disease. These studies might reveal common pathways across these diseases by elucidating the mechanisms by which herbals reduce inflammation; how herbal lipids may alter prostanoid, thromboxane, and leukotriene synthesis as well as other aspects of the inflammatory response; and/or how herbals may regulate the microflora of the gut (mouth to anus). Studies might also explore the ways in which herbals act directly on brain function (via neurotransmitters) and stem cell/neuron regeneration.

The proposed herbals research program would also contribute to the research programs under way in the intramural research programs of other NIH Institutes and Centers by identifying and characterizing the herbals used by patients participating in and/or those that are the subject of clinical trials (across all NIH Institutes and Centers).

The collaborative environment of the NIH intramural research programs and the availability of expertise and resources in microarray analysis, genomics, epigenomics, proteomics, metabolomics, immunokine-cytokine systems, neuroimaging, system biology, and bioinformatics present a unique opportunity to carry out an herbals research program.

Mind-Body Research Program

Substantial evidence shows that mind-body practices enhance quality of life, reduce psychological stress, and improve mental health outcomes. However, it is not possible for the field to forecast the impact of mind-body strategies on other tangible health outcomes without basic information on neural and other biologically plausible mechanisms that may drive these benefits. In other words, if mind-body strategies are to be translated into large-scale efficacy trials, specificity regarding proposed outcomes and possible mechanisms of action will need to be delineated.

A mind-body research program would focus, for example, on the impact of meditation practices on quality of life and/or research on the placebo effect. A mind-body research program focused on the impact of meditation practices would study the impact of practices such as mindfulness meditation or the meditation components of tai chi or yoga on underlying neural pathways and quality of life, including symptom measures, such as depressive affect or chronic pain. A research program focused on placebo research would add to the substantive research base showing the impact of expectancies on outcome.

The opportunities at NIH to bridge across disciplines, including neuroscience, cognitive neuroscience, neuroimaging, immunobiology, and genomics are unique and critical for the success of achieving an integrated understanding of the range of neural and biological effects of meditation and/or placebo that drive clinical benefit. Moreover, the Clinical Center provides access to unique clinical populations, which have been extensively characterized, including at the genomic level.

Recommendations

1. The NCCAM IRP should comprise a single program

Given the size of the IRP and the importance of having a critical mass of investigators pursuing a shared theme, the Panel recommends that the NCCAM IRP should comprise a single program focused on either herbals or mind-body research.

2. The Scientific Director should possess several important qualifications

A successful leader of the IRP should:

- Have expertise in systems biology (herbals) or neuroscience (mind-body) characteristics
- Be scientifically credible and command respect
- Articulate and/or demonstrate a commitment to CAM concepts
- Be skeptical and willing to apply hard science to the study of CAM
- Have an interest in applying appropriate modern multiplexed technology
- Appreciate the multi-pathway, multi-target mechanisms of action of herbals or mind-body approaches
- Be able to think out-of-the-box
- Have a track record of team-building that is coupled with interdisciplinary and bench-to-bedside research.

3. NCCAM should recruit a shared-theme interdisciplinary research team

A shared theme interdisciplinary research program should be built around a “critical mass” of investigators that represent several disciplinary areas linked to the research program.

4. NCCAM should provide appropriate research facilities and infrastructure support

Depending on the selection of the future Scientific Director and the choice of research focus for the IRP, various options are recommended for consideration. For example, if the research focus emphasizes herbals research, utilization of laboratories on the Twinbrook campus should be considered, given their proximity to NIH Chemical Genomics Center, the NIH Intramural Sequencing Center, and other relevant research programs. If the research focus of the NCCAM IRP emphasizes mind-body research, which would capitalize on the clinical research strengths on the NIH Campus, utilization of laboratories located on the NIH Bethesda Campus (either in Building 10 or with other neuroscience and neuroimaging colleagues in the Porter Neuroscience Research Center) with strong linkages to the Clinical Research Center is strongly recommended.

5. NCCAM should develop a training program

Given the relatively small size of the intramural research program, collaborations across NIH Institutes and Centers are critical toward advancing its interdisciplinary research aims. It is envisioned that a training program, which places trainees in mutually collaborative laboratories, will serve a bridging function to strengthen linkages across institutes and disciplines.

