



**AMERICAN CANCER SOCIETY**  
**CANCER STEM CELL CONSORTIUM INSTRUCTIONS**  
**EFFECTIVE JANUARY 2022**

**ELECTRONIC APPLICATION DEADLINE: June 1, 2022**

**AMERICAN CANCER SOCIETY, INC.**  
**Extramural Discovery Science Department**

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**MISSION**

**The American Cancer Society's mission is to save lives, celebrate lives, and lead the fight for a world without cancer.**

# CANCER STEM CELL CONSORTIUM APPLICATION INSTRUCTIONS

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## GENERAL INFORMATION

### 1. AMERICAN CANCER SOCIETY (ACS) GRANT APPLICATION SYSTEM

- Access the ACS Research site at [www.cancer.org](http://www.cancer.org).
- Select “Our Research” > “Apply for Grant” > “Grant Types”.
- Select link to your grant, which opens the electronic application process at proposalCENTRAL.
- Follow instructions for login/register, completion, and submission.
- Key steps:
  - Filter on the “Grant Opportunities” Tab > “Choose American Cancer Society” > “Review Grant Types” > “Select Grant” > “Apply Now”
  - Enter Project Title (unless already displayed) > SAVE. This permits access to other application components.
  - Saved applications are stored under “Manage Proposals”.
- See proposalCENTRAL login page for tutorials and additional details about the grant application process.
- Alternatively, click “Help” or contact ALTUM Customer Service at [pcsupport@altum.com](mailto:pcsupport@altum.com) or 1-800-875-2562.

### 2. FORMAT

- Insert Principal Investigator (PI) name in the header for each template of the application. Do not change the footers on the templates.
- Application documents may be single- or double-spaced (if single spacing, enter a space between paragraphs).
- **Type size:** 12-point Times New Roman or 11-point Arial are the minimum font sizes for the text; 10-point Times New Roman or 9-point Arial font type may be used for figures, legends, and tables.
- **Margins:** ≥ 0.5 inches all around unless a form with different margins is supplied in the Application Templates.
- **Page numbering:** Number the pages in upper right corner according to the proposal sections listed in the Table of Contents.
- **Do not number:** Signature Page, Contact Page, General Audience Summary, Structured Technical Abstract, Statement of Cancer Relevancy and Impact, Justification of Alignment with Research Priorities, Budget & Justification, if applicable, or the Appendix.

### 3. UPDATES OF INFORMATION

The following updates should be communicated to Lynne Elmore, PhD ([lynne.elmore@cancer.org](mailto:lynne.elmore@cancer.org)), the Scientific Director of the Cancer Stem Cell Consortium (CSCC).

**Withdrawal of Application:** Notify the Scientific Director promptly of your intent to withdraw your application. Include in your letter or email, the PI name, application number (if assigned), and reason for withdrawal. If the project has been funded by another organization, please list that funding agency.

**Change of Address:** Notify the Scientific Director via email if a mailing address, email address, or phone number has changed since a submission. Include the PI name and application number (if assigned) on the correspondence and update your information in proposalCENTRAL.

**Change of Institution:** If you change institutions between application submission and peer review, contact the Scientific Director to inquire how this may impact the review.

#### 4. REQUIRED INFORMATION

**Note:** *Not all fields are required for all applications; see grant-specific instructions.*

**Project Title:** Do not exceed 150 characters including spaces; avoid abbreviations if possible.

**Note:** The title will be truncated after 81 characters on the title page.

**Principal Investigator/Applicant Information:** Some (or all) of the required information from your Professional Profile may already be displayed. If any information is outdated, **stop**, and update the Professional Profile before completing this section and submitting an application. Please keep all contact information current.

**Key Personnel:** Individuals who contribute to the scientific development or execution of a project in a substantive and measurable way (whether or not they receive salaries or compensation under the grant) are considered Key Personnel. **The PI is always considered Key Personnel, but do not list them under key personnel on proposalCENTRAL.**

Key Personnel can include individuals at the master's or baccalaureate level (such as graduate students and research assistants) if they meet this definition. "Zero percent" or "as needed" are not acceptable levels of involvement for key personnel.

The **Principal Investigator** assumes the authority and responsibility to direct the project. The ACS does not permit applications to be directed by co-Principal Investigators.

A **Co-Investigator** is a vital scientific contributor (at the same or a different institution), often bringing a needed expertise to the research team. This person commits some level of measurable effort to the project and is therefore Key Personnel, whether compensated or not.

A **Collaborator** plays a lesser role in the thinking and logistics of the project than co-investigator. Depending on the role and effort, a collaborator may be designated as Key Personnel and may be compensated.

A **Consultant** provides expert advice most often for a fee. If the consultant contributes to the scientific development or execution of a project substantively and measurably, he or she should be designated as Key Personnel.

**Other** is defined as individuals who are compensated for their contribution to the project but are not considered Key Personnel (e.g., student assistants, technical staff).

A **Mentor** assists in the scientific and professional development of the mentee. A Primary Mentor should be identified and listed as Key Personnel **ONLY** for Postdoctoral Fellowships and Clinician Scientist Development Grants. If additional mentors are identified, they should also be listed as Key Personnel.

The table below provides information about the documents required for each personnel class. See grant-specific instructions for detailed guidance.

### REQUIRED SUPPORTING DOCUMENTS FOR NAMED PERSONNEL

Personnel	Designated “Key”	Biosketch	“Other Support” Documentation	Included in Budget & Justification	Letters
Principal Investigator	Yes <sup>a</sup>	Yes	Yes	Yes	N/A
Co-Investigator	Yes	Yes	Yes <sup>b</sup>	Yes <sup>c</sup>	Letter of Agreement/Support <sup>b</sup>
Collaborator	Yes	Yes	Yes <sup>b</sup>	Yes <sup>c</sup>	Letter of Agreement/Support <sup>b</sup>
	No	No	No	No	
Consultant	Yes	Yes	Yes, if paid <sup>b</sup>	Yes, if paid <sup>c</sup>	Letter of Agreement/Support <sup>b</sup>
	No	No	No	Yes, if paid	
Other	No	No	No	Yes	No
Mentor(s) <sup>d</sup>	Yes	Yes	Yes	Yes <sup>d</sup>	Letter of Agreement/Support

<sup>a</sup> The PI is always considered Key Personnel but supporting documents should **not** be duplicated in the Key Personnel section on proposalCENTRAL.

