

## SCIENTIFIC ADVOCATE NETWORK (SAN)

SC EPSCoR/IDeA Solicitation Number: 09-107

### Important Dates

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**Release Date:** Wednesday, December 9, 2009

**Track-1 Submission of Proposals:** Open – Period of Performance Not to Exceed Three (3) Months

**Track-2 Submission of Proposals:** Open – Submitted Three (3) Weeks Prior to the Proposed Seminar

**Award Amount:** Up to \$7,500

### Program Information

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The Scientific Advocate Network (SAN) program is a resource for increasing diversity among South Carolina's faculty in STEM disciplines. The Scientific Advocate Network is a tool for institutions to increase candidate pools for technical staff, postdoctoral fellow, and tenure-track faculty positions. Institutions of higher education in South Carolina can propose one or more of the following activities:

#### Track-1:

- Broadly market available faculty, postdoctoral fellow or technical staff positions by posting in non-traditional journals, catalogs, or other media that are targeted to underrepresented minority groups
- Develop an extensive and comprehensive public relations campaign (publishing a campus guide or other marketing materials) that targets underrepresented minority groups

#### Track-2:

- Invite speakers that are potential applicants for faculty, postdoctoral fellow or technical staff positions to give scientific seminars; or invite individuals experienced in recruitment, mentoring and retention of historically underserved populations to share effective strategies to diversify the professoriate and STEM workforce. The host institution is expected to broadly publicize invited speakers and to schedule activities for the speaker during the day of the seminar, e.g. tour of campus and research facilities, meetings with department/division chairs/deans, consultation with faculty involved in related research areas, etc.

Activities proposed must be tied to the goals of the 2009 SC NSF EPSCoR RII Track-1 (see appendix C).

### Proposal Guidelines

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Proposals submitted in response to this solicitation must be prepared using the following guidelines and specific forms listed. Proposals must be prepared as an electronic document (Microsoft Word or PDF) with 1" margins and a font size no smaller than 11pt. All proposals must include authorized institutional representative signature on both the Cover Sheet and Budget Page.

#### All SAN proposals must be assembled in the following sequence:

- Cover Sheet for proposal to the SC EPSCoR/IDeA Program (Appendix A).
- Project Description (maximum of 2 pages) should describe the activities to be performed, and must include the following:
  - Evidence of the likelihood of diversifying candidate pools for faculty, postdoctoral fellow or technical staff positions.
  - The relationship of the proposed activities to the goals of the 2009 SC NSF EPSCoR RII Track-1 (see appendix C).
  - Current activities being performed to increase the diversity of candidate pools
  - Specific aspects of the activities as they relate, such as the public relations campaign strategy, job posting media/outlets that will be targeted, topic(s) of seminar(s), academic qualifications of invited speaker(s), and/or expected numbers of attendees.

- Agenda (for Track-2 only) detailing activities for the speaker during the day of the seminar.
- Budget Page for the project (Appendix B). An institution may request up to a total of \$7,500 per application. Indirect costs are not allowed. Periods of performance cannot exceed six (6) months. All awards will be cost-reimbursable, and are governed by the federal cost principles for educational institutions (OMB Circular A-21). Awardees should ensure that costs claimed are allowable and reasonable.
- Budget Explanation of estimated costs. Include support requested or available from other sources, including institutional, local, and federal agencies (maximum one page).
- Biographical Sketches of the principal investigator, any proposed speakers, or other key personnel (maximum two pages per individual; NSF format).

### **Submission Instructions**

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Proposals must be submitted as a single MS Word or PDF file to the South Carolina EPSCoR/IDeA Program via email to [lee.snelgrove@scra.org](mailto:lee.snelgrove@scra.org).

Track-2 only: Complete proposals, including a signed Cover Sheet and Budget Page, must be submitted at least three (3) weeks prior to the invited speaker's visit to the awardee institution.

### **Incomplete or late submissions will not be accepted.**

Submission of a complete proposal signifies the applicant's agreement that the SAN proposal will be released for review. Oversight for the review is provided by the State Committee of the SC EPSCoR/IDeA Program.

