 **ND**

## ACS PRF NEW DIRECTIONS (ND) RESEARCH GRANT

The following comments are presented to assist you in the preparation of a proposal for a New Directions research grant-in-aid. See also **ELIGIBILITY, TERMS, AND CONDITIONS** on page v.

**Nature and Scope of the Research:** American Chemical Society Petroleum Research Fund **(**ACS PRF) research grants are made to non-profit institutions for regularly appointed scientists/engineers whose research may be sponsored in accordance with the Agreement of Transfer of Trust:

“The recipient (ACS) shall use all funds exclusively for advanced scientific education and fundamental research in the ‘petroleum field,’ which may include any field of pure science which in the judgment of (ACS) may afford a basis for subsequent research directly connected with the petroleum field.”

The ACS PRF New Directions grants program is not a source of funding for ongoing research projects, but instead is designed as a source of funds for new concepts and new projects. The lead principal investigator must demonstrate that the topic is an entirely new research direction from what the lead investigator has done to date. Proposals that are not a “new direction of research” will be denied without external review, or may be rejected by the PRF Committee. ACS PRF will not support a proposal having overlap, or partial overlap, with research funded by another agency.

A new project is one that is different from previous research performed by the lead Principal Investigator, even though it may involve a field of science or engineering in which others are already working. Thus, the proposed research may not be a logical extension of the research previously conducted by the lead PI. For more details about New Directions grants, refer to the ACS PRF website (www.acsprf.org).

Note that *fundamental research* is required as opposed to applied research or methods development. All ND proposals will be reviewed for the following required elements*:* ***completeness and correctness of the application, fundamental nature of the research topic, relevance to petroleum or fossil fuels, and the extent to which the proposed research is a new direction for the lead principal investigator.***

**Funding Criteria:** The PRF Committee makes relative rankings of ND proposals and recommendations for funding on the basis of the following criteria:

* The extent to which the proposed research represents a new or independent area of investigation for the lead principal investigator.
* The overall quality, significance, and scientific merit of the proposed research, including the extent to which it will increase basic knowledge and/or stimulate additional research.
* The impact of funding the research, including the effect on the principal investigator’s overall research program.
* The qualifications or potential of the principal investigator(s) and adequacy of the facilities to conduct the research.
* The extent to which advanced scientific education will be enhanced through the involvement of students in the research.
* All Principal Investigators must describe any significant risks or hazards that may be encountered in the proposed work, and how these risks or hazards would be mitigated.

**Eligibility:** To be eligible as a principal investigator for a New Directions grant, each applicant must meet all three of the following criteria. It is assumed that tenured or tenure-track faculty meet these criteria. If you are not tenure-track, include a letter from your Department Chair verifying that you meet all of the ACS PRF eligibility criteria.

1. The non-profit institution submitting the proposal must certify that each individual listed as a principal investigator on the cover page qualifies as a principal investigator under the institution’s policies.
2. In view of the long-standing policy of ACS PRF to give priority to support of students (undergraduate, graduate, or postdoctoral), each principal investigator must be eligible to serve as the formal, official supervisor of graduate students in graduate degree programs.
3. The terms of appointment of each principal investigator must promise reasonable continuity of service. The appointment should continue at least through the period of funding requested in the proposal.

One co-principal investigator (co-PI) is permitted on a New Directions grant proposal. The proposed research does not have to be a new direction of research for the co-PI. However, the co-PI must meet all other eligibility criteria as the lead PI and provide the same information requested of the lead PI in the application, except for the “New Research Direction Justification”. The lead PI (who should be denoted as such on the proposal) and their institution (designated as the grantee institution) would subcontract the co-PI through the co-PI’s institution. Any number of collaborators may participate on the project, but no funds from a ND grant may be used to support collaborators or their respective students.

**Budget:** The PRF Committee requires at least 60 percent of the total budget be devoted to support the education and training of students (graduate students, undergraduates, and/or postdoctoral fellows). See item 4 below for details. A budget justification is required as Part I of the application. If you have any questions about allowable budget allocations, please contact the appropriate Program Manager **before** submitting a proposal. For proposals that are funded, the budget becomes part of the grant agreement. Revisions to the grant budget can only be made **with prior approval** of ACS PRF.