In addition, to advance the research training goals of the NCCAM intramural research program and to disseminate research advancement in CAM, it would be important to build a seminar program to complement the excellent NCCAM newsletter that is already in place.

Blue Ribbon Intramural Research Strategic Planning Panel

Background

Based on their recognition of the growing popularity of complementary and alternative medicine (CAM) in the United States¹, beginning in the early 1990s, Congress initiated a series of steps to focus the National Institutes of Health (NIH) on research programs in the area of CAM. These efforts culminated on the establishment of the National Center for Complementary and Alternative Medicine (NCCAM) in February 1999, as the 25th independent component of the NIH.

The Public Law (P.L. 105-277) creating NCCAM in October 1998 (fiscal year 1999) states that the Center's purposes are for "the conduct and support of basic and applied research...research training, and other programs with respect to identifying, investigating, and validating complementary and alternative treatment, diagnostic, and prevention modalities, disciplines and systems."

Stephen E. Straus, M.D., was appointed the first Director of NCCAM in October 1999. Josephine P. Briggs, M.D., became the second Director in February 2008.

The NCCAM Intramural Research Program

History

To complement the activities of the NCCAM extramural research program, the Division of Intramural Research was established in April 2001. It was composed of the Office of the Scientific Director for Clinical Research (OSDCR) and the Laboratory of Clinical Investigation (LCI), and Marc R. Blackman, M.D., was appointed the first Scientific Director for Clinical Research and Chief, Endocrine Section, LCI. An Oncology Program in the OSDCR under the direction of Staff Clinician Patrick Mansky, M.D., was established in July 2001; the Diabetes Unit under the direction of Michael J. Quon, M.D., Ph.D., was established in the LCI in March 2002; and the Complementary and Integrative Medicine Consult Service, under Dr. Manký's direction, was established in April 2007.

¹ Eisenberg, D.M. et al. "Trends in Alternative Medicine Use in the United States." 1990-1997. *JAMA*. 1998; 280:1569-1575.

Current Staffing

Dr. Blackman left NIH to pursue other career opportunities, and Robert B. Nussenblatt, M.D., has served as Acting Scientific and Clinical Director since March 2004. He performs these duties in addition to those of his primary appointment as Chief of the Laboratory of Immunology at the National Eye Institute (NEI).

Dr. Nussenblatt serves also as the Acting Chief of the Endocrine Section, which conducts laboratory-based investigations defining the effects of endocrine-related CAM agents on normal and neoplastic human prostate stromal and epithelial cells.

Dr. Quon, the sole Principal Investigator in the IRP, is Chief of the Diabetes Unit, directing a research program that seeks to understand how nutritional supplements and functional foods modulate the biological actions of insulin and the molecular mechanisms of insulin resistance as they relate to the pathophysiology of diabetes, obesity, cardiovascular diseases, and their complications.

Dr. Mansky left NIH in 2009 and the Oncology Program has been discontinued. Dr. Rangangath Muniyappa, M.D., Ph.D., has taken over as Acting Director of the Complementary and Integrative Medicine Consult Service.

Available Resources

In keeping with the NIH norm, NCCAM has allocated \$12.5 million, approximately 10 percent of its total budget, for the IRP. Allowing approximately one-third of this budget for overhead (\$4 million) and approximately \$1.5 million for salaries of current staff, an annual incremental budget of approximately \$6.5 million is available to support a Scientific Director and up to six tenured and/or tenure-track investigators.

Currently, the NCCAM intramural research program has been allocated 972 square feet in the NIH Clinical Center (Building 10) for the Complementary and Integrative Medicine Consult Service. An additional 2,255 square feet of space is available in Building 10 for the Scientific Director designee and a second Principal Investigator, and 5,000 square feet of space is available at the Twinbrook campus for five Principal Investigators, including the sole, currently tenured Principal Investigator.

The Blue Ribbon Intramural Research Strategic Planning Panel

In this its 10th anniversary year, NCCAM has embarked upon its third strategic planning process.² As the first step in this process, Dr. Briggs appointed the Blue Ribbon Intramural Research Strategic Planning Panel to present a report to Council and the

² Two plans have been published previously: Expanding Horizons of Healthcare, Five-Year Strategic Plan, 2001 – 2005 and Expanding Horizons of Healthcare: Strategic Plan 2005 – 2009.

