

MEETING SUMMARY
PRESIDENT'S CANCER PANEL
ASSESSING PROGRESS, ADVANCING CHANGE:
CHALLENGES IN TRANSLATING RESEARCH

October 24, 2005
Washington, DC

OVERVIEW

In 2004–2005, the President's Cancer Panel (PCP, the Panel) conducted a series of meetings focusing on translating research into cancer care. The Panel learned that the current culture and workforce infrastructure of the cancer research enterprise are at the root of many of the impediments to translating basic science discoveries into improved cancer prevention, treatment, and dissemination. The October 24 meeting brought together key stakeholders and decision makers from the cancer community, with the goal of identifying actionable steps that can be taken to implement select recommendations made by the Panel in its 2004–2005 report, *Translating Research Into Cancer Care: Delivering on the Promise*. Information generated at the meeting will be used to accelerate implementation of the Panel's recommendations regarding team science and workforce issues.

President's Cancer Panel

LaSalle D. Leffall, Jr., M.D., F.A.C.S., Chair
Margaret Kripke, Ph.D.

National Cancer Institute (NCI)

Abby Sandler, Ph.D., Acting Chief, Institute Review Office, NCI; Executive Secretary, PCP

OPENING REMARKS—DR. LaSALLE D. LEFFALL, JR.

Dr. Leffall welcomed invited participants and the public to the meeting. He introduced Panel members, provided a brief overview of the history and purpose of the Panel, and described the aims of the current series of meetings.

The specific purpose of the meeting was to identify actionable steps that can be taken to implement recommendations made by the Panel in its 2004–2005 annual report entitled *Translating Research Into Cancer Care: Delivering on the Promise*. Dr. Leffall explained that the meeting would utilize two roundtables, with the first centering on team science and the second focusing on workforce infrastructure issues.

Invited participants were each asked to prepare and submit a short summary describing their current position and their organization's efforts relative to the recommendations being addressed. This information was shared among the roundtable participants prior to the meeting.

Throughout the course of the meeting, participants were asked to address three questions relative to each recommendation:

- *What has happened with regard to this recommendation since its issuance in June 2005?*
- *What needs to be done to implement the recommendation?*
- *What should the priorities be in this area over the next 2 years?*

Discussants also addressed next steps, concentrating on specific courses of action to move identified priorities forward.

ROUNDTABLE I—TEAM SCIENCE

Speakers

Georgia Decker, M.S., R.N., C.S.-A.N.P., AOCN, CN, President-Elect, Oncology Nursing Society (ONS)

James Doroshow, M.D., Director, Division of Cancer Treatment and Diagnosis, NCI

John Gallin, M.D., Director, Clinical Center, National Institutes of Health (NIH)

William Hait, M.D., Ph.D., Director, The Cancer Institute of New Jersey

Martha Hare, Ph.D., R.N., Program Director, Immune Responses and Oncology, National Institute of Nursing Research (NINR)

Col. Janet Harris, Ph.D., M.S.N., Director, Congressionally Directed Medical Research Programs, Department of Defense (DoD)

Sandra Horning, M.D., President, American Society of Clinical Oncology (ASCO)

Barnett Kramer, M.D., M.P.H., Editor-in-Chief, *Journal of the National Cancer Institute* (JNCI)

Joel Kupersmith, M.D., Chief Research and Development Officer, Department of Veterans Affairs (VA)

Thomas Lawley, M.D., Member, Council of Deans Administrative Board, Association of American Medical Colleges

Theodore Lawrence, M.D., Ph.D., Chair, American Society for Therapeutic Radiology and Oncology (ASTRO)

Fred Rodriguez, Jr., M.D., President, American Society for Clinical Pathology

Antonio Scarpa, M.D., Ph.D., Director, Center for Scientific Review, NIH

Joseph Stephenson, Jr., M.D., Director of Experimental Therapeutics, Cancer Center of the Carolinas

The first roundtable focused on two recommendations:

- The existing culture of cancer research must be influenced to place more value on translational and clinical research. To effect this culture change, a task force representing key stakeholders in academic research should be convened to examine and modify existing reward systems (e.g., compensation, promotion/tenure, space and resource allocation, prestige) to encourage collaborative research and ensure that all contributors (including, but not limited to, pathologists, radiologists, and research nurses) benefit from participating in these activities.
- Governmental and private research sponsors must place greater emphasis on and substantially increase funding for clinical research and human tissue research. Funding mechanisms should promote collaborative science and include greater support through the R01 mechanism.

