

MARCE



**Middle Atlantic Regional Center of Excellence
for Biodefense and Emerging Infectious
Diseases Research**

<http://marcebiodefense.org>

Request For Proposals (RFP)

**Solicitation for Mentored BASIC SCIENTIST
Career Development Awards**

Solicitation Release Date:	February 15, 2011
Letter of Intent Deadline (Required):	March 6, 2011 (Sunday by 12:00 midnight)
Electronic Submission Deadline:	March 20, 2011 (Sunday by 12:00 midnight)
Approximate Award Date:	May 1, 2011

The Middle Atlantic Regional Center of Excellence for Biodefense and Emerging Infectious Diseases Research (MARCE) fosters research that will enable rapid defense against bioterror agents and emerging infectious diseases. Multiple universities, government institutions, and corporate partners are currently working together to improve our nation's public health response system. This RFP is issued to solicit basic scientist Career Development Awards to enhance MARCE's current research portfolio. With regard to product development, projects will be encouraged to address broad-spectrum activity, broad-spectrum technology, and broad-spectrum platforms. Applicants will be expected to relate their career development project plans to the MARCE's over-arching theme of "**Emerging pathogen-host interactions**", and to select one Research Program to integrate their project within. The P01-like Research Programs are as follows:

- Program I** – Interaction of Emerging Viruses with Host Cell Pathways.
- Program II** – Emerging Virus Entry into Host Cells: Strategies for Inhibition.
- Program III** – Bacteria & Protozoa that Invade or Cause Disease via the Mucosa.
- Program IV** – Interactions of Select Agent and Emerging Bacterial Pathogen Toxins with Host Cells.
- Program V** – Diagnostics: Development, Support and Discovery.

The purpose of the Mentored Basic Scientist Career Development Award is to support the career development of investigators who have made a commitment to focus their research endeavors on basic scientific research. This mechanism provides support for **two years of supervised study and**

research for professionals who have the potential to develop into productive, **scientific investigators focusing on basic research in the broad area of biodefense or emerging infectious diseases.**

Applications must be relevant to the NIAID Category A-C Priority Pathogens (<http://www3.niaid.nih.gov/topics/BiodefenseRelated/Biodefense/research/CatA.htm>) and emerging infectious diseases (EID) agents (<http://www3.niaid.nih.gov/research/topics/emerging/list.htm>) as defined here by the NIAID.

Furthermore, proposals will be expected to synergize with one of the five Research Programs. Each applicant must clearly note the Research Program to which they are applying. The MARCE website contains further details on current areas of study: <http://marcebiodefense.org>.

The over-arching theme for the overall MARCE Research Program is **“Emerging pathogen-host interactions”**. The **five Research Programs** centered on this theme are described below.

Program I – Interaction of Emerging Viruses with Host Cell Pathways. The central theme of this Research Program, which emphasizes under-studied NIAID Category A and emerging pathogens, is the analysis of virus-host interactions to detect therapeutic targets and identify and allow development of therapeutic agents. Many projects in this Research Program utilize innovative small molecule, proteomic and RNAi screening technologies to identify host pathways with which viral pathogens interact and to identify and characterize potential antiviral agents. The viral pathogens currently under investigation in this Research Program include phleboviruses (Rift Valley Fever virus), Hantaviruses (Sin Nombre virus, Andes virus, and Puumala virus), emerging paramyxoviruses (Nipah and Hendra viruses), and poxviruses.

Program II – Emerging Virus Entry into Host Cells: Strategies for Inhibition. The central theme of this Research Program is to focus on the attachment and entry of viruses into cells with the goal of teasing out and identifying the molecular details of both the viral and cellular factors involved in this process. By attaining a thorough understanding of the factors and events comprising the viral entry process, the potential of discovering and developing novel therapeutic modalities and prevention strategies are made possible. The viral pathogens currently under investigation include Filoviruses (Ebola and Marburg viruses), New World Arenaviruses (Junin and Machupo viruses), the rhabdovirus Australian bat lyssavirus, and the orthopoxviruses (variola and monkeypox viruses).

