

MINUTES

Biological and Environmental Research Advisory Committee (BERAC Meeting)
Office of Biological and Environmental Research
Office of Science
U.S. Department of Energy

DATE: April 20-21, 2005

LOCATION: American Geophysical Union, 2000 Florida Avenue, NW, Washington, DC. The meeting was announced in the Federal Register on April 12, 2005.

PARTICIPANTS: Approximately 75 people were in attendance for part or all of the meeting. Fifteen BERAC members were present:

Keith Hodgson	Margaret Leinen
James Adelstein	Patricia Maurice
Eugene Bierly	Melvin Simon
Michelle Broido	Lisa Stubbs
Joanne Fowler	James Tiedje
Ray Gesteland	Barbara Wold
Will Harrison	John Wooley
Steven Larson	

Seven BERAC members were not present:

David Burgess	Louis Pitelka
Richard Gibbs	Janet Smith
Jonathan Greer	Warren Washington
Richard Hallgren	

Information on the BERAC membership can be found at:
<http://www.sc.doe.gov/ober/berac/members.html>

Wednesday, April 20, 2005

Ray Orbach (handout)

FY06 budget comments. Where are we and where are we going? SC FY06 budget received the greatest cut of any US science agency. Now more than ever our advisory committees are essential for helping make the case for science to the administration, congress and the public. The out years for the Office of Science (SC) would decrease by 10% in absolute dollars resulting in a 40% real decrease based on current budgeting formulas being used by the Administration to reduce the deficit. This is the case for all science agencies. We (and others) need to make the case about our uniqueness and importance to science and society.

We structured the FY06 budget for world leadership in science in the areas we are responsible for. Not just world class but world leadership. What are the consequences? We needed to reorient ourselves to achieve this goal.

SC continues to be the prime supporter of US physical sciences. Physical sciences (#1), environmental sciences (#3), math and computing (#3), life sciences (#5). Value and importance of different agency approaches with unique missions, funding strategies, and independent voices. Having a single agency that speaks for all science (as proposed by some) has its risks.

Mission driven does not just mean applied research. We need to continue to get the word out about the importance and value of the relationship between DOE applied and basic research programs.

Future of SC science, e.g., high end computation. Two 20 Tflop machines going online at ORNL this fall. Specific architectures (vector and scalar) enabling advances in different fields. Coming competition for 10-15% of time on these machines for scientific discovery. Need to find out how these machines work - avoiding "over commitment" to one machine or architecture and the mistake of aiming just for the highest peak speed. Part of the EMSL machine is being bundled into this opportunity along with NERSC.

FY05 budget in constant dollars was the highest for SC in history if the peak during the era of the Superconducting Supercollider is discounted.

Pie charts - still haven't completed the FY05 chart yet but can compare FY04 and FY06 request. ~49% of the FY04 core is for research with funding for labs and universities about the same. ~45% (a decrease) of FY06 is projected for core research. This is the trend of concern. A warning sign for all of us. The FY06 budget is not yet over by any means.

FY06 investments for scientific leadership:

- 1 Fusion, ITER
- 2 Leadership class computing
- 3 Spallation neutron source
- 4 Nanotechnology
- 5 X-ray free electron laser at SLAC, online in FY08 or FY09
- 6 High energy physics
- 7 Nuclear physics
- 8 Climate change
- 9 Genomics - large bet being placed on capabilities for energy & the environment

Questions / comments:

- 1 Devastation to nuclear medicine community of cuts and proposed elimination of nuclear medicine research. Small program with big impacts. Rationale? Restoration opportunities? [R. Orbach] - Impacts on science and patients recognized. Long tradition of contribution. Decision calls into question the investment of the past 50 years. Presume it will be replaced in the US