<sup>b</sup> For postdoctoral fellows, technicians, and graduate students, other support documentation is not required.

<sup>c</sup> If Key Personnel are not being paid, enter \$0 for the amount requested; percent effort is required. Note that the percent effort indicated on the budget tool in proposalCENTRAL can be different than the requested compensation.

<sup>d</sup> For mentored grants (CSDG, PF), include the Primary Mentor and other mentors, if applicable, as Key Personnel. Only CSDGs should include the mentor(s) in the budget/budget justification.

#### **Key Personnel Roles for the CSCC Team Award Mechanism Only:**

**Lead PI** assumes the authority and responsibility to direct the project therefore must devote a minimum of 10% effort to this role. The American Cancer Society *does not permit* applications to be directed by Co-Principal Investigators.

**Team Principals** collaborate with the Lead PI. Principals direct specific areas of the scientific and technical work and lead a component of the research based on their areas of expertise. Team Principals should be budgeted at least 10% effort. The Lead PI and all Team Principals share authority for scientific leadership.

**Team Investigators** contribute to the proposed research. Investigators within the first 5 years of their initial faculty appointment may serve as a Team Investigator, but not Lead PI or Team Principals.

**Note:** See above for all other Key Personnel definitions

## CSCC TEAM - REQUIRED SUPPORTING DOCUMENTS FOR NAMED PERSONNEL

Personnel	Designated "Key"	Biosketch	"Other support" Documentation	Included in Budget & Justification	Letter of Agreement/Support
Lead Principal Investigator	Yes <sup>a</sup>	Yes	Yes	Yes	N/A
Team Principal(s)	Yes	Yes	Yes	Yes	Yes
Team Investigator(s)	Yes	Yes	Yes	Yes	Yes
Co-Investigator	Yes	Yes	Yes <sup>b</sup>	Yes <sup>c</sup>	Yes <sup>b</sup>
Collaborator	Yes	Yes	Yes <sup>b</sup>	Yes <sup>c</sup>	Yes <sup>b</sup>
	No	No	No	No	
Consultant	Yes	Yes	Yes, if paid <sup>b</sup>	Yes, if paid <sup>c</sup>	Yes <sup>b</sup>
	No	No	No	No	
Other	No	No	No	Yes	No

<sup>a</sup> The PI is always considered key personnel, but you do not need to duplicate supporting documents in the Key Personnel section.

<sup>b</sup> Exception: Support documentation and letters are not required for postdoctoral fellows, technicians, and graduate students.

<sup>c</sup> If Key Personnel are not being paid, enter \$0 for the amount requested; percent effort is required. Note that the percent effort indicated on the budget tool in proposalCENTRAL can be different than the requested compensation.

**Citizenship Status (mandatory):** On proposalCENTRAL under "Professional Profile", indicate your current citizenship status and country of citizenship.

**Justification of Eligibility:** Applicants must satisfy all eligibility requirements defined for each application type. Under Professional Profile, indicate the date (months and year) your terminal degree was awarded and when your first independent faculty position (or equivalent) began, if applicable. If you have a letter from the ACS Eligibility Committee, include in the Appendix and indicate this in the Table of Contents.

**Justification of Designation "Priority Focus in Health Equity Research": n/a for the Cancer Stem Cell Consortium.**

**Space:** If applicable, indicate the approximate area of independent research space provided by your institution to support your research program, along with the name of the department head who can verify this commitment. You must insert a value for square footage under Professional Profile, even if that number is zero.

**Institutional Official:** Indicate the name and address of the official authorized to sign for the institution. Institutional Officials may electronically sign the application if required by the institution, but this is not required by ACS for submission. The PI must give the Institutional Official access to the application for e-signing to be completed. Provide a mailing address for disbursement of funds, in the event that your grant is awarded funding.

**Technology Transfer Officer (TTO):** Indicate the name and email address of the TTO. The TTO is responsible for technology transfer and other aspects of the commercialization of research that take place at a university. The TTO will be responsible for annually reporting all IP updates to the ACS should the project be awarded funding.

**Department Chair:** Indicate the name, department, and email address of the Department Chair. The electronic signature of the Department Chair is not required by the ACS.

**Primary Mentor:** Complete all fields for mentor information (if applicable).

**Additional Mentor(s):** Complete all fields for additional mentor information (if applicable).

**ORCID Identifier:** ORCID provides a persistent digital number that you own and control, and that identifies you from every other researcher. Please provide an ORCID identifier if you have one. To add the ORCID ID, click Professional Profile and connect/register for an ID. Once connected, return to your proposal, and click Save.

**Committee Code:** Designate as CSCC (Cancer Stem Cell Consortium)

## 5. GENERAL AUDIENCE SUMMARY

The general audience summary provides an overview of the proposed research for people who are **not** trained in the sciences. This summary may be read by peer review stakeholders, ACS staff members, potential donors, and the public. **Stakeholders** are individuals without formal scientific or medical training who are full voting members of peer review panels. The stakeholder uses the general summary to evaluate how the proposed work will benefit cancer patients and their families.

- **ACS staff members** use these summaries to identify projects that align with the specific interests of **donors** and may share them with donors.
- Staff may use the summary for communicating to local media about ACS-funded studies. Summaries of all grants funded by the Society are also made available to the **public**. Therefore, do not include proprietary/confidential information.

The general audience summary should **not** duplicate the structured technical abstract and should be written in an understandable way for the general public. Describe concisely the background, significance, question(s) being asked, information to be obtained, and potential impact of your proposed research. If symbols or Greek characters must be used, they should be spelled out to avoid formatting problems. *See an example of General Audience Summary in Appendix A.*

This form is limited to 3,100 characters including spaces and will truncate at that point. Comply with the character limit to permit readers (including peer reviewers) to fully appreciate the “big-picture perspective” of the proposal.

## 6. STRUCTURED TECHNICAL ABSTRACT

**Note: The Consortium Lead Award does not require a structured technical abstract.** The structured technical abstract is a summary of the proposed research or scholarly project for **general scientific** audiences. *See an example of a Structured Technical Abstract in Appendix B.*

Organize the abstract into the following sections:

- Background
- Objective/Hypothesis
- Specific Aims
- Study Design

This form is limited to 3,100 characters including spaces and will truncate at that point. Comply with the character limit to permit peer reviewers to fully appreciate the technical synopsis.

