

MINUTES

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

DATES: December 5-6, 2005

LOCATION: American Geophysical Union, 2000 Florida Avenue, NW, Washington, DC. The meeting was announced in the Federal Register on November 18, 2005.

PARTICIPANTS: Approximately 70 people were in attendance for part or all of the meeting. Fourteen members were present; one member participated by telephone.

Keith Hodgson	Steven Larson
James Adelstein	Melvin Simon
Michelle Broido (by phone)	Lisa Stubbs
Joanna Fowler	James Tiedje
Ray Gesteland	Warren Washington
Richard Gibbs	Barbara Wold
Jonathan Greer	John Wooley
Richard Hallgren	

Seven members were not present:

Eugene Bierly	Patricia Maurice
David Burgess	Lou Pitelka
Willard Harrison	Janet Smith
Margaret Leinen	

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

MONDAY, DECEMBER 5

Mike Kuperberg

Acting Division Director

Environmental Remediation Sciences Division

Update on the Environmental Molecular Sciences Laboratory (EMSL) Action Plan

Presentation available at <http://www.science.doe.gov/ober/berac/Kuperberg12-05.ppt>.

A BERAC subcommittee conducted a review of EMSL operations May 17-19, 2005. This was a two-headed review - BERAC review and SC Office of Project Assessment (Lehman Review).

The draft report on this review was approved in September 2005 on a BERAC meeting that was held by conference call to discuss this report. The report is on the BERAC web site at http://www.sc.doe.gov/ober/berac/EMSL_Report.pdf.

In response to this report, EMSL developed a formal action plan that has been approved and is being monitored by the Office of Biological and Environmental Research (BER) and the Pacific Northwest Site Office (PNSO). The EMSL Action Plan is on the SC “watch list” that includes monthly briefings on progress.

Path Forward:

- Shared vision/mission is in place
- EMSL valued as a National Scientific User Facility
- BER, PNSO, Pacific Northwest National Laboratory (PNNL) and EMSL are well connected and aligned
- Action Plan will be completed on time (12/31/2005) – Note, this does not mean that all actions will be implemented.
- Next step is implementation
- BER will evaluate the implementation plan in spring 2006

Andy Felmy

EMSL Chief Scientist for Scientific Programs (a molecular & field scale geochemist)

Update on EMSL

Presentation available at <http://www.science.doe.gov/ober/berac/Felmy12-05.ppt>.

EMSL includes science, management, and operations. There are currently 729 active user proposals at EMSL. Approximately 2000+ users are associated with the facility annually.

Mission – EMSL, a national scientific user facility, provides integrated experimental and computational resources for discovery and technological innovation in the environmental molecular sciences to support the needs of DOE and the nation.

Q - Does this preclude EMSL working on other key national needs, especially in times of national emergency? Absolutely not. Science themes and mission statement drive where EMSL goes but does not define users.

Roles of advisory committees. New charters for Science Advisory Committee (important because of theme area development) and User Advisory Committee

Focus around science themes. Where is science going? What are the challenges? How does EMSL enable this area? What new capabilities are needed? What investments are needed? What is the potential scientific impact?

Establish calls for proposals around science themes. Have stronger presence at major science meetings. Establish close ties with research programs.

New user definition: Anyone not in the EMSL organization who makes use of the facility as part of an active user proposal in the EMSL User System. Users counted once per proposal but separately as part of separate proposals, i.e., individuals can be counted as more than one user if they are part of separate proposals.

Current plan is for external peer review for oversubscribed instruments and internal peer review for instruments with available time.

Discussion:

Q: What is the policy toward industrial users? Do not recall the disclosure/nondisclosure rules. Percentage of industrial users has dropped off. Has been a decline in industrially funded research in this area, hence potential users.

BES counts a single user (person) once per year regardless of how many different proposals they are part of. Decision made here to count each user once per proposal. This is a deviation from how BES counts users at synchrotrons. This is different from all other SC user counts. Question whether the rationale is sound or not. NOTE – EMSL will keep statistics so that users can be reported both ways as needed. EMSL will reevaluate this counting and reporting strategy at a later date.

