

Where Have Traditional Competing RO1 Grants Gone?¹

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Basic research, particularly investigator-initiated research, is a crucial foundation stone for supporting all progress in the National Cancer Program and invariably is highlighted in NCI³ bypass budget documents. Over the past 5 years (1985-1989) the budget of the National Cancer Institute has expanded by nearly 33%. The Research Project Grants category, the primary vehicle for supporting basic research, has experienced the largest growth of any NCI support mechanism, in both dollars and percentage increase. Therefore, one might expect that each component of the RPG budget mechanism (hereafter referred to as the pool) would increase proportionately. However, that is not the situation. What are the forces that have influenced the distribution of the RPG pool, especially monies available for new and competing renewal grants? The underlying challenge that has been presented to the NCI is a careful balancing of the desire to award research grants for a longer duration with the desire to augment the total number of investigators in the cancer research field. Dependent on the growth of the total NCI budget, these objectives could be in apparent conflict and from time to time lead to arguments that shed more heat than light.

Components of the RPG Pool

Historically, the Research Project Grant (grant-in-aid) pool has been composed of two major support mechanisms, the traditional investigator-initiated RO1 grant and the program project (PO1) grant. More recently, several new grant mechanisms, one unique to NCI and the others available to all NIH grant applicants, have been implemented within the pool. Among these are NCI's unique Outstanding Investigator Grant and the more general NIH awards including Method to Extend Research in Time Awards, First Independent Research Support and Transition Awards, and Small Business Innovation Research grants.

Following a study by the President's Cancer Panel, the NCI initiated in 1985 the new OIG support mechanism. A motivation for this action was an interest in developing a mechanism that provided the more established investigator with greater security of funding. In addition the awarding of this 7-year award in lieu of the more usual 3-year grant reduced the frequent preparation, submission, and review of grant applications. This results in both administrative time and cost savings for both the investigator and the NIH. An additional consequence of the lengthened award is an increase to the Institute's annual dollar commitments, the so-called type 5 or noncompeting grant.

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¹ At the December 1989 meeting of the National Cancer Advisory Board, Dr. Samuel Broder, Director of the National Cancer Institute, provided a historical overview of the funding pattern for research project grants with particular emphasis on traditional RO1 grants. This article provides a summary of the presentation.

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³ The abbreviations used are: NCI, National Cancer Institute; RPG, Research Project Grants; OIG, Outstanding Investigator Grant; MERIT, Method to Extend Research in Time Award; FIRST, First Independent Research Support and Transition Award; RFA, Requests for Application.

In 1986, the NIH developed the MERIT award, one of its features being a longer award term, again with a concomitant increase to the noncompeting requirements. The FIRST award was implemented in order to provide renewed emphasis and commitment to supporting those investigators entering the biomedical research field with their first grant. They are seen as providing an extra protection for the process of renewal and the generation of diversity in the population of NCI grantees. FIRST awards validate the career choice of basic and clinical research for young people who have just finished their training.

Growth of the NCI Budget

Fig. 1 depicts the growth of the NCI budget during the past 5 years. The amounts shown are in current year dollars; a figure elsewhere in this article displays the impact in constant dollars. For the NCI as a whole, the budget increased from \$1.178 billion in 1985 to \$1.571 billion in 1989, a 33% increase. During this same time interval, funding for the RPG mechanism has exceeded the NCI average. They have expanded the most in terms of both percentage and dollars of any NCI mechanism, increasing from \$516 million in 1985 to \$723 million in 1989, an approximate 40% growth. The amounts shown include funds for all programs funded through the NCI, including those devoted to research on the acquired immunodeficiency disease syndrome (AIDS).

1985-1989 Funding Patterns

In Fig. 2 the first two columns illustrate the traditional grant-in-aid mechanisms supported by the NCI, RO1 grants and PO1 grants, respectively. These two mechanisms meet the standard concept of investigator-initiated research. It is clear that the traditional RO1 grants represent the preponderance of the funds within the pool. In 1985 almost two-thirds of the total dollars of \$339 million were directed to this grant vehicle. By 1989, while still increasing by \$40 million, they decreased to approximately 52% of the total pool. The next largest segment is the Program Project (PO1) grant, which has remained constant at about 26% of the pool.