### **Proposal Selection**

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All proposals that meet the eligibility requirements and guidelines will be evaluated by peer-review. Evaluations will be based upon the extent to which they meet specific criteria, including:

- Likelihood to increase candidate pools for faculty positions;
- Change in institutional academic or research culture;
- Alignment with the NSF EPSCoR RII Track-1 (Appendix C); and
- Reasonableness of budget.

### **Award and Reporting Requirements**

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Principal Investigators will receive notice of SAN award/declination via e-mail.

Award recipients are required to provide the SC EPSCoR/IDeA state office with information for evaluation and reporting purposes. A progress report must be submitted no later than sixty (60) days after the expiration of their award containing evidence of advertising materials or public relations documentation that may have been developed as part of the SAN program. Further instructions for the preparation and submission of progress reports will be sent to the PI within 30 days after the expiration of the award. Any invited speakers should be notified by the awardee that they will be expected to respond to follow-up surveys regarding their visit for program evaluation purposes.

### **Contact Information**

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General inquiries regarding this program should be made to:

R. Lee Snelgrove  
Program Coordinator, SC EPSCoR/IDeA  
[lee.snelgrove@scra.org](mailto:lee.snelgrove@scra.org)

1000 Catawba Street  
Columbia, SC 29201  
Tel: 803.733.9060  
Fax: 803.376.1721  
www.scepscoridae.org



South Carolina Experimental Program to Stimulate Competitive Research and Institutional Development Awards

## COVER SHEET FOR PROPOSAL

|  |                |   |  |                                      |  |
|--|----------------|---|--|--------------------------------------|--|
| SC EPSCoR/IDeA SOLICITATION NAME AND NUMBER  |                |   |  | DATE SUBMITTED                       |  |
| IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER AGENCY?<br><input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, LIST NAME(S):  |                |   |  |                                      |  |
| NAME OF AWARDEE INSTITUTION (INSTITUTION OF PI)  |                |   | ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE                  |                                      |  |
| NAME OF COLLABORATING ORGANIZATION   |                |   | ADDRESS OF PERFORMING ORGANIZATION, IF DIFFERENT, INCLUDING 9 DIGIT ZIP CODE |                                      |  |
| IS AWARDEE ORGANIZATION (Check All That Apply)<br><input type="checkbox"/> FOR-PROFIT ORGANIZATION <input type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> MINORITY BUSINESS <input type="checkbox"/> WOMAN-OWNED BUSINESS<br>EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)  |                |   |  |                                      |  |
| TITLE OF PROPOSED PROJECT  |                |   |  |                                      |  |
| REQUESTED AMOUNT<br>\$   |                | PROPOSED DURATION (1-12 MONTHS)<br>Months |  | REQUESTED STARTING DATE              |  |
| TARGETED AGENCY OR ORGANIZATION<br>(IF APPLICABLE)   |                | SUBTOPIC (IF APPLICABLE)                  |  | FEDERAL PROPOSAL SUBMISSION DEADLINE |  |
| CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW<br><input type="checkbox"/> PROPRIETARY & PRIVILEGED INFORMATION<br><input type="checkbox"/> VERTEBRATE ANIMALS<br><input type="checkbox"/> HUMAN SUBJECTS<br><input type="checkbox"/> HAZARDOUS MATERIALS INCLUDING REGULATED BIOLOGICAL MATERIALS AND/OR RADIOACTIVE AND/OR OTHER REGULATED CHEMICALS/MATERIALS<br><input type="checkbox"/> INTERNATIONAL COOPERATIVE ACTIVITIES: COUNTRY/COUNTRIES INVOLVED _____ |                |   |  |                                      |  |
| NAME   | HIGHEST DEGREE | YEAR OF DEGREE                            | TELEPHONE NUMBER   | EMAIL ADDRESS                        |  |
| PI   |                |   |  |                                      |  |
| Co-PI  |                |   |  |                                      |  |
| Co-PI  |                |   |  |                                      |  |
| Co-PI  |                |   |  |                                      |  |
| PI DEPARTMENT  |                |   | PI MAILING ADDRESS   |                                      |  |
| PI FAX NUMBER  |                |   |  |                                      |  |