1. *Request*: Proposals request $110,000 for two grant years. The total budget may be divided among years according to the needs of the project. The normal ACS PRF budget year extends from September 1 to August 31. The first grant period may begin earlier than September 1, but must start on the first day of a month and end on August 31 of the following year. **A starting date earlier than September 1 will result in the first budget period being longer than twelve months.**
2. *Excluded Charges:* No overhead costs may be charged. Secretarial and/or administrative salaries are considered part of regular departmental expenses and should not be included in proposed budgets or charged against the grant. Funds ***may not*** be used to support laboratory technicians, contractors, consultants, or visiting faculty.
3. *Principal Investigator Stipend:* The proposed budget may include a contribution for PI's summer salary, with an upper limit of $8,000 per grant year, ***including fringe benefits* and the salary of the co-PI, if any**, to a maximum of $16,000 for the grant. This limit does not change as a result of time extensions. Summer salaries or contributions thereto are not provided for principal investigators in colleges or universities outside of the United States and its possessions.
4. *Support of Students:* Total student support must be at least 60% of the grant budget. Students are defined as graduate students, undergraduates, and/or postdoctoral fellows. Student support categories include stipends/salaries/benefits, graduate tuition, and Field Work. Field Work expenses may include transportation, lodging, etc. and must be described in **Part I Budget Justification**.
5. *Travel:* A maximum of $2,000 per year, or $4,000 total, may be budgeted for conference travel. This limit does not change as a result of time extensions. Support of student travel to scientific meetings is encouraged. Note that scientific work performed away from the home institution is considered field work and is budgeted separately.
6. *Capital Equipment:* Requests for capital equipment on type ND grant proposals **are discouraged**. However, a limited amount of capital equipment funds (≤$5,000) may be included in the proposed budget, with justification and description of institutional cost-matching (if any) in **Part I Budget Justification**.

**Carryover and Time Extensions**: Funds that are unexpended at the end of an annual grant period may be carried forward into the next period in the same budget category. If unexpended funds remain in the grant account at the expiration of the original grant period, an extension of time without commitment of additional funds may be requested. A maximum of two one-year time extensions may be approved provided reporting requirements are up to date.

# Proposal Submission:

1. *Format, Signatures:* Complete and fully signed proposals on the **current version** of the application form (this document) are submitted as a single PDF file, using the online proposal submission website at **www.acsprf.org** (follow the New Directions link). Note that the footer of the application form contains the date of the PRF Committee meeting at which the proposal will be considered; this date is also on the watermark of each page of the application form. No proposals will be accepted on prior versions of ACS PRF application forms.
2. *Page Order:* A complete proposal includes the following: pages 1 through 6 of the application with signatures on the title page and the budget page; proposal abstract; proposal narrative with **word count** on the last page; references cited; and any supporting documentation such as letters of collaboration, etc. (if applicable). **Please do not submit the blue-text instruction pages (pp. i-v)**. Number the pages of your proposal in the footer, with the abstract as Page 1. No institutional cover letter is required; if one is included please place it after the references.
3. *Length Restrictions*: The PRF Committee has set an upper limit of 4,000 words, double-spaced in 12-point font (**Times Roman, Arial, or Courier**) with one-inch margins, for the scientific text of the narrative portion of the proposal, excluding abstract, figures, tables, equations, and references. The word count is entered at the end of the proposal narrative. Proposals that exceed this limitation will not be considered. The abstract of the proposal should not exceed 250 words.
4. *Limitations*: An investigator (lead PI or co-PI) may have only one active ACS PRF grant, or proposal under consideration, at any time. In addition, principal investigators (lead PI or co-PI) may have only one ND grant application considered in a 12-month period. Thus, a principal investigator (lead PI or co-PI) who has a New Directions proposal denied may not submit another ND proposal until the PRF Committee meeting one year later.
5. *Safety Statement*: All principal investigators must describe any significant risks or hazards that may be encountered in the proposed work, and how these risks or hazards would be mitigated. Web links to relevant references, and illustrative examples of risk assessments and mitigation strategies, are at [www.acsprf.org/safety](http://www.acsprf.org/safety) and also on the PRF Website.
6. *Additional material:* **If this is a resubmission of a previously denied proposal, you will need to answer the question, “What has been changed in this revised version?” in the online submission form.**

**The ACS Petroleum Research Fund reserves the right to scan proposals for plagiarism.**

Principal Investigators must keep the ACS PRF office advised of the status of applications for research support at other agencies while your proposal is under consideration by The ACS Petroleum Research Fund.