Center regarding future directions for the Intramural Research Program. Members are listed in Appendix I.

Charge to the Panel

Members of the Panel were asked to identify areas of research for NCCAM to pursue that will capitalize on what the NIH intramural environment offers and have the potential to make a significant contribution to the field of CAM research.

Specifically, the Panel was asked to address the following three questions.

- Are there areas that NCCAM should consider for focused intramural research program development that would:
 - capitalize on the unique capabilities and resources of the NIH Clinical Center
 - benefit from the general intramural research environment
 - add significantly to existing efforts in the field of CAM research?
- For each area identified, what are the major scientific opportunities, advantages, and disadvantages of the NIH intramural environment in building a program? What are the potential synergies or redundancies with other ongoing intramural or extramural activities in these areas? What are the relative priorities?
- Within this context, what are the panel's recommendations concerning the appropriate scope of intramural research training and career development activities?

Meetings and Deliberations of the Panel

Members of the Panel met several times via teleconference in preparation for their face-to-face meeting on the NIH campus on March 16, 2009. On December 15 and 18, 2008, Dr. Briggs charged the Panel. On February 9, 2009, the Panel met to identify and promising scientific areas. Subgroups subsequently met on February 13 to explore possibilities for a mind-body research program and on February 16 to discuss a proposed herbals research program. On March 3, 2009, the Panel met to prepare for their final deliberations at the meeting in Bethesda on March 16.

To provide context and inform their deliberations, the Panel was given extensive background materials (listed in Appendix II) and discussed relevant intramural programs with key NIH Intramural Research Program staff (listed in Appendix III).

Promising Areas for Focused Intramural Research

The Panel identified two research areas that hold promise for making significant contributions to the field of CAM research: herbals research and mind-body research.

Herbals Research

Significance

Herbs, botanicals, and dietary supplements (referred to as herbals in this document) are widely used by the American public. According to the Institute of Medicine, 15 million adults take herbal remedies or high-dose vitamins³. Indeed, many patients with chronic diseases have unmet clinical needs to which herbals may contribute. Included are brain function-associated diseases, such as dementia, neurodegeneration, stroke, and trauma management, as well as arthritis, cardiovascular disease, diabetes, osteoporosis, and chronic skeletal pain, particularly in the elderly. Since herbals are multi-chemical in nature, they may provide benefit in ways that single-chemical pharmacological agents fail to achieve. Yet the role of herbals in preventing and influencing disease outcome is poorly understood.

Determining the components of herbals that are responsible for their biological activities will contribute toward gaining an understanding of how herbals prevent and influence disease outcome. Moreover, while drug development is not within NCCAM's mission, determining the components of herbals that are responsible for their biological activities will facilitate their further development as lead compounds for targeted drug discovery by groups other than NCCAM.

Proposed Studies

An herbals research program would focus, for example, on the role of botanicals in maintaining health and wellness and in elucidating their mechanisms of action in chronic disease, such as, arthritis, cardiovascular disease, diabetes, neurodegeneration, and osteoporosis, as well as chronic skeletal pain. These studies might reveal common pathways across these diseases by elucidating the mechanisms by which herbals reduce inflammation, central in the pathogenesis of many chronic diseases; how herbal lipids may alter prostanoid, thromboxane and leukotriene synthesis as well as other aspects of the inflammatory response; and/or how herbals may regulate the microflora of the gut (mouth to anus), with profound indirect effects on human health. Studies might also explore the ways in which herbals act directly on brain function (via neurotransmitters) and stem cell/neuron regeneration.

To elucidate mechanisms of action of herbals in normal and pathophysiology, studies would apply state-of-the-art approaches, including microarray analysis, genomics, epigenomics, proteomics, metabolomics, immunokine-cytokine systems, neuroimaging, system biology, and bioinformatics. These studies might reveal common pathways across these diseases.