Key Points

- The bulk of the clinical research portfolio of the NINR focuses on symptom management, including a new initiative to investigate symptom clusters. NINR is also the lead Institute for research on end-of-life care, which involves highly collaborative work by research teams. NINR encourages researchers to address a wide range of questions in basic, clinical, and community-based research settings. NINR evaluates research proposals in part on the basis of

whether the research will have an impact on outcomes for patients, families, and/or caregivers.

- The recommendation to increase funding for R01 grants to conduct applied research could reduce funds available for other mechanisms that could also contribute to applied research.
- At the NIH Clinical Center, investigators from 17 Institutes come together to conduct clinical research. The Center has developed a curriculum for clinical investigators, who receive certificates upon completion of the program. In partnership with Duke University, the Center established a master's degree program in clinical research. Telecommunications are used to reach a broad audience with training activities. Of 700 participants in an Introduction to Principles and Practices of Clinical Research, more than half were outside NIH and almost 200 were outside the United States.
- Despite progress in developing mechanisms to support clinical research, the workforce remains small. Medical schools have not done a good job of exposing students to clinical research in ways that are stimulating. Improving the ability of schools to increase student interest in clinical research early in their careers will reduce the burden of finding already-trained doctors and bringing them into the clinical setting.
- Emory University is modifying its medical school curriculum to better expose students to translational research. The University is also considering creation of a Ph.D. program in Translational Research.
- Medical schools should be encouraged to reach out to undergraduates who may be open to pursuing an interest not only in medicine, but also in medical research.
- The culture of research needs to be changed to increase incentives for inquisitiveness. Recent literature suggests generational differences that affect the way young doctors respond to the rewards system. The incentives that motivated the "baby boom" generation may not be appropriate for the current generation.
- The recent RFA to support translational research centers is a great step forward. Many medical schools will be interested in creating these centers.
- Journals like the JNCI do not receive many submissions that focus on translational work. Because these types of studies are very large, involve large teams, and take a long time to complete, they result in publications less frequently than do more traditional research projects. In addition, the number of publications in any area is dependent on the funding available to support adequate numbers of investigators conducting definitive studies.
- Some journal editors are trying to develop innovative ways to increase the number of articles published on translational research and to enhance the recognition of the many individuals involved in team research. One way to do that is to state, when appropriate, that the order in which the coauthors are listed is random because all members of the team were equal contributors to the design and conduct of the project. In some cases, principal authors can be highlighted and their leadership described in a footnote. This would be useful to academic promotion and tenure committees.
- JNCI also seeks articles and commentaries on methodological issues in translational research. Editors consider articles on translational research to be good choices for highlighting in news releases or "memo to the media" columns because their demonstrable relevance to benefits for patients is attractive to the media.
- The VA has a long history of supporting clinical and translational research. The agency also has numerous health services research programs as well as career development awards to provide training for clinical investigators. The VA Quality Enhancement Research Initiative is designed to translate and implement research findings. Within the VA system, cooperative

studies receive the same respect and support as basic science, but translational researchers do not always have a similar experience in the academic world.