Checklist of Common Errors - Please Review Carefully Before Submitting a Proposal

Most unsuccessful proposals have problems with one or more of the following criteria. If in doubt, please call ACS PRF (202-872-4481) or email the appropriate Program Manager before the submission deadline. Program Managers and their email addresses are listed on the “Contact PRF” page of our website (www.acsprf.org).

1. Topic outside the scope of ACS PRF. Research topics within all areas considered by the PRF Committee are listed on our website (www.acsprf.org), along with “Research Topics NOT Supported by ACS PRF.”
2. Missing or insufficient statement of petroleum relevance (*i.e.,* How is the proposal “advanced scientific education and fundamental research in the ‘petroleum field’?” with the definition of ‘petroleum field’ in the downloadable “Agreement of Transfer of Trust” document.) This petroleum relevance statement is entered on the online submission page before the PDF file of the proposal is uploaded.
3. Old version of the application form. No proposals will be accepted on previous versions of ACS PRF application forms. The footer of the application form contains the date of the PRF Committee meeting at which the proposal will be considered; this date is also on the watermark of each page of the application form.
4. Incomplete application. No late submissions or document substitutions after the deadline are allowed. Early submissions are encouraged to allow for the possibility of being notified of errors that can be corrected with time to resubmit.
5. Budget for the wrong amount (must be $110,000). If necessary to make the total request equal this amount, add the “extra dollars” to the student support categories, or to the Supplies and Services budget.
6. Insufficient student support. The PRF Committee requires that at least 60 percent of the total budget be devoted to support the education and training of students (graduate students, undergraduates, and/or post-doctoral fellows). See item 4 on page ii.
7. Principal Investigator salary over the maximum allowable amount of $8,000 per year (*this amount includes fringe benefits* and the salary of the co-PI, if any). The limit on PI Salary does not change as a result of any no-cost time extensions.
8. Travel budget over the maximum allowable amount of $2,000 per year. This is for travel to meetings or symposia to present research results. Travel to obtain data is part of the “Field Work” budget category.
9. Proposal longer than 4,000 words, double-spaced in 12-point font. The word count is entered at the end of the proposal narrative. Proposals that exceed this limitation will not be considered.
10. Missing information for PI or co-PI. For each Pl (and co-PI), include all academic degrees, institution and date received, the name(s) of the dissertation director(s) of the PI, and any post-doctoral supervisor(s), if appropriate.
11. Missing or incomplete information on suggested reviewers. Include the names, organizational affiliation, and email addresses of at least six peer experts who are qualified, willing to take the time to evaluate the proposed research, and who have no conflicts of interest with the PI (and co-PI, if any). This information is required on both the application form and the online submission form.
12. Missing signatures. The signatures of the PI, the co-PI (if appropriate), and an authorized official of your institution are required on both the title page and the budget page. The institutional official is not the Department Chair, but the person who is authorized to commit the PI’s institution to performing the proposed research. All signatures are required on both pages.
13. Incomplete reference citations. Include the names of all authors, complete article title, journal title, year of publication, volume number, and pages of cited article. Do not use *“et al.”* in reference citations.
14. No outline of revisions. For a previously denied proposal, which has been revised and resubmitted, the PI did not address reviewers’ concerns/comments and did not include, with the application, a summary of major changes.
15. Safety statement missing. Principal Investigator has failed to provide required risk assessment and mitigation strategies in their proposal.

Guidelines for Text of the Proposed Research

# The scientific text of the proposal should conform to the following guidelines:

## The first section of the proposed research should be an abstract of no more than 250 words. (The abstract is also entered as part of your online application, on the proposal submission website.) The abstract should present the rationale of the research, its scientific objective, and an estimate of the significance to the field of research if the objective is reached.

## The body of the narrative should expand upon the salient points presented in the abstract. In addition, it should provide an introduction of the proposal topic, a detailed description of the research plan, including tables and figures, and a survey of pertinent literature (see Part D below), and any non-scientific matters which require explanation (for example, plans for access to specialized equipment, required field studies, etc).

## Please number the pages of your proposal in the footer, with the abstract as Page 1. Print the word count of the proposal narrative (Proposal Narrative = nnnn words) at the end of the proposal, before the reference citations.

