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## Cooperative Group Consolidation Unlikely To Save Money, NCI's Doroshow Says

By Paul Goldberg

Consolidation of clinical trials cooperative groups is not expected to save money and may, in fact, cost more money in the short term, said James Doroshow, director of the NCI Division of Cancer Treatment and Diagnosis.

“Let me just make it very clear: there is no expectation that merging will—quote-unquote—save money *per se*,” Doroshow said at a meeting of the Clinical Trials and Translational Research Advisory Committee Sept. 21.

“In fact, we now have pretty good evidence that in the short term it will cost us money,” said Doroshow, who chaired the meeting that focused largely on revamping the cooperative groups. “The best analogy I’ve heard is base closings. You can’t just shut down one group without building up something  
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### Advocacy:

## National Breast Cancer Coalition Sets Goal To End Breast Cancer By Jan. 1, 2020

By Paul Goldberg

*Over two decades following its formation, the National Breast Cancer Coalition has been both politically aggressive and respectful of good science. Earlier this week, the Washington-based coalition that has cultivated an excellent working relationship with top-notch scientists has set a deadline for the end of breast cancer: Jan. 1, 2020. Details are posted at <http://breastcancerdeadline2020.org>.*

*What does this mean in the area of science that has already seen many ambitious goals and promises? The Cancer Letter asked Fran Visco, the coalition’s president to explain:*

**TCL: Are you *promising* the end of breast cancer or are you *demanding* the end of breast cancer?**

Fran Visco: Actually, neither. We cannot promise it, because we do not control every aspect of what is needed to achieve the goal. And we wouldn’t demand it, because that implies we are standing by the side asking someone else to do it all. We are saying that it is time to figure out how to end breast cancer by the end of the decade. The knowledge and the tools exist, and we will do everything we can to achieve that goal.

We have invested billions of dollars in research and technology. A huge infrastructure has been built up around breast cancer that seems content  
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## CTAC Examines A "Marriage" Of Group Statistical Operations

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else. Long-term, maybe there will be efficiencies, but not short-term."

The committee, founded by then NCI Director Andrew von Eschenbach, was chaired by von Eschenbach, and, later, his successor John Niederhuber. NCI Director Harold Varmus told the committee it would be inappropriate for him to chair the advisory committee and that he would appoint a chairman from outside the institute.

The committee focused on one example of changes within cooperative groups, the recent decision by Cancer and Leukemia Group B, North Central Cancer Treatment Group, and the American College of Surgeons Oncology Group to combine their "back end" statistical operations while maintaining their scientific leadership structures ([The Cancer Letter, July 2](#)).

Earlier this year, a report by the Institute of Medicine called for an overhaul of the publicly funded infrastructure for conducting clinical trials ([The Cancer Letter, April 16](#)).

### Stretching the Marriage Metaphor

The leaders of the three groups presented their merger as a case study at the CTAC meeting.

The presentation prompted one CTAC member, James Abbruzzese, chairman of GI oncology at M.D. Anderson Cancer Center, to ask whether the three groups

should consider a full merger.

"There is already a tremendous amount of cross-group interactions among investigators, statisticians," Abbruzzese said. "Many cancer centers participate in more than one group. The presentation we heard earlier about three very good groups suggests that they are going steady. The question is, why not get married and actually integrate the scientific components of the groups as well as data management. I would think that there would be tremendous synergy. Why stop?"

"As opposed to an arranged marriage?" offered CTAC member David Parkinson, president and CEO of Nodality Inc. of South San Francisco.

It went on.

"It's funny you should say this," said Monica Bertagnolli, chair of CALGB and associate professor of surgery at Harvard Medical School. "This is not an overnight process. You made a great analogy. This is about learning what the other groups do, expanding the areas where we can have synergistic activities. On my first visit out to Mayo Clinic to meet everyone in the organization when we were considering this move, my comment to one administrator was 'I am here to meet the in-laws.' It kind of captured the spirit of what was going on, and we'll see what happens."

HEIDI NELSON (ACOSOG co-chair and the Fred C. Andersen Professor of Surgery at Mayo Clinic): "It's much easier to look at the pieces—the IT and databases—those are not people. Those are functions. And cooperative groups rest heavily on volunteerism. It's not just about three people—it's about hundreds of people who represent thousands of people who work within the groups, and they can't lose interest along the way."