Program III – Bacteria & Protozoa that Invade or Cause Disease via the Mucosa. The central themes of this Research Program are: 1) how various pathogens interact with the gastrointestinal and respiratory mucosa; and 2) ways to stimulate different arms of the mucosal and systemic immune system. The objectives are to seek common features and virulence mechanisms among the different pathogens that may be amenable to the design of broad spectrum prophylactic and therapeutic interventions to interrupt pathogenesis and synergistic immune responses to confer broad spectrum protection. The emerging bacterial pathogens currently under investigation in Program III include *Shigella*, enteric fever *Salmonella* (Typhi, Paratyphi A & B), non-typhoidal *Salmonella*, enteroaggregative *Escherichia coli* (EAEC), enterotoxigenic *E. coli* (ETEC), enterohemorrhagic *E. coli* and Shiga toxin-producing *E. coli* (EHEC & STEC), *Francisella tularensis*, and the protozoan *Cryptosporidium*.

Program IV – Interactions of Select Agent and Emerging Bacterial Pathogen Toxins with Host Cells. The central theme of Research Program IV is to study how toxins of various NIAID Category A-C microorganisms and certain emerging pathogens interact with host cells, the consequences of those interactions, and the development of methods to block or ameliorate the impact of these virulence factors on the target cells and the host. The toxins currently under investigation in this Research Program include Shiga toxin, ricin, *Clostridium perfringens* epsilon toxin, *Clostridium difficile* toxins A and B, Staphylococcal enterotoxin B, and other staphylococcal super antigens.

Program V – Diagnostics: Development, Support and Discovery. The central theme of Program V is to discover, develop, and support broad-based diagnostic methodologies with capacity for select target identification. Projects aim to incorporate state-of-the-art technologies and translational research capacity, and promote relationships with biotechnology companies that may lead to product development. Research Program V is currently comprised of two ‘Hubs’ that house proven technologies well along the pathway toward commercialization and licensure. The Universal Nucleic Acid Amplification Technology Hub houses platforms that exploit broad-based PCR methods which, when combined with innovative, simple and rapid post amplification detection techniques, allow for specific target detection. This assay is being evaluated in multiple clinical matrices, human samples and animal models for common, biothreat and emerging pathogens. The second Hub leverages the already proven microwave-accelerated metal enhanced fluorescence platform by developing a multiplexed capacity for several agents in a high throughput screening format. The technology has the potential to detect a wide range of agents simultaneously in mixed complex media such as whole blood, with little pre-processing time. In response to this RFP, proposals in the area of Diagnostics should be complementary and synergistic with those represented in the Hubs. Furthermore, the proposal must be clearly linked to one of the existing Research Programs (I-IV, above), and/or a specific existing Research Project within these Programs (see MARCE website). In this way a new Career Award in the area of Diagnostics will promote synergy between a pathogen of interest and a method of detection.

INSTRUCTIONS FOR APPLICANTS

ELIGIBILITY REQUIREMENTS

In general, the candidate must have a doctorate or its equivalent, and must have demonstrated the capacity or potential for highly productive independent research in the period after the doctorate. The candidate must identify a mentor with extensive research experience. The candidate must be willing to spend a minimum of 80 percent of full-time professional effort conducting research and research career development during the entire award period. The candidate must clearly describe the rationale and need for intensive research supervision for a period lasting two years leading to research independence.

The recipient must be an advanced and qualified post-doctoral fellow or a junior faculty member. An established investigator may be eligible if the proposed research experience is in a fundamentally new field of study (regarding biodefense or emerging infections) than their previous experiences, or there has been a significant hiatus in their research career because of family or other personal obligations. Also, under some circumstances, current principal investigators on NIH research grants may be eligible if the proposed research experience is in a fundamentally new field of study. More senior principal investigators, even if the application is in a fundamentally new field of study, are discouraged from applying. Current principal investigators on NIH career awards are not eligible. Pre-doctoral candidates, and post-doctoral candidates who have been in the laboratory for more than 6 years, are also not eligible.

The candidate of the proposed Career Development Project must reside within the Middle Atlantic Region (MD, VA, WV, PA, DE, and D.C.). Collaborators to the project may reside outside the Region. Minorities, women and individuals with disabilities are encouraged to apply. At time of award, candidates must be citizens or non-citizen nationals of the United States, or have been lawfully admitted to the United States for permanent residence.

