BER Response to the Report of the BERAC Committee of Visitors
Review of the Biological Systems Science Division

Date of COV: July 9 - 11, 2014
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Introduction
The Committee of Visitors (COV) reviewed program management in the Biological Systems Science Division (BSSD) in the Office of Biological and Environmental Research (BER) for the period October 1, 2011 through September 30, 2013 (Fiscal Years 2011, 2012, and 2013), including the processes used to create and manage the research portfolio. The COV presented findings and recommendations in a report presented to the Biological and Environmental Research Advisory Committee on October 1, 2014. The report provided helpful recommendations and constructive comments for the management of the programs in the division, which comprises a wide range of scientific programs and research projects, a major national user facility, and several larger research centers, including three Bioenergy Research Centers. Additional special portfolio elements are comprised by research efforts at the DOE National Laboratories, organized into team-based Scientific Focus Areas (SFAs).

BER has compiled the following responses to specific COV recommendations; although some responses are specific to BSSD, others apply more generally to business practices for all of BER

Responses to Comments and Recommendations

COV Recommendation	Program Response
General Office-Wide Recommendations	
There is an urgent need to develop and implement a plan to hire additional staff. There is also a need to provide greater flexibility and budget support for PM and staff attendance at scientific meetings, site visits, and contractor reviews.	BSSD is working with Office of Science-Human Resources to post positions as soon as possible and to move quickly to select potential candidates. BSSD agrees with the COV regarding constrained travel budgets for Program staff. Given current travel budgets, BSSD will continue to do its best to carry out on-site reviews of the most critical activities and make best use of alternate approaches (reverse site visits, etc.) for others.
Electronic records, when developed, should be designed to facilitate the review and record keeping of this process.	BSSD agrees and expects that the full implementation of the Portfolio Analysis and Management System (PAMS) will address this issue.
Organize and provide materials differently for future COVs to enable efficient program review and project oversight. This would include: cover document with a table of contents, summary of project personnel and collaborations, for SFAs, an outline of SFA review chronology and subsequent decisions, also program level metrics.	The COV reviewed BSSD activities at a time of transition from a more paper-based management system to a more comprehensively electronic system. It is expected that the PAMS system will provide most if not all of this documentation in a much more easily accessible and reviewable format for general metrics and materials related to the FOAs. Materials related to the National Laboratory SFAs are expected to also be incorporated into the PAMS system but at a later time.
Provide greater background information relating to FOA and SFA development, integration, and prioritization.	New FOAs or SFAs usually result from BSSD supported workshops that identify gaps in our current portfolio of scientific activities. BERAC also contributes ideas on scientific directions that complement or expand on current BSSD efforts. All FOAs contain links to workshop summaries made available on the web providing background material upon which the FOA is based. New

	SFAs are also related to BSSD workshops and white paper solicitations to the Labs generally reference workshops and other available background material. BSSD will seek to clarify how FOAs and SFAs are developed within its portfolio to future COVs.
Facilities: Joint Genome Institute Recommendations	
The COV recommends that the continued development of analytical capabilities should not occur in a vacuum and that any overlap with KBase needs to be monitored. The COV notes that appropriate travel support for the PM to meet with scientists within and outside the JGI is needed.	BSSD agrees and will continue to monitor complementary interactions between JGI and KBase to ensure that both JGI and KBase continue to work to build effective links between them so users can efficiently port JGI data and initial analyses seamlessly to KBase. BSSD agrees with the recommendation of the need to maintain a strong dialogue with JGI staff and users, using a variety of communications options.
COV recommends that the review process for the new initiatives (ETOP, JGI-EMSL, DNA Synthesis) be developed into a robust peer review process that reaches out and includes outside scientific expertise. This review should include regular documented evaluation addressing specifically whether the facility is the best use of program resources.	The JGI-EMSL and DNA synthesis capabilities already incorporate external peer review. The ETOP process is an internal JGI activity designed to build emerging capabilities; its merits are reviewed in the context of the triennial JGI user facility review.
Given activity in the commercial sector, the COV recommends that adjusting the DNA Synthesis program accordingly is critical to generating a program that is truly responsive as a user facility supportive of community research.	BSSD agrees with this recommendation. The triennial review process will focus attention on the DNA synthesis services to ensure that these capabilities are community focused and do not duplicate efforts in the commercial sector.
Facilities: Structural Biology Facility Access Program Recommendation	
The COV emphatically encourages the continued co-funding of these facilities with NIH and other agencies, including the continued support of the Protein Data Bank.	BSSD agrees on the importance to BER science of collaborative infrastructure and actively works with other agencies to coordinate their support.
The COV recommends that the BSSD put in place a mechanism to prepare for the timely upgrades of BER funded synchrotron and	BSSD will continue to work with other relevant agencies and within the Structural Biology portfolio to maintain and upgrade