- infrastructure but not obvious that will be the case. Had to maintain programs that only BER could or would do. One of the consequences of doubling one agency's budget while reducing others. Society for Nuclear Medicine is certainly getting the message out and presumably Congress will hear them. We are also cutting back on some of our support for NNSA laboratories. NNSA budget has gone up in recent years but SC's has not.
- 2 Thank you (Ray Orbach) for what you have done. Have made tough and painful decisions and that is appreciated and recognized. Have made a strong case for protection of students and researchers today and with future investments. [R. Orbach] - Previous Secretary supported science. The current Secretary is a scientist. We will see how that plays out. Chairs of SC Advisory Committees have met as a group and conveyed the value and importance of science to the Secretary. We need help from the broad community, not just the physical sciences communities. Need to go to the Administration and Congress to tell them why what we do is important and support of science. Hard to get people to get beyond their own institutional projects and interests and to talk in support of science broadly.
 - 3 DOE has supported research at the intersection of the physical and biological sciences that is unique among federal agencies. This is what has been lost with current reductions. Worry that this will be the first of many assaults on this type of biological research at the intersection of the physical and biological sciences. A real set back for a sector of medicine but also for research at the intersection. [R. Orbach] - People do know and understand the pioneering research that DOE has done. This is all still driven by a very difficult budget envelope. The issue is not just nuclear medicine or ecological research at Savannah River which also took a huge hit but the overall budget envelope within which SC operates.
 - 4 Of the different items on the leadership list represent where we are leaders already, where we are close, and where to we aspire to be leaders. [R. Orbach] - Believe that across the 6 SC programs we are still world leaders but we can't take any of this for granted. There is a lot of competition out there. High energy physics - we are the leaders with 2 of the best machines in the world at least for the next 2-3 years. Will cede leadership to Europe in 2010. Nuclear physics - still world leaders and dependent on RHEA being built. Fusion - best machine is elsewhere. If we don't join the international program we will cede leadership. BES - world leaders in materials for the indefinite future. LCLS and SNS will have no equals and provide great opportunities for biology too. BER - genomics leaders but lots of competition.
 - 5 Interesting point related to the NNSA - SC relationship. NNSA and other agencies have swung way over to application under the assumption that SC will continue to support necessary basic research. Possibility that the current, critical paradigm will be lost in the future with serious, threatening consequences. Not clear how NNSA could pick up the slack. Where are the alarm bells? [R. Orbach] - Historical relationship that has proven its value. Same thing as nuclear medicine. Do we want to just give this up?
 - 6 Some say that international leadership is no longer a compelling argument in this town. [R. Orbach] - Estimates in terms of worker productivity suggest that 2/3 is achieved through R&D and only 1/3 through worker education. This is about scientific leadership. Can we or do we really want to just live off the scientific

- growth of the rest of the world? Gambling with our future and our children's future. This just isn't true. People do sense that leadership still important.
- 7 Human infrastructure for the future. This argues against being able to just live off of advances in the rest of the world. We are not just losing the bottom 10%. The best and the brightest are choosing other opportunities in other fields. [R. Orbach]
- The need for scientific leadership is essential if we are going to bring the best and the brightest into science. Just look at your graduate programs.

Dave Bader (handout)

Report on subcommittee report in response to BERAC charge on BER research directions and opportunities in abrupt climate change and in superparameterization.

Regards from Warren Washington. He is doing well and should be able to travel soon. Dick Hallgren also couldn't be here today.

Report had broad consensus. No minority positions.

Report does not support deep cuts in existing BER research portfolio in climate change research though it does encourage BER to support more research in these two high priority areas.

Findings - super parameterization

- 1 No cloud parameterization deadlock as has been reported
- 2 Lots of parameterizations out there but difficult to get these into models
- 3 Programs such as the ARM program are very supportive of improvements in climate models.
- 4 The MMF (super parameterization) approach is best suited to modeling precipitative convective systems but less so in simulating cloud systems with weaker dynamics and smaller scale motions

Existing DOE programs could be enhanced, e.g., ARM and aerosol program, and would benefit from enhanced cloud parameterizations

Findings - abrupt climate change

- 1 Not as much new ground to cover beyond NRC report
- 2 Important area
- 3 Does need to be looked at seriously

Should encourage analysis of climate simulations with abrupt climate change emphasis within the past millennia, particularly the past few centuries, and potential future climates. Advisory input needed for BER/BERAC with appropriate links to other agencies to provide advice on the topic of abrupt climate change.