## For reference citations, include the names of all authors, complete article title, complete journal title, year of publication, volume number (if any), and pages of cited article. Do not use et al. For example:

## Dunn, D.A., Lee, B.I., Fahr, A., and Clancy, T.C., Characterization and Analysis of Oil-Shale Kerogen from West Virginia. Journal of Petroleum Chemistry, 2015, Volume 16, 200-215.

**When possible, please include a web link to the cited paper or abstract.**

## The proposal should be as concise as is consistent with an adequate presentation and justification of the research idea. The PRF Committee has set a limit of 4,000 words, double-spaced, in 12-point font (Times Roman, Arial, or Courier) with one-inch margins for the scientific text of proposals; this word limit excludes abstract, figures, and references. Proposals exceeding this length will be denied without review.

## A 100-word statement of petroleum-relevance (i.e., How is the proposal “fundamental research in the petroleum field”?) is required as part of the proposal submission. This statement is entered in the online submission form before the PDF of the proposal is uploaded.

## Do not attach preprints or reprints of articles to proposals. Unpublished information may be included in the text of the proposal. Updates regarding pending proposals with other agencies should be forwarded to your ACS PRF Program Manager. No additional material may be submitted while a proposal is under review.

## ACS PRF NEW DIRECTIONS RESEARCH GRANTS

**ELIGIBILITY, TERMS, AND CONDITIONS**

1. ACS PRF New Directions research grants are made to non-profit institutions for regularly appointed scientists/engineers whose research may be sponsored by ACS PRF in accordance with subsection (a) of Article SECOND of the Agreement of Transfer of Trust creating the American Chemical Society Petroleum Research Fund (Transfer Agreement), dated October 25, 2000. To be eligible as a principal investigator for a New Directions grant, applicants must meet the following three criteria. It is assumed that tenured or tenure-track faculty meet these criteria.
	1. The non-profit institution submitting the proposal must certify that each individual listed as a principal investigator on the cover page qualifies as a principal investigator under the institution’s policies.
	2. In view of the long-standing goal of The ACS Petroleum Research Fund to give priority to support of students (undergraduate, graduate, or postdoctoral), each principal investigator must be eligible to serve as the formal, official supervisor of graduate students in graduate degree programs. Emeritus faculty who may supervise post-doctoral fellows are also eligible to apply.
	3. The terms of appointment of each principal investigator must promise reasonable continuity of service. The appointment should continue at least through the period of funding requested in the proposal.
2. ACS PRF New Directions research grants are $110,000 for a two-year period. This amount is exclusive of any added research supplements that might be recommended and authorized to further assist the principal investigator. ACS PRF grants do not include a contribution to institutional overhead or administrative charges. Shifts in budget category allocations require prior approval of ACS PRF, except as noted in item 4, below.
3. The following limitations apply and do not change as a result of time extensions:
	1. The budget may include a contribution to the principal investigator’s summer salary, with an upper limit of $8,000 per grant year, ***including benefits*** and the salary of the co-PI, if any, to a maximum of $16,000. Summer salaries or contributions thereto are not provided for principal investigators in colleges or universities outside of the United States and its possessions.
	2. Except for field work, travel expenses (including scientific meetings) shall not exceed $2,000 per grant year, to a maximum of $4,000 for the two-year grant.
4. ACS PRF New Directions grants may be used to support postdoctoral fellows, graduate students, and/or undergraduate students. Funds budgeted for a student at one of the three levels may be subsequently shifted to student support at a different level without prior approval from ACS PRF. Funds may **not** be used to support laboratory technicians, contractors, consultants or visiting faculty.
5. The institution, by acceptance of this grant, provides assurance that support normally provided by the institution for research of the faculty member will not be diminished.
6. At the end of each grant year, the grantee will submit a financial report, a report of progress, and a personnel statement. Of the support given, funds remaining at the end of each grant year may be carried forward into the next in the same budget category. If funds remain at the expiration of the grant and the principal investigator plans to continue to work on the project, time extensions may be approved by the ACS Petroleum Research Fund, for no more than two years beyond the original grant period, provided reporting requirements are up to date.
7. The Transfer Agreement, wherever applicable, and more specifically subsections (d), (e) and (f) of the Article SECOND thereof shall be complied with by the grantee institution accepting an ACS PRF grant. The reports required by said subsection (d), the publications required by said subsection (e), and a certified copy of any instrument of dedication required by subsection (f) of Article SECOND shall be submitted to the American Chemical Society by the grantee institution. A copy of said Transfer Agreement is attached hereto, is incorporated by reference, and wherever applicable shall be binding upon both the American Chemical Society and the grantee institution.
8. In order to comply with the precise requirements of subsection (e) of said Article SECOND of the Transfer Agreement, each publication prepared in connection with an ACS PRF grant, shall make acknowledgment for the support of this research to the donors of the American Chemical Society Petroleum Research Fund, in the following manner: “Acknowledgment is made to the Donors of the American Chemical Society Petroleum Research Fund, for support (or partial support) of this research.”
9. **In compliance with subsection (f) of said Article SECOND of the Transfer Agreement, any patent which is taken out by or on behalf of the principal investigator or the grantee institution shall be dedicated to the public, royalty free.**
10. Acceptance of an ACS PRF New Directions grant will be conditioned upon agreement by the grantee institution that in the event the principal investigator is unable for any reason to conduct the research proposed, the funds, if previously paid by the American Chemical Society, shall, upon demand, be returned in full to the Society, and, further, that in the event the principal investigator is unable for any reason to continue with the research after it has commenced, this grant shall be terminated forthwith and the unexpended and unencumbered balance of any funds theretofore advanced shall be returned to the Society.