BER and PNSO are pleased that PNNL has elevated the EMSL director to “associate lab director” type position.

What is rationale for two tiered review approach for instrumentation use proposals for instruments that are/aren't fully utilized? Large number of proposals? Maximization or resource issue? Don't want to over use external reviewers for small proposals when time is available. NOTE – EMSL has subsequently agreed to use external reviewers for all proposals.

John Wooley

Report on Life Sciences Committee of Visitors (COV) Review

This is the third COV review for BER. Still a relatively new process as a quality control activity for federal spending in government research programs.

Important for federal officials to use their power of discretion to do their jobs. Importance of COV reviews as empowering.

Focus of the COV review - Evaluate the process. Look at the relevance of the awards, the balance of the portfolio, etc.

Strong, independent reviewers and excellent support from BER.

Resounding support from the COV for the efforts of Life Sciences program staff. Comments at the highest level very much in common with those of the previous two COVs. The draft report is a true consensus document from the COV subcommittee.

The draft report acknowledges excellence in the process. With limited staff they have to figure out what is important and to do it well as they do. Only so much is possible with limited staff like BER has.

Looked at Genomics/Joint Genome Institute (JGI), Low Dose Radiation Research, Structural Biology, Genomics: GTL (GTL). In every case there is an element of inadequate communication of opportunities at DOE and of communication of the results of the research. Also, when program directors have discretion they need to have the opportunity to stay current with their fields – an issue that gets back to internal funding issues for things such as travel to scientific meetings.

The review process across all activities is primarily by panel review. What is the level of ad hoc review that should be used to complement/supplement the panel review process? No panel can be large enough to be all inclusive. Hard to get mail reviewers to respond in an efficient and timely manner, however. This is also a staffing issue and a common criticism across agencies. Too easy to send out declination letters that simply say “we didn’t have enough money.” Program officers are encouraged to provide more quality input on the rationale for declinations.

Scientific goals for Life Sciences are today as visionary as they ever have been in this program including those that led to the Human Genome Project. Balance of high risk research is good. Quality of funded research is high. Exemplars in science in GTL, JGI, Low Dose Program. Opportunities to sustain GTL are highly likely to continue. Program is an important conduit in the federal government for bringing computational sciences into biology. Also for bringing diverse researchers from academia, industry, labs, etc.

In one program (Ethical, Legal and Societal Issues research) there is an example of using reviewers from too limited an area (DC area). Quality of review was good but opportunity for greater/broader national outreach missed.

Low dose program – Began with a mandate and would be easy therefore to just do business as usual. High quality scientific review. Program has changed our understanding of the science and the field. Program is to be commended.

Structural biology – BER had been funding high quality, DOE centric structural biology research on DNA damage recognition and repair. Higher priorities in the face of extreme budget cuts led BER to make difficult decisions to cut high quality, high value research. In the end the COV supports the BER management decisions that were made. What was sustained are the structural biology facilities which is appropriate. Should note that there is no way for GTL to achieve its broad goals without some elements of structural biology

research. COV report has described highest impact structural biology research that could/should be done in GTL.

Q – Concerns about the proposed structural proteomics activity. If a specific program is carved out then there is a defined budget that goes with it that also faces the same risks faced by the previous structural biology program. Should be embedded in GTL and not separate. A – That was the intent of the COV so the report language should be modified.

Sooner or later, aspects of GTL will need structural information. Recommendation is for the program to be more aware and proactive to accelerate the contributions of structural biology to GTL.

The COV process is encouraged to remain a combination of administrative and scientific review.

JGI and GTL are exemplars for how federal science programs should be run. Would like to see GTL expand even in fixed/tight budget times to include more emphasis on marine microbes and ecogenomics.

One way JGI could use their unique capabilities and efficiencies would be to transform microbiology by spending several years sequencing all of the culturable microbes (~6,000 microbes). Only a suggestion from the COV. This is an incredible opportunity.

Discussion:

Need to aim for greater inclusiveness of applicants and reviewers. Encourage broader participation from the community and from younger scientists.

What can BERAC do about the staffing issue? Will again pass the information on to Ray Orbach.