Also need for computational platforms that enable necessary calculations to be done. This is being addressed within SC. US in general trying to address this issue of experimentation within the models. 50 papers under development for the IPCC by people

doing experiments with the models. Subcommittee was not asked to address computational issues and stayed close to its charge.

Report approved by BERAC as presented.

Peter Lunn (handout)

Previous BERAC report (spring 2004) recommending changes in Atmospheric Science Program. Report set priorities - important for spending limited resources.

Aerosols contribute to global warming and cooling with direct or indirect impacts on radiation and on clouds.

Science team now in place for the newly revamped aerosols program. ~36 funded projects. A number of organizations who are interested in the program and data are also contributing to the science team, bringing their own funding and a general interest in atmospheric/aerosol science. Research announcement has been issued, competed, funded.

Working groups on instrument development, lab studies, field studies, model development and evaluation and with science focus on gas-particle interactions, new particle formation, aerosol optical properties, cloud-aerosol interactions.

Several field campaigns under development that also leverage other resources and capabilities such as ARM. Large Mexico City campaign scheduled for early 2006 to characterize megacity aerosols and evaluate the rates and yields of both primary particle aging and secondary aerosol conversions. Hope for partnership with other agencies, e.g., NASA, that enhance the range and scale of measurements that are possible since DOE aircraft focus is on low, slow, limited range measurements.

Important partnerships with other programs and agencies, e.g., ARM, NSF, NASA, climate modeling community (to ensure program products are needed and used by climate modelers)

Program (and science) deliverables handout. Need to go beyond simply advancing the state of the science. Research products need to be incorporated in climate models. Involving the modeling community in defining experiments, data, and data packaging.

Program website - www.asp.bnl.gov. All projects represented with associated PowerPoint presentations included plus logistical and scientific details of planned field campaigns.

Questions:

- 1 Great job in getting this revised program going. Doesn't seem to be sufficient investment in instrument development to replace old instruments currently being used. [Lunn] Science team has considerable expertise in this area though admittedly weak on the Steering Committee. Did take the subset of BERAC

- recommendations for priority instrument development and incorporate these into the program.
- 2 Opportunity for looking at the origin of aerosols in the California experiment - aware of this interest but not the primary goal or priority. Has OMB been told about this program? [Lunn] Spring 2001 Academy report calling for increased emphasis on aerosols was really the instigator. White House, OMB, and Head of Climate Program (Jim Mahoney at NOAA) are aware of DOE's initiative in this area.
 - 3 Thank you for an upbeat presentation. Hope that the scientists being supported are as enthusiastic especially given the community concerns of one year ago. [Lunn] The current program has more collaborations between academia and DOE labs than ever before.
 - 4 Link to nanoscale science research centers or Environmental Molecular Science Institutes? Ways to better integrate? [Lunn] Current collaboration with at least one EMSI. Can't speak to the nanoscale science center interactions though the steering committee acknowledged the value to making this connection. Will do in the future.

Jerry Elwood (handout)

New charge to BERAC to review terrestrial carbon cycle research program.

- 1 Is near term program priority appropriate?
- 2 Is program resolving major uncertainties?
- 3 Is program balance appropriate?
- 4 Are program elements providing useful data?

Focus on terrestrial carbon cycle research program including relevant research funded through the National Institute for Global Environmental Change (NIGEC). Includes role and benefit of AmeriFlux and FACE sites and experiments.

Next solicitation from this program will, hopefully, benefit from BERAC response to this charge.