MECHANISM OF SUPPORT

Planning, direction, and execution of the program will be the responsibility of the candidate and her/his mentor on behalf of the applicant institution. The project award will be for **two years** in the amount of **\$150,000 in direct costs per year**. Indirect costs will be awarded at your institutional rate. Career

Development Awards are not renewable. **One basic scientist Career Development Award will be awarded** in response to this solicitation.

RESEARCH OBJECTIVES

A. Environment: The institution must have a well-established research career development program and qualified faculty in basic research to serve as mentors. The institution must be able to demonstrate a commitment to the development of the candidate as a productive, independent investigator in the area of biodefense and/or emerging infectious diseases research. For individuals who plan to carry out research on Category A-C select agents, it must be clearly explained what level of Biosafety Containment is required for the proposed research. The candidate, mentor, and institution must be able to describe an in-depth, multi-disciplinary career development program that will utilize the relevant research and educational resources.

B. Program: The MARCE Career Development Award provides 2 years of support. At least 80 percent of the recipient's full-time professional effort must be devoted to the goals of this award. The remainder may be devoted to clinical, teaching, or other research pursuits consistent with the objectives of the award. Unlike typical NIH K awards, a recipient of the MARCE Basic Scientist Career Development Award can utilize other federal funds to support the remaining portion of their salary not funded by this award. Both the didactic and the research phases of an award period must be designed to develop the necessary knowledge and research skills in scientific areas relevant to the career goals of the candidate.

Because of the focus on progression to independence as a researcher, candidates for the Basic Scientist Career Development Award should propose a plan of study and career development consistent with her or his previous research experience. For example, a candidate with limited experience in a given field of research may find a phased developmental program lasting two years that includes a designated period of didactic training followed by a period of closely supervised research experience the most efficient means of attaining independence. A candidate with previous research experience in a related field may not require extensive additional didactic preparation and a program that focuses on an intensive, supervised research experience may be appropriate. All programs must be tailored to meet the individual needs of the candidate ensuring that he/she will gain the skills and knowledge necessary to carry out high quality biodefense/emerging infection-related research. The candidate and the mentor are jointly responsible for the preparation of the plan for this program. The sponsor may form an advisory committee to assist with the development of a program of study or to monitor the candidate's progress through the career development program.

C. Mentor(s): Candidates must name a primary sponsor (or mentor), who together with the applicant is responsible for the planning, direction, and execution of the program. The mentor should be recognized as an accomplished investigator in the proposed research area and have a track record of success in training independent investigators. The mentor should have sufficient independent research support to cover the costs of the proposed research project in excess of the allowable costs of this award. Candidates may also nominate co-mentors as appropriate to the goals of the program. Where feasible, women, minority individuals and individuals with disabilities should be involved as mentors to serve as role models.

D. Allowable Costs:

The MARCE Career Development Award will consist of \$150,000 direct costs annually for two years.

1. **Salary:** The MARCE Career Development Award may be used to provide salary and fringe benefits for the career award recipient. The overall annual salary must be consistent both with the established salary structure at the institution and with salaries actually provided by the institution from its own funds

to other staff members of equivalent qualifications, rank, and responsibilities in the department concerned.

The MARCE will allow a maximum of \$90,000 to be directed to salary and fringe benefits for the candidate. If the candidate's annual salary plus fringe exceeds this amount, in order to demonstrate institutional commitment, the candidate's institution will pay the remaining amounts of the candidate's annual salary. Institutional supplementation of salary must not require extra duties or responsibilities that would interfere with the purpose of the Career Development Award.

2. Research Development Support: Whatever portion of the annual \$150,000 award is not used for salary and fringe benefits may be directed to support the following expenses: (a) tuition, fees, and books related to career development; (b) research expenses, such as supplies, equipment and technical personnel; (c) travel to research meetings or training; (d) statistical and computational services including personnel and computer time. All expenses must be directly related to the proposed research career development program.

3. Ancillary Personnel Support: Salary support for mentors, secretarial and administrative assistance, etc., is not allowed.