The American Cancer Society may share the structured technical abstract under a non-disclosure agreement with a third party. Therefore, do not include proprietary information. Please notify us if you do not wish to have your abstract utilized in this manner.

## **7. STATEMENT OF CANCER RELEVANCE AND IMPACT (LIMIT TO 1500 CHARACTERS)**

This section is important to the stakeholders (non-scientific members) on the peer review committee as well as to several general audiences, including donors. **Avoid the use of technical jargon.**

Describe how the cancer stem-cell related project contributes short- and/or long-term to the control of cancer. For basic studies relying on experimental models (rather than human cancer cells, tissues, or clinical data) explain how the successful completion of the proposed work will lead to a better understanding of the disease or improve our ability to prevent, detect, treat, or manage cancer or cancer patients.

For studies involving human subjects, how could your study improve cancer outcomes? What effects do you anticipate on the morbidity, mortality, and/or quality of life of your study population?

## **8. SELECTION OF RESEARCH PRIORITIES**

Select the research priority or priorities to which your proposed project most strongly aligns and indicate the percent alignment. If multiple priorities are selected, the total should equal 100%. You are required to select a research priority area. Descriptions of the research priorities can be found in the Consortium Policies document with further details on cancer.org.

## **9. JUSTIFICATION OF PROJECT ALIGNMENT TO ACS RESEARCH PRIORITIES AND CONSORTIUM GOALS (LIMIT TO 1500 CHARACTERS)**

Explain how your proposed project aligns to the selected research priority/priorities **and** the consortium goals (e.g., to advance the understanding of cancer stem cells and accelerate the translation of these discoveries to benefit cancer patients). See [here on cancer.org](https://www.cancer.org) for a listing, descriptions, and specific examples of research that may fall under the ACS priority areas. If your project aligns to multiple priority areas (not a requirement), provide additional justification of the alignment to those areas in this section as well. Please make sure that the priority area or areas are clearly stated. We welcome projects all along the research continuum if they meet these important criteria. Below we provide a pre-clinical example, with the preferred format. Note: If the character limit is exceeded in this section, which is evaluated, it will be truncated.

### **Example:**

**ACS Priority Alignment:** The focus of this investigation is to elucidate how cancer stem cells in triple negative breast cancers (TNBC) resist chemotherapies with the goal of developing new strategies for anti-cancer drug design (Treatment as the primary priority). This breast cancer subtype has been very difficult to target since it doesn't express estrogen, progesterone or the HER2 oncogene and is well documented to be more deadly in African American women than white women. The mechanistic insights we glean from the ability of cancer stem cells to continuously self-renew could also lead to the development of improved prognostic and diagnostic markers (Screening and Diagnosis) as well as a better understanding of cells that drive tumorigenesis and disease recurrence (Etiology).



**Alignment with Consortium Goals:** The improved understanding of cancer stem cells in TNBC will make possible the future testing of much-needed new approaches and/or targets for treating this aggressive tumor type and monitoring of treatment response.

**Selection of Priorities:**

Etiology: 20%

Screening and Diagnosis: 30%

Treatment: 50%

## 10. PROJECT CODING

**Note: Project coding is not considered at peer review. Red asterisks indicate required fields; not all grant types require project coding.**

Donors often have interests in funding specific types of cancer research. Your selection of project codes permits identification of proposals for consideration of donor-driven special funding. This information also assists the Society in communicating our research portfolio to the public.

Select the most appropriate Areas of Research (Common Scientific Outline—CSO) and Types of Cancer. Note that relevant items may be included under Resources and Infrastructure Related to [specific area]. See Appendix C for specific terms and examples.

## 11. ASSURANCES AND CERTIFICATION

All activities involving human subjects and vertebrate animals must be approved by the appropriate institutional committee before the application can be funded. Compliance with current US Department of Health and Human Services and ACS guidelines for conflict of interest, recombinant DNA, and scientific misconduct is also required.

**Vertebrate Animals:** Every proposal involving vertebrate animals must be approved by an Institutional Animal Care and Use Committee (IACUC), in accordance with Public Health Service Policy on Humane Care and Use of Laboratory Animals before the application can be funded. Enter the date of the most recent IACUC approval in the space provided.

All research supported by the ACS (including subcontracted activities) involving vertebrate animals must be conducted at performance sites covered under an approved Animal Welfare Assurance. It is the responsibility of the institution to immediately report to the ACS any action, including recertification or loss of IACUC approval, that is pertinent to the work described in the grant application.

**Human Subjects:** All proposed research projects involving human subjects must be approved by an Institutional Review Board (IRB) at an institution approved by the Office for Human Research Protections (OHRP) of the US Department of Health and Human Services (DHHS). Enter the institution's Assurance of Compliance number(s). Copies of the DHHS policy, assured status, and assurance numbers may be obtained from OHRP. Definitions and further clarification can be found at the [NIH Office of Extramural Research website](#).

**Submission of Approval Documentation:** If institutional review of human or vertebrate-animal subjects has not been finalized before the submission date of the application, you must indicate that approval is pending on the certification page and give the appropriate institutional reference numbers, if available. The Institution Official who signs during the grant activation process is responsible for confirming that approval has been granted for the research to begin. In addition, certification of the approval, clearly labeled with the assigned ACS application number, must be

uploaded to proposalCENTRAL within 3 months of grant activation. Failure to comply may result in withholding of payments and/or cancellation of funding.

If a grant is funded, it is the responsibility of the institution to immediately report to the ACS any action, including recertification or loss of IRB approval, which occurs during the term of the award that is related to the work described in the grant application.

## 12. PI DATA

The PI demographic information is for use by the Extramural Discovery Science department. While “choose not to disclose” is an option, we **strongly encourage** all applicants to specify their gender, race, ethnicity, and sexual orientation. We use this information for statistical purposes to understand the diversity of our applicant pool. We are committed to investing in a diverse research workforce and this data enhances our ability to develop inclusive policies and new funding opportunities to address current limitations. ***This information is not accessible to peer reviewers and is not considered at peer review.*** By sharing this information with us, you help the American Cancer Society track our progress and identify areas that need improvement.

## 13. RESUBMISSION

**All resubmissions must create a new application on proposalCENTRAL.** The option for resubmissions will depend on the need to round out the consortium membership of ~15 Principal Investigators. Please see grant-specific instructions for details.