**CERTIFICATION PAGE**

**Certification for Principal Investigators and Co-Principal Investigators**

I certify to the best of my knowledge that:

- (1) The statements herein (excluding scientific hypotheses and scientific opinions) are true and complete; and
- (2) The text and graphics herein as well as any accompanying publications or other documents, unless otherwise indicated, are the original work of the signatories or individuals working under their supervision. I agree to accept responsibility for the scientific conduct of the project and to provide the required project reports if an award is made as a result of this proposal. I understand that the willful provision of false information or concealing a material fact in this proposal or any other communication submitted is a criminal offense (U.S.Code, Title 18, Section 1001).

| Name (Typed) | Signature | Date |
|--------------|-----------|------|
| PI           |           |      |
| Co-PI        |           |      |
| Co-PI        |           |      |
| Co-PI        |           |      |

**Certification for Authorized Organizational/Institutional Representative**

By signing and submitting this proposal, the individual applicant or the authorized official of the applicant firm or company certifies that:

- (1) The statements made herein are true and complete to the best of their knowledge;
- (2) It agrees to accept the award terms and conditions and should these terms not be met, to negotiate a fair and reasonable plan to reimburse the South Carolina EPSCoR/IDeA Program/South Carolina Research Authority for expenditures incurred under the award;
- (3) The organization or its principals are not presently disbarred, suspended, proposed for disbarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal or State department or agency;
- (4) The organization is not delinquent on any Federal or State debt;
- (5) The organization operates as a drug-free workplace;
- (6) Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: Title VI of the Civil Rights Act of 1964 (P.L. 88-352, Title IX of the Education Amendments of 1972, as amended (20 U.S.C. § 1681-1683, and 1685-1686), Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794), the Age Discrimination Act of 1975, as amended (42 U.S.C. § 6101-6107);
- (7) No funds will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of a Member of Congress in connection with the awarding of any Federal contract, grant, loan or cooperative agreement;
- (8) Submission of a complete proposal, including a signed Cover Sheet and Budget Page, signifies the applicant's agreement to release the proposal for external review; and
- (9) Failure to submit a proposal to the targeted agency or organization as listed on page 1 of the Cover Sheet will constitute DEFAULT under the related program. Further, SC EPSCoR/IDeA reserves the right to recover all previously expended funds issued under the related award and the right to refuse any future proposals for SC EPSCoR/IDeA funding.

| Name (Typed)     | Signature  | Date          |
|------------------|------------|---------------|
|                  |            |               |
| Telephone Number | Fax Number | Email Address |
|                  |            |               |

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# SC EPSCoR/IDeA

South Carolina Experimental Program to Stimulate Competitive Research and Institutional Development Awards