JAN BUCKNER (NCCTG chair, chief of medical oncology at Mayo Rochester, and chair of the group chairs): "There are various complementaria in statistics and IT and data management side. Obviously it does make sense to look for complementaria of science as well, where there are strengths within one group that can be made even stronger by some sort of collaborative arrangement. This does go on among cooperative groups. The large phase III trials anymore are rarely done by single groups simply because you need to combine resources across the country and around the world. In the brain tumor world, we bring together Canadian, European, Japanese, Australian groups."

### Unfunded Mandates: Biomarkers, Images & QOL

Committee members said the current group system isn't set up for systematic collection of tissues,



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images, and quality of life data required for correlative studies.

LEE HELMAN (chief of the NCI Pediatric Oncology Branch and scientific director for clinical research at the NCI Center for Cancer Research): “From my perspective, the molecular tools are there. What’s not there is the ability to sample the tumors.

“One of the things that has become clear to me is that when we have a clear target and a clear need to assay that target in the patient’s tumor, it becomes a voluntary part of the protocol, as opposed to mandatory. And in things that are voluntary, we never ever get the data. From our perspective, the big impediment is dealing with IRBs.

“You are building this great patient characterization center and other tools with the idea to make these tools available, but the tools can only be used if you have access to the tissues.

“I’ve seen three examples in the last two years where there was initially the plan to get the tumor, to do the analysis, and they made it elective, so 15 percent got all of the information. This has become a critical issue.”

MITCHELL SCHNALL (professor of radiology at the University of Pennsylvania): “We have the same problem with imaging. When the imaging endpoint is a voluntary endpoint, it doesn’t happen. The site RAs do everything they can just to get protocols done. If they have to coordinate any other activity, that becomes complicated.”

DEBORAH BRUNER (director of clinical trials recruitment, retention and outreach at the University of Pennsylvania Abramson Cancer Center): “It’s the same with quality of life. We are seeing this with correlative endpoints, which we are finding so integral now to the trials. But we don’t have the infrastructure support for it. And as much as we would like to make it all mandatory, each of us from our perspectives value all of this, but with per-case reimbursement we just don’t have the resources.”

HELLMAN: “Surely we don’t have the money. But I would say, do two studies to get the data you need rather than doing 10 studies that don’t get the data you need.

### ***Ménage a trois, Polygamy, Tribal Behavior***

JAMES WADE (director of medical oncology at Decatur Memorial Hospital): “I would like to highlight Jim Abbruzzese’s question-comment about marriage, whether it’s a marriage of *ménage a trois* or a polygamist family or a traditional Midwestern marriage.

“We now have the ability for multiple people across the world to contribute—like Wikipedia. If trial design occurred that way, it would be a very interesting experiment in trial design. Like Wikipedia, it could be built internationally. That’s almost the exact opposite of cooperative groups where we functioned as we have for thousands of years of trials. We have wiring inside of us, our behaviors.

“Although it’s exciting to think that we have the technology of spreading this out to almost a Wikipedia-type system, we may lose something. We may lose the that tribal feel of voluntary effort. I think it ought to be done stepwise, maybe watching how the initial Minnesota marriage occurs.

“We might watch it for a few years. It may be a good lesson to us all before these lessons might be applied to the other groups. To think about how we evaluate, we have to look at how many people want to come in and participate with this triumverate system.

“What’s the committee structure going to look like? How many PIs are going to be on trial, how many people can participate? How many new faculty people are we creating in this system, or are we squeezing them out because we are shrinking down the number of people who can participate?”

ABBRUZZESE: “If you approach it in this way, where it is done part-way, it’s not really a good test of the question, because the scientific components of the three groups are going to remain relatively distinct.

“There probably will be some funding of the questions that would be dependent on the volume that the statistical group can handle. If you are going to test the question of how efficient would consolidation be, and how good will be science that would come out of that, and would our innate human nature to work in smaller groups override the net benefit of consolidation? We are not going to know the answer to that question unless there is more consolidation at the scientific part of that.”

SANDRA HORNING (Genentech senior vice president, global head of clinical development, hematology/oncology): “Getting back to tribal philosophy, it’s not something I studied, but we do tend to gravitate toward the tribes, and in many of these cases it’s the disease.

“As we have seen in the hematologic oncology space, our European colleagues have moved ahead of us. And they moved ahead of us, because they are organized around a disease, like CLL.