What about role of ocean sequestration? Most of that research is at other agencies. Coordinated through interagency working groups especially the USGCRP (initially) / Climate Change Science Program (today). This coordination is almost second nature since it has been going on so successfully for so long. Just because it is well coordinated doesn't mean that there are not strong and differing scientific views that do occasionally get out of hand.

What happened to the ocean center that BER was funding? [Elwood] Wasn't effectively operating as a center to integrate research so it was not continued.

Robin Staffin - Science talk - The Year of Physics (handout)

100th anniversary of Einstein's 1905 paper. We do not know what 96% of the universe is made of including materials, particles, etc. that we don't even know of or understand

today.

- 1 0.03% heavy elements
- 2 0.3% ghostly neutrinos
- 3 0.5% stars
- 4 3.5% free hydrogen and helium
- 5 23% dark matter (don't even have names for this yet)
- 6 70% dark energy (have candidates but no placeholders in theory yet)

Questions and tools for a scientific revolution:

- 1 Are there undiscovered principles of nature? New symmetries? New physical laws?
- 2 How can we solve the mystery of dark energy?
- 3 Are there extra dimensions of space? (that we don't even see/recognize)
- 4 Do all the forces become one? (realizing Einstein's dream)
- 5 Why are there so many kinds of particles?
- 6 What is dark matter? How can we make it in the laboratory?
- 7 What the neutrinos telling us?
- 8 How did the universe come to be?
- 9 What happened to antimatter?

Is there a limit to the amount of energy that can realistically be generated/used to discover new particles? Are there new ways that can/will be developed to make these discoveries? Need for continuation of breakthrough technologies. Future use of lasers to accelerate particles - possibility of 1,000x increases. Always a difficult balance of R&D investments versus keeping your facility running. Many particles in space (though not many of them) of much higher energies than we currently generate.

In times of decreasing budgets how do you "ensure" funding for the off-the-wall science that may be the key to solving the next revolution?

Ari Patrinos

My apologies for not having any slides. Things have been busy. Ray Orbach said many of the things I was planning to say and I appreciate his candor about the tough decisions that affect many of you.

BERAC charges -

- 1 New terrestrial carbon charge discussed by Jerry Elwood.
- 2 FY05 language about potential for two new beam lines at the NSLS. There is a current BERAC charge. [Keith Hodgson] - Jonathan Greer to chair subcommittee. Had hoped to meet prior to this meeting but didn't work out. Plan to meet in next 2 months. Subcommittee should take a slightly broader view than the narrowness of the charge. Has been awhile since BERAC looked at structural biology at all.
- 3 Committee of Visitors - Report tomorrow on completed Environmental Remediation Sciences review. John Wooley is working on Life Sciences COV scheduled for late May. Medical Sciences COV promised for FY06. Given current status of funding there may be questions about whether it should be done.

Need to get ruling from OMB examiner though we would prefer to complete this one as well. [Keith Hodgson] - COVs can also provide broad comments on portfolio and its overall value so may be especially worth doing.

- 4 Environmental Molecular Sciences Laboratory review under the leadership of Michelle Broido. Scheduled for May. We have become concerned about flat budget and old instruments at EMSL so review will be very timely and helpful in giving us hard hitting advice that could have broader impacts across BER.

Ray Orbach gave grim facts about FY06 budget request. Two principle casualties. ~\$10M cut in Environmental Remediation Sciences. ~\$7.8M of this impacts the Savannah River Ecology Laboratory in Aiken, SC. Have heard from Paul Bertsch in the past. This lab was part of "SC" for many years until its relatively recent transfer to the Office of Environmental Management and then in the last few years back to BER. SREL have been realigning some of their programs to become more responsive to BER and SC needs so what we did was very abrupt and cruel. The budget system is often a ruthless and unforgiving system. Unfortunately we are not allowed to give "heads up" on critical issues in the budget until it goes to congress even if we know several months prior. SREL no longer has "protected" status in BER/DOE budget that it has had until now. Now they have to compete openly for funds. However, the reality is that even if they were 100% successful for current competitions they still could not recoup the funds being lost. Impact of the political process on the SREL fate remains to be seen.