## BUDGET PAGE

| INSTITUTION   |                               |    |    |                                  |                            |       |
|---|-------------------------------|----|----|----------------------------------|----------------------------|-------|
| PRINCIPAL INVESTIGATOR  |                               |    |    |                                  |                            |       |
| A. SENIOR PERSONNEL: PI/PD, Co-PI's. Faculty and other Senior Associates(List each separately with title) | EPSCoR/IDeA FUNDED PERS. MOS. |    |    | FUNDS REQUESTED FROM EPSCoR/IDeA | NON-FEDERAL MATCHING FUNDS | TOTAL |
|   | CL                            | AC | SU |                                  |                            |       |
| 1.  |                               |    |    |                                  |                            |       |
| 2.  |                               |    |    |                                  |                            |       |
| 3.  |                               |    |    |                                  |                            |       |
| 4.  |                               |    |    |                                  |                            |       |
| 5.  |                               |    |    |                                  |                            |       |
| 6. ( ) OTHERS (LIST INDIVIDUALLY)   |                               |    |    |                                  |                            |       |
| 7. ( ) TOTAL SENIOR PERSONNEL (1-6)   |                               |    |    |                                  |                            |       |
| B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)   |                               |    |    |                                  |                            |       |
| 1. ( ) POST DOCTORAL ASSOCIATES   |                               |    |    |                                  |                            |       |
| 2. ( ) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)   |                               |    |    |                                  |                            |       |
| 3. ( ) GRADUATE STUDENTS  |                               |    |    |                                  |                            |       |
| 4. ( ) UNDERGRADUATE STUDENTS   |                               |    |    |                                  |                            |       |
| 5. ( ) SECRETARY CLERICAL   |                               |    |    |                                  |                            |       |
| 6. ( ) OTHER  |                               |    |    |                                  |                            |       |
| TOTAL SALARIES AND WAGES (A+B)  |                               |    |    |                                  |                            |       |
| C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)   |                               |    |    |                                  |                            |       |
| TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)   |                               |    |    |                                  |                            |       |
| D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$1,000)                      |                               |    |    |                                  |                            |       |
| TOTAL PERMANENT EQUIPMENT   |                               |    |    |                                  |                            |       |
| E. TRAVEL 1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)   |                               |    |    |                                  |                            |       |
| 2. FOREIGN  |                               |    |    |                                  |                            |       |
| TOTAL TRAVEL  |                               |    |    |                                  |                            |       |
| F. PARTICIPANT SUPPORT COSTS  |                               |    |    |                                  |                            |       |
| TOTAL PARTICIPANT COSTS   |                               |    |    |                                  |                            |       |
| G. OTHER DIRECT COSTS   |                               |    |    |                                  |                            |       |
| 1. MATERIALS AND SUPPLIES   |                               |    |    |                                  |                            |       |
| 2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION  |                               |    |    |                                  |                            |       |
| 3. CONSULTANT SERVICES  |                               |    |    |                                  |                            |       |
| 4. COMPUTER (ADP) SERVICES  |                               |    |    |                                  |                            |       |
| 5. SUBCONTRACTS   |                               |    |    |                                  |                            |       |
| 6. OTHER  |                               |    |    |                                  |                            |       |
| TOTAL OTHER DIRECT COSTS  |                               |    |    |                                  |                            |       |
| H. TOTAL DIRECT COSTS (A THROUGH G)   |                               |    |    |                                  |                            |       |
| I. INDIRECT COSTS (SPECIFY)   |                               |    |    |                                  |                            |       |
| TOTAL INDIRECT COSTS  |                               |    |    |                                  |                            |       |
| J. TOTAL DIRECT AND INDIRECT COSTS (H+I)  |                               |    |    |                                  |                            |       |
| K. AMOUNT OF ANY REQUIRED COST-SHARING FROM NON-FEDERAL SOURCES   |                               |    |    |                                  |                            |       |
| L. TOTAL COST OF PROJECT (J + K)  |                               |    |    |                                  |                            |       |
| PRINCIPAL INVESTIGATOR - TYPED NAME AND SIGNATURE   |                               |    |    | DATE                             |                            |       |
| AUTHORIZED ORGANIZATIONAL/INSTITUTIONAL REPRESENTATIVE - TYPED NAME AND SIGNATURE                         |                               |    |    | DATE                             |                            |       |

## NSF EPSCOR RII TRACK-1 PROJECT SUMMARY

The South Carolina 2009 NSF EPSCoR RII Track-1 proposal presents an integrated plan to implement a statewide vision that will give South Carolina a competitive edge in the field of biofabrication — an emerging ‘*transforming*’ technology — operationally defined as computer-aided, layer-by-layer deposition of biologically-relevant material with the purpose of engineering functional 3D tissues and organs. Challenges lie on both the engineering and biological sides. Biology-based questions relate to identifying cell sources, optimizing hydrogels for cell growth and differentiation, and designing “blueprints” for computer-aided printing of functional tissues. A major challenge remains in achieving *vascularization* and maintaining viability of the printed construct. Without a vascular supply, thickness of tissue constructs is limited to four cell layers or less. To proceed to true organ level, one must successfully engineer a vascular supply, which requires creating a branching 3D tree-like construct. This challenge is the subject of the South Carolina Project and the research theme of the 2009 NSF EPSCoR RII Track-1 proposal.

