

nature chemical biology

The bottom line

Enhanced funding support and increased engagement of chemical biologists in the funding process are essential for the advancement of the field.

In the best of times, academic scientists face challenges in obtaining funding to support their independent research efforts. These are not the best of times. The recent economic downturn and the associated shrinking of funding agency budgets have produced a ripple effect felt throughout the global scientific research community. Chemical biologists are particularly concerned, not only because funding shortages have direct effects on their laboratories, but also because a stable funding base is essential at this critical time in the development of chemical biology as a field. In the current issue, we feature several global perspectives on chemical biology funding and outline here some recurring themes that should guide future chemical biology funding initiatives.

The current grant crunch is illustrated by recent funding trends in the United States. The US National Institutes of Health (NIH) budget, which doubled between 1998 and 2003, has since witnessed decreasing appropriations. To make matters worse, the number of funding applications submitted to the NIH has doubled between 1998 and 2007 (*NIH Extramural Data Book*, May 2008, <http://report.nih.gov/>). These factors have contributed to an overall decrease in proposal funding rates since 2003 and have generated a treadmill of resubmissions that has led to a 50% reduction in the number of first-time submissions that are funded (*Science* **320**, 1404, 2008). It now takes longer to obtain an NIH grant, which has taken a particular toll on unfunded young investigators (*Science* **320**, 1274, 2008). In parallel, the budget for the US National Science Foundation (NSF) reached a plateau beginning in 2004 following a period of steady increases. The overall NSF funding rate dropped from 30% to 21% between 2000 and 2006, due in part to greater proposal activity and increases in award levels within a limited budget (*Impact of Proposal and Award Management Mechanisms*, August 2007, <http://www.nsf.gov/od/ipamm/ipamm.jsp>).

Funding worries are not only affecting American scientists. In conversations with scientists at conferences and lab visits, we continually hear investigators describing similar levels of frustration in spending an increasing proportion of their time applying for grants. Researchers acknowledge that they are under increasing pressure from their institutions to aggressively apply for and secure external funding. Many scientists have suggested that these pressures encourage investigators to take fewer risks and to submit more conservative proposals that may have an increased chance of being funded. In facing these real pressures, scientists are also keenly aware that this constant focus on raising money takes them away from their other scientific and scholarly responsibilities of directing research, teaching and mentoring students.

While scientists in most fields share these concerns, chemical biologists and funding agencies face a unique set of challenges as they seek to promote the growth of chemical biology. Several pieces in this issue offer perspectives on these challenges. Colón and colleagues at the NSF discuss the evolution of their review processes for grant proposals at

the chemistry-biology interface (p. 511). Jiang *et al.* describe a targeted approach toward chemical biology funding that is meeting with success in China (p. 515). As highlighted by McGovern (p. 519), private foundations offer relatively untapped opportunities for chemical biology funding. We also explore how collaborative chemistry projects are being financed across Europe through the 'ERA-Chemistry' program (p. 523). Though these articles do not prescribe solutions to current woes, they do offer insights to guide future chemical biology funding efforts.

A unifying theme is the importance of funding new chemical biology investigators, which will in turn support the growth of chemical biology as a field. Mechanisms for increasing the success of junior chemical biologists should focus on enhanced institutional support, better mentoring, and targeted funding opportunities (*Nat. Chem. Biol.* **2**, 347, 2006). Fortunately, this theme has emerged more broadly, which bodes well for short-term gains in funding for junior researchers. Programs have recently been launched to foster the development of young scientists in Europe (see p. 523 and *Nat. Genet.* **40**, 485, 2008). Additionally, this summer, the NIH has announced changes to their peer review system (<http://enhancing-peer-review.nih.gov/>) that include separate peer review and funding targets for proposals from new investigators.

Although these steps are promising, chemical biologists will need to take a more active role in positioning the field to have a major impact in basic and biomedical research. To ensure their success, both new and established chemical biologists need to be persistent in their funding efforts and resourceful in identifying new sources of financial support. Scientists working at the chemistry-biology interface need to ensure that their proposals are targeted to the most appropriate evaluating committees, which will require greater communication between scientists and program officers. Because chemical biology proposals cover many subdisciplines of chemistry and biology, they are likely to be assessed by individuals from diverse backgrounds. As a result, chemical biologists need to know what allied fields seek in funding applications and must ensure that they are communicating their ideas to the broadest possible scientific audience. Finally, chemical biologists must realize that an exciting new compound, technology or newsworthy biological system is often not enough to secure funding—in the end the research project must be able to deliver fundamental conceptual advances at the chemistry-biology interface that have wide-ranging implications.

Funding support will be essential for the future growth of chemical biology as a field. Chemical biologists must become more actively engaged in broader funding issues and the proposal evaluation process. By accepting positions on study sections, attending workshops sponsored by funding agencies and communicating their funding needs, chemical biologists will help determine funding agendas that will benefit both current research at the interface of chemistry and biology and the next generation of chemical biologists. ■