- DoD is trying to effect cultural change by offering training mechanisms to support multidisciplinary postdoctoral training in order to encourage collaborative research. However, peer reviewers have been resistant to this change, expressing a preference for more traditional science.
- ASTRO has greatly increased its grants to support translational research, established a translational research committee, and created a career development award. In addition, ASTRO includes within the realm of translational research the development of new technologies that can be applied to the detection and treatment of tumors.
- Criteria for identifying outstanding clinical investigators are needed so that accreditation for investigators and their institutions can be initiated. NCI has engaged the Accreditation Council on Graduate Medical Education in initial discussions on this subject.
- Difficulty in recruiting adequate numbers of patients for clinical trials continues to be a limiting factor. Educating the public about the benefits of participation in clinical trials will be essential to achieving the goal of expanding translational research initiatives. NCI is working with the U.S. Surgeon General to launch a major public education effort. Community oncologists could also play an important role in addressing this issue.
- The NCI Cancer Center Support Grants program placed a great deal of emphasis on success in the translational research arena. The journal *Clinical Cancer Research*, which in the past has published primarily basic science articles, is increasingly accepting papers on clinical studies submitted by investigators working in cancer centers. The Specialized Programs of Research Excellence (SPOREs) have also made a major contribution to translational research.
- Because most cancer treatment is delivered in the community setting, ASCO has established a community-based training workshop for oncologists and is exploring the possibility of enhancing its fellowship training programs to provide additional training for fellows who decide to pursue careers in community practice. ASCO is also conducting focus groups with representatives of academic institutions to learn about their concerns related to translational research.
- Relative to oncologists, it will be more difficult to encourage radiologists and pathologists to become involved in multidisciplinary translational research because mechanisms to pay for their time are not readily available. DoD has taken steps to ensure participation of these specialists as part of its efforts to build infrastructure for a clinical consortium.
- It will be difficult to engage radiologists in multidisciplinary efforts if they are always described as playing a subordinate role. Translational research should be a two-way process in which each party sometimes leads and sometimes follows. Radiologists are developing new technologies and making original contributions to scientific knowledge.
- Medical pathologists in community settings can play a major role in translational research since they identify the individuals who require cancer treatment. New incentives need to be created to encourage pathologists to identify patients at the local level for participation in trials.
- Changing the way resources and recognition are allocated is a first step in changing the culture of science. In order to increase recognition for participation in collaborative research, academic institutions must make the value of such research explicit in formal appointments and promotions rules. The external reward systems are important, but researchers must be valued within their own institutions to achieve satisfactory career advancement. Some academic institutions may be resistant to this idea, but in response to a growing awareness of

the importance of clinical research among many faculty, gradual progress in this area is being made.

- The ONS has developed a research agenda focused on translating research findings into clinical practice as well as symptom management. Nurse-scientists can play a major role in translational research; they have a skill set that complements that of clinical investigators and provides a link to the patient within the multidisciplinary team.
- The Children's Oncology Group has created a mentoring process in which nurse-scientists work with advanced practice nurses to develop research studies. This model could be adapted by other groups to promote multidisciplinary research.
- Some NIH Institutes are beginning to provide increased support for quality-of-life research. Investigators need to be better educated on how to add quality-of-life studies to clinical trials, both in understanding the methodologies involved and in preparing for the type of review these plans will undergo.
- The culture of research within the clinical departments of medical schools needs to evolve along with the way professionals pursue their careers. In the past, the key player in medical research was an excellent clinician, teacher, and laboratory scientist. A new tripartite system for organizing clinical research is needed to accommodate the fact that research and teaching have become more specialized. Today, medical schools have people who focus their energies on a single area to excel as teachers, as physician-scientists, or as clinical investigators. The clinical investigator fits somewhere between the clinician/teacher, who sees many patients, and the scientist, who sees few patients. Often, these individuals conduct investigator-initiated studies rather than participate in Cooperative Groups. Improved mechanisms are needed to support larger numbers of clinical investigators in conducting independent Phase II studies that are not based solely on the interests of their departments and institutions.
- The Clinical Trials Working Group (CTWG) of the NCI recently conducted a study of its clinical trials system. There was a consensus that clinical investigators are the "glue" that holds multidisciplinary research together. The report based on this study recommended that mechanisms be found to increase the availability of resources to pay for larger amounts of time for these individuals and that the guidelines for reviewing applications for support of clinical trials be revised to emphasize the importance of translational research.
- The bureaucracy associated with conducting translational research needs to be made less overwhelming. The NIH Clinical Center has developed a tool called ProtoType that helps researchers author protocols, project resource requirements, track performance, and merge clinical data with basic science data in a data warehouse. NCI is also providing leadership developing informatics standards so that everyone conducting translational research can share data and tools more easily.
- At many universities, scientists involved in basic research are able to focus their work because the bulk of their salaries comes from grant support. Similar levels of support are not yet available to clinical investigators.
- NIH provides a noteworthy model for bestowing tenure based on participation in team science. NIH recognizes that not every member of a tenure committee is qualified to judge every area of science. NIH maintains the rigor of scientific review by establishing special subcommittees or panels when fields not represented on a standing committee, such as epidemiology or biometry, are involved.
- The NIH Clinical Center created the Patient Advisory Group, which is composed of patients from all of the disciplines NIH addresses. The Group meets quarterly to advise Clinical Center leadership on patient needs and interests. As a result of patient input, policies on how