Also concerned about the lack of getting the word out well enough about JGI and GTL successes. Perhaps what is needed is a summary type article in the front of a journal like Science. There doesn't seem to be a link between what is going on in the real world and what is going on in the DOE programs. Perhaps Congress thinks they are making these links in the areas of bioenergy for example but it is not happening. Even at the recent JGI review there was considerable skepticism on the part of the reviewers prior to the review but not after the review. Not sure that much more can really be done. PR never hurts but the case is already being made so strongly in many different ways. Things are just now coming together.

BER staffing level question has come up on every COV review.

Report accepted by BERAC with appropriate revisions.

SCIENCE TALK

Drew Endy

Massachusetts Institute for Technology
Foundations for Engineering Biology

Why does a genome (like T7 phage) look the way it does and what happens if you start changing it around? As small as T7 is, we still don't know what a number of its genes do.

Recent advances in DNA synthesis enable expanded opportunities in experimental engineering of biological systems. Synthesis capabilities are lagging 5 or more years behind DNA sequencing because comparable investments have not been made.

Cost (~10x reduction over next few years from a year or so ago), time to delivery, error rate (going to zero), length (getting longer quickly), diversity, terms of sale (everything from no restrictions to complete restrictions)? Gene and genome synthesis issues.

Biology as technology. Still a fundamental research challenge, not just doable as you would like to. Try to separate design and construction. Look at other examples where engineering emerged from a natural science. Lessons learned – decoupling to simplify, standardization, abstraction (systems, devices, parts) – biology is too complicated to engineer without some degree of simplification.

Growing competition for schools to participate in annual synthetic biology event (http://csbi.mit.edu/outreach/outreach_programs/synth_bio_comp). 13 schools internationally this year. 20-30 or more next year?

National need for rapid response to bioterror threats as but one example of value: information, materials, chemicals, energy, food, environment, health

Societal issues: risk and security, perception & understanding, ownership & sharing, communities. Can we get to point of detection, analysis and response so that we don't have to worry about manipulation? Perhaps not. What, if anything, do we need to do about the evil versus good bioengineering activities?

Ari Patrinos

The State of BER

Presentation slide available at <http://www.science.doe.gov/ober/berac/Patrinos12-05.ppt>.

Two thoughts to summarize where BER is today.

(1) It could have been worse. (2) Good news and bad news.

The good news – we got our FY06 request

The bad news – we got our FY06 request

Fate of Life Sciences program in BER was in limbo at the last BERAC meeting. Secretary Bodman's first question to Dr. Orbach was why does DOE have a biological research program. After a briefing on the program he became one of its biggest supporters.

Life Sciences actually down because of PED funding in FY05. Climate up slightly. Environmental down. Medical way down because of the funding debacle in that program. Record number of 160 earmarks totaling \$130M in FY 2006.

Budget reconciliation a real roller coaster due to conflicting language between the House and Senate. Initially lots of direction to fund various things without funds so if we had gotten both House and Senate language we would have had to severely cut other parts of the program. House "restored" medical and Savannah River Ecology lab. House supportive of SREL. Senate added \$40M for GTL – half research and half facilities. In the end the conference language said to ignore both the House and Senate language and to just follow the conference report.

Within modest allocation for Medical Sciences BER will support two things – artificial retina and the medical imaging infrastructure at BNL. The program leader for the artificial retina effort, Mark Humayun, received the 2005 R&D innovator of the year award (<http://www.rdmag.com/ioy.aspx>). We are planning to have a National Academies of Science (NAS) study of the nuclear medicine field funded by BER, DOE's Office of Nuclear Energy and the National Institutes of Health (NIH) to review the state of the science, opportunities, and challenges. Hopefully in the end DOE, NIH and OMB will get together to revisit who does what. We hope that this process will influence the FY08 budget though the timing is very tight. NIH is also having their own challenges to deal with. Our preference would certainly be to restore the Medical Sciences program but we will follow the wishes of our bosses' decisions in the end. We will work to ensure, either way, that the capabilities we have worked so hard to nurture over the years are maintained.