Why is the RO1 proportion decreasing? A significant reason is the development of the other mechanisms comprising the pool which are shown in the remaining bars. Indeed, the OIG has grown since its conception in 1985 to a point where it comprises slightly more than 7% (\$53 million) of the funding from the pool. However, these awards represent investigator-initiated research in the truest sense of that term. The recipients of these awards are individuals who are well experienced and historically very competitive in the peer review system. Thus, they would almost assuredly be funded with either an RO1 or a PO1 if the OIG mechanism were not available.

The MERIT award was developed as a special NIH-wide initiative that provides 5 years of support rather than the more routine 3-year period. It can be extended after administrative review. The recipients of these awards submitted their application(s) as an RO1 and were then recommended for and agreed

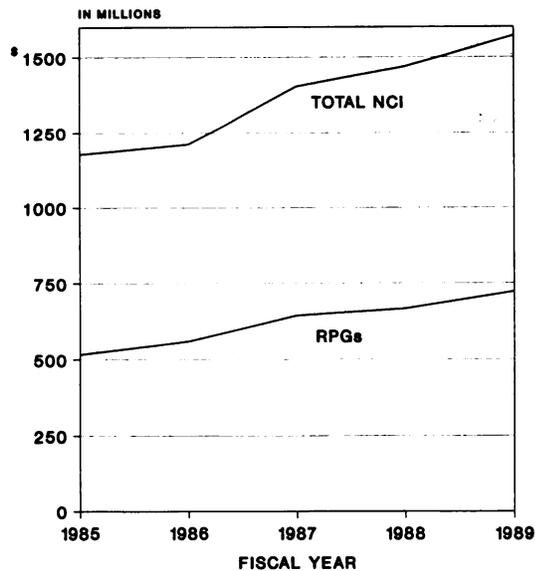


Fig. 1. National Cancer Institute funding history, 1985-1989.

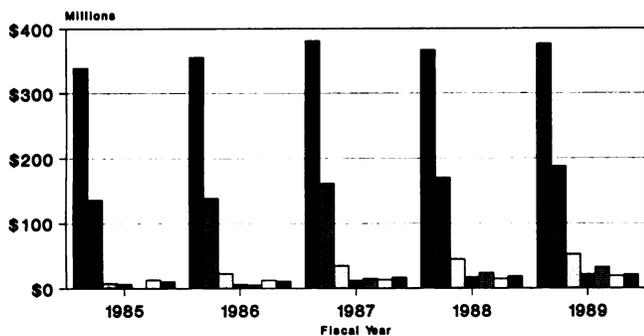


Fig. 2. National Cancer Institute Research Project Grants by mechanism. ■, traditional (ROI); ■, Program Project (PO1); □, OIG (R35); ■, FIRST; (R23, 29); ■, MERIT (R37); □, RFA (RO1); ■, COOP (UO1).

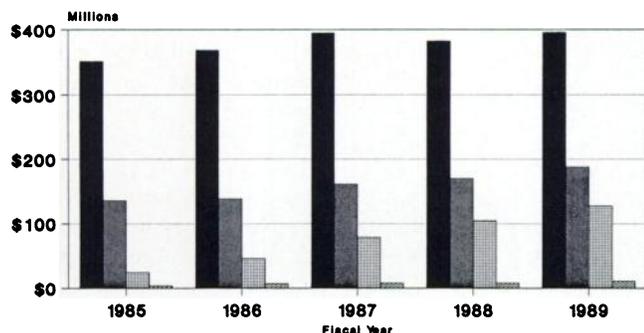


Fig. 3. National Cancer Institute Research Project Grants by mechanism. ■, ROI + RFA. ■, Program Project (PO1); □, R23, R29, R35, R37, UO1; ■, SBIR (R43,44).

to be funded with a MERIT award. Since their inception in 1986, MERIT awards have expanded to comprise over \$30 million, or better than 4% of the pool. Also shown is the support provided to RFA and Cooperative Agreements (UO1). Combined they constitute 5% of pool resources.