neutron experimental stations.	equipment at these facilities according to scientific priorities.
The COV strongly recommends that the BSSD management prepare a timely succession plan and at the same time establish a panel of experts to help prepare for both a smooth transition of leadership and for the establishment of a road map to guide future facility development and operation.	BSSD agrees with the need for succession planning and a strategic plan and roadmap for structural biology infrastructure needs.
Laboratory Science Focus Area (SFA) Recommendation	
A formal, documented and reviewed process for the creation of new SFAs should be created and made available to future COVs for review.	The COV reviewed the creation of one new SFA within the portfolio for the time period 2011-2013. This was the KBase SFA that stemmed from a 2008 workshop entitled "*Systems Biology Knowledgebase for a new Era in Biology.*" The creation, management and review of all SFAs follows documentation provided to the COV in the background materials. BSSD will clarify for future COVs how SFAs are reviewed, managed, redirected, and terminated.
Develop a clear process and documentation of the decision process when redirecting or terminating an existing SFA.	The processes for creation, management, review and potential consequences of a review of an SFA were provided to the COV in the background materials and is posted on the web at http://science.energy.gov/ber/funding-opportunities/laboratory-scientific-focus-area-guidance/. The results of each review, actions to be taken by the Labs and BSSD, in addition to individual reviewer comments are provided to each SFA project after a review. Explicit documentation for all SFA reviews and consequences of those reviews is enclosed in each SFA jacket. BSSD will clarify for future COVs how SFAs are reviewed, managed, redirected, and terminated.
The COV encourages BER to develop mechanisms to produce ongoing dialogue between related SFAs when appropriate, and to request collaboration and synergy between related SFAs. This particularly applies to the	BSSD agrees with the need to manage the SFA portfolio and its FOA-solicited projects to ensure complementarity and prevent redundancy. BSSD actively encourages SFAs to communicate and

(non-BRC) biofuel SFAs and their relationship to the BRCs, and to KBase and JGI.	collaborate not only among each other but also with the academic members of the portfolio. This is a key feature of the annual Genomic Sciences PI meeting that BSSD staff actively promotes.
The balance of plant to microbial emphasis within KBase should be revisited.	BSSD will continue to monitor the overall balance of scientific effort within KBase. Plant efforts within KBase have been bolstered by a recent Memorandum of Agreement (MOA) with NSF to coordinate KBase efforts in plants with the ongoing iPlant effort at NSF.
A plan should be put in place to provide necessary computational resources for any tools developed under this program that are both successful and computationally intensive. Such a plan should be focused on resources and infrastructure provision rather than being a focus of the KBase program itself	BSSD agrees. The "*DOE Systems Biology Knowledgebase Implementation Plan*" posted online at http://science.energy.gov/ber/news-and-resources/ provides a description of computational requirements for KBase and other computational assets available within and external to DOE. BSSD also has access to extensive computational assets outside of KBase through the National Energy Research Scientific Computing Center (NERSC) that is coordinated though DOE's Office of Advanced Scientific Computing Research (ASCR) and are available to the BSSD-funded community. BSSD will continue to assess the need for new computational resources as needed.
Evaluate and budget for future incorporation of a flexible cloud compute allocation (from elsewhere in DOE or an external provider such as a commercial cloud computing supplier) in anticipation of widespread adoption of KBase.	BSSD agrees with the COV that careful planning for future growth of KBase will be needed. These efforts are currently in progress. KBase is preparing for widespread adoption and use. The KBase compute infrastructure is already cloud-based, runs within the DOE ES Net system for high speed, high volume data transfer and is housed on redundant computer systems at LBNL, ANL, ORNL, and BNL.