We abruptly terminated funding for the Savannah River Ecology Laboratory in FY 2006, a laboratory that did many good things and was even restructuring to better meet the needs of the BER program. There is somewhat of a good news ending. SC, EM and NNSA are providing some funds to make the transition more orderly. The process is turning out to be much less disruptive than we thought it was going to be. Many thanks to Mike Kuperberg for his efforts.

GTL remains BER's highest priority program. This is going to be a very, very fiscally tight year for GTL. We have made more commitments than we likely even have funds for. The program continues to enjoy congressional support and to receive continued advice about how the program should go forward. Having a common story to tell about GTL will help all of us but many of you continue to have your own interpretations of what the program is or should be. This is symptomatic of biology and biologists. Biology doesn't yet have the maturity of fields like astronomy for example. The Funding Opportunity Announcement (FOA) for the GTL 1 facility should be out any day now (as

I have been saying for 2 years). (NOTE – Was issued on January 9, 2006) The NAS is reviewing the GTL program – both research and facilities. Their final report will be in our hands in the spring which is time enough to have an impact on the FY08 budget and the facility process. We have been having extensive discussions with the National Cancer Institute about possible partnerships for GTL facilities especially in proteomics. Not sure where these will end up but the dialogue is healthy for both organizations. Have also had international interest especially with the Japanese with regard to protein production. Finally, there is interest from the Environmental Protection Agency, US Department of Agriculture and within DOE (Energy Efficiency and Renewable Energy). Lots of opportunities of collaboration. Jim Decker will give BERAC a new charge and will likely talk about it in detail this afternoon since he has some strong views about different paths forward. Congress has also given us direction to make the remaining three GTL facilities smaller and cheaper and to launch them simultaneously. Our original recommendation was the best strategy at the time based on the community advice we received. Is there a better or different way to go forward today? Of course.

The Joint Genome Institute expanded this past year to include PNNL and Oak Ridge National Laboratory (ORNL). This does not mean that the other labs are excluded from JGI activities. This is a gradual process akin to European Union expansion. New Memorandum of Understanding recently signed by the directors of the 5 laboratories. Thanks to Jeff Wadsworth, ORNL Director for his efforts to make this happen.

Q – What does it mean to have all these partners? A – Brings the JGI into focus for the Directors of these labs. The JGI is easily forgotten since it is a free-standing entity. Greater chance that technologies and capabilities will be brought in from other parts of the Department that would not necessarily even be involved in biology.

We continue to see incredible success of production DNA sequencing at the JGI. Remarkable cost effectiveness and wonderful science coming out from the sequencing of so many different organisms with a focus beyond human health. The Laboratory Science Program was just initiated. This program seeks to expand the biological research at the DOE labs using DNA sequencing as a tool. Surprisingly this wasn't happening much until recently. On a separate note I must stress that all the sequencing we now fund at the JGI is relevant to DOE and DOE missions. You will hear more from Mel Simon about recent JGI review later today.

The Biological Effects of Ionizing Radiation VII (so-called BEIR VII) report was mentioned earlier. We were disappointed by this report that ignored the most recent publications of our program and that came out very strongly in support of the linear no-threshold program. We will continue the good fight through our research.

Climate Change Research Program. Our Climate Change Science and Technology programs are continuing. Significant progress has been made and significant uncertainties remain. Recent controversy – did global warming have anything to do with the increased incidence of serious weather events? Jim Mahoney is stepping down from his leadership of the interagency program. He will be greatly missed. Recently completed the Climate

Change Science Program's second major workshop – how do you transition from scientific result to decision making? Still pushing for synthesis and assessment products as the major policy relevant products but there are many “legal obstacles” we continue to struggle with.

Environmental Remediation Sciences program. Will emerge from EMSL review, action plan and watch list scrutiny as a stronger more customer oriented program. Reengaging in the Strategic Environmental Research and Development (SERDP) Program through the efforts of Mike Kuperberg. This may benefit many of our National Lab colleagues with funding for environmental research.