### Resubmission guidelines:

- Submit a complete application electronically via proposalCENTRAL
- The title of the project can be altered but the application **must** be marked as a first or second resubmission.
- Select the appropriate application number from the list of your prior submissions on proposalCENTRAL.
- If invited to resubmit under the Cancer Stem Cell Consortium, provide the **CSCC** peer review committee code.

## 14. APPLICATION SUBMISSION AND REQUIRED E-SIGNATURE

**We are now only accepting electronic submissions with e-signatures.**

- All application attachments, including the Appendix, must be uploaded as .pdf documents.
- Validate the application on proposalCENTRAL. An application that has not been validated cannot be electronically submitted.
- Applications must be electronically submitted on proposalCENTRAL by 11:59 PM ET on the specified deadline date. If the deadline falls on a weekend or holiday, applications will be accepted the following business day.
- The applicant’s electronic signature is required on the Signature Page. The e-signature of the Institution Signing Official and the Department Head are optional but available for use should the institution require them. In order to e-sign an application, the signees must be included in the application Contacts in proposalCENTRAL.
- Technical questions regarding the electronic application process should be directed to Altum at <https://proposalcentral.com/> or 1-800-875-2562.

**Note: After submission, you will not be able to make any changes to the forms or upload any modifications to the files.**

## **SPECIFIC INSTRUCTIONS BY GRANT MECHANISMS**

### **CONSORTIUM LEAD AWARD**

#### **INSTRUCTIONS**

##### **I. THE GRANT APPLICATION SYSTEM**

- a.** This is an invite-only process following submission of a Letter of Intent (LOI). An email from proposalCENTRAL will be sent inviting to submit a Consortium Lead Award application. The application will be created in the PI's proposalCENTRAL account and can be found in the "proposals" tab. Click on "edit" to access the application materials.
- b. Enable Other Users to Access this Proposal:** To assist in the development and submission of the Consortium Lead Award application, applicants may allow others (e.g., institutional administrators, collaborators, or the partnering institution or group) to view, edit, or submit the proposals by following these steps in proposalCENTRAL:
  - Click the blue Proposals tab and the Edit button next to the appropriate application.
  - Click the "Enable Other Users to Access this Proposal" section in the gray menu on the left.
  - Add the e-mail address of the User at the bottom and click the Find User button.
  - Select the appropriate access level from the drop down in the "Permissions" column and click the Accept Changes button. The possible access levels are:
    - **View:** View only; cannot change any details.
    - **Edit:** Can view and change information in the application; cannot submit the application or view the "Enable Other Users to Access this Proposal" screen.
    - **Administrator:** Can view, edit, and submit the application; can give access rights to others on the "Enable Other Users to Access this Proposal" section.
- c.** Technical Assistance: Detailed information is available through tutorials provided on the proposalCENTRAL login page. If you have problems accessing or using the electronic application process, click on "Help" or contact ALTUM Customer Service at pcsupport@altum.com or 1-800-875-2562.

##### **II. GENERAL AUDIENCE SUMMARY**

The general audience summary provides an overview of your strategic plan for fostering collaboration to accelerate cancer stem cell research impact within the consortium and for testing a creative cancer stem cell-related concept within the framework of your research program. This summary should be written for a lay audience since it will be utilized during the review of the application by stakeholders and, if funded, it may be shared with the general public including ACS staff members and donors.

If symbols or Greek characters must be used, they should be spelled out to avoid formatting problems. This form is limited to 3,100 characters including spaces and will truncate at that

point. Comply with the character limit to permit readers (including peer reviewers) to fully appreciate the “big-picture perspective” of the strategic plan.

### III. APPLICATION TEMPLATES

An application consists of several sections that must be uploaded before the application is submitted. Templates for these sections are available once an application is started on proposalCENTRAL.

The templates must be downloaded to a computer and completed offline. Detailed below are the instructions for completing the individual sections. *The sections must be converted into .pdf documents before being uploaded. Please see proposalCENTRAL’s FAQ or call support at 1-800-875-2562 if you need assistance.*

#### 1. TABLE OF CONTENTS (PAGE 1.1)

The Table of Contents is pre-numbered and should be limited to 2 pages, including an itemized list of contents in the Appendix.

#### 2. BIOGRAPHICAL INFORMATION OF APPLICANT (PAGE 2.1)

##### A. Personal Statement (*not to exceed 2 pages*)

Describe why you are well suited to be named the advisory lead of the Cancer Stem Cell Consortium. Relevant factors may include aspects of your training, previous experimental work, technical expertise, your vision for this field, collaborators, scientific environment, and service.

##### B. Leadership (*not to exceed 2 pages*)

Describe how you have enhanced the broader cancer research field and specifically the cancer stem field in your role as a leader. These activities could be regional, national and international.

##### C. Contributions to Science (*not to exceed 4 pages*)

Describe up to five of your most significant contributions to the cancer research field with at least one being highly relevant to cancer stem cells. For each contribution, provide: the historical background that frames the scientific problem; the central finding(s); the influence of those finding(s) on progress within the field or their application to health or technology; and your specific role in the described work. Reference up to four peer-reviewed publications relevant to each contribution. The description of each contribution should be no longer than one half page including figures and citations.

**In addition, upload your complete and updated curriculum vitae, which includes leadership roles, mentorship, honors, awards and all publications, to the Appendix.**

#### 3. RESEARCH SUPPORT (PAGE 3.1)

List all sources of research support, Federal, non-Federal, or Institutional, available to you through research grants, cooperative agreements, contracts, fellowships, and other means. Describe all awards, active support, and all applications pending review. Give the name of the granting agency, grant number, project title, award amount and term, your role (e.g., principal investigator, co-investigator, collaborator), and your percent effort.

#### 4. STRATEGIC PLANS DURING THE TERM OF THE AWARD (PAGE 4.1)

**This section should not exceed 6 pages.**

The strategic plan has two equally important components: (1) your strategy to create and sustain a highly collaborative scientific community committed to accelerating the clinical impact of cancer stem cell research; and (2) the cancer stem cell-related research activities that are planned within your esteemed research program during the award period.

**Include a timeline of the proposed activities for both aspects of the strategic plan.**

In part 1, describe how you will engage with the grantees within the Cancer Stem Cell Consortium, ACS Extramural Discovery Science staff, and thought leaders outside of the consortium during the project period. Describe how the proposed activities (i.e., leadership, networking, data sharing, etc.) will advance the understanding of cancer stem cells and accelerate the clinical impact of the supported research projects.

