

BPS COMMENTS
on the
NIGMS STRATEGIC PLAN
MARCH 2007

The Biophysical Society applauds the National Institutes of General Medical Science for seeking broad input from the NIGMS community as it begins its strategic planning process.

1) What factors should NIGMS consider in deciding how to set priorities with respect to new and emerging areas of support?

When looking at areas of support, NIGMS should recognize that new and emerging areas may need different levels of support than the typical grantee required in the past. Reviewers of grants in new and emerging areas should be instructed to give special attention to appropriateness of budget and make explicit recommendations with respect to this.

NIGMS should give priority to the quality and uniqueness of the idea in new and emerging areas as well as their chances for success. New ideas, including those that result from bringing multiple fields of science together, may have exceptional potential for transforming science.

The most challenging issue to NIGMS that is special with respect to new and emerging areas is that the ideas in these proposals may outstrip the ability of an existing study section to deal appropriately with those ideas, since the organization of study sections is explicitly based on past patterns of submissions and what issues those submissions raised. Grant applicants should be invited to nominate their applications for inclusion in such a category, and a small fraction of proposals should be eligible to be put into a “new and emerging” category and reviewed by a more eclectic panel.

2) What factors should NIGMS consider in deciding how to set its priorities with respect to research?

When setting priorities for research, NIGMS must maintain its commitment to investigator-initiated research proposals. While centers and other large projects should remain part of the NIGMS portfolio, they should not dominate it. There are occasions when large projects are required to bring together several scientific disciplines or to support broadly enabling centers and sharable scientific resources.

NIGMS also should consider the amount of support applicants already have when making funding decisions. The Biophysical Society supports NIGMS’s past scrutiny of awards to principal investigators with over \$500 thousand in support per year. Nurturing of science careers is as essential for the long term health of science as is the principle of merit based funding. Therefore, the Society believes the research enterprise is best served by distributing funding in a way that ensures continual baseline funding of a larger number of highly

qualified individuals, at the cost of inhibiting growth of very large labs under the direction of individual very prominent researchers.

When funding research, NIGMS must also consider the rising costs faced by PI's. For example, the biomedical research inflation index must be taken into consideration in continued funding of a project, and mandates such as the requirement to increase compensation to the postdoctoral fellows must be considered carefully while the NIH budget remains flat, as in recent years. In addition graduate student tuition often increases at 2 to 3 times the allowed inflation rate.

3) What new or emerging areas, approaches, or technologies in basic biomedical research should NIGMS pursue?

NIGMS is the natural home for quantitative biology. In the strategic planning, significant efforts should be made to recruit allied disciplines – physics, math, computer science, engineering, even some areas of non-medical biology. This requires new programs, long-term stable funding, deep efforts to attract scientists from outside the usual biomedical disciplines, and lowering of any non-scientific barriers for the entry of newcomers.

In addition, a wide variety of chip technologies for miniaturization are needed for high through-put research on the genomic or proteomic scale to study complex biological systems. New chemical synthetic methods are needed to produce designer drugs, including environmentally friendly methods. Understanding how cells work at the molecular level, and how tissues and organs work at the cellular level are needed to achieve the goals of molecular medicine.

4) As part of its efforts to maintain a balanced research portfolio, how can NIGMS best encourage and support research that is highly innovative and/or risky?

The nature of scientific research requires investment in strong high-risk, high-reward proposals that can transform a field if they succeed, but are not a sure bet. Dr. Elias Zerhouni has eloquently described the need for NIH to balance its portfolio between incremental and high-risk research. The Biophysical Society strongly supports the Eureka grant program NIGMS plans to launch this spring and believes it is a good step in making sure that visionary research is included in the NIGMS research portfolio. By creating a separate pot of money and a separate review process for the EUREKA program, NIGMS is making high-risk high reward research a priority. Since it will take time to have data to evaluate the program, The Biophysical Society strongly encourages NIGMS to maintain its commitment to this program through the five years covered by this strategic plan.

The Biophysical Society also encourages NIGMS to expand its current collaborations with other NIH institutes and federal agencies. Seeking to break down the barriers between agencies is critical as scientific disciplines become more interdependent. The math-bio program NIGMS runs with NSF is an excellent example of the type of program

NIGMS should pursue. By collaborating, NIGMS can better foster interdisciplinary research involving research communities that have historically not considered NIH their home.

An explicit program of inter-NIH-agency funding would be of benefit to investigators. Program managers at NIGMS should exert leadership in seeking shared funding for investigators at disease- or system-oriented NIH Institutes to leverage their portfolio. NIGMS HSAs should organize a workshop for their counterpart HSAs at other Institutes to enhance the familiarity among HSA personnel and their priorities. Interagency communication could promote cross-Institute, cross-disciplinary research and projects with farther-horizon benefits than normally supported.

5) Are there areas of current NIGMS research activity that should receive less emphasis?

NIGMS should focus on general medical science; more disease-oriented research should go to the other relevant institutes. However, care should be taken that methodology development within disease-oriented research does not fall between the Institutes. Much new basic science is emerging and GM is the main source of support for it.

6) How can NIGMS enhance its communication with the scientific community and the public?

NIGMS has done an outstanding job keeping in touch with the scientific community in recent years. Establishing in concrete, documented form the impact on both health and the economy is vital for continued support for NIGMS and the NIH in general. Collection, interpretation and dissemination of data are essential activities in this respect. The Biophysical Society will be glad to assist in efforts to enhance communication of NIGMS to its members, its constituencies, and the public at large.

When discussing budget issues, NIGMS should revise its metric for how to measure the size of its budget. It should not be relative to inflation, but rather relative to the size of the U.S. economy. We are continually being asked to set priorities in a way that is analogous to a parent being asked which child the parent wants to sacrifice, because we are using the wrong metric (inflation) to measure our growth against. There is a Catch-22. It is precisely because of improved technology based on basic science that the economy grows faster than inflation, so when we turn around and peg our appropriate research expenditures to inflation rather than the size of the economy, we are in effect recommending that we reduce our investment in precisely that which has helped us the most. NIGMS should take the lead in changing the parameters of the public discussion on this issue.

7) How can NIGMS more effectively promote and encourage greater diversity in the biomedical research workforce?

In order to promote and encourage greater diversity in the biomedical research workforce, NIGMS must maintain a commitment to fund both graduate training in the form of institutional training grants as well as researchers early in their careers. The allowed and rapidly escalating tuition fees for graduate students are reducing the number of early career scientists that can be supported by normal investigator initiated research proposals. NIH has launched many high profile programs, such as the Pathways to Independence Award, in the past year. But with only 35 awards per year, the program is vastly underfunded. NIGMS may also want to consider creating a similar program run through its MARC program.

8) Do you have other comments for NIGMS?

The Biophysical Society recommends NIGMS consider its current funding for instrumentation and large facilities. Funds for instruments are critical to basic biomedical researchers. Thirty years ago one could regularly renew instruments in labs with a small allocation of funds on competing renewal applications. This source has essentially dried up.

The biology community is more frequently relying on large state of the art instrumentation, such as nuclear magnetic resonance spectrometers, electron microscopes, and computer resources beyond small lab clusters. NIGMS must ensure its researchers have access to these instruments and the facilities necessary to advance their work. To take full and efficient advantage of these instruments, the development of methodology and protocols must be supported along with technology.