

EXECUTIVE SUMMARY

The charge of the site visit team was to evaluate the accomplishments in year seven of the Center for Behavioral Neuroscience (CBN), a Science and Technology Center (STC) funded by the National Science Foundation (NSF). The CBN is a consortium of public and private institutions, including major research and teaching universities in the Atlanta area.

The team found several accomplishments of the CBN during the current funding year especially noteworthy. First, the receipt of the Biomedical Community Award from the Georgia Biomedical Partnership represents recognition beyond the neuroscience community. Second, the research productivity has been exceptional. Third, the Knowledge Transfer and Outreach efforts were truly outstanding. The structural reorganization indicates that the CBN is flexible and the documentation of these efforts is exemplary.

In addition to these strong accomplishments of the CBN, the team recognizes several major areas where improvement is warranted. Principal among these is that the CBN needs to develop a realistic, functional strategic plan. As funding from NSF begins to ramp down, critical and difficult decisions will need to be made regarding: positions to retain, management logistics, general organization and funding priorities. The site visit team would like to see these issues prioritized by SWOT analyses before the next site visit. Second, it is not apparent to the team that all institutions of the CBN have an equal commitment to the continued excellence in neuroscience.

In conclusion, the team determined that the CBN continues to be a very successful enterprise. The vision and implementation of the CBN has produced a cultural change and developed a successful model for conducting collaborative, interdisciplinary, and multi-institutional scientific research.

INTRODUCTION

A team of external reviewers and the NSF officials visited the CBN at Georgia State University on November 7-9, 2006. This is the seventh evaluation of the CBN and is associated with oversight prior to its eighth year of funding. The team included the following participants:

External members:

Dr. Cole Gilbert, Cornell University
Dr. Kathryn L. Crossin, Scripps Research Institute
Dr. J. Steven de Belle, University of Nevada, Las Vegas
Dr. Karen A. Mesce, University of Minnesota
Dr. Antonio A. Nunez, Michigan State University
Dr. Jennifer M. Swann, Lehigh University

NSF members:

Dr. Thomas E. Brady, Division Director, BIO / IOB
Dr. Judith A. Verbeke, Senior Advisor, BIO/ AD
Dr. Diane M. Witt, Program Director, BIO / IOB

The team met at the Georgia Institute of Technology with the PI and CBN Director, Professor H. Elliott Albers (Georgia State University, GSU), co-Director of Research Professor Walter Wilczynski (GSU), Co-Director of Knowledge Transfer Professor Stuart Zola (Emory University, EM) and Associate Director Dr. Kelly Powell (GSU) as well as several faculty members and students from Morehouse College, Morehouse School of Medicine, Clark Atlanta University, Georgia Institute of Technology, Georgia State University and Emory University.

Formal presentations were made by the Director and each of the Co-Directors. Brief presentations on research were made by Dr. Stephen P. DeWeerth (Georgia Institute of Technology), Dr. Michael Goodisman (Georgia Institute of Technology), and Dr. Paul Katz (GSU). In addition we also heard presentations from Dr. Kyle Frantz (GSU), Dennis Kelly and Rebecca Snyder (Zoo Atlanta), and Syreeta Skelton (GSU). In addition, we had informal discussions with some faculty hired with some support from the CBN, students and post-docs from the participating institutions. The team was graciously welcomed by Dr. Charles Liotta, the VP for research at Georgia Institute of Technology.

CENTER ACHIEVEMENTS AND PLANS

Research

Strengths:

The research productivity of the multiple collaboratories has been excellent, and this was evident by the impressive numbers of publications generated and research presentations given during the previous year. Also evident was the significant increase in extramural funding, which has added to the visibility of the CBN as an outstanding model of collaborative research. It was clear that the CBN has been instrumental in attracting and supporting a number of outstanding graduate students and postdoctoral fellows. The interdisciplinary and collaborative nature of the training available through the CBN appears to provide students and postdoctoral fellows with a competitive edge. Many of the collaboratories were viewed as being strong, and the team noted an improvement in the collaborative efforts of the Fear Collaboratory. The research presented by Dr. Paul Katz exemplified that the CBN can provide intellectual benefits as well as monetary ones.

Concerns & Recommendations:

It is in the best interest of CBN to identify how many of their publications and presentations have authors based among multiple collaboratories and across institutions. This information would solidify the true collaborative nature of the various research groups and could be used to garner future funds that could be allocated across institutions. It is imperative that CBN members explicitly acknowledge support through the CBN in their publications. It is unclear whether the current configuration or the potential reconfiguration of the various collaboratories is optimal for the distribution of venture grants and the support of other research activities. If the CBN continues to add new collaboratories, a specific plan is needed to address how funds will be allocated during the ramp-down period.