APPLICATION PROCEDURES

Letter of Intent:

A Letter of Intent (LOI) is required and must include the following:

Name, institution, and contact information of Principal Investigator (PI)

Name and institution of any Co-PIs or collaborators receiving funds

Name and institution of the Mentor

Indicate the specific Research Program (Program I – Program V) to which you are applying

Proposed title of the application

Very brief description of the work being proposed (4-5 sentences will suffice)

Submission of a LOI is required to remain eligible for the award. The LOI will facilitate the coordination of appropriate reviewers for your full application.

LOIs are to be submitted electronically only. **Email to rcegrants@medicine.umaryland.edu by 11:59 PM EST on March 6, 2011.**

Full Application:

Career Development Proposals must include the following:

- Face page (Institutional signature is not required for the electronic submission)
- Abstract Page
- Table of Contents
- Detailed Budget for Initial Period (\$150,000 maximum direct costs; indirect costs will be awarded at the currently approved rate for your institution and should be included in the checklist page noted below; modular budgets are not allowed)
- Budget for Entire Proposed Period of Support (2 years of funding are allowed)
- Budgets Pertaining to Consortium/Contractual Arrangements
- Biographical Sketches of Principal Investigator and all Key Personnel (Biosketches must be current)
- Resources and Environment
- Candidate's Statement and Career Development Plan (A maximum of 2 pages of text)
- Mentor's Statement (required)

- ❑ Research Plan (**A maximum of 8 pages of text will be allowed for Sections 1 and 2 listed below.** Clearly **state which Research Program (Programs I – V)** you are addressing in your proposal.)
 1. Specific Aims
 2. Research Strategy (Significance, Innovation and Approach)
 3. Bibliography and References Cited/Progress Report Publication ListAs appropriate, include:
 4. Protection of Human Subjects
 5. Inclusion of Women and Minorities
 6. Targeted/Planned Enrollment Table
 7. Inclusion of Children
 8. Vertebrate Animals
 9. Select Agent Research
 10. Multiple PD/PI Leadership Plan
 11. Consortium/Contractual Arrangements
 12. Letters of Support (e.g., Consultants)
 13. Resource Sharing Plan(s)
- ❑ Checklist

Full Applications are to be prepared using PHS398 forms and following the PHS398 instructions for formatting (<http://grants.nih.gov/grants/funding/phs398/phs398.html>). The application does NOT need to be signed by your institutional official. If your application is selected for the award, we will request formal institutional signatures at that time.

Submission of Application:

Completed applications are to be submitted electronically in a single word document and **emailed to rcegrants@medicine.umaryland.edu by 11:59 PM EST on March 20, 2011.** If you are unsure whether your proposed research would fit into the aims of this Request for Proposals, please contact Dr. Snyder as below. Please note below that 3 letters of recommendation are required and should be emailed separately by March 20, 2011, to rcegrants@medicine.umaryland.edu.

MARCE contact for information on scientific scope/research:

Jennifer A. Snyder, Ph.D.
MARCE Associate Director
Center for Vaccine Development
University of Maryland School of Medicine
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MARCE contact for information on budgets/forms:

Gloria Smedley, MBA
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The application must address the following issues that will be scored during the review:

Candidate

- ❑ Describe the commitment to a career in biomedical research related to biodefense or emerging infections.
- ❑ Describe the rationale and need for intensive research supervision that will result in research independence.

- ❑ Establish the potential to develop into an independent investigator.
- ❑ Describe immediate and long-term career objectives, explaining how the award will contribute to their attainment.
- ❑ A commitment of at least 80 percent effort to research career development activities.
- ❑ Letters of recommendation. Three letters of recommendation addressing the candidate's potential for a research career must be transmitted directly by each author to the MARCE separate from the application to maintain confidentiality.

Career Development Plan

- ❑ Describe the career development plan incorporating consideration of the candidate's goals and prior experience. A systematic plan should be presented for obtaining the necessary basic biomedical science background and research experience to launch an independent research career. Less experienced candidates may require a phased developmental period in which the first part of the award is largely of a didactic nature followed by a period of intense, supervised research experience. Candidates with more experience at the time of application may need a shorter didactic period and may already have an adequate theoretical background. In any case, the career development plan must be specifically tailored to the needs of the individual candidate and the ultimate goal of achieving independence as a researcher in the broad area of biodefense or emerging infectious diseases.
- ❑ Candidates must justify the need for a two-year period of mentored research experience and must be able to provide a convincing case that the proposed period of support will substantially enhance his/her career and/or will allow the pursuit of a novel or promising approach to a particular research problem.