In part 2, the research activities proposed **should not** simply be a continuation of your current work. Rather, the plans should describe a novel strategic direction and should reflect the exceptional nature of this Award. Indicate the impact the Award would have on your program and outline how it will enable you to advance your research program in ways that would not be possible otherwise (i.e., what would you do if you had \$80,000 a year to spend to bring about significant change to the cancer stem cell field?). While the peer reviewers will assess your past scientific contributions, they will also focus on your potential for continuing to be a leader in the field based, in part, on the strategic plans you propose in terms of its innovation, novelty, and feasibility.

In the final analysis, reviewers will evaluate past accomplishments, your potential to continue making significant contributions in cancer research and leadership, as well as, your vision and plans for this unique cancer stem cell consortium.

**Please use the following format to describe your research plans:**

**A. Strategic Direction**

What knowledge gaps in the cancer stem cell field remain to be filled? Concisely summarize and critically evaluate related work done by others and specifically state how you plan to strategically fill this void to advance scientific knowledge and its application to benefit patients. Articulate your vision for how you will advance cancer stem cell field in the next six years, acknowledging top challenges in the field.

**B. Innovation**

1. Explain how the application challenges and seeks to shift current research or clinical practice paradigms.
2. Describe any novel theoretical concepts, approaches or methodologies, instrumentation, or intervention(s) to be developed or used, and any advantage over existing methodologies, instrumentation, or intervention(s).

**5. BUDGET**

Up to \$30K per year is available to cover administrative costs, including personnel associated with the consortium. Up to \$80K per year is available for use at the discretion of the Consortium Lead for activities proposed in the strategic plan. Budget categories are provided below to aid in the development of your budget online at proposalCENTRAL.

**Personnel.** Names and positions of all Key Personnel must be individually listed, and the percent effort for all key persons should be entered. Details of contractual arrangements with Key Personnel should be provided in the Budget Justification section.

The costs to the institution of employee fringe benefits should be indicated as a percent of the employee's salary. The amount of fringe benefits requested must be prorated to the salary requested. For example, if 50 percent of an individual's annual salary is requested, then no more than 50 percent of that individual's annual cost for fringe benefits can be requested.

**Supplies.** List any materials or supplies that might be needed for the planned activities. Group supplies into major categories.

**Travel.** Domestic travel only; special consideration will be given for attendance at scientific meetings held in Canada. There is no need to budget costs for traveling to consortium retreats.

**Miscellaneous Expenditures.** List specific amounts for each item.

**Total Amount Requested.** Budget totals should reflect a maximum duration of 6 years. Enter the sum of all years of requested direct costs and round to the nearest thousand dollars. Indirect costs are not allowed.

## 6. JUSTIFICATION OF BUDGET

Include budget justification on the template provided. Justify all items costing over \$5,000, as well as your needs for personnel, supplies, travel, and other miscellaneous items. If the budget includes a request for funds to be expended outside the United States or its territories, include an explanation of why such costs are essential for the successful conduct of the project, and why there are no alternatives. Provide details of contractual arrangements with key personnel in this section.

## 7. REFERENCES (PAGE 5.1)

The list of references should correspond to the citations listed in the sections starting on Page 4.1. References should be listed numerically in order of their appearance in the text. Each literature citation should include the names of all authors, year of publication, the title of the article, the name of the book or journal, volume number, and inclusive page numbers. There is **no page limit** for the list of references.

## 8. LETTERS OF RECOMMENDATION (PAGE 6.1)

List the name, title, and address of three individuals from whom you have requested letters of recommendation. These individuals must also be listed in the appropriate section of the electronic application. Listing them electronically will result in them being contacted immediately by email with a request to provide a reference and instructing them on how to submit the reference to proposalCENTRAL. You will see when the letters have been sent in, but they are submitted blindly. **You will not be able to submit the application** until all the letters have been provided to the site.

## 9. INSTITUTIONAL AND/OR DEPARTMENTAL COMMITMENT (PAGE 7.1)

Using the template provided, describe the institution's commitment to the research program of the candidate. The department head, dean, or equivalent official must complete this section.

## 10. ENVIRONMENT (PAGE 8.1)

Briefly describe the environment available as it relates to the research program of the candidate. The department head, dean, or equivalent official must complete this section.

## **11. APPENDIX TO APPLICATION**

All supplementary materials (C.V., key reprints, preprints, etc.) included in the Appendix should be listed in the Table of Contents (Page 1.1 of the application).

## **IV. REVIEWER GUIDELINE CRITERIA**

For each section, focus on the strengths and weaknesses. Your final score should align with your written critique.

### **1. INVESTIGATOR**

Assess the impact, to date, that the applicant has had on cancer research, with a focus on contributions to the cancer stem cell field. Evaluate the unique contributions of the investigator and whether he/she continues to be a leader in the cancer stem cell field. Is he/she likely to continue to be a leader into the future? Are their contributions more intellectual or technical in nature? Consider the content of the Letters of Recommendation when critically evaluating the applicant.

### **2. STRATEGIC PLAN FOR THE CONSORTIUM**

Does the applicant provide a feasible and innovative plan for creating and sustaining a highly collaborative community? Does the plan integrate networking, career development, and data sharing opportunities? Does the applicant have unique resources that could be leveraged to benefit members of the consortium for scientific and/or career advancement? Do the proposed activities address gaps in the cancer stem cell field? Are there plans to measure and encourage membership engagement, research translation, and research impact?

### **3. RESEARCH PROGRAM**

Evaluate the significance, cancer relevance, and novelty of the overall research program. Is the applicant's cancer research program addressing a critical unmet need in innovative ways? Does this program have a likelihood of continued high impact discoveries for cancer stem cell research and beyond?

### **4. PROPOSED PROJECT**

Evaluate the significance, cancer relevance, and novelty of the proposed project. The research plan is not intended to be as specific or detailed as an ACS research grant (i.e., Research Scholar Grant) but must be scientifically sound, justified, and include a novel aspect of work for the investigator. The award is intended to support the testing of innovative ideas, not simply to supplement ongoing projects. Does the proposed project explore a new direction (technically and/or conceptually) rather than a continuation of current investigations? Is the applicant proposing a creative use of the discretionary funds? Are there other investigators doing similar work?