The proposed Research Plan to engineer a 3D vascular tree is divided into five scientific “thrust” areas. All require enabling infrastructure in terms of content expertise and technology systems. Thrust I focuses on analysis of structural-functional properties of an authentic (natural) branched vascular tree. Anticipated research milestones include a computer-aided design or simulation of a natural branched vascular tree based on the acquisition of detailed data inputs from histological, morphometric and immunohistochemical analyses of sequential segments, and biomechanical testing of sequential segments from a natural branched vascular tree. Thrust II focuses on directed differentiation of adult stem cells into monomer units of vascular cell types, specifically to induce stem cells isolated from fat tissue to enter a smooth muscle cell lineage. Thrust III requires functional biomechanical testing of engineered, sequential segments and comparison to naturally occurring (authentic) branched vascular trees. This requires an enabling technology for the scalable production of standard sized, vascular tissue spheroids having a single lumen surrounded by endothelial cells and smooth muscle cells. Thrust IV is biofabrication of a branched vascular tree, or creating linear 3-D, hollow tubular segments representing branches that can be transformed into branched “Y” or “T” vascular units. Thrust V focuses on accelerated tissue maturation of bioprinted, branched vascular tubes. This requires clever design and fabrication of a perfusion bioreactor, as well as evidence that one or more candidate maturogens can accelerate tissue maturation (e.g. growth factors, extracellular matrix or cytokines). Thus, the scientific theme of the RII is broadly based and includes stem cell biology, cell and developmental biology, molecular biology, tissue engineering, extracellular matrix, biomathematics, chemical and mechanical engineering.

The 2009 SC NSF EPSCoR RII focuses on a diverse subset of institutions including 3 research intensive institutions, 3 HBCUs (1 public and 2 private) and 2 other PUIs (1 private and 1 public), with outreach to 2 technical colleges. Together this will form an alliance for tissue biofabrication. The research infrastructure improvement strategies include: (1) engaging a diverse group of institutions that bring complementary approaches to research, education, training and production of South Carolina’s future STEM workforce; (2) recruiting 22 new tenure-track faculty at Claflin, Furman, MUSC, USC and USC-Beaufort, and Voorhees with interests and expertise in one or more of the enabling biofabrication technologies; (3) identifying and mentoring “target” junior faculty who can enhance the potential to successfully implement the SC Project; (4) creating a local and global virtual e-community that will facilitate and hasten the development of sophisticated databases on the vascular tree; (5) creating academic-industrial collaborations needed to overcome the major challenges of biofabrication; (6) integrating statewide initiatives for education, outreach, and communication to the general public; and (7) expanding a current bioprinting program at MUSC into an Advanced Tissue Biofabrication Center that will serve as the S&T hub and sustainable center.

Efforts directed towards strengthening STEM research and education in SC’s graduate and undergraduate institutions and technical colleges, and interfacing with K-12/pre-college level programs, are critical for building SC’s workforce and economy. Proposed RII activities support postdoctoral and graduate research training at Claflin, Clemson, Furman, MUSC, and USC. A new Masters program in Biorobotics and Biofabrication is in development at SC State University. Two 2+2 degree programs between Claflin and Greenville Technical College, and Voorhees and Denmark Technical College, will be supported with appropriate outreach to the K-12 sector.

The integrated 2009 RII plan includes diversity, cyberinfrastructure improvements, outreach and communication, sustainability, management, accountability and evaluation. The South Carolina Light Rail will be expanded to provide statewide high speed, high capacity linkage to regional, national and international cyber-networks and support collaborative e-communities in S&T and education. An Innovative Integration Board will advise, design, implement and review activities that bridge SC’s minority serving programs and integrate with the science, education, communication and sustainability programs of the RII. Educational innovations include development of e-textbooks and new curricula to recruit and train a diverse 21<sup>st</sup> century workforce. A novel outreach activity will expand the capacity of South Carolina’s reporters, journalists and journalism students to understand and report complex S&T developments and enhance science literacy statewide. The sustainability plan outlines specific approaches to obtain mainstream grants for research, training and technology development, as well as activities for mentoring, career development and technology transfer. An integrated, multi-year evaluation approach will measure progress towards goals, document outcomes and transformative results, and identify areas for improvement. An RII management team and External Advisory and Review Board will ensure implementation of the South Carolina Project and assist the South Carolina EPSCoR/IDeA Committee and its staff in meeting the overarching requirements for accountability and substantive impact.