- As you heard our most recent Committee of Visitor review again recommended the need for additional staff in BER. We have actually started to recover from several years of staff erosion. A number of increases:
- Mike Viola now officially Division Director of Medical Sciences
- Peter Kirchner back as an IPA
- Peter Lunn retired in June 2005 from Climate Change Research.
- Drew Tate and Ray Wildung left Environmental Remediation Sciences. These were expected rotations.
- Tim Boyle returned to SNL from Life Sciences.
- Sharlene Weatherwax in Life Sciences from Basic Energy Sciences
- Kent Lohman joins Life Sciences from private industry – genome instrumentation and technology
- Marc Jones joins Life Sciences from DOE Environmental Management – facilities experience. Brings needed adult supervision.
- Several currently advertised positions in climate change research and environmental remediation sciences.

You heard at past meetings that BER was going to initiate a program of BER Distinguished Fellows for leading scientists at the National Labs. Our recent competition was very competitive. More detailed descriptions of our four new Distinguished BER Fellows are on the BER website. Credit goes to Marv Frazier who pushed hard for this. \$250K for 5 years.

Mina Bissel, LBNL (Life Sciences)

Dr. Joanna Fowler, BNL and BERAC (Medical Sciences)

Terry Hazen, LBNL (Environmental Remediation)

Ben Santer, LLNL (Climate Change)

May have heard about the “Gathering Storm” report under the auspices of the NAS (<http://books.nap.edu/catalog/11463.html>). The US research enterprise is suffering especially in the physical sciences. May be having an impact in the physical sciences. Very hard hitting report. Urge you to read it and find out about its history and how it got the message out.

Export controls issue. You are blessed if you do not know what I am talking about. There is increasing concern about making sensitive technology available to scientists, grad students and post docs from countries who are on certain lists. It's a long story. The Department of Commerce will come out with interim regulations in January. Some may be quite onerous. There are legitimate concerns on both sides. I have been co-chairing a working group with a colleague from the Department of Defense. Risks? Costs? Penalties? Trying to make this as realistic and painless as possible while taking concerns very seriously. All of you need to be involved in this so that you can weigh in one way or another as necessary and appropriate.

Discussion:

Who would deal with results of NAS medical study? NIH/Zerhouni? Bodman? OMB? The disruption to scientists and the field caused by our budget reduction can hardly be overstated. Government at its worst. Is there anything that could be done to head this kind of thing off in the future? Answer – Cannot change the timing. The President's budget is embargoed until it is released. This is how it needs to be.

Mel Simon
JGI review

The subcommittee looked at science, management and safety issues/concerns?
Bruce Birren, Jane Rogers, Rick Wilson, Jim Tiedje, Rick Mural, Bruce Chrisman, Linda Horton, Klaus Berkner

Science – Many of the reviewers may have thought that the JGI was still where it was at the end of the human genome project. Talked to many different people in and around the JGI. The experts were quite satisfied. Appropriate and inspiring vision. Driving and exploiting sequence-based science. Annotation abilities/capabilities have gotten much better. Way over subscribed these days so can be much more selective. Metagenomics – from the nature of sequence are beginning to deduce what is going on in an environment. Almost an unending variety of “microbial” genomes and organisms in the environment. No one has gotten near the bottom of the complexity. There have been a few disconnects with clients and sequence quality was initially not great but quality and standards are now state of the art for the field. Large scale sequencing centers are an ongoing work in progress with continued need for improvement and adjustment. A resource/tool for comparing all microbial genomes has been developed and is on line. Turns out to be easier to annotate 50 genomes than one. Have “cornered the market” on sequencing for energy, carbon sequestration and environmental remediation. There is a problem with outsourcing since some of the analyses are being done at other facilities but this is being resolved.

The Laboratory Science Program. Currently quite a complex structure but will require a visionary leader. Has the potential to have a big impact on the future of the JGI and biology at the labs but the current structure may not be ideal. Program lead needs to have a more direct relationship with the director of the JGI. New instruments coming on board

that will increase rate of sequencing and decrease costs by orders of magnitude. JGI setup to use the computational power of the national labs and is encouraged to leverage this.

BER needs to think about addressing several issues. The Production Genomics Facility (PGF) is located in Walnut Creek with employees from LLNL and LBNL with very different personnel policies, pay scales, etc. Amazing that it has worked as well as it has which is a real testimony to the employees themselves. Becomes more of an issue since different labs have different safety requirements, definitions, training, etc.