Biggest casualty was medical sciences. Went from \$44M in FY05 to \$15M in FY06 request. Protected programs were the artificial retina and the infrastructure at BNL. Had 5 minutes to make this decision and I take responsibility. Secretary Abraham was still at DOE and the artificial retina program was one of the few SC programs that was a high priority for him. BNL infrastructure leverages considerable NIH funding. Biggest casualty was radiopharmaceutical program at a number of universities. Don't know what congress will do with this cut. Did communicate the situation to NIH through NIH's official DOE liaison Francis Collins. Dr. Zerhouni also has gotten personally involved. Can't tell you that NIH has fixed everything. Only know that we continue to meet with NIH but don't know the outcome. I have proposed a National Academies cradle to grave study of NIH and DOE nuclear medicine research including radio isotope production for medicine (a DOE Office of Nuclear Energy not SC/BER mission). DOE has bought into this but still need NIH and OMB buy-in. Would not ask them to get into the business of recommending which agency should fund what science. [Q] Does the Department know the impacts and the history of DOE's role? [A] Certainly Ray Orbach does though probably not to the extent that some of you might wish. Hard to know about the Secretary. Need to appreciate the difficulty of setting absolute priorities. What is more "important" - finding top quarks, nuclear medicine, climate models, etc? [Q] Issue of medical isotope development a significant issue as more of this goes overseas. This is more than just about production but also about high cost of development that most companies are not able or likely to pick up. This is a Federal role.

There may be other things like this that we will have to face in the near future. We are already starting on the FY07 budget. Ray Orbach laid out the stark realities of the out years at present. We will involve BERAC as we can and as it makes sense.

[Q]What about NIGEC infrastructure. [A] Announced in FY06 budget that U of California will not run this any more, will go from 6 to 4 centers, and will compete as other programs. This began as an earmark in BER but has turned around in recent years.

[Q] What about the earmark quotient? Will it go up and get worse? [A] Hard to tell. History has been that money gets added for a number of years and then a year comes when money doesn't get added.

[Q] What about programs that cut across agencies like microbial research that is relevant to both DOE and NIH? [A] Current opportunity we have with GTL is that in the end it is really uniquely DOE even though at some level biology is biology. We have made the GTL case very successfully in many quarters. It will always be "white knuckles" for us every time there is a change in leadership. There will always be a question about biology at DOE. Low dose program also a uniquely DOE program though this program also has an influential proponent in the Senate.

[Q] Low dose program was initially a 10 year program. What is the current time frame? [A] Was a 10 year program at \$23-25M per year. Have never gotten more than \$18M and initially less.

Current Secretary has specifically asked why DOE supports life sciences. Hopefully I will be making a presentation to the Secretary in the next few weeks. Convinced that we will prevail and will make a compelling case that the Secretary will embrace. David Galas likes to say that there is no significant energy solution of importance to DOE that doesn't involve biology. We are also commissioning a National Academy study on the GTL program, including the facilities plan/rationale, that will hopefully be completed in a time frame that can impact the FY07 budget. There is always uncertainty in these kinds of efforts.

GTL roadmap document will be completed in May and printed in June. Will it be perfect? Of course not. Can it be improved? Of course. First systems biology roadmap. Still committed to GTL facilities. These are absolutely important starting with the Protein Production facility. Current competition understanding is that we will issue an open competition for all. Project Engineering and Design funds appropriate in FY05 for this facility can/will be carried forward to FY06 as needed.

[Q] Clearly some large hungry projects in SC. Need to remain vigilant for BER GTL facilities. For the first facility there will be some belt tightening in BER since we will build this one within budget. Can only hope that budgets in out years will improve and give us more options. Budgeting is still a year to year process in spite of multi year planning.