## INTERDISCIPLINARY TEAM AWARD INSTRUCTIONS

### I. THE GRANT APPLICATION SYSTEM

- a. This is an invite-only process following submission of a Letter of Intent (LOI). An email from proposalCENTRAL will be sent inviting the Team PI to submit the Consortium Team Award application. The application will be created in the PI's proposalCENTRAL account and can be found in the "proposals" tab. Click on "edit" to access the application materials.
  
- b. **Enable Other Users to Access this Proposal:** To assist in the development and submission of the Interdisciplinary Award application, applicants may allow others (e.g., institutional administrators, collaborators, or the partnering institution or group) to view, edit, or submit the proposals by following these steps in proposalCENTRAL:
  - Click the blue Proposals tab and the Edit button next to the appropriate application.
  - Click the "Enable Other Users to Access this Proposal" section in the gray menu on the left.
  - Add the e-mail address of the User at the bottom and click the Find User button.
  - Select the appropriate access level from the drop down in the "Permissions" column and click the Accept Changes button. The possible access levels are:
    - **View:** View only; cannot change any details.
    - **Edit:** Can view and change information in the application; cannot submit the application or view the "Enable Other Users to Access this Proposal" screen.
    - **Administrator:** Can view, edit, and submit the application; can give access rights to others on the "Enable Other Users to Access this Proposal" section.
  
- c. **Technical Assistance:** Detailed information is available through tutorials provided on the proposalCENTRAL login page. If you have problems accessing or using the electronic application process, click on "Help" or contact ALTUM Customer Service at [pcsupport@altum.com](mailto:pcsupport@altum.com) or 1-800-875-2562.

### II. APPLICATION TEMPLATES

An application consists of several sections that must be uploaded before the application is submitted. Templates for these sections are available once an application is started on proposalCENTRAL.

The templates must be downloaded to a computer and completed offline. Detailed below are the instructions for completing the individual sections. *The sections must be converted into .pdf documents before being uploaded. Please see proposalCENTRAL's FAQ or call support at 1-800-875-2562 if you need assistance.*

#### 1. TABLE OF CONTENTS (PAGE 1.1)

The Table of Contents is pre-numbered and should be limited to 2 pages, including an itemized list of contents in the Appendix.

#### 2. BIOGRAPHICAL SKETCH OF APPLICANT (PAGE 2.1)



Complete the NIH Biosketch template. Follow the formats and instructions provided by the NIH.

### **3. REPLY TO PREVIOUS REVIEW (PAGE 3.1)**

*IF THE APPLICATION IS A NEW SUBMISSION*, upload the provided template with “Not Applicable” in the body.

All resubmissions must create a new application on proposalCENTRAL.

For resubmissions, address the points raised in the previous critiques and direct the reviewer to the specific sections of the text, figures, or tables where edits have been made. Revisions should be easily identifiable in the revised application (e.g., bold type, italicized, or underline type). This section should not exceed 3 pages.

### **5. PREVIOUS CRITIQUES (RESUBMISSIONS ONLY)**

To access your previous critiques, go to the “Submitted” page, select “View Review Info,” click “Print” to save it as a .pdf. Upload the document to your new application with the other proposal sections.

### **6. RESEARCH PLAN AND ENVIRONMENT (PAGE 4.1)**

**Section A below should not exceed 1 page. Sections B-E below must not exceed 12 pages. This page limit does not include Sections F-I.**

Proposals should be realistic in terms of work to be accomplished for the project proposed for funding. Failure to conform to the guidelines on type size, page length, or project scope may result in the application being returned to the investigator without review.

#### **A. Hypothesis and Specific Aims (1 page max)**

List the hypotheses, objectives, and goals of the research proposed. In addition, state the anticipated impact of the cancer stem cell focused research.

#### **B. Background and Significance (B through F, 12 pages max)**

Concisely summarize and critically evaluate related work done by others. Specifically state how the successful completion of the proposed work will advance scientific knowledge to advance the understanding of cancer stem cells and to leverage this knowledge to design and test innovative strategies to prevent cancer stem cells from contributing to treatment resistance, metastasis, disease recurrence, and/or cancer mortality.

#### **C. Innovation**

- Explain how the application challenges and seeks to shift current research understanding or clinical practice paradigms.
- Describe how the research question(s) was developed and how insight from team members of various disciplines was used to create study aims, research design, and methods.
- Describe how the research proposes meaningful improvements or addresses critical gaps.
- Describe any novel theoretical concepts, approaches or methodologies, instrumentation, or intervention(s) to be developed or used.

- Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation, or interventions.

#### **D. Preliminary Studies and Previous Experience**

Provide results of research accomplished by you or team members that are relevant to this proposal in a sufficiently comprehensive manner to indicate their significance.

- For existing teams, provide a succinct summary of the previous work including specific accomplishments pertinent to the proposed scope of work.
- If the partnership is new, describe how the collective assets of the team will facilitate the success of this study and provide the foundation for future collaboration.

Note that the entire research plan is considered confidential, including reports of unpublished research.

#### **E. Research Design and Methods**

State the study design and describe your proposed implementation methods in enough detail to permit evaluation by other scientists.

- Describe the plan for data collection and analysis. Discuss potential difficulties and limitations of the methods and procedures and provide alternative approaches.
- Order your priorities and estimate the length of time required to complete each specific aim. Although the time estimated should not exceed the term for which support is requested, it is helpful to state how this project fits into the long-term research goal(s).

#### **F. Experimental Details (3 pages max)**

Use this section for a concise summary of how the team will function, metrics of progress, and what will be actionable from the research-translation to practice and future research plans. **The following details should also be included:**

- **Leadership Plans:** Describe how the team will function in an integrated way to achieve their specific aims including team roles and responsibilities; decision making and problem-solving processes; monitoring and reporting progress; meeting mode and frequency; and communication strategy for planning and dissemination.
- **Project Timeline:** Include a timeline with milestones for the project period.
- **Potential for Knowledge Transfer (required):** Clearly define your plan about how the results of the study will be used to inform future translational, clinical and/or implementation research.

#### **G. Environment**

Briefly describe the space and equipment available for you to carry out the proposed research project. Investigators must have an institutional commitment of research facilities. The amount of committed space must be verified by the Department Chair. This section is of major importance for applicants whose appointment is not in the tenure stream.