To ensure the validity of studies, NCCAM intramural investigators would provide quality control by characterizing herbals under investigation. And they would conduct pharmacokinetics and pharmacodynamics studies, including, for example,

³ *Complementary and Alternative Medicine in the United States*. Committee on the Use of Complementary and Alternative Medicine by the American Public, 2005.

biofractionation of herbals and use of suitable model systems to identify bioactive ingredients and their cellular targets and conduct absorption, distribution, metabolism, and excretion (ADME) studies of bioactive components.

The proposed herbals research program would also contribute to the research programs under way in the intramural research programs of other NIH Institutes and Centers. Indeed, many of the patients who are in clinical studies at NIH are using herbals, often with little documentation or analysis of actual intake or circulating plasma levels of the bioactive ingredients derived from these materials. The proposed herbals program would identify and characterize the herbals used by patients participating in and/or those that are the subject of clinical trials (across all NIH Institutes and Centers). As a corollary, interaction with other NIH components would allow NCCAM intramural investigators to better define the clinical attributes of patient groups selected for herbals intervention studies, thereby improving the quality of these clinical studies. Overall, this interaction between NCCAM and the other NIH Institutes and Centers will add to the strength of the systems biology approach to the integration of science and medicine.

Unique Opportunities for Herbals Research at NIH

The collaborative environment of the NIH intramural programs and the availability of expertise and resources in microarray analysis, genomics, epigenomics, proteomics, metabolomics, immunokine-cytokine systems, neuroimaging, system biology, and bioinformatics present a unique opportunity to carry out an herbals research program. Overall expertise across NIH related to mechanisms of action of small molecules (activators and inhibitors of signaling and metabolic pathways, gene induction) is a strength that can guide the interpretation of the impact of herbals on promotion of health and prevention and possible treatment of disease.

Mind-Body Research Program

Significance

In 2007, approximately 19 percent of adults in America reported use of mind-body therapies.⁴ Substantial evidence has been generated in the extramural research community to show that mind-body practices, such as meditation and/or practices that incorporate meditation components (e.g., tai chi, yoga), enhance quality of life, reduce psychological stress, and improve mental health outcomes. However, it is not possible for the field to forecast the impact of mind-body strategies on other tangible health outcomes without basic information on neural and other biologically plausible mechanisms that may drive these benefits. In other words, if mind-body strategies are to be translated into large-scale efficacy trials, specificity regarding proposed outcomes and possible mechanisms of action needs to be delineated. The basic mind-body research

⁴Barnes, PA., Bloom, B, and Nahin, RL: Complementary and Alternative Medicine Use Among Adults and Children: United States, 2007. National Health Statistics Reports; no 12. Hyattsville, MD: National Center for Health Statistics. 2008

proposed for the NCCAM IRP program would provide an important first step in this direction. In addition, an explicit focus on the placebo effect would address a common problem for research in CAM as well as in other fields. In many randomized controlled trials, the placebo shows similar benefit to the active arm, but little is known about the mechanism of action.

Proposed Studies

A mind-body research program would focus, for example, on the impact of meditation practices on quality of life and/or research on the placebo effect.

A mind-body research program focused on the impact of meditation practices would study the impact of practices such as mindfulness meditation or the meditation components of tai chi or yoga on underlying neural pathways and quality of life, including symptom measures, such as depressive affect or, chronic pain. Meditation is thought to impact biologically plausible mechanisms, and foundational research in this area would have a large impact on discovery of prevention approaches and possible treatment for a number of highly prevalent stress-related conditions including, for example, cardiovascular disease, depression, and metabolic syndrome. As noted, research in the extramural setting has provided some evidence that these treatments have effects on stress response pathways (i.e., autonomic functioning, emotion regulation), but this research has not been integrally connected to understanding the neural processes that drive these proximal mediators of benefit. Furthermore, there is considerable individual variability in such biological responses, and it is not known whether genomic vulnerabilities and/or varying neural responses drive individual differences, which may ultimately predict clinical outcomes. An intramural research program at NCCAM would address these important gaps by facilitating linkage with rich infrastructure and personnel resources in neuroimaging including both availabilities in fMRI and PET scanning, as well as interactions with collaborators in genomics and bioinformatics.