One of the things we would like to do across BER is to have chief scientists for most or all of our major programs where it makes sense. Have "piloted" this in our Climate Change Research programs for a number of years. A practicing scientist who can become the voice for our programs in the community. Eddy Rubin plays this role for the JGI. Jim Fredrickson has agreed to play this role for GTL.

A few words about the labs. Two activities. Instead of having SC “on-site” visits Ray Orbach is having reverse site visits this year to develop business plans. Will inform specific future directions and emphases for the labs. We are offering to have mini versions of this business planning to the lab leadership with BER management.

BER staffing situation. I am currently playing two Division Director acting roles - Medical and Life Sciences. Need to fill these positions. If there is someone who could be recommended for the Life Sciences position please let me know. We are anticipating being able to fill the Medical Science position soon. Sharlene Weatherwax has recently joined BER from BES. Position for a geneticist and for a biologist (including Human Subjects responsibilities) have been announced and have closed. Tim Boyle from Sandia is finishing his year with BER after helping with GTL. Drew Tate from LANL is leaving soon. Ray Wildung from PNNL will be returning to the lab soon. Are pursuing three positions in Environmental Sciences (2) and ARM (1). Looking for someone who could be a facilities project manager.

Climate Change program not being avoided here. Commented earlier on its good integration across the government. This is a relatively mature program that has not lost any of its volatility with time. Should be proud of the contributions this program has made.

Interagency activities. Always highly valued in BER. This continues unabated. Have had discussion with the National Cancer Institute about the possibility of building a GTL facility together.

[Q] DOE’s biggest problem is that it is DOE. DOE doesn’t tout its successes very well. The National Academy just put out an aerosol report that doesn’t even mention the DOE program or the recent BERAC report. This is very bothersome. [A] Some of our programs are doing a better job of getting the word out. BNL regularly gets high profile imaging results out. The JGI has also been very successful doing this recently. Having a cadre of Chief Scientists may help. Let’s also be realistic. Good PR doesn’t always spell success. NASA has been very good at getting the word out yet their budgets haven’t necessarily benefited.

[Q] Five sitting chairs of SC Advisory Committees met with the Secretary a few weeks ago. The pending Life Sciences briefing will be very important. The Chairs asked what could be done to make a difference. More people need to make their voices heard, especially people from higher positions at universities, industry, the labs, etc. AAU is making an effort to get people involved.

[Q] What can be done at a different level? Believe it or not individuals can go to their individual representatives and they will listen because you vote for them. There is an organized science visitation day in May coordinated through scientific societies. Don’t forget the local offices of your congressional representatives.

Mike Viola (handout)

Ray Orbach charged BERAC to provide advice on how BER should/could broaden its artificial retina related work to research on neural prostheses.

Labs have broad capabilities in this area. This research has been going on for about 15 years but was only recently energized through contributions from DOE labs. Evolution of devices from hard cased, electronically simple devices to much more sophisticated devices with much more complex, sophisticated electronics. In July will implant first patient with 64 electrode device. A total of 10 have been proposed to FDA. Design for the 256 electrode device has now been frozen. Significant contributions coming from groups who never did biology before.

How do you seal devices from their wet environments and to remain functional for long periods of time - 70 years? Ultrananocrystalline diamond coating developed at Argonne.

LLNL group that develops telescopes made an ophthalmoscope for correcting distortions that occur when looking into the eye.

Currently each group that is part of the artificial retina project has 6 month deliverables and reviews.

Need to discuss how best to reenergize this charge and provide a report to Ray Orbach as requested.

Peter Faletra (handout)

Outreach and education in SC. Challenge of staying within the DOE/SC mission without straying into the mission areas or programs of other agencies. Trying to grow and nurture diversity at the national level. The Secretary's advisory board on education deals with many issues that aren't even directly related to education - DOE "brand recognition" challenge.

IG report (2001) notes that DOE will face 40% shortage in S&T positions in 5 years.

Grade school to graduate school approach. Trying not to drop people along the way but we still do.