Establish a formal mechanism to insure that KBase and JGI collaborate productively and avoid duplication with ongoing computational biology efforts (both within and outside DOE).	BSSD agrees and is fully committed to making a connection between KBase and JGI complementary and seamless.
The COV recommends exploring inter-agency co-funding from other scientific programs (e.g., NASA, NIH, Navy), or possibly international coordination in order to recover momentum and expand efforts in the Low Dose Radiation Program.	BSSD certainly values partnerships with other agencies in areas of mutual interest. BSSD continuously evaluates new scientific opportunities and evolving scientific needs; flat budget scenarios require difficult decisions and strategic priorities.
New initiatives in the low dose program are essential for retaining the balance between Federal Laboratory and university efforts	BSSD acknowledges the contributions of the low dose radiation program to advance the understanding of the effects of radiation on cellular processes. BSSD continuously evaluates new scientific opportunities and evolving scientific needs; flat budget scenarios require difficult decisions and strategic priorities.
The committee finds it a National priority to retain expertise and training in radiochemistry and radiation science, including low dose. Thus, the COV recommends increasing the priority for funding the radiochemistry SFAs.	BSSD acknowledges the remarkable scientific contributions of the radiochemistry and low dose radiation programs to advance a basic understanding of radiochemistry principles and the impact of radiation on cellular processes. BSSD continuously evaluates new scientific opportunities and evolving scientific needs; flat budget scenarios require difficult decisions and strategic priorities.
The Radiochemistry program would be more effectively leveraged through better integration of SFA and FOA portfolios (e.g., don't have one focusing on plants and the other human health).	BSSD program managers are charged with evaluating their SFA and FOA portfolios to look for leveraging opportunities, foster collaboration and limit redundancy. The Radiochemistry FOA was issued in response to funding provided specifically for human health research.
Encourage BSSD to continue support for ELSI as an integrated component of ongoing scientific programs.	BSSD agrees.
Funding Opportunity Announcements (FOAs) to the University Community Recommendations	
A more focused solicitation and/or more rigorous screening of pre-applications is advised such that the funding rate is elevated to 20-25%. BSSD should more narrowly focus FOAs and	BSSD will continue to work to clarify and focus the language in its FOAs and employ the pre-app screening process. BSSD will evaluate pre-applications for relevance to

clearly articulate not only what is sought, but also what is not, would be beneficial (e.g., no "food" plants), and will ensure the correct panel expertise is invoked for each proposal.	the FOA topic and not to achieve a funding rate or a quota.
Make available a single spreadsheet that lists each FOA, "workshop", and "orphan project", giving the title, investigator names and institutions, ranking, and rationale for funding lower ranked proposals (e.g., high-risk but potentially high-impact). Provide summary information for each funded project, including and total and annual budgets.	Summary information on review process, justification and budget for each project is available in the selection statements. The new PAMS system will make this much easier to review.
Retain appropriate level of funding to both universities and national labs as needed to maintain essential training and workforce development in key radiochemistry areas (nuclear medicine and plant/microbe imaging and radiochemistry).	Training is an integral component of all research supported by the Office of Science.
Maintain appropriate review and oversight to insure that BRC research remains focused and consistent with the funded BRC research programs, and does not overlap or compete with other funded programs, including related SFA initiatives.	BSSD will continue to provide strong oversight of the BRCs and ensure complementarity of the BRCs and the other funded bioenergy-relevant programs.
The COV recommends that a unified strategic plan be developed for the BRCs and biofuel SFAs.	Biofuels research in BSSD is guided by the "*DOE Office of Biological & Environmental Research: Biofuels Strategic Plan"* posted on the BER website at http://science.energy.gov/~/media/ber/pdf/Biofuels_strategic_plan.pdf and the latest version of the "*DOE Genomic Science Program 2014 Strategic Plan"* posted at : http://genomicscience.energy.gov/strategicplan/index.shtml.