

April 30, 2003

MEMORANDUM

To: Ms. Dianne Chinnes, Chairman, and Members, Committee on Academic Affairs and Licensing

From: Dr. Gail M. Morrison, Deputy Executive Director, and Director of Academic Affairs and Licensing

Informational Report on South Carolina Research Initiative Grants (SCRIG):
Recapitulation of SCRIG 1999 First Outcomes Report
Updated Information on SCRIG 1999 for Calendar Year 2002
First Outcomes Report for SCRIG 2000

Background

In September 1999, the Commission held the first competition for the newly authorized South Carolina Research Initiative Grants (hereafter referred to as "SCRIG"). The *Guidelines* for the competition stated that the period of research activity for funded projects was scheduled for January 1-December 31, 2000. A second SCRIG competition was held in September 2000 with research activity for that period scheduled for January 1-December 31, 2001. The grant activities associated with each period of the SCRIG competitions could be extended by six months by researchers requesting additional time to conduct their research. In fact, in each of its years of operation, all but a few SCRIG researchers did request and were granted the six-month extension.

During the two years in which the SCRIG program operated, its purposes remained: 1) to provide research grants to faculty researchers at public institutions of higher education in South Carolina for the development of research activities; and, thereby 2) to promote the economic development of the state both through the grants themselves and through "leveraging" additional funding as a result of the SCRIG grants. Ninety percent of all available research funds was directed to the three research institutions and 10% of the funds was reserved for faculty in the state's four-year teaching institutions. The establishment of a larger number of recognized, experienced

research faculty in South Carolina's public universities and colleges was hoped for as an outcome by using the SCRIG program as "seed money" for additional funding applications to eleemosynary, federal government, and private agencies which sponsor research grant programs. Likewise, interinstitutional cooperation was noted as a priority in the *Guidelines* for the SCRIG program. Finally, the spinning off of not-for-profit units and profit-making businesses was also contemplated by this program as part of the strategy for using SCRIG as a vehicle for economic development.

For each of its two years of operation, the SCRIG program operated under a legislative proviso which appropriated \$2.5 million, of which \$40,000 was set aside for administration, specifically for the contracting of an external professional evaluation by a panel of experts whose work was directed by the Experimental Program to Stimulate Competitive Research (EPSCoR) office. To divide equitably the 90% of competitive funding available to the three research institutions, the Commission decided upon a formula which distributed funds to each of the three in accord with the percentage of the most recent three-year average of the total number of research dollars expended by each of the three.

An outline for a final report of the SCRIG 1999 competition's funded projects was developed by the Commission's staff in communication with several institutionally-based Sponsored Programs and Research (SPAR) officials and Principal Investigators (PIs). The final report form was composed of two parts: 1) a narrative report on the outcomes and assessments of impact of the funded proposal; and 2) a close-out fiscal analysis showing how the funds for each project were expended and whether any funds remained at the conclusion of the project. The report was designed to be analytical, data-rich, and succinct. The vast majority of SCRIG recipients chose to follow the suggested format for the report. The summary narrative and financial data aggregated through this effort were used to develop the staff report which was prepared for and accepted by the Commission in Fall 2001.

The Commission then requested that a follow-up report on the SCRIG 1999 competition grants be prepared for calendar year 2002 to assess additional activity in grants-leveraging or economic development which might have resulted from SCRIG 1999 funding.

What follows is a report on both SCRIG competitions (i.e., 1999 and 2000.) The first part of this report contains both a recapitulation of first year outcomes of SCRIG 1999 projects and an update on what additional outcomes occurred in calendar year 2002. The second part of the report is a similar format on outcomes generated from the SCRIG 2000 projects.

Information from First-Year Outcomes Report for SCRIG 1999 Grants

The staff report on the measurable outcomes of the SCRIG 1999 projects had been divided into several sections, as follows:

- Number of proposals received and funded.
- Amount of funding per proposal requested and received by institution and sector.
- Funded proposals categorized by disciplinary area.
- Number and types of additional funding requested from external sources and received per proposal and by type of proposal.
- Number of projects which have created new incubator or “spin off” industry as a result of their SCRIG funding.