**ND**

**THE PETROLEUM RESEARCH FUND**

**NEW DIRECTIONS PROPOSAL**

 *(Please refer to statement of eligibility, terms, and conditions.)*

 **PRIVILEGED COMMUNICATION**

This proposal is intended for review exclusively by ACS PRF staff, members of the PRF Committee, and outside reviewers officially asked to furnish scientific comments. It may not be transmitted to other parties, copied, or retained for future reference; please destroy after use.

 (Principal Investigator) (Institution)

 (Department) (City) (State)

**Title of Proposed Research:**

The ACS Petroleum Research Fund does not tolerate scientific misconduct. Scientific misconduct includes, but is not limited to, fabrication, falsification, and plagiarism. Instances of alleged or suspected scientific misconduct will be referred to the PRF Committee for investigation. Upon determination of scientific misconduct, the PRF Committee may, in its discretion, take any actions it deems appropriate. Such actions may include: disqualifying proposals from consideration; disqualifying individuals or institutions from submitting future proposals; revoking grant awards; contacting appropriate Officers of the relevant institution(s), such as the Dean, and/or Department Head of the investigator(s); and other such actions that the Board feels are appropriate.

The ACS Petroleum Research Fund reserves the right to scan proposals for plagiarism.

By signing below, we acknowledge that we have read and understand this scientific misconduct policy.

In addition, we confirm that, should this proposal be funded, the proposed budget will become the approved grant budget and funds will be spent according to the budget amounts and categories approved by ACS PRF. Any revisions to the approved budget require **prior approval** from an ACS PRF Program Manager.

Lead Principal Investigator:

 (Signature) (Date)

Co-Principal Investigator:

 (if applicable) (Signature) (Date)

Officer of the Institution

Endorsing the Proposal:

 (Signature) (Title) (Date)

**PROPOSED BUDGET — NEW DIRECTIONS GRANT. Budget justification required in Part I.**

**Amount: $110,000 for two grant years.** Although some budget flexibility can be allowed, *with prior approval*, after a grant has been awarded, an outline of the projected use of the funds being requested will aid in the evaluation of the proposal. Shifts in budget category allocations, consistent with the terms and conditions outlined on page v, and time extensions without the commitment of additional funds may be arranged ***with prior approval***. Funds not expended in one budget year may be carried forward into the next in the same category. **Do not add any categories to this budget page; the listed categories are the only expenditures approved.**