#### **H. Statement of Science Outreach and Advocacy (1 page max)**

The ACS considers it important that scientists communicate the results of their research to a wide range of communities. Explain the potential impact of your proposed project on your community and to the American Cancer Society's mission of eliminating cancer as a major health problem.

Share any previous experiences in science outreach and advocacy. Describe the plan for disseminating the team's work in the cancer arena through advocacy, awareness, education, or service. Also include your plans for sharing your research with your (non-academic) community members and for engaging with community partners in the dissemination process.

## I. References

The list of references should correspond to the citations under headings a-d above. Each literature citation should include the names of all authors, title, book or journal, volume number, page numbers, and year of publication. There is no page limitation for the list of references.

## 7. DETAILED BUDGET

Interdisciplinary Team Awards may not exceed \$200,000 per year in direct cost plus 20% indirect cost. The total maximum allowable budget is \$1.2M inclusive of indirect costs for five years.

### A. Personnel

List the name and position of all key personnel and the percentage of time they will devote to the project, even when salary is not requested (in-kind).

- The **Lead PI** must list at least 10% time and effort to the proposed research.
- List all **Team Principals** and **Team Investigators**; **Team Principals** must list at least 10% time and effort to the proposed research.
- List all **collaborators** (defined as people who will participate actively in the design and/or execution of the studies). Details of contractual arrangements with collaborators should be provided in the Justification of Budget section of the application. If the person has not been selected, please list as "vacancy."
- Include **consultants** in the budget as subcontractors. Consultants are not considered key personnel but rather are defined as people who will provide any combination of advice, guidance, and reagents but do not commit any specified measurable effort (i.e., person months).
- Personnel may receive **salary support** up to a maximum that equals the National Cancer Institute salary cap, prorated per their percent effort on the project.
- Give the costs to the institution of **employee fringe benefits** as a percent of the employee's salary. Prorate the amount of fringe benefits requested to the salary requested. For example, if 10% of a team member's annual salary is requested then no more than 10% of that member's annual cost for fringe benefits can be requested.

### B. Equipment

- **Permanent equipment:** Defined as items of nonexpendable property with a purchase cost per unit that equals or exceeds \$5,000 with a useful life of more than 1 year. List separately and justify the need for each item of permanent equipment. **Note:** The cost of permanent equipment **is not included** in the Direct Cost total used to calculate Indirect Costs.
- **Small or expendable equipment:** Defined as expendable property with a purchase cost per unit that is less than \$5,000 and/or that has a short service life (<1 year). **Note:** The cost of small or expendable equipment **may be included** in the Direct Cost total used to calculate Indirect Costs.

- **General purpose equipment:** Equipment such as computers or laptops used primarily or exclusively in the actual conduct of the proposed scientific project are considered direct cost and may be included in the Direct Cost total used to calculate Indirect Costs. Computers, laptops, or other general-purpose equipment that will be used on multiple projects or for personal use should not be listed as a direct cost and should not be included in the calculation for indirect cost.

**C. Supplies.** Group into major categories (glassware, chemicals, radioisotopes, survey materials, animals).

**D. Travel.** Travel funds are restricted for domestic travel within the US, its territories, and Canada.

**E. Miscellaneous Expenditures.** List specific amounts for each item; examples of expenditures allowed include publication costs, special fees (e.g. pathology, computer time and scientific software, and equipment maintenance).

**F. Subcontracts**

If any portion of the proposed research is to be carried out at **another institution**, enter the total costs and provide a categorical breakdown of costs using duplicate copies of the pages for the grant application Budget and Justification of Budget.

- Subcontracts required to complete the research project may be with **public or private** institutions provided they are not in violation of ACS policies.
- Subcontracts involving a **contractor residing outside the borders of the US** are not permitted unless the applicant can document that it is not feasible to have the work performed within the US.

**Note:** Use of any subcontractor outside the US **must be approved in writing** by ACS before any grant-funded work is done.

- **Administrative pages:** Include a Letter of Agreement pertaining to the subcontract in the Appendix.

**G. Indirect Costs**

To help the institution provide proper laboratory and clinical facilities, an indirect cost allowance of up to 20% of the direct costs is permitted, excluding permanent equipment. Indirect costs for a subcontract budget may be claimed by either the primary or the secondary institution, but not both. Indirect costs can be provided to the secondary institution through negotiation with the Principal Investigator’s institution but the total amount of indirects, inclusive of subcontracts, may not exceed 20% of the award.

**H. Total Amount Requested**

Budget totals should reflect a maximum duration of five years inclusive of direct and indirect costs. Enter the sum of all years of requested support including indirect costs, and round to the nearest thousand dollars. Transfer this figure to the title page of the online application.

**8. JUSTIFICATION OF BUDGET**

Justify the need for personnel, supplies, travel, miscellaneous items, and all items of permanent equipment costing over \$5,000. If the budget includes a request for funds to be expended outside the US, its territories, or the Commonwealth of Puerto Rico, this section should include

an explanation of why such costs are essential for the successful conduct of the project, and why there are no alternatives.

## 9. BIOGRAPHICAL INFORMATION OF KEY PERSONNEL (PAGE 5.1)

Complete the NIH Biosketch template. **Note:** Follow the formats and instructions provided by the NIH.

## 10. OTHER SUPPORT (PAGE 6.1)

The ACS does not fund projects that are supported all or in part by another agency. Projects are considered to overlap if there are any shared *Specific Aims or areas of budgetary overlap*. The ACS Scientific Director makes final decisions regarding any questions of overlap.

The only exceptions are:

- Funds provided by the institution as start-up support to develop a new laboratory or to gather pilot data; and
- Awards that provide only salary support for the PI. In the latter case, if the salary support for the PI's contribution to the project is covered by the other agency, no additional salary support for the PI may be requested from the ACS.

Provide the following information separately for the PI and all other Key Personnel:

**A. Current Support.** List all current funding from intramural and extramural sources (e.g., institutional awards and grants from for-profit and not-for-profit agencies, including other grants from the ACS). Provide for each award:

- a. Source of funds
- b. Grant number
- c. Project title
- d. Inclusive dates of approved or proposed project. For example, in the case of NIH support, provide the dates of the approved or proposed competitive segment.
- e. Total direct costs
- f. Percent effort or person-months. For an active project, use person months, even if unsalaried for the current budget period. Classify person-months as academic, calendar, and/or summer.
- g. An outline of the goals of the project in a brief paragraph.
- h. A clear indication of overlap and differences between this grant and the proposed study. If necessary, include an explanatory letter in the Appendix.