“And they are doing definitive trials that are changing the practice of oncology. It’s just another way

of thinking about consolidation and in fact it looks to me that it's consistent with that first recommendation of IOM, thinking about reduction in the number of disease committees. This is a model that it working well internationally. It is something that we ought to look at."

### FDA News:

## **FDA Delays Approval Decision On Avastin For Breast Cancer**

*By Paul Goldberg*

FDA has delayed the approval decision on the drug Avastin for the breast cancer indication, announcing that it needs another 90 days to review new data submitted by the company.

The agency was expected to make a decision on full approval of the Biologic License Application on Sept. 17. Now, the decision date has been pushed to Dec. 17.

The company confirmed that new data have been submitted to the agency. "We did submit additional information to the FDA after the ODAC meeting," said Edward Lang, a spokesman for Genentech, a unit of Roche, the drug's sponsor. "Discussions with the FDA are ongoing, and we are not sharing additional information at this time."

Clinical trialists familiar with Avastin studies said there were no previously unreported phase III trials of Avastin in breast cancer. With phase III data absent at this stage, Washington observers speculate that the 90-day extension was given at least in part in order to push the decision past the November mid-term election.

Some conservative groups have described ODAC's unanimous vote to recommend against approval as an act of rationing of health care. The words "death panels" and "Obamacare" were used ([The Cancer Letter, Sept. 3](#)).

While some observers regarded the agency's move as a politically motivated effort to avoid giving ammunition to "Tea Party" conservatives at a time when Democrats are facing the threat of losing control over the House, others suggested clinical explanations.

"One possibility: by calling the two new trials a 'major amendment' to the initial package, it opens the door to them rejecting the 'major amendment,' but retaining the initial label," said a knowledgeable source who spoke on condition that he would not be identified by name.

Avastin received an accelerated approval in 2008 based on use with a weekly paclitaxel regimen. However, confirmatory studies were conducted with

twice-weekly docetaxel and a variety of other regimens. These trials failed to show a dramatic improvement in progression-free survival.

Some observers hypothesized that Roche's efforts to broaden the label had backfired on the drug. Others counter that this speculation is groundless. The agency—and ODAC—were acting on the data in front of them, and anything beyond that is conjecture.

Regardless of its reasons for delay, the agency is likely to face two separate decisions. One will be the decision on whether to give a full approval to the Avastin BLA. ODAC recommended against this in a unanimous vote.

If the agency takes the committee's advice on the BLA, it would proceed to Question Two: withdrawal of Avastin's accelerated approval. The committee recommended in a 12 to 1 vote that this be done ([The Cancer Letter, June 25](#)).

Though the law that established accelerated approval allows FDA to pull indications, this has never been done. Last month, the agency started the procedures to withdraw the indications of another drug—midodrine hydrochloride for symptomatic orthostatic hypotension—but aborted the process in an apparent response to pressure from patients.

This means that Avastin now is a candidate to become the first drug to lose an accelerated approval. Other accelerated approval drugs have been pulled off the market, but this occurred when sponsors agreed to withdraw them voluntarily or—as was the case with Iressa—the agency mandated a restricted access program.

At this time, Avastin remains under accelerated approval in combination with paclitaxel for the first-line treatment of HER2-negative metastatic breast cancer. The FDA is currently reviewing two sBLAs that Genentech submitted in November 2009 for Avastin in combination with taxane-based, anthracycline-based and capecitabine chemotherapies based on the results of the AVADO and RIBBON1 studies. Data from AVADO and RIBBON1 were submitted as part of Genentech's effort to convert the accelerated approval to a full approval.

"We are pleased by the FDA's decision to review additional information on Avastin and are committed to working closely with the agency during this extended review period," Hal Barron, executive vice president, product development and chief medical officer, said in a statement.

Avastin will remain available for off-label use. It's approved for first- and second-line treatment of metastatic colorectal cancer in combination with

intravenous 5-FU-based chemotherapy, first-line treatment of unresectable, locally advanced, recurrent or metastatic, non-squamous, non-small cell lung cancer in combination with carboplatin and paclitaxel, and metastatic renal cell carcinoma in combination with interferon alfa.

### Advocacy:

## **“We Have To Develop A Plan To End Breast Cancer”—Visco**

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with keeping itself going. I don't mean to say that all researchers and providers are satisfied with the way things are going and with incremental progress. There are many who are eager to challenge the status quo.