Proposals Received and Projects Funded for SCRIG 1999

From 94 proposals received from nine public four-year institutions a total of 30 projects (32%) was funded. Table 1 shows the numbers of full proposals received and the number funded by institution and sector.

| Table 1 | | |
|---|--------------------|------------------|
| Proposals Received and Funded by Institution and Sector for the SCRIG 1999 Competition | | |
| Institution | Proposals Received | Proposals Funded |
| RESEARCH INSTITUTIONS | | |
| Clemson | 18 | 8 |
| MUSC | 21 | 9 |
| USC-Columbia | 41 | 9 |
| Sector Subtotal | 80 | 26 |
| TEACHING UNIVERSITIES | | |
| The Citadel | 1 | 1 |
| College of Charleston | 2 | 2 |
| Coastal Carolina University | 5 | 1 |
| South Carolina State University | 2 | - |
| USC-Aiken | 2 | - |
| Winthrop University | 2 | - |
| Sector Subtotal | 14 | 4 |

Grant Funding Requested and Received

For those grants which were funded through the SCRIG 1999 competition, the following table shows the amount of funding which had been initially requested for them and the actual amount awarded. The data is aggregated by institution and by sector.

| Table 2 | | |
|--|-------------------------|----------------------|
| Amount Requested and Actual Amount Funded | | |
| For SCRIG 1999 Funded Projects | | |
| Per Institution And Per Sector | | |
| RESEARCH SECTOR | Amount Requested | Amount Funded |
| Clemson University | \$879,146 | \$580,732 |
| Medical University of SC | \$1,440,506 | \$808,996 |
| USC-Columbia | \$1,239,400 | \$824,272 |
| Sector Subtotal | \$3,559,052 | \$2,214,000 |
| TEACHING UNIVERSITIES | | |
| The Citadel | \$64,800 | \$62,300 |
| Coastal Carolina University | \$91,800 | \$91,800 |
| College of Charleston | \$91,900 | \$91,900 |
| Sector Subtotal | \$248,500 | \$246,000 |

Funded Projects by Discipline

Since the *Guidelines* were explicit about the purposes of the grants, the principal interests of the external panel were to assure that the proposal showed rigor and promise for having the capacity to promote the state's economic development and/or to serve as "seed money" for capturing additional grant funding. No criterion existed for seeking "balance" by discipline in the funding of proposals.

Institutional programmatic and research emphases were displayed in various ways as the following bullets demonstrate:

- all the projects funded at MUSC were in the life sciences, principally in biochemistry and biophysics, and one in bioinformatics.
- At USC-Columbia chemistry, biochemistry, and biology were the principal funded areas of research. One project was also funded in each of the following areas: geology, information technology, and bioinformatics.
- At Clemson, three projects were funded in engineering, three in biochemistry, and one in transportation.

- At the teaching universities, the four funded projects were in biochemistry, chemistry, geochemistry, and biology.

In summary, a majority of the projects funded were found in the life sciences (bio-technology, bio-medical, bio-chemistry, bio-physics.) This was true at all the research institutions, not just at MUSC.

Number and Type of Additional Funding Requested and Received by Institution In First Report on SCRIG 1999

The promise of the SCRIG-funded projects was in part predicated on the idea that SCRIG would become a springboard for additional grants which were external to state public funds for the support of the same or cognate research. Examination of the SCRIG 1999 first-year final reports suggests that this promise had been met in some cases and was still pending in others. By the time of the submission of all final reports in August 2001, the following information was available about the ‘multiplier effect’ of the SCRIG program.

| Table 3 | | | | |
|---|----------------|-----------------|-------------|---------------------|
| | Clemson | USC-Cola | MUSC | Teaching U’s |
| Total number of SCRIG Grants: | 8 | 9 | 9 | 4 |
| Total number of requests for additional funding: | 16 | 22 | 13 | 7 |
| Additional funding received | 0 | 0 | 3 | 1 |

Additional spin-off “products” reported for SCRIG 1999 in First Report

As reported in 2001, five professional journal articles had been published as a result of the SCRIG 1999 projects. One patent had been granted. A number of professional papers had been delivered at conferences. While journal articles and professional presentations are useful in academic environments and should be noted in a paper of this sort, they were not listed as foci of the legislation that created the SCRIG program.