Education

Strengths:

The CBN has been very successful in the recruitment of graduate students and postdoctoral fellows who play key roles in the development and maintenance of collaborations across laboratories and institutions. Graduate students are benefiting from activities supported by the CBN, which complement and enrich the education and research training within their individual programs. The team is very enthusiastic about the new Bio-Business seminar series that has been developed in collaboration with the Georgia Biomedical Partnership and business schools from the CBN universities. The ability to implement cross-university educational initiatives, such as the Bio-Business seminar, reflects the high degree of collaboration that exists among the CBN institutions with respect to their graduate curricula. Postdoctoral trainees are also benefiting from the activities supported by the CBN, including their participation in the collaboratories where they develop grant-writing skills during discussions of venture grant proposals. The CBN is also providing postdoctoral fellows with unique opportunities to develop teaching skills and to participate in interesting outreach activities. The CBN is now tracking the placements and career trajectories of the trainees, which represents an important first step in longitudinal evaluation of the impact of the educational programs of the center. The team was pleased to hear that the leadership of the CBN is committed to the development of a comprehensive evaluation of all educational activities. The BRAIN program appears to be a very effective and comprehensive program for undergraduates. There is evidence that the BRAIN participants engage in activities that enhance their professional development and prepare them for graduate school. The [CBNuf](#), which is an extension of the BRAIN program, has all the components of a very effective program.

Concerns and Recommendations:

The graduate students expressed some frustration with respect to their efforts to interact on a regular basis with students from other CBN schools. The team urges the CBN to support the efforts to create a multi-institution graduate student association and to invest institutional resources for supporting social events that facilitate the development of a graduate student network.

Although the team is very enthusiastic about the ongoing assessment efforts, there are moderate concerns about how best to analyze and interpret what could be a very extensive data set with both quantitative and qualitative components. At this stage of the project, a single 50%-time evaluator may be insufficient to complete the assessment.

Diversity and Human Development

Strengths:

The diversity of the postdoctoral fellows and graduate students in the CBN is exemplary, well above the national average. It is a model for other programs. The CBN also has commendable diversity among faculty, in spite of having limited influence over hiring policies. The team recognizes recent efforts to recruit graduate and undergraduate students by attending minority meetings (e.g., the HACU and SACNAS meetings, and the minority social at the Society for Neuroscience meeting in October 2006). The BRAIN program has the potential to become another viable recruiting mechanism for the CBN graduate program.

Concerns and Recommendations:

While programs are inclusive for gender and underrepresented groups, the CBN could achieve its goals for diversity in research and education more effectively by strengthening interactions with their AUC partners. The team strongly recommends more frequent collaboratory meetings at the AUC to increase the exposure of students and faculty in these institutions to ongoing research.

Knowledge Transfer and Outreach

The team was extremely impressed with the effort and genuine commitment to knowledge transfer and outreach. The reorganization of K-12 programs to fall under the direction of the Knowledge Transfer and Outreach Director is an improvement and is a more logical organization than the previous model.

The team was very impressed with the activities of the science education faculty detailed in the well articulated and thoughtful presentation. Many of these efforts, such as the newly developed assessment scheme, professional publication of results, and K-12 curriculum development, are likely to have a significant impact on science literacy. The selection of the Decatur school system seems logical and tractable.

The productive relationships with external partners, especially ZooAtlanta and The Fernbank Natural History Museum, continue to be very effective and represent a model of how academic institutions can forge mutually beneficial partnerships in their communities. The interaction with the new Georgia Aquarium is promising, despite its slow start, principally due to administrative turnover at the Aquarium. The team endorses this partnership, and expects that it will continue to move forward to complete the development of the two live animal exhibits. The self-sustaining nature of the BRAIN camp beyond the time of NSF funding is also commendable.

Concerns and Recommendations:

In spite of the excellent progress made in this area in the past year, the team recognizes one area in which more effort could be focused. Participants in the Brain Bee and Brain Camp are self-selected, and thus are already interested in science. The team acknowledges that it may be difficult to reach students who are more at risk for academic failure, but it recognizes the CBN's intentions to develop strategies to reach these students in the future.

Product Development

Strengths:

The team commends the development of research tools by the cores, especially the behavioral and viral cores. The publicly available software packages that have been developed are particularly noteworthy. It also acknowledges that the CBN cannot excel in all areas and agrees with the reduced prioritization of product development to the point of patenting and licensing as expressed in the 2006 annual report.

Concerns and Recommendations:

Nevertheless, the team encourages the CBN to think more about distribution of products that are already available. The team is under the impression that many products are

available for use and would be welcomed by the broader scientific community. The team would like to see evidence that the CBN is disseminating information about such products by means other than simply the website and citation in publications.