Mentor's Statement

- ❑ The application must include a statement from the mentor including information on research qualifications and previous experience as a research supervisor. The applications must also include information to describe the mentor's research support related to the candidate's research plan and nature of the supervision that will occur during the proposed award period.
- ❑ Similar information must be provided by any co-mentor. If more than one mentor is proposed, the respective areas of expertise and responsibility should be described.

Research Plan

- ❑ Describe the research plan and the use of a basic science approach to a biomedical problem in biodefense and/or emerging infectious diseases. The research plan must be described as outlined in form PHS 398 including sections on the Specific Aims and Research Strategy (Significance, Innovation and Approach). The plan must relate to one of the MARCE Research Programs (Program I – Program V). The candidate should consult with the mentor regarding the development of this section.

Environment and Institutional Commitment

- ❑ The sponsoring institution must document a strong, well-established research program related to the candidate's area of interest including a high-quality research environment with staff capable of productive collaboration with the candidate. The sponsoring institution also must provide a statement to document the level of commitment to the candidate's development into a productive, independent investigator during the period of the award. This must include an indication of support for candidate's proposed level of effort (at least 80 percent), commitment to the necessary release time, as well as the availability of support and supervision during the award period.

REVIEW CONSIDERATIONS

Funding decisions will be made based on the recommendations of the MARCE Steering Committee, with final review and approval provided by the NIAID RCE Program Office. Incomplete applications will

be returned to the applicant without further consideration. As part of the merit review, all applications will receive a numerical score and written comments. The following review criteria will be applied:

Candidate (30 points)

- ❑ Quality of the candidate's research, academic and (if relevant) clinical record;
- ❑ Potential to develop as an independent researcher;
- ❑ The candidate's rationale and need for intensive research supervision that will result in research independence; and
- ❑ Commitment to a research career.

Career Development Plan (15 points)

- ❑ Appropriateness of the content, the phrasing, and the proposed duration of the career development plan for achieving scientific independence;
- ❑ Consistency of the career development plan with the candidate's career goals and the objectives of the RCE; and
- ❑ Likelihood that the plan will contribute substantially to the achievement of scientific independence.

Mentor/Co-Mentor (10 points)

- ❑ Appropriateness of mentor(s) research qualifications in the area of this application;
- ❑ Quality and extent of mentor(s) proposed role in providing guidance and advice to the candidate;
- ❑ Previous experience in fostering the development of researchers;
- ❑ History of research productivity; and
- ❑ Adequacy of support for the proposed research project.

Research Plan (30 points)

Reviewers recognize that applicants will have variable amounts of previous research experience. Those with limited research experience are less likely to be able to prepare a research plan with the breadth and depth of that submitted by a more experienced investigator. Nevertheless, all applications must include a fundamentally sound research plan but reviewers will consider the applicant's prior research experience in judging the level of detail provided.

- ❑ Scientific and technical merit of the research question, design and methodology;
- ❑ Address an important problem within the overall area of biodefense or emerging infections;
- ❑ Results of these studies advance the goals of the MARCE to develop broad-spectrum vaccines, therapeutics, and diagnostics targeted to Category A-C agents or emerging infectious diseases;
- ❑ Relevance of the proposed research to the candidate's career objectives; and
- ❑ Appropriateness of the research plan to the stage of research development and as a vehicle for developing the research skills described in the career development plan

Environment and Institutional Commitment (15 points)

- ❑ Adequacy of research facilities, training opportunities, and appropriate educational opportunities;
- ❑ Quality and relevance of the environment for scientific and professional development of the candidate;
- ❑ Applicant institution's commitment to the scientific development of the candidate and assurances that the institution intends the candidate to be an integral part of its research program; and
- ❑ Applicant institution's commitment to an appropriate balance of research responsibilities including the level of 80 percent effort proposed by the candidate.

Budget

- ❑ Justification of the requested budget in relation to career development goals and research aims.