patients are admitted, how clinical data are shared with patients, and other issues have been modified.

- The Community Clinical Oncology Program (CCOP) in Greenville, SC, is affiliated with the Greenville Hospital System, which has set aside space for basic researchers from Clemson University. Basic research findings can be translated into patient care within the hospital setting, with the CCOP providing clinical leadership to help move discoveries toward patient care applications. However, there are constraints based on availability of funding. Private practitioners donate their time, and the group has reached the limits of what can be accomplished with their practice budgets. One solution has been to bring in supplemental support through participation in drug development and gene therapy trials sponsored, respectively, by the U.S. Oncology Network and the Mary Crowley Research Network.
- NCI has trained community physicians very well. At the beginning of the CCOP program, there was resistance to the idea that community physicians could run clinical trials, but the program has been an enormous success and has raised the standard of cancer care throughout the entire community. It can be used as a model for linking early-phase trials with translational research programs.
- Culture change may also require bringing in research partners from other fields, including the social sciences and public health. However, it remains to be seen whether funding will be available to support this type of collaboration.
- It would be useful to know if any data exist to show whether collaboration results in economies of scale. Since collecting and housing data is expensive, it seems reasonable to assume that warehousing and sharing of information to create larger aggregations of data and provide access to those data for analysis by multiple investigators should result in increased benefits from available funding. However, increasing the amount of research will necessarily increase the amount of money spent.
- One way to save money is to redesign processes. Examples include standardization of institutional review board (IRB) review of research protocols (including establishment of centralized IRBs); linking of data repositories so that failed experiments do not have to be repeated; and addressing the issue of technologies that should be able to share information but are currently incompatible.
- Since new funds are not likely to become available and reallocating funds from other activities is difficult to accomplish, existing funds must be used more efficiently. If the cancer community fails to increase efficiency, it is possible that translational research may become vulnerable to outsourcing to countries where costs are lower.
- New methodological approaches to clinical research should be considered. The VA is exploring the use of its extensive clinical records for retrospective randomization.
- It may become necessary to limit the number of institutions that perform specialized research services, such as DNA sequencing and phenotyping, and allow investigators in communities to use those institutions as core service providers.

NEXT STEPS—TEAM SCIENCE

- Journals should be encouraged to publish more articles on research conducted by consortia and other collaborative groups. Publication of commentaries that stress the importance of team science will not be as effective in promoting the concept as publication of tangible results of team science that meet rigorous cross-disciplinary standards.
- Formal mechanisms should be added to academic promotion and evaluation systems to acknowledge individuals who are excellent clinical investigators. Peer review has become the

most important mechanism for professional recognition because it is associated with the money that research grants bring to the institution. Historically, basic scientists have been disproportionately represented on peer-review panels.