JGI line managers are very good especially the sequencing lead.

There will be big issues coming up in the next few years. DOE will have to look carefully at how to manage these. Good contact between JGI and BER. Instrumentation will change completely in 2-3 years. Need for this kind of facility will continue. An evolving process.

Thanks to Dan Drell for doing lots of leg work to make this review happen.

Although BERAC members will no longer be active by the time the report is written BERAC did vote to endorse the report as presented at the meeting pending the completion of the report for final review at the spring meeting.

Jim Decker

Ray Orbach is out of the country otherwise he would be here. FY06 budget was a surprise since it looked like several issues in our budget would be resolved but were not. Where we came out in FY06 was at the President's request. Ray was trying to keep US science in a leadership position. Going to be a tight year but there is good news.

- Advanced Scientific Computing Research (ASCR) +\$30M to keep leadership class computing, a benefit to all
- Fusion – ITER negotiations going forward
- BES – Spallation Neutron Source will be completed, 4/5 nanoscience facilities to be complete, LINAC going forward
- High Energy Physics – tevatron and B-factory fully funded
- Nuclear Physics – electric cost issues that could affect operations
- BER – lots of earmarks but money added, at request

New BERAC charge. In part driven by budget constraints. Moving forward with GTL 1 facility but could use advice on moving forward with next 3 facilities. Have gotten advice from BERAC before. Have a program that has high dependency on these facilities for its success. Fairly expensive as currently laid out. If we do these in series the time frame is much longer than any of us want. Federal process for facilities is quite lengthy. 4-5 years from start of budget process to having something built. Can we be cleverer? Can we even proceed without even classifying them as projects/facilities? JGI process took less than one year.

Thank you to Keith for 10 years as chair of BERAC. Exciting and challenging times. Important and valuable impacts. GTL has been one of the most important.

Questions for Jim:

Any chance of a supplemental appropriation? These are very difficult and rare. We essentially came out at the FY05 level. There still may be a recession and if this happens there will be some programs that are in tough shape.

Secretary Bodman has made some public statements about the importance of DOE science. How will this likely impact the future? He is very supportive publicly. It has to be helpful to us. One area of impact is the priority that science will have within DOE. As or more supportive of SC than anyone in his position. Deputy Sec Clay Sell as well.

Energy Bill created a new position of Under Secretary for Science. What is happening? Sure that the White House is working on a nomination. (NOTE: Ray Orbach has been nominated)

Have been reminded that BERAC ceases to exist soon. How will this impact this new charge? GC has said that we can have a subcommittee work on this charge though it cannot become a BERAC report until new BERAC membership is constituted and votes to accept/reject the subcommittee's work.

Jonathan Greer

Recap of structural biology subcommittee charge already approved by BERAC in September. Will not capture presentation here since report is already on the BERAC web site (http://www.sc.doe.gov/ober/berac/SMB_Report.pdf).

Discussion: None

Warren Washington

Terrestrial carbon cycle program charge draft report.

Federal Climate Change Science Program coordinates the climate change science across the government. Sources and sinks of carbon and processes that govern them. How do these change with time and in the future?

Program of measurements, experiments and models with continual feedback through this cycle.

AmeriFlux and Free Air Carbon Dioxide Enrichment (FACE) programs measure carbon fluxes and impacts of elevated CO₂ respectively.

Program being managed well, strong leadership, good program balance, attention to continuity.

- Establish science steering committees.
- Phase out some of the older observational sites that measure fluxes and establish new high priority sites.
- Upgrade and maintain effective databases for collection of data and reanalyzed some of older data for broad use.
- Integrate international efforts

Soil – focus on soil carbon turnover research. Build a national soil carbon model that simulates and predicts fate of below ground carbon.

Form modeling team to develop a national terrestrial carbon model with DOE leadership. This could integrate the observational programs with a national coupled carbon climate modeling activity.

Quality of DOE support research in this area is excellent. More details in the written report.

Discussion:

How does this correlate with ocean carbon cycle. Still uncertainty over balance between the two systems. Largest uncertainty in the terrestrial system. 2 giga ton uncertainty in ocean systems. Larger for terrestrial systems.