- 1 DOE Science Bowl - >15,000 students
- 2 Undergrad internships - required abstract, research paper (10 pages). Publication in DOE Journal of Undergraduate Research - one way to evaluate quality of students, mentors, and the program. Mentors are co-authors on the papers, putting additional pressure/responsibility on the student-mentor partnership. Journal distribution to members of congress who have students from their districts and colleges and universities who have students plus new, current and former students. Also on-line. Thanks to AAAS for help.
- 3 Graduate fellowships but poorly tracked currently
- 4 Faculty research opportunities

Using the DOE labs as a resource. Coordination with NIH and NSF to get their students to come to DOE labs.

Undergrad programs

- 1 4 year internship program (Science Undergraduate Laboratory Internships - SULI), up to 8 weeks per year for up to 3 years. Will place >450 students in 14 labs this summer. Over 2,000 applicants. The mentors choose the students.
- 2 Community College Institute. Lot's of specific enrichment programs. Expanding scientific workforce career opportunities.
- 3 Pre-service Teacher Program. For teachers in college. Paid summer research internship at a lab. Interns work with a research mentor and a Master Teacher. For juniors or seniors or graduating community college students.

Graduate/Faculty programs - for schools in lower 50% of research funding. Faculty-student teams matched to labs as a pair. Teaching teams how to write grants. NSF has been very supportive of the program - they have money and we have labs.

BER Global Change Education Program run by Rickey Petty. SURE program for undergraduates. GREF program for graduate students. Value/importance of tracking the students.

[Q] Short period of time for young students makes it very difficult since it takes time for first time students to get going. Longer programs? (A) Easier with returning students.

New Business

[Keith Hodgson] SC advisory committee chairs met with the Secretary recently. Trends in Knowledge and Creation of New Ideas showing trends across graduate school, patents, etc for US versus non-US contributions plus funding trends. Report is available on the web.

[Steve Larson- slides available] Impacts of nuclear medicine program reductions. Enabling legislation for biology research at DOE. DOE's research is the foundation for nuclear medicine nationally and internationally. Iodine-131, gamma camera, single photon computerized tomography (SPECT), PET, technetium-99m radiopharmaceuticals and fluorine-18 radiopharmaceuticals, therapeutic radionuclides - Y-90, Bi-213, Ac-225.

DOE support is not large even today. \$30M being cut - 113 investigators, 8 national labs, 30 academic institutions, 8 companies. Largely translational research at the interface of chemistry/physics/biology/medicine. Not categorical, not disease specific so not funded by NIH. Examples - streamlining cyclotron production of radionuclides for hospital radiopharmacy applications; optimizing 3D SPECT/PET to get resolution from 4 to <1mm; gene expression, phenotype imaging in oncology, neurology, cardiology; targeted radiotherapy with alpha emitters.

Thursday, April 21, 2005

Mike Kuperberg (handout)

Environmental Remediation Sciences Division - overview and reorganization

In the last 12 months:

- 1 Teresa Fryberger to OSTP
- 2 Todd Anderson joined as new federal staff
- 3 Ray Wildung & Drew Tait arrived on assignment & are getting ready to leave
- 4 Committee of Visitors review
- 5 Review of Field Research Site and Old Rifle site
- 6 EMSP Subsurface call
- 7 NABIR Biomolecular call
- 8 Division recommended for reorganization
- 9 Budget reduction by ~\$10M

Current program structure:

- 1 NABIR
- 2 EMSP
- 3 EMSL
- 4 SREL
- 5 SBIR

Goal to integrate as outlined in FY06 budget. Science themes:

- 1 Tanks & high level wastes
- 2 Fate & Transport of Contaminants
- 3 Remediation & Stabilization - Active measure to influence fate & transport
- 4 All of the above tied to Field Research

Management organizational structure:

- 1 High level waste
- 2 Biological processes & DOE contaminants
- 3 Physical Processes & DOE contaminants
- 4 EMSL - deserves management separate from research programs