- Recognition of investigator-initiated science is easier than recognition of team science because clear and well-established criteria are available. NCI and professional societies should consider establishing awards designed to recognize group efforts in research.
- Formal training has been identified as the best predictor of success in academic and research careers. Expanded formal programs are needed to train individuals who plan to pursue clinical investigation and to instill the culture of research among those who are training to practice medicine in the community.
- Specialized education about translational research should be designed for medical students who have no research-related career goals. As they move into clinical practice, their increased appreciation of the importance of research will motivate them to refer patients to clinical trials.
- Implementation of the recommendations of the NCI CTWG will contribute to the fostering of team science.
- Major research centers should form patient advisory groups to advise leadership on issues that are important to consumers.
- Many clinical investigators' salaries are paid with income from patient care, leaving them little time for research-related activities. A high priority should be placed on finding ways to support protected time for clinician-researchers.
- Meaningful partnerships with industry can provide training for clinical investigators in the use of new technology.

ORGANIZATIONAL COMMITMENTS—TEAM SCIENCE

- The NIH Center for Scientific Review is reducing the timeframe for peer review by about half. The changes will be implemented for young investigators in February 2006 and will eventually be extended to established investigators.
- ASTRO will continue to offer numerous seed grants and career development awards and plans to establish a committee on emerging technology that will bring together industry, radiation oncologists, and regulatory groups early in the process of developing new technologies to make the development process more efficient.
- DoD will continue to support mechanisms for translational research and encourage team science through consortia and Center of Excellence awards. The agency will investigate ways to recognize multiple principal investigators on research projects.
- The VA already provides protected time for its investigators, and it is beginning to issue requests for applications that combine laboratory, clinical, and health services research components.
- JNCI is eager to work with authors to find ways to acknowledge multiple key authors and to acknowledge in appropriate ways the contributions of industry to research projects.
- Within the next 2 years, NCI will begin awarding its new Cancer Clinical Investigator Team Leadership Award. NCI is also reviewing and streamlining the review process for grants that support translational research.
- NINR has a robust career development program and will continue to work closely with NCI to enhance the involvement of research nurses in the CCOP program.

- The American Society for Clinical Pathology will consider extending the scope of its annual award for clinical research beyond individual investigators to include the work of research teams and will take into consideration the need to develop certification mechanisms for translational scientists.
- The NIH Clinical Center will investigate ways to provide staff with more protected time for research activities. The Center is willing to share its training curricula for young investigators.
- ASCO will consider placing increased emphasis on translational research and team science in its career development program, including creation of fellowships for those in clinical practice. The Society is discussing the possibility of advocating a policy of redistributing some income from patient care that would increase protected time for investigators. ASCO is interested in partnering with other organizations to address issues related to certification.
- The AACR's *Journal of Clinical Cancer Research* is committed to working with others to develop unified criteria for authorship recognition that would be accepted by national membership organizations and medical schools.

PUBLIC COMMENT—TEAM SCIENCE

Dr. Mien-Chie Hung—Chair, Department of Molecular and Cellular Oncology, The University of Texas M. D. Anderson Cancer Center

Key Points

- Some students may be resistant to multidisciplinary postdoctoral fellowship programs because they feel that these programs will not help them obtain faculty appointments. A program similar to the NIH K01 grant could be used to support multidisciplinary postdoctoral fellows, and the associated funding would make the students competitive for faculty positions.
- The M. D. Anderson Cancer Center provides Faculty Achievement Awards in several research areas, including clinical research. These have been given primarily to oncologists and surgeons, but the Center has begun awarding them to individuals involved in patient care, such as radiologists.
- The M. D. Anderson Promotion Committee has begun to include participation in team science among the criteria for professional advancement.