A program focused on placebo research would add to the substantive research base showing the impact of expectancies on outcome. Little progress has been made in understanding the basis and neural pathways by which this occurs. A long-term, high-risk approach facilitated by an intramural research program may achieve these goals. This research would benefit from collaboration with investigators conducting clinical trials at a number of NIH Institutes and Centers. Drawing on populations with different diseases and undergoing different treatments may illuminate common as well as disease-specific characteristics and processes associated with the placebo response. As with meditation, the resources for neural imaging would facilitate this research.

To translate this basic research into the clinical setting and to export this foundational research to large-scale phase III trials, seed grants or other mechanisms might be developed to foster and encourage collaborations between intramural and extramural scientists. In so doing, effort should be made toward standardizing components of mind-body protocols, which show strong linkages with neural mechanisms and other proximal mechanisms of possible clinical benefit as demonstrated by the NCCAM intramural research program.

Unique Opportunities at NIH for a Mind-Body Research Program

The unique opportunities at NIH to bridge across disciplines and include each of the above areas, neuroscience, cognitive neuroscience, neuroimaging, immunobiology, and genomics are critical for the success of achieving an integrated understanding of the range of neural and biological effects of meditation and/or placebo that drive clinical benefit. The NIH Clinical Center provides access to unique clinical populations, which have been extensively characterized, including at the genomic level. In addition, access to comparison control populations are available that may be more motivated to participate in interdisciplinary research protocols that require experimental challenges and/or longer term, longitudinal characterizations.

Recommendations

1. The NCCAM IRP should comprise a single program

Given the size of the intramural research program and the importance of having a critical mass of investigators pursuing a shared theme, the Panel recommends that the NCCAM IRP should comprise a single program focused on one or the other of these programs, recognizing that certain aspects of herbal research might complement and synergize with a mind-body research program, or vice versa.

2. The Scientific Director should possess several important qualifications

The expertise of the Scientific Director who is selected to direct and oversee the intramural research program must, of course, be guided by the identified research area. The Scientific Director of an herbals research program should have expertise in systems biology. The Scientific Director of a mind-body research program should have expertise in neuroscience.

However, the Panel has identified shared commonalities for this position regardless of the research area. A successful leader of the intramural research program should:

- Be scientifically credible and command respect both in the NCCAM and greater NIH intramural and extramural communities
- Articulate and/or demonstrate a commitment to CAM concepts in consideration of the whole person rather a strict reductionist approach
- Be skeptical and willing to apply hard science, while appreciating the complex nature of herbals or mind-body approaches
- Have an interest in applying appropriate modern, multiplexed technology (such as omics, bioinformatics, neuroimaging), where appropriate
- Appreciate the multi-pathway, multi-target, mechanisms of action of herbals or mind-body approaches
- Be able to think out-of-the-box
- Have a track record of team-building that is coupled to interdisciplinary and bench-to-bedside research.

3. NCCAM should recruit a shared-theme interdisciplinary research team

A shared-theme interdisciplinary research program should be built around a “critical mass” of investigators who represent several disciplinary areas linked to the research program. The team would build upon and substantially extend the interdisciplinary breadth and reach of the Scientific Director’s individual research program, and would be directed in part by his/her vision. It is anticipated that six investigators, in addition to the Scientific Director, would comprise this team, and include expertise, for example, in neuroscience, neuroimaging, systems biology, bioinformatics, immunology, genomics, and therapeutics. Given that this NCCAM intramural team will be relatively small, collaborations with other NIH intramural investigators will be of utmost importance for building a successful program in the long term. Joint appointments, when possible, are likely to foster further interdisciplinary, collaborative ties between the NCCAM intramural research team and other NIH components, which share commitment to the above-noted research areas.