But we do believe that the world of breast cancer has entered a comfort zone, where the focus is on building bit by bit on technology, success is considered a drug that affects tumor response and not survival, and too many spend vast resources arguing over whether mammography should be done every year, or every other year. We have to break out of this definition of success.

We have to develop a strategic plan of action to end breast cancer. We have never tried to do that. We believe the huge investment in technology, in basic and applied science, the thousands of researchers working on this problem, the ever increasing number of research institutions and breast centers, should now take stock and figure out how to apply all of that to end the disease. They have never attempted to do that.

We believe it is possible, and we are committed to doing everything we can, and to expand the group of stakeholders willing to do everything they can, to end breast cancer by 2020.

I would say it is a combination of a promise, a demand, a commitment and a belief.

**TCL: What's the difference between this and former NCI Director Andrew von Eschenbach setting a “challenge goal” to end “suffering and death due to cancer by 2015?” In this situation, is there a difference between a government bureaucrat and an advocate?**

FV: I can only speak to what we plan to do. We believe government is only one of the players needed to achieve the goal.

We strongly believe that educated advocates, NBCC, must convene and lead this effort. We have no one to answer to, we do not have to worry about whom

we are alienating or if we will be reappointed. That is not to say we will not alienate anyone. Of course, we will. We have certainly done so in the past.

That happens when you push to change business as usual. I think of NIH and NCI as business as usual. Again, it is an important part of the answer but not the totality of it.

We have spent 20 years building NBCC's reputation and garnering the respect of many in policy, science and health care. And we have looked carefully at where we are, and where we need to go, and who needs to come to the table to help reach the deadline. We don't want to keep the system going; we want to shake it up and change it.

When we started NBCC, our mission was to eradicate breast cancer. We said we wanted to end the disease.

We were told by other groups and by scientists that was a “silly” mission, it could never happen. Today, most breast cancer groups have ending breast cancer as their mission or in their mission statement.

We were told we would never be able to get federal funding for breast cancer research increased by \$300 million in one year (1992) and then later that we could never expand an “entitlement” program so that government funded screening programs would include treatment. Other groups, scientists, policy makers, all told us it was impossible. But we did it.

We know those successes are not the same as ending breast cancer. But we also know that ending breast cancer is not impossible, and we are not at all afraid to push for it, and we put our reputation on the line.

What's the alternative? More of the same? We have already failed haven't we? In the U.S. alone, more than 40,000 women and 350 men will die of breast cancer this year. Worldwide, we're talking about 500,000 deaths. That should be no one's definition of success or even progress.

**TCL: Over the past 20 years, NBCC has been at the forefront of safeguarding the tradition of skepticism, which is the mainstream in science. Is the 2020 campaign consistent with this aspect of the NBCC history?**

FV: Yes.

We have always been about finding ways to foster and encourage innovation in science. But we have never been about just getting more money for scientists and leaving them to their own devices. We have never believed in simply tinkering with what we already know in breast cancer.

There is room in our plan for those who are innovative and believe we need to leave the process and the questions to science to find its way. And there is room for those who are innovative and are willing to focus all their efforts on achieving the deadline.

We need all approaches in order to figure out how to reach the goal. There will come a time in the next 10 years when we will have a very good sense of where we all need to focus. That will be a particular challenge for many scientists, but we know those who are up to it will welcome this effort. And we need to hear from those who think this is impossible, so we know what the barriers are.

But we need to hear criticisms beyond “science doesn’t work that way.” It can and it should. We need more specifics.

Let’s say it is Jan. 1, 2020, and we have ended breast cancer. How did we get there? Let’s get some of the brilliant minds that are focused on a gene or a genome to think that way. At least to tell us what we need to overcome to achieve the goal.

We welcome the skepticism; we believe it is crucial to success. I hear so often that great science is serendipitous. I certainly believe there is some great science that is. But there comes a time when we have to take what we know, synthesize it, and apply it to solving a problem for humankind. This is the time to do that in breast cancer.

And let’s also talk about our own tradition of skepticism. It is our skepticism that has led us to this point. We are skeptical that the current system will ever lead to significant progress.

A deadline will help focus efforts where they will have the greatest chance of achieving the goal.

The world of breast cancer has spent the vast majority of its resources—time, money and effort—on early detection and a new drug. Neither has made enough of a difference.