**Each period must end on August 31 and be at least twelve months in duration.**

**A starting date earlier than September 1 will result in a first budget period longer than twelve months.**

**For the Periods**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| Approved budget categories: | \_\_\_\_\_\_\_\_\_ 1, \_\_\_\_\_ |  |  Sept. 1, 2019  |
|  |  |  |  |
| 1. Salaries/stipends (**includes benefits**): |  to Aug. 31, 2019  |  |  to Aug. 31, 2020  |
|  a. Principal Investigator(s) |  |  |  |
|  (maximum: $8,000/grant year) |  |  |  |
|  |  |  |  |
|  b. Graduate Student(s)  |  |  |  |
|  |  |  |  |
|  c. Undergraduate Student(s)  |  |  |  |
|  |  |  |  |
|  d. Postdoctoral Fellow(s) |  |  |  |
|  |  |  |  |
| 2. Tuition (Graduate Student)  |  |  |   |
|  |  |  |  |
| 3. Expendable Supplies and Services |  |  |  |
|  i.e., chemicals, glassware, analyses, etc. |  |  |  |
|  |  |  |  |
| 4. Capital Equipment (max: $5,000; |  |  |  |
|  see instructions)  |  |  |  |
|  |  |  |  |
| 5. Travel (conference) |   |  |   |
|  (maximum: $2,000/grant year) |  |  |   |
|  |  |  |  |
| 6. Field Work |  |  |  |
|  a. Principal Investigator(s) |  |  |  |
|  |  |  |  |
|  b. Students |  |  |  |
|  |  |  |  |
| **ANNUAL TOTALS** | **$** |  |  **$** |

 **TOTAL AMOUNT $110,000**

Lead Principal Investigator:

 (Signature) (Date)

Co-Principal Investigator:

 (if applicable) (Signature) (Date)

Officer of the Institution

Endorsing the Proposal:

 (Signature) (Title) (Date)

Grantee Institution:

# BUDGET JUSTIFICATION

Describe the intended use of grant funds including number and level of students receiving support. If field work is budgeted, describe the purpose and location, and the number of students involved. Additionally, specify how those funds will be allocated, *e.g.,* for transportation, lodging, etc.

If capital equipment is requested, provide a detailed description of the proposed equipment and the need that it fulfills in your research; also describe any matching funds that are to be obtained.

# EDUCATION AND EXPERIENCE (PI and co-PI, if any)

## Indicate all academic degrees, when and where received, and Ph.D. thesis title and supervisor. List postdoctoral appointment(s) and supervisor(s), if appropriate. List current and previous positions, in chronological order; significant honors and awards; and other pertinent biographical information.

## Do you currently hold a tenured or tenure-track position? \_\_\_\_\_\_\_\_\_\_\_\_\_. If not, please explain your eligibility, and include a letter from your department chair verifying you meet all three ACS PRF eligibility criteria (see pages i-ii).

# CURRENT AND PENDING RESEARCH SUPPORT (PI and co-PI, if any)

## List any active research grants or other current financial support received for research. Give titles, amounts (annual direct costs; if more than one PI, indicate only your share of the granted amount), sources, time periods of awards, and relationship to this proposal. Use a separate page if necessary; indicate “none” if applicable.

## List any other research grant applications pending. Give titles, amounts requested (annual direct costs), sources, and relationship to this proposal. Use a separate page if necessary; indicate “none” if applicable.

#  PUBLICATIONS

# List all research publications from the last five years. Include titles, co-authors, and literature references.

# Use separate page(s) if necessary.

1. **SAFETY**

Principal Investigators must describe any significant risks or hazards that may be encountered in the proposed work, and how these risks or hazards would be mitigated.

1. **SUGGESTED REVIEWERS**

## Provide the names and addresses (including emails) of six suggested reviewers who are experts in the field of the proposed research. Do not include former research mentors, students, collaborators, or colleagues at your current or former institutions. At least four suggested reviewers must be experts residing in the United States. Please do not list reviewers whom you have suggested in any proposal previously submitted to ACS PRF within the past four years. Include the title, first name, middle initial (if any), last name, full current mailing address with zip code, and email address of all suggested reviewers.

# NOTE: This information is also entered as part of the online application, on the proposal submission website.

# COLLABORATIONS

# If you will be collaborating with other scientists in the performance of the research described in this proposal, identify the collaborators and briefly indicate the nature of the collaboration. If any of these collaborators are current ACS PRF grantees or applicants, discuss the relationship between this proposal and the collaborator’s ACS PRF project. A letter from the collaborator(s), confirming the extent and nature of the collaboration, should be added to the application.

# NEW RESEARCH DIRECTION JUSTIFICATION (Lead PI only)

## Provide a one-page description (12 point font, double-spaced, 1 inch margins) of your current research and describe how this proposal is a new and innovative area for you in the space provided below. The description should include how prior research is unrelated to the proposed research of this submission.