What kind of environments would be desirable for new sites? Drought areas for example. Also areas with land use change. Sometimes have to take measurements over several decades to balance out natural variability.

Report accepted (<http://www.sc.doe.gov/ober/berac/TCCRPREport.pdf>).

George Sguoros, PhD

Johns Hopkins Medical Institute

Department of Radiology

Public comment on behalf of the Society of Nuclear Medicine. Written statement provided for the record. <http://www.science.doe.gov/ober/berac/Conti%20SNM.pdf>

Specific and personal example here. Targeted radionuclide therapy. Combination of DOE and NIH support beginning with DOE support. Necessary dosimetry and target radionuclide therapy itself would not exist without previous DOE support. FDA approved treatment for non Hodgson lymphoma has resulted. Recent funding attempts at NIH did not fair well because too much technology development and not enough hypothesis driven science. Technology development project was subsequently funded by BER. This

highlights the fundamental differences between funding strategies at NIH and DOE contrary to views that there is significant overlap.

BERAC encouraged to advocate for this program although it is recognized that some of these decisions are out of BER/SC/DOE control.

Encouraging that NAS review being pursued by DOE and NIH.

DISCUSSION:

Recommend that BERAC endorse Dr. Sgouros' comments. Does BERAC have the expertise to make this type of endorsement on its own? Would prefer to wait for NAS report? When is report expected? Fall 2006 for preliminary report at the earliest? BERAC did accept report on future needs in this field and BER's role in it. This is something very serious that could happen to any element in the program. Thus BERAC should go on record opposed to changing scientific directions "on a moments notice." Programs are built up over many years and it may or may not be possible to rebuild them in the future. Would feel very comforted to have a statement of support from BERAC for the development of scientific tools that have broad public impact. FY06 budget decisions were made by the Administration which does not necessarily mean that the process is flawed. True the BERAC did issue report on the strength and value of the nuclear medicine program. This gives BERAC the "authority" to issue a statement of support.

Will draft a response (Keith Hodgson) to be sent to Ray Orbach.

TUESDAY, DECEMBER 6

David Thomassen

Life Sciences Research overview

Presentation available at <http://www.science.doe.gov/ober/berac/LSD%20LTM.ppt>

Q – Long term fate of low dose in light of BEIR VII type reports?

A – NAS staff acknowledges the value of a more comprehensive look at Low Dose Program research in the future. Report is not a set back for the Low Dose Program, though aspects are disappointing, but a validation of the importance of completing the original goals of the program.

Jerry Elwood

Climate Change Research overview

Presentation available at <http://www.science.doe.gov/ober/berac/CCRD%20LTM.ppt>

Q – Modelers talking to experimental and observational scientists to ensure that needed data is provided?

A – Being actively addressed across program areas.

Mike Kuperberg
Environmental Remediation Sciences Research

Presentation available at <http://www.science.doe.gov/ober/berac/ERSD%20LTM.ppt>

A – EMSL should be called out in ERSD proposals so that applicants are encouraged to work with EMSL though EMSL does more than ERSD science.

A – Anyone who uses EMSL after January 1 will do so as a user as described yesterday. PNNL scientists will also continue to use EMSL and we don't discourage that. There should be.

Q – Budget for this division.

A - Budget presented includes EMSL operations in addition to the research programs.

Mike Viola
Medical Sciences Research

Presentation available at <http://www.science.doe.gov/ober/berac/MSD%20LTM.ppt>

Q – Transfection of rhodopsin receptors into the back of the eye.

A – We are not the only players in this business but are the most successful so far. Have been interested in using plant rhodopsin receptor. Would be transfecting a photon absorbing pigment.

New Business

Draft of letter to Ray. Appropriate members have reviewed “their” sections.

- EMSL – BERAC pleased to hear of significant progress
- COV – Importance to staffing levels + points made yesterday
- FY06 budget – Nuclear Medicine program reduction.
- GTL facilities – new charge. Response by summer of FY06
- JGI review – supportive of preliminary report. Formal report coming for review after new Committee forms.
- Carbon cycle report to be transmitted separately.
- COV report to be transmitted separately – final changes needed by Dec 12.

Meeting adjourned at noon.