We need to focus on understanding and ending metastasis and on prevention. We should harness technology, incredible scientific minds and dollars in these areas.

**TCL: What happens if you don’t meet this goal, and—by the same token—what happens if you do meet this goal?**

FV: If we are successful, it’s clear. Many, many lives are saved and we go away.

And if we do not succeed, I believe we will have achieved many successes along the way and will have still saved many lives.

For me? Either way I am moving to Tuscany.

## *In the Cancer Centers:* **MD Anderson Completes \$500M Research Endowment**

**UNIVERSITY OF TEXAS MD ANDERSON CANCER CENTER** has completed a \$500 million research endowment that began with a \$50 million gift from philanthropist **T. Boone Pickens**. Pickens made his donation, the largest single gift in MD Anderson’s history, with the stipulation that the center would not begin to use the funds until other funds could be added to create a \$500 million endowment.

Proceeds from the endowment, but not the \$500 million principal itself, will support basic, translational, clinical and population research at MD Anderson. Institutional funds contributed to the endowment come largely from MD Anderson’s operating and patient care revenues that traditionally support research, educational programs, facilities construction and renovation, and major equipment.

The purpose of the research endowment is “to capitalize on amazing leaps in scientific knowledge about cancer and its treatment that have been made, here and around the world, in the last few years,” said **John Mendelsohn**, president of MD Anderson. He said the center also is taking this step to ensure an adequate pipeline for research funding in an uncertain economic climate.

The UT System Board of Regents approved MD Anderson’s request to name its new, 21-story academic building the T. Boone Pickens Academic Tower. Pickens has long supported MD Anderson, and served on its Board of Visitors from 1977 to 1986, including a term as chair from 1983-1984.

**CITY OF HOPE** received a five-year, \$3.3 million grant from NCI to investigate whether a low daily dose of tamoxifen will decrease the risk of breast cancer among women who have been treated for Hodgkin’s lymphoma in childhood, adolescence or early adulthood. **Melanie Palomares**, assistant professor in the departments of Population Sciences and Medical Oncology & Therapeutics Research, will lead the study.

The study involves 300 healthy, female Hodgkin’s lymphoma survivors at five institutions who received radiotherapy for lymphoma before age 30. Other institutions participating in the study include St. Jude’s Children’s Research Hospital, Emory University School of Medicine, University of Michigan’s C.S. Mott Children’s Hospital, and Princess Margaret Hospital.

**LESLIE BERNSTEIN**, director of City of Hope's Division of Cancer Etiology, received the 2010 Abraham Lilienfeld Award from the American College of Epidemiology. The award recognizes outstanding contributions and leadership in epidemiology.

An epidemiologist known for establishing the connection between exercise and reduced breast cancer risk, Bernstein leads City of Hope's research on the genetic, lifestyle and environmental causes of cancer. Her research interests include breast cancer, esophageal adenocarcinoma, and non-Hodgkin's lymphoma.

She serves as a chair or member of several advisory committees, including the Nurse's Health Study at Harvard University and the Breakthrough Generations Breast Cancer Program in the U.K. She is principal investigator of the California Teachers Study, a cohort of more than 130,000 public school teachers and administrators formed in 1995 to determine how breast and other cancers affect women. She also serves as president for the Society of Epidemiologic Research.

**MICHAEL CALIGIURI**, director of the Ohio State University Comprehensive Cancer Center and CEO of the James Cancer Hospital and Solove Research Institute, received a Method to Extend Research in Time award from NCI for his research on manipulating the immune system to prevent and treat cancer.

The award provides up to 10 years of support to investigators with impressive records of scientific achievement in research areas of special importance or promise.

The 25-member Caligiuri laboratory focuses on three research areas: the biology of human natural killer cells, a component of the immune system that attacks cancer cells; development of a vaccine to protect against lymphoma; and the molecular biology of acute myeloid leukemia and the development of new therapies to treat this malignancy. The MERIT Award recognizes Caligiuri's work on natural killer cells and interleukin-15.

Caligiuri also is president of the Association of American Cancer Institutes, chair of the American Association for Cancer Research publications committee, an associate editor of the journal *Blood*, and sits on the advisory boards of 10 of the NCI-designated cancer centers.