Fig. 3 is a simplified presentation of the data in Fig. 2. In Fig. 3, the first column represents the traditional ROI plus those ROIs that were supported in response to a RFA. During the time period represented by these data it is significant to note that awarding grants in response to a RFA has not had an adverse impact on the funds available within the pool. Program projects are shown separately as the second column. The third

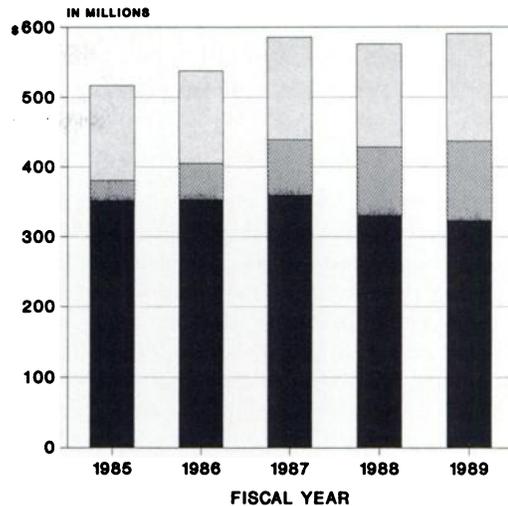


Fig. 4. National Cancer Institute Research Project Grants (in 1985 constant dollars). ■, RO1 + RFA; ■, all other; □, PO1.

Table 1 National Cancer Institute Research Project Grants Growth from 1985 through 1989 is shown in millions.

	1985	1989	Change
Research Project Grants	\$516.5	\$723.0	\$206.5
New/expanded mechanisms:			
Outstanding Investigator Grants	7.9	53.0	45.1
Merit Awards	0.0	32.4	32.4
First/New Investigator Awards	6.6	21.3	14.7
	14.5	106.7	92.2
% of new/expanded mechanisms to total RPG growth			45

column combines the newer mechanisms previously identified, most of which are for a longer award period. It is readily seen that this group has expanded considerably since 1985, an increase of about \$100 million, representing about 17% of total pool resources in 1989.

Each of the newer grant-in-aid mechanisms was designed to address a specific need felt by the scientific community. Thus, both the OIG and MERIT award mechanisms provide stability of funding and perhaps a greater opportunity to explore creative ideas without as many administrative distractions. These mechanisms introduce their own problems and complexities into the National Cancer Program.

If one strongly favors the greater stability of funding for the more established, highly productive individual investigator, then the longer term MERIT and OIG mechanisms are very appropriate. An immediate benefit to the principal investigator is a reduction in the frequency of preparing grant applications. While not necessarily a drawback, this lengthening of the award period generally has the effect of extending the noncompeting (type 5) base by several years. Dependent on the total annual dollar increase of the RPG pool, this will generally result in a diminished availability of funds for competing grants. This occurred in 1989 when the total funds in the RPG category actually grew by almost \$60 million. However, the noncompeting (type 5) commitments increased by over \$100 million; this resulted in a decrease in funds of about \$40 million for competing grants. It is important to stress that any initiative to increase the length of the award period will have the effect of transferring available funds from the new and competing renewal pool to the noncompeting pool unless money is added to the overall mechanism.

The data that have been shown are in current year dollars. What is the result if one were to consider the inflationary effects on biomedical research? Fig. 4 displays in 1985 constant dollars

the relationship of ROIs to the balance of the RPG pool. ROIs are shown as a declining portion of the total, while the PO1 mechanism has remained fairly stable. The most significant impact can be seen in the other categories whose proportion of the total pool has increased during this time period.

The final representation (Table 1) presents the actual dollar amounts that are referenced in the illustrations. The new or significantly expanded mechanisms (*i.e.*, OIG, MERIT, and FIRST awards) have consumed 45% of the available RPG pool growth. However, the extended time periods provided by the OIG and MERIT awards are not affecting the total pool (*i.e.*, both competing and noncompeting grants) *per se*. It is extremely probable that in any given year these longer term awards would have been funded, albeit from within the competing pool rather than from the noncompeting component. Dependent on the viewpoint of the individual investigator, it is possible that the advantage of receiving a longer term award is offset by other factors. For example, the grant cannot compete for the larger

than inflationary increases generally recommended during the competing renewal application process. However, whichever viewpoint one takes, there is no simple algorithm for resolving all of the complex forces at work.

The trend toward longer term awards, of course, is not the only force that has affected the funds available to support competing grants. Other significant factors are the growing number of peer reviewed approved applications competing for funding and the increasing costs of conducting biomedical research.

Thus, the first challenge for the NCI will be to continue to maximize the funds available for the awarding of innovative grants, including those to investigators who are in the competing renewal cycle of their grant or who are submitting a new research project grant application. The second challenge will be to provide funding stability and protection from unnecessary administrative burdens for a significant segment of the scientific community. These challenges are real, and they must be met.

Cancer Research

The Journal of Cancer Research (1916–1930) | The American Journal of Cancer (1931–1940)

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