4. NCCAM should provide appropriate research facilities and infrastructure support

Depending on the selection of the Scientific Director and the choice of research focus for the intramural research program (emphasis on botanicals/herbal products or research in the mind-body approaches), various options are recommended for consideration. For example, if the research focus emphasizes herbal research, utilization of four individual laboratories on the Twinbrook campus should be considered, given their proximity to NIH Chemical Genomics Center, the NIH Intramural Sequencing Center, and other relevant research programs. If the research focus of the NCCAM IRP emphasizes mind-body research, which would capitalize on the clinical research strengths of the NIH Campus, utilization of laboratories located on the NIH Bethesda campus either in Building 10 or with other neuroscience and neuroimaging colleagues in Building 35 (Porter Neuroscience Research Center) with strong linkages to the Clinical Research Center is strongly recommended. Moreover, when new space becomes available with the completion of “Porter II,” placement of the neuroscience and neuroimaging components of the mind-body research program at this site is viewed a critical step in advancing working collaborations with colleagues in neuroscience, cognitive neuroscience, and neuroimaging. However, it is important to note that components of the herbal research program also emphasize neuroscience and neuroimaging. Hence, regardless of primary research focus – mind-body approaches or herbal products research – close collaborations with neuroscientist colleagues will be of utmost importance for a successful program. Thus, the success of a NCCAM’s future intramural research program will require a location on the NIH Campus either in Building 10 or in the Porter Neuroscience Research Center, with the extent of such presence related to the programmatic focus of either mind-body or herbal products research.

5. NCCAM should develop a training program

Research training is integral to the success of the NCCAM intramural research program. Given the relatively small size of the IRP, collaborations across NIH institutes are critical toward advancing its interdisciplinary research aims. It is envisioned that a training program, which places trainees in mutually collaborative laboratories, will serve a bridging function to strengthen linkages across institutes and disciplines. It is

recommended, for example, that individual post-doctoral fellows would be assigned to NCCAM laboratory scientists, and in turn the post-doctoral fellow would also be trained jointly in a related disciplinary science (e.g., neuroscience, neuroimaging, genomics, systems biology). With the proposed size of the NCCAM research team totaling seven investigators, there would also be a total of seven post-doctoral trainees.

In addition, to advance the research training goals of the NCCAM intramural research program and to disseminate research advancement in CAM, it would be important to build a seminar program that would feature outstanding intra- or extramural research in CAM would enhance the visibility, educational, and training opportunities of the program. The educational activities that target the NIH faculty and trainees would be in addition to the excellent NCCAM newsletter that is already in place.

Appendix I

Blue Ribbon Intramural Research Strategic Planning Panel

CHAIRPERSON

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⁷ NCCAM Board of Scientific
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Appendix II

Background Materials

I. NCCAM OVERVIEW

- A. Definition of CAM
- B. Organizational Chart
- C. Budget

II. CAM REPORTS

- A. National Health Interview Survey
Complementary and Alternative Medicine Use Among Adults and Children: United States, 2007
by Patricia M. Barnes, M.A., and Barbara Bloom, M.P.A., Division of Health Interview Statistics, National Center for Health Statistics; and Richard L. Nahin, Ph.D., M.P.H., National Center for Complementary and Alternative Medicine, National Institutes of Health
- B. IOM Report: CAM Use in the U.S.
Complementary and Alternative Medicine in the United States
Committee on the Use of Complementary and Alternative Medicine by the American Public

III. INTRAMURAL RESEARCH PROGRAMS AT NIH

- A. Overview: NIH Intramural Programs
- B. Research in the IRP of Other ICs
- C. Other Blue Ribbon Panel Reviews - NIMH

IV. NCCAM's DIVISION OF INTRAMURAL RESEARCH

- A. Organization & Resources
- B. Research Programs
- C. Board of Scientific Counselors Reviews
- D. Complementary & Integrative Medicine Consult Service

V. NCCAM'S EXTRAMURAL RESEARCH PROGRAM

- A. Profile of the Extramural Portfolio
- B. Partnerships: Other ICs & Agencies
- C. Quality of Natural Products
- D. Funding Opportunities

APPENDIX: STRATEGIC PLANS

Strategic Plan 2001-2005

Strategic Plan 2005-2009

Appendix III

Presentations

The NIH Intramural Research Programs

Michael M. Gottesman, M.D.

Deputy Director for Intramural Research, NIH

NCCAM's Intramural Research Program and Complementary and Integrative Medicine Consult Service

Robert B. Nussenblatt, M.D.

Acting Director, Division of Intramural Research, NCCAM

Intramural CAM Research in the National Cancer Institute (NCI)

Jeffrey White, M.D.

Director, Office of Cancer Complementary and Alternative Medicine, NCI

Genomics

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Systems Biology and Immunology

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