Dr. Emil Freireich—President, Association for Patient Oriented Research

Key Points

- The investigational new drug (IND) process, which was implemented to protect patients from being exploited by physician experimenters, should be eliminated now that institutional IRBs and other surveillance systems are in place. This would greatly improve the efficiency of the drug development process. It has been estimated that the IND process accounts for between 60 and 80 percent of the cost of bringing a new agent into therapeutic use. The approval process for new drugs should be decentralized and responsibility given to academia.
- Study sections should be established for peer review of clinical and translational research. The encouragement of collaborative teams of laboratory and clinical scientists to submit applications would promote efficient use of existing funds to conduct new translational studies.

Dr. Robert Croyle—Director, Division of Cancer Control and Population Sciences (DCCPS), NCI

Key Points

- Much of the research being conducted in the area of cancer control takes place in the context of primary care. DCCPS has shifted significant resources into health services research as a way to translate research into practice. NCI recently held a conference on finding ways to leverage health care delivery systems as research platforms. One issue discussed at that meeting was the importance of linking information resources such as the current linkage of the Surveillance, Epidemiology, and End Results data with Medicare claims data.
- Another area with which NCI is increasingly concerned is the “science of science.” DCCPS is working to develop research methods to evaluate science and measure scientific progress, as well as focusing on team science models and methods for translational research.
- Many researchers involved in NCI-supported Cancer Centers, SPOREs, Tobacco Youth Research Centers, and other programs have voiced the need for recognition of team science. Awards from professional organizations for collaborative accomplishments would send a strong message to the research community.

ROUNDTABLE II—WORKFORCE ISSUES

Speakers

Olaf Andersen, M.D., President, National Association of M.D.-Ph.D. Programs

Emil Freireich, M.D., President, Association for Patient Oriented Research

William Galey, Ph.D., Director, Graduate Science Education Program, Howard Hughes Medical Institute (HHMI)

Ernest Hawk, M.D., M.P.H., Director, Office of Centers, Training, and Resources, NCI

Mien-Chie Hung, Ph.D., Chair, Department of Molecular and Cellular Oncology, The University of Texas M. D. Anderson Cancer Center

Joel Kupersmith, M.D., Chief Research and Development Officer, Department of Veterans Affairs

Kenneth Shine, M.D., Executive Vice Chancellor for Health Affairs, University of Texas System

Lawrence Tabak, D.D.S., Ph.D., Co-Chair, *NIH Roadmap* Interdisciplinary Research Teams of the Future Working Group

Douglas Weed, M.D., Ph.D., Chief, Office of Preventive Oncology; Director, Cancer Prevention Fellowship Program; Dean of Education and Training, Division of Cancer Prevention, NCI

The second roundtable focused on the following recommendations:

- To attract and retain young investigators to careers in translational and clinical research:
 - Protected research time and mentoring must be provided earlier and potentially for a longer period of time than is now the norm. Government training funds may be needed to enable academic institutions to provide this supportive environment.
 - New or expanded student loan buy-back programs should be established to enable young investigators to pursue the additional training necessary for a career in translation-oriented research.

- Academic institutions should make special efforts to recruit and retain young scientists from underrepresented population groups.