**EMINA HUANG**, a member of the University of Florida Shands Cancer Center and associate professor of surgery in the UF College of Medicine, received a \$1.52 million grant from NIH to fund research into

the origins of colon cancer and how to prevent the progression from benign ulcerative colitis to cancer. "We asked the question: Are tumor-initiating cells present in ulcerative colitis?" said Huang. "We found the answer is 'yes,' and we've been able to identify those and work with them."

### NIH News:

## **Biennial Report of the Director Offers Portrait of NIH Research**

NIH Director Francis Collins announced the release of the Biennial Report of the Director, NIH, for fiscal years 2008 and 2009.

The report provides an integrated portrait of NIH research activities for Congress, advocates and patient groups and the general public to understand the many activities of the agency.

This is the second report under the mandate in the NIH Reform Act, which reinvented the NIH Biennial as a consolidated report, replacing many disparate ones. Now on NIH's website, the report will be available in print this fall.

The report contains an assessment of the state of biomedical and behavioral research organized by disease category, investigative approach, and resource. The chapter on NIH-funded cancer research is at [http://report.nih.gov/biennialreport/PDF/Ch2\\_Cancer.pdf](http://report.nih.gov/biennialreport/PDF/Ch2_Cancer.pdf). The full report is available at <http://biennialreport.nih.gov>.

**Gulf Health Study:** NIH plans to begin a multi-year study of the potential health effects from the oil spill in the Gulf region.

The Gulf Worker Study is in response to the largest oil spill in U.S. history, caused by the explosion of the Deepwater Horizon offshore drilling oil rig in the Gulf of Mexico. NIH Director Francis Collins pledged \$10 million in NIH funding for the study's initial phases.

BP will contribute an additional \$10 million to NIH for this and other health research. The BP funding will come through the Gulf of Mexico Research Initiative, a 10-year, \$500 million independent research program established by BP to better understand and mitigate the environmental and potential health effects of the Gulf spill. NIH will have full autonomy for distribution of the \$10 million, with input from external experts.

The study will focus on workers' exposure to oil and dispersant products, and potential health consequences such as respiratory, neurobehavioral, carcinogenic, and immunological conditions. The study is also expected to evaluate mental health concerns.

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The Symposium, a CME activity of the Tisch Cancer Institute of the Mount Sinai School of Medicine and The Chemotherapy Foundation, will be presented November 9-13 at the Marriott Marquis in New York City. A faculty of leading investigators report on new agents and clinical trials. The focus is on practical applications for clinicians in varied practice settings to achieve better outcomes for patients.

The Symposium begins Tuesday afternoon with a session on Pediatric Oncology, followed by full-day sessions on Hematology and GI Cancers on Wednesday; Gynecological, Breast, Head and Neck cancers and Personalized Medicine on Thursday; Prostate, Renal, Bladder, Melanoma and Endocrine Cancers and a dialogue on new models of practice in a changing environment for health care providers on Friday. Experts on practice issues will explore strategies for survival of small practices, effective ways to recruit patients for clinical trials, rapid learning systems for cancer care, and how a longer term view in development of educational activities will foster attitudes favorable to the future of live CME. New Perspectives in Oncology Practice for Oncology Nurses, Physician Assistants, Nurse Practitioners, Case Managers and Pharmacists is scheduled for Nov. 13.

Register online at [www.chemotherapyfoundationsymposium.org](http://www.chemotherapyfoundationsymposium.org).

Contact [jaclyn.silverman@mssm.edu](mailto:jaclyn.silverman@mssm.edu) for further information.

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*A National Cancer Institute-Designated Comprehensive Cancer Center*

**DEPUTY DIRECTOR ADVERTISEMENT**

**OEOD# 5012**

The Hematology/Oncology Division of the Department of Medicine at the University of California, Irvine (UCI) is recruiting a physician scientist for a tenured position at the associate or full professor level who will also be the Deputy Director of the Cancer Center. We are seeking an experienced translational scientist with an established research program focused on either basic/translational investigations or clinical/translational science. This is a senior leadership position with a National Cancer Institute (NCI) designated Comprehensive Cancer Center.

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For more information, contact Krista Hollinger, MPH at [kholling@uci.edu](mailto:kholling@uci.edu).

Application Procedure: Interested candidates must submit cover letter, curriculum vitae, a statement of research, a statement of teaching, and contact information for 3-5 references via the University of California's Academic Personnel RECRUIT system at <http://recruit.ap.uci.edu>.

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