Shared Experimental Facilities

Strengths:

Access to research facilities was viewed by the team as an important strength of the CBN, enabling equal participation by members from all partner institutions. This asset is reflected in important added value for all facets of the CBN.

Concerns and Recommendations:

The CBN must provide a strategic plan for sustaining these facilities that accounts for declining levels of NSF funding during the final years of the grant. Furthermore, CBN strategic plans beyond 2009 should anticipate whether funding will be achieved through new grants, a recharge structure, other external sources, or some combination of the above. If a recharge structure is established, it should be cognizant of the financial situations of the AUC. Reports of core facility use should document participation from all partner institutions. The team anticipates that the image core, in particular, has the potential to be over subscribed in the future.

Strategic Plan 2007

Strengths:

The center has begun to develop a strategic plan through intensive assessment of its components. Time lines for the process and a rough draft of the plan were provided.

Concerns and Recommendations:

The team was surprised and dismayed that the concerns of the previous years have not been addressed. Efforts made in this area are limited to funding and address the future rather than the present.

The team strongly recommends that the CBN develop a strategic plan for the last three years of NSF funding. The plan must include a SWOT (strengths, weaknesses, opportunities, threats) analysis of each of the areas that are headed in the report (i.e. research, education, diversity and development of human resources etc.). The CBN has been given slides and templates for the development of the strategic plan and the information provided should be used.

Rationale and Value Added

The CBN appears to have achieved its goals in almost every category. Added value was clear in research (doubling of publications and significant extramural funding), education, and the inclusion of partner institutions. Both students and faculty universally acknowledged that the CBN has enhanced research and helped to initiate projects that would not have occurred otherwise. New recruits uniformly agreed that their decisions to join their institutions were strongly influenced by the presence of the CBN. New faculty

members at smaller institutions have been aided by the CBN in their efforts to establish their research programs.

The CBN has continued to refine its mission of providing a new means for carrying out "team-based" research. This broader mission is being realized as a major contribution to the community of behavioral scientists.

The venture funds are being leveraged to yield a large amount of external funding. As noted in the 2006 progress report, since 1999, \$1.6 million in venture funds provided by the CBN has generated over \$40 million in support from external sources.

Concerns and Recommendations:

The team noted that some recent hires are not yet well integrated into the **collaboratory** structure of the CBN.

Institutional and Other Sector Support:

The team continues to be impressed by the support that the CBN receives from the home institution, and from important partners such as the Georgia Research Alliance. Also, the Georgia Biomedical Partnership will likely play a significant role in the enrichment of the graduate curriculum for CBN graduate students and provides an important link with the private sector.

Commitment from Lead Institution

Lead institution should be commended for their creation of the Brains and Behavior program and their commitment to **neuroscience** which bodes well for the future of the Center.

Commitment from Partner Institutions

Strengths:

The team was impressed by the commitment of the AUC institutions. While this may not be a direct effect of the CBN, Spelman and Morehouse College faculty now have reduced teaching loads, thus making it easier for them to develop research programs.

Concerns and Recommendations:

The team was disappointed that the Georgia Institute of Technology (GIT) is not more engaged in the activities of the CBN. The Institute seems to be moving away from, rather than towards, more collaborations with the CBN. While there is a clear plan to obtain commitments from Emory, no plans were presented for GIT or the AUC. The team strongly recommends that the CBN obtain a solid commitment from Emory, GIT and the AUC to continue as partners. Commitment from the AUC is critical to the success of the newly established research in these institutions. Full engagement of GIT would make the CBN truly unique.

Other Partners

The Georgia Research Alliance continues to be a strong supporter of the CBN and establishment of the 501 (c) (3) account is commendable as the CBN moves forward to develop alternative funding streams. Interaction with the Templeton Foundation, although still very limited, is encouraging. The collaboration of the CBN with the Georgia Biomedical Partnership to develop the BioBusiness Seminar series is exciting.

Budget

The allocation of funds across the different core missions of the CBN has been consistent and seems adequate for the immediate future of the center. The distribution of funds across institutions is also adequate. The leadership of the CBN plans to evaluate the effectiveness of all the activities of the CBN. The results of such evaluations will be used to make strategic budget decisions to accommodate changes in the level and sources of support for the center. The team endorses this strategy and recommends the immediate and energetic implementation of these evaluations concurrently with a review of the priorities of the CBN with respect to research, education and community activities. One concern about future allocation of resources is the apparent mismatch between the anticipated level of funding and the plan to expand the number of collaboratories. The leadership needs to develop a plan that identifies explicitly the priorities of the CBN with respect to support for the existing and developing collaboratories and particularly their venture grant programs.