Second Year Follow-Up Report SCRIG 1999 Grants

An updated response for activity attributable to SCRIG 1999 funding was requested by the Commission in January 2003 for the calendar year of 2002. By February 25, 2003, all six institutions receiving SCRIG 1999 grant funds had responded to this request for additional information. These institutions reported a total of 72 articles having been published in 2002 from the SCRIG 1999 grant projects. A variety of

professional presentations based on SCRIG 1999 project activities were also listed in several institutional reports for calendar year 2002.

In addition to the four grants reported in the first follow-up report for SCRIG 1999 (covering the year 2001), **these institutions reported in the second follow-up report 15 more grants which had been leveraged in 2002 from non-state sources. These grants accounted for a total reported dollar figure of \$3,464,928.** In other words, the second follow-up report demonstrated that substantially more grant monies had been leveraged than had been initially reported in the first report for SCRIG 1999 projects. The grants which were leveraged during 2002 demonstrated more than a 1:1 ratio of external sources to SCRIG funds. Virtually all the external funds leveraged in 2002 were from federal sources, principally found in the NSF.

Finally, **one institution reported a spin-off corporation having been developed as a result of a SCRIG 1999 grant.** While this is not overwhelming, it shows at least that the SCRIG funding can be a real stimulus for growing South Carolina-based private sector research corporations. In short, the second follow-up report on SCRIG 1999 displays substantial return for the initial SCRIG investment.

A First-Time Report on the Funded Projects from “SCRIG 2000”

The second SCRIG funding cycle occurred in Fall 2000. The Fall 2000 competition was also the final SCRIG competition since the General Assembly subsequently chose not to fund the program for a third competition, and established instead the Research Centers for Economic Excellence/Endowed Professors program. Although the implementation time period for the projects funded under SCRIG 2000 was for January 2001-December 2001, the *Guidelines* once again called for an automatic extension of six months, if a researcher requested this option. Thus, final reports for the program did not come to the Commission until September 2002.

A total of 86 proposals were received for the SCRIG 2000 competition. Of these a total of 34 (39%) were recommended for funding.

| Table 4 | | |
|--|--------------------|------------------|
| Proposals Received and Funded by institution and sector | | |
| For the SCRIG 2000 Competition | | |
| | | |
| Institution: | Proposals Received | Proposals Funded |
| | | |
| RESEARCH INSTITUTIONS: | | |
| Clemson | 17 | 7 |
| MUSC | 24 | 10 |
| USC-Columbia | 24 | 11 |
| Sector Subtotal | 65 | 27 |
| TEACHING UNIVERSITIES | | |
| | | |
| The Citadel | 1 | 1 |
| College of Charleston | 14 | 5 |
| Coastal Carolina | 3 | -- |
| Francis Marion | 1 | -- |
| USC-Spartanburg | 1 | -- |
| Sector Subtotal | 20 | 6 |
| | | |
| Total for All Institutions: | 85 | 34 |

| Table 5 | | |
|--|-------------------------|----------------------|
| For SCRIG 2000 Funded Projects | | |
| Amount Requested and Amount Actually Funded | | |
| Per Institution and Per Sector | | |
| | | |
| | Amount Requested | Amount Funded |
| RESEARCH SECTOR | | |
| Clemson University | \$ 634,952 | \$ 538,002 |
| Medical University of SC | \$1,100,995 | \$ 903,312 |
| USC-Columbia | \$ 840,702 | \$ 772,686 |
| Sector Subtotal | \$2,576,649 | \$2,214,000 |
| TEACHING UNIVERSITIES | | |
| The Citadel | \$ 224,600 | \$181,800 |
| College of Charleston | \$ 106,320 | \$ 64,200 |
| Sector Subtotal | \$ 330,920 | \$246,000 |
| | | |
| Total for all Institutions | \$2,907,569 | \$2,460,000 |

Not all SCRIG-distributed funds were expended by the projects which were funded in the SCRIG 2000 funding competition. As a result, a total of \$70,000 were returned to the Commission to be returned to the General Fund of the state.