Continued support for user facilities and field sites

- 1 EMSL
- 2 ORNL FRC
- 3 Old Rifle UMTRA & Hanford chromium sites
- 4 Soon to be release call for additional FRCs
- 5 Environmental beam line support at 4 light sources

Collaborations:

- 1 BES geosciences
- 2 NSF Environmental Molecular Sciences Institutes (EMSI)
- 3 Other BER - Genomics:GTL, JGI/PGF sequencing
- 4 DOE Office of Environmental Management & Office of Legacy Management (long term stewardship after EM done with cleanup and likely biggest long-term program customer)
- 5 Other

Increase emphasis on field research over time. Annual solicitation for each element. Annual opportunities for “outlier” proposals

[Q] - Long term progress/strategy on Hanford tanks? [A] - Changing emphasis to residuals since EM focus on getting materials out of tanks. Lots of chemistries we still don't understand. Removal of tanks (not preferred) versus remediation in place (more likely result).

[Q] - Where are the major tank farms. [A] - Savannah River, Hanford, Idaho. We have no responsibility for the tanks themselves or their cleanup

Allison Campbell (see handout)

EMSL overview/update

BERAC review of progress toward long term performance measures

Standing BERAC subcommittees John Wooley/Ray Gesteland (Life Sciences), Warren Washington (Climate), Michelle Broido (Environmental), Steve Larson (Medical) will take responsibility for evaluating and reporting on each program area. BERAC will issue overall report. Short presentations from BER staff on each program area at fall BERAC meeting. What matters in addition to a grade is an explanation.

External factors may result in poor progress. Encouraged not to engage in grade inflation for fear of impacts.

Two programs are going before BER so there will be some precedent for form and structure.

Current grades - Excellent, Good, Fair, Poor

Reviews should be very powerful to external audiences. How do you know there is public benefit from investments?

NSF was able to argue for a very different process. NSF can't set the metrics for the grantee community. NSF results in large measure based on COV results. NSF committee does integrative review of all the COV reports to determine if transformative science has been generated. Does the National Science Board get involved? Not directly - they are a policy body.

Logical approach to rely on subcommittees and COVs. Need to give BERAC time to do broad look at synergisms, etc.

Other business

[Q] What happened to the synthetic genome report? [A] Approved and posted on the web site but not sent directly to the Secretary since it came out nearly a year after it was promised.

Would be useful to provide BERAC with updates on COV recommendations over time. Problems that BERAC could help with sooner rather than later. Link these updates to program updates requested above for fall meeting

Public Comment

Alan Packard, Vice President Society of Nuclear Medicine (handout)

[Q] Emphasis of the importance of this program in development of intellectual capital in the US especially radiochemists. [A] There are no other sources of funding for this kind of research and resource development that promise to continue to revolutionize the field of nuclear medicine. Must support the idea that it must be restored and continued. It represents the only program at the interface of biology, physics, chemistry, and medicine.

[Q] Where does this program sit in the international community? [A] The gemstone internationally in this area. There are 6-7 key programs - Washington University, UCLA, BNL, Stonybrook. Hard to over estimate the impact of the "Atoms for Peace" program. This is not just a legacy of the past but part of the future. Not just upset but also concerned. DOE has funded the nuts and bolts of nuclear medicine that feed into many fields of medicine for decades. Drug research and development, pharmacology, imaging, psychiatry. One of the concerns is training in this area. Dismantling many groups will have a serious impact.

[Patrinos] In the President's FY06 request there is no mentioning of zeroing the program out in FY07. This needs to be corrected for the record. [Packard] Got the information from SNM President Dr. Matthew Thakur. Don't know where he got it. [Note - Packard verified that he wanted this statement about FY 2007 funding to remain as part of his comments.]

A letter from the Society of Nuclear Medicine dated April 18, 2005, to Keith Hodgson, Chair, BERAC, was received and has become part of the record.

http://www.science.doe.gov/ober/BERAC/BERAC_letter_SNM.pdf