Key Points

- The NIH Clinical and Translational Science Award, which emerged from the *NIH Roadmap* initiative and is administered by the National Center for Research Resources, has been created to address concerns in the research community that clinical research does not have a true “home” in many academic institutions. The Award will support faculty who will be able to conduct original research, develop graduate programs, design training curricula, and create programs that integrate clinical and translational science across the academic landscape of an institution.
- M. D. Anderson has established a physician-scientist program that provides protected time for clinicians identified as having the potential to become investigators. Training is provided to help these physicians obtain R01 grants.
- These Panel recommendations should be addressed in the context of the shortage of physicians predicted by the National Association of M.D.-Ph.D. Programs. Increased pressure to take care of patients will make it more difficult for physicians to find time to become involved in clinical research. Academic institutions should make special efforts to recruit young scientists from underrepresented population groups. Institutions also need to create constructive models for participation in patient-oriented research.
- In 1985, HHMI partnered with NIH to create a Medical Research Scholars Program, which provides an opportunity for students to spend a year away from medical studies to participate in research projects at NIH. In addition, the HHMI’s Medical Research Fellows Program provides similar opportunities for medical students to conduct research within their own institutions or another institutions outside of the NIH. HHMI has a new partnership with the National Institute on Bioimaging and Bioengineering to create an interface of physical, computational, mathematical, and biomedical sciences for the purpose of graduate student training. HHMI has also launched an initiative to bring a better understanding of medicine, including translational research, to graduate students.
- M. D. Anderson does not grant a Ph.D. degree, but it works in partnership with the Houston Health Science Center and with the Gulf Coast Consortia (which include several Houston area medical schools) to provide young people with a wide range of research experiences. In collaboration with the University of Houston and the University of Texas at Austin, M. D. Anderson has established the first multi-institutional Department of Bioengineering. M. D. Anderson has also created a Physician-Scientist Award, funded with private donations, that provides 80 percent protected time for 3 to 5 years.
- Translational research is a term that usually refers to a process leading to new treatments, but it can also lead to new avenues for cancer prevention. The NCI Cancer Prevention Fellowship Program is a 3-year multidisciplinary program that includes 1 year of study toward an M.P.H. degree, followed by 2 years of research at NCI. Participants have protected time for research and receive both scientific and career-development mentoring. About 30 percent of the Fellows are members of minority populations, and about 15 percent are members of groups that are underrepresented in science. Recruitment has not been necessary because Fellows recommend the Program to other members of the populations they represent.
- Basic scientists who enter the Cancer Prevention Fellowship Program bring a great deal to the NCI research community because they can communicate with both the basic science and the clinical worlds. The additional training in a new research methodology gives them the ability to make significant contributions. The same is true for Fellows with backgrounds in the behavioral and social sciences.

- Training at NCI is a diverse enterprise conducted in five extramural components of the Institute as well as within the intramural programs. In FY2004, the NCI training budget was about \$280 million. Over the next year, NCI will focus on finding ways to evaluate the outcomes of the various training activities.
- The NCI Clinical Trials Working Group produced a series of recommendations, some of which focus on training issues. A new NCI Translational Research Working Group has embarked on a similar effort and is likely to produce further ideas about training and manpower as they relate to translational research.
- The VA has a well-established career development award system in clinical research and health services research, as well as two Centers of Excellence for training clinical investigators; however, the VA does have difficulty in recruiting highly compensated specialists.
- The Association for Patient Oriented Research believes that physicians without scientific research training are not well prepared to implement new knowledge developed by research scientists. Medical schools should include a track for training physician-scientists.
- An award similar to the NIH K01 award is needed to direct support to scientists interested in careers in translational research.
- In addition to the K series of career development awards, NIH has a supplements program that can add funds to existing research grants to attract underrepresented minorities into research activities.
- Cultural factors must be taken into consideration when designing recruitment efforts for members of underrepresented groups. For example, it was noted that many Hispanics avoid borrowing money to pay for training, even if there is a promise that the loans will be repaid by the Government; others hold clinical careers in high esteem but not academic careers. Leadership in both the public and private sectors must make the effort to understand the cultural barriers that affect members of various populations.
- Young members of minority groups need substantial support and assistance in identifying potential mentors.
- Translational research is not the only research area in which manpower issues are significant. Efforts are also needed to ensure career opportunities in behavioral, social sciences, and health care services research.
- Women constitute an underrepresented minority in the upper levels of academic medicine and research. Many women leave academic medicine before they reach the level of full professor or department chair.
- The quality of research is more important than whether it fits into the realms of basic, translational, or clinical research.
- NCI supports partnerships between established Cancer Centers and minority-serving institutions to develop mentorship and collaborative interactions in an environment of equality and to improve the ability of both types of institutions to address issues that affect underrepresented populations.
- A recent study showed that, within medical schools in the United States, there are more basic scientists with appointments in clinical departments than in basic science departments. These basic scientists are an untapped resource for translational activities because they learn the language of medicine and know the problems being faced by the clinical faculty in their departments.