One researcher who had moved out of state submitted only a financial report. All other researchers have submitted all elements of their reports through their SPAR offices.

| Table 6 | | | | |
|---|----------------|-----------------|-------------|---------------------|
| Additional Funding for SCRIG 2000 Grantees Requested and Received by Institution | | | | |
| | Clemson | USC-Cola | MUSC | Teaching U's |
| Total Number of SCRIG Grants: | 7 | 11 | 10 | 6 |
| Total Number of Requests for Additional Funding: | 8 | 21 | 10 | 7 |
| Additional Grants Received By Time of Final Report in Fall 2002: | 4 | 4 | 2 | 3 |

Virtually all the requests by principal investigators of SCRIG 2000 projects for additional funding were submitted to federal agencies. Of the 46 proposals submitted to external agencies, 41 were to agencies of the federal government. The other five were scattered among private eleemosynary, state agencies outside South Carolina, one other-nation government agency, and one private for-profit agency. This summary suggests the overwhelming importance of public funding from the federal government for advancing basic and applied research in the areas these researchers have chosen to study.

At the time that the institutional reports on SCRIG outcomes were received at the Commission in Fall 2002, a total of \$4,233,777 had already been received as a result of these grant applications. This computes to a ratio of 1.89:1 leveraged externally for every dollar invested by the state of South Carolina. If a follow-up report for additional funding for SCRIG 2000 were to be done in Fall 2003, it would necessarily show an even higher ratio than this, since at least one grant which had been funded had not yet been determined in dollar value at the time of the report submissions in Fall 2002.

The small group of projects funded in the teaching universities spanned the gamut from highly theoretical mathematics projects to highly application-oriented research on recreational skills for the disabilities community, as well as projects in chemistry and bio-medical fields. Several published articles appeared and presentations to invitational research conferences occurred as a result of these projects. As might be anticipated, these projects did not typically possess the broad span of research that those coming from the

research institutions did, but they spawned additional proposals for external funding in several cases. Beyond that, it is clear that persons with these kinds of research interests at teaching universities are highly likely to become better teachers from the experience of having delved more deeply into research areas.

Additional Spin-Off Projects

Besides the external funding requested and received as a result of projects funded through SCRIG 2000, the principal investigators amassed a record of several “spin-off” operations with potential for the mid-term and long-term benefit of South Carolina. Many of the final report narratives cited the importance of the funded project to the teaching and mentoring of students at their institutions. It is well to note these remarks, even though the SCRIG legislation places primary value on the ability of these funded projects to increase economic development in the state. “Spin-off” projects related to economic development include the following:

- A total of 50 articles reported to have been submitted for publication and 33 of them already published by Fall 2002.
- Two new incubated corporations, one at Clemson and one at MUSC.
- Two potential patents emerging from the research, one at USC and one at MUSC
- Two potential cooperative ventures between institutional researchers at USC and MUSC and one tri-institutional cooperative research endeavor (i.e., the South Carolina Biomedical Engineering Institute) for stem cell research among researchers at USC, MUSC and Clemson.

Summary

The data from awards in the two SCRIG competitions (1999 and 2000) show some interesting developments. In the second year follow-up report institutions indicate that the SCRIG 1999 projects provided the impetus for significantly more grant proposals and leveraged dollars in 2002. Almost three times as many grants were attributed to SCRIG seed-money in the follow-up report as had been attributed to SCRIG 1999 in the first report.

In the first year report for outcomes from the SCRIG 2000 projects, another significant leveraging of external-to-South Carolina research dollars occurred. In this report alone the leveraging of external grant funding is almost 2:1 in relationship to the original SCRIG 2000 investment by the state.

The formation of two “incubator businesses” within two of the state’s research institutions for investment in cutting-edge industry are reported to have grown from the SCRIG funding. In addition, an institute on stem cell research has been developed as a joint project of all three research institutions. Given the critical nature of stem cell research to the future quality of life on earth and economic development, it is imperative

that the state's research institutions be involved in this endeavor and that they be supported financially.

Taken together, these reports show progress in developing a corpus of seasoned researchers within the state, primarily at the research institutions, through a modest outlay of state funds to leverage significantly larger amounts of funding from non-state sources. These outcomes suggest that the development and administration of the SCRIG program by the Commission on Higher Education has been a good investment for the state.

Recommendation

The staff recommends that the Committee on Academic Affairs and Licensing accept this report for information and commend it favorably to the Commission and to the General Assembly as the appropriate accountability report on program achievements.