NEXT STEPS—WORKFORCE ISSUES

- The number of medical students recruited into training for research is much lower than the number who express interest in a research-related career. There is a need to capitalize on this large, untapped resource of future physician-scientists.
- Additional protection and assistance in taking the first few steps in career development should be made available to physician-scientists, particularly for women and members of underrepresented minorities. Women would also be more likely to participate if better childcare options were available.
- Private industry, especially biotechnology and imaging companies, should be persuaded to contribute resources and expertise to train young scientists. At such an early point in a trainee's career, conflict of interest is not likely to be a serious issue.
- A much larger investment is needed in programs to train M.D.-Ph.D. physician-scientists in several areas, including clinical research, behavioral science, and informatics.
- NIH should consider awarding National Research Service Award grants to M.D.-Ph.D. students.
- Specialists in mathematics, physics, and chemistry should be recruited for faculty positions within medical schools, and physicians should be encouraged to pursue second degrees in these fields.
- The translational research workforce needs training in the concepts and methodology of technology transfer.
- Medical school admission requirements should be modified so that entering students are more familiar with biological and other sciences and, thus, better prepared to consider research careers. Admissions departments of medical schools should pay closer attention to the research interests of applicants, and medical school programs should be adaptable for those interested in research.
- The public needs to be taught that clinical research is associated with better health care. Publicizing the value of clinical translational research at a national level will create increased motivation for participation by physicians.
- A national collaborative effort should be established to evaluate current training efforts. SPORes should be considered as a model for fostering translational research through career development.
- NIH supports extensive research on the interface between basic science and the behavioral and social sciences; this work should be reviewed and considered in any discussions concerning changes in the way scientists are trained.
- Involvement of young scientists in translational research would be aided by increased Medicare and third-party payor coverage of health care delivered as part of clinical trials.
- Study sections should be established for peer review of translational research proposals; this will bring more basic scientists into translational research.
- Regulatory reform could shift an enormous amount of money away from the administrative component of research into patient-oriented work.

ORGANIZATIONAL COMMITMENTS—WORKFORCE ISSUES

- HHMI is very interested in partnering with NIH and other organizations to develop new approaches to manpower issues, such as shortening the time it takes a new investigator to obtain his or her first R01 grant.

- The University of Texas System will utilize existing linkages between medical schools and undergraduate institutions to identify and encourage undergraduate students who have an interest in pursuing careers in science and medicine.
- The NCI Division of Cancer Prevention has partnerships with the governments of Ireland and Northern Ireland and with some pharmaceutical companies that support prevention studies. The Division will consider establishing partnerships with private industry to explore ways in which industry can support training activities.
- The National Association of M.D.-Ph.D. Programs will consider becoming more involved in training medical students who do not want a Ph.D. but are interested in learning about research. It will also work more closely with high school, college, and medical school advisors to help them understand the need for physician-scientists.

PUBLIC COMMENT—WORKFORCE ISSUES

There were no public comments.

CLOSING REMARKS—DRS. KRIPKE AND LEFFALL

Dr. Kripke thanked the roundtable participants. An important outcome will be building momentum in areas where progress is already being made by the VA, HHMI, the National Association of M.D.-Ph.D. Programs, M. D. Anderson, and others.

Dr. Leffall also thanked participants on behalf of PCP member Mr. Lance Armstrong, who was unable to attend.

CERTIFICATION OF MEETING SUMMARY

I certify that this summary of the President's Cancer Panel meeting, *Assessing Progress, Advancing Change: Challenges in Cancer Survivorship*, held October 24, 2005, is accurate and complete.



Certified by:

Date: February 4, 2006

LaSalle D. Leffall, Jr., M.D., F.A.C.S.
 Chair
 President's Cancer Panel