**B. Pending Support.** List all pending applications for funding from intramural and extramural sources (e.g., institutional awards and grants from for-profit and not-for-profit agencies, including other grants from the ACS).

- a. Source of funds
- b. Project title
- c. Inclusive dates of approved or proposed project. For example, in the case of NIH support, provide the dates of the approved or proposed competitive segment.
- d. Total direct costs

- e. Percent effort or person-months. For an active project, use person months, even if unsalaried, for the current budget period. Classify person-months as academic, calendar, and/or summer.
- f. An outline of the goals of the project in a brief paragraph.
- g. A clear indication of overlap and differences between this grant and the proposed study. If necessary, include an explanatory letter in the Appendix. In such cases, you may accept only one award if both are approved for funding. The ACS does not negotiate partial funding of grants with overlapping specific aims.

Please notify the Scientific Director if a pending extramural grant, that affects the feasibility of the PI's proposed effort or imposes scientific overlap, is funded during ACS peer review.

**C. Institutional Support.** *Required for only the Team Lead PI, Team Principal(s), and Team Investigator(s).*

- a. For early-stage investigators, a description of any start-up funds provided by the institution to the applicant. An award of start-up funds does not decrease the likelihood of ACS support, and can be important evidence of institutional commitment.
- b. Details of the institutional commitment to support the applicant's salary.
- c. The current term of the applicant's appointment.

These details should be confirmed by the Department Chair in the Statement of Institutional Support included in Section 13, below.

Non-tenure track applicants should also include a more detailed description of the space committed to the project. If the applicant is in the same department as a previous mentor, provide information on the relationship between the mentor's research space, and the space available for the project, and the relationship between funded research projects in the mentor's laboratory and the present application. Documentation should be included in the Statement of Institutional Support (Section 13, below) written by the Department Chair.

**11. LIST OF LETTERS OF SUPPORT FROM COLLABORATORS/CONSULTANTS (PAGE 7.1)**

Provide a list of collaborators/consultants and upload the letter from each of them as an attachment. The letter should outline the role that person will play with enough detail for evaluation of the value of that person's contribution. You are not required to use the template.

**12. COMPLIANCE STATEMENTS (PAGE 8.1)**

**Human Subjects**

**Selection of study population.** When conducting research on humans, provide the rationale for selecting your target population. Include the involvement of children, minorities, and especially vulnerable populations such as neonates, pregnant women, prisoners, institutionalized individuals, or others who may be considered vulnerable populations or others who may be considered vulnerable populations. The institution is required to ensure IRB approval is obtained for the grant to start, and the approval documentation is uploaded into proposalCENTRAL within 3 months of grant activation.

On the planned enrollment form, estimate the total number of subjects by primary ethnicity and race, race/ethnicity subgroup (if applicable), and gender. Include a rationale for excluding any population. Estimate the planned enrollment based on these calculations.

Also include estimates of the sample distribution by gender, race, and ethnicity (if available). For example, if your sample size is 200, to complete the *total number of subjects* column by race (based on what you know about the population demographics or the existing dataset you plan to analyze), multiply by the estimated percentage.

Estimated percentage of the population by race	Estimated total number of subjects
50% White	100 (200 x 0.50)
49% AA	98 (200 x 0.49)
1% Asian	2 (200 x 0.01)

For applicants performing research with non-human subjects, check the box that most appropriately describes your research.

**Potential benefits, risks, and knowledge gained.** Succinctly describe the potential benefits and risks to subjects (physical, psychological, financial, legal, or other). Explain why the risks are reasonable in relation to the anticipated benefits, both to research participants and others. Where appropriate, describe alternative treatments and procedures, including the risks and potential benefits to participants.

**Research specimens and data.** If the proposed research involves biospecimens, explain how the research material will be obtained from living subjects and what materials will be collected. List any specific non-biological data, such as demographic information, and how it will be collected, managed, and protected. Specify who will have access to such data and what measures you will maintain to keep personally identifiable private information confidential.

**Collaborating sites.** Where appropriate, list any collaborating sites where research on human subjects will be performed and describe the role of those sites and collaborating investigators in performing the proposed research. Explain how data from the site(s) will be obtained, managed, and protected.

\*For additional protections for vulnerable populations, see <http://www.hhs.gov/ohrp/policy/populations/index.html>.

### **Vertebrate Animals**

IACUC approval must be obtained before animal work begins. An IACUC approval letter must be uploaded to proposalCENTRAL immediately upon approval.

Provide your rationale for using live vertebrate animals including the:

1. Necessity for using the animals and species proposed;
2. Appropriateness of the strains, ages, genders of the animals to be used;
3. Justifications for, and appropriateness of, the numbers of animals proposed. When completing the Targeted Enrollment Table, select non-human subjects research and check the box that most appropriately describes your research.

### **Biohazards**

Briefly describe whether any materials or procedures proposed are potentially hazardous to research personnel, equipment, and/or the environment. What protections will mitigate such risks? Include biological and chemical hazards, if applicable.

### **Authentication of Key Biological and/or Chemical Resources**

Briefly describe methods to ensure the identity and validity of key biological and/or chemical resources to be used in the proposed studies. These resources may or may not be generated with ACS funds and:

- may differ from laboratory to laboratory or over time;
- may have qualities and/or qualifications that could influence the research data; and
- must be integral to the proposed research.

These may include, but are not limited to, cell lines, specialty chemicals, antibodies, and other biologics. Researchers should transparently report how they have authenticated key resources, so consensus can emerge.

Standard laboratory reagents that are not expected to vary do not need to be included in the plan (e.g., buffers and other common biologicals or chemicals). After reviewers assess the information you provide in this Section, their questions will need to be addressed prior to an award.

In this section, focus only on authentication and/or validation of key resources to be used in the study. Include all other information within the page limits of the research strategy. Applications that fail to comply may be dismissed.

### **13. STATEMENT OF INSTITUTIONAL SUPPORT (PAGE 9.1)**

The Lead PI must include a letter from the Department Chair (or equivalent) with the application. This letter should clearly state the commitment of the institution to support you and your research program. Details should include, but are not limited to, salary support, dedicated space for the research proposal, startup funds, and the amount of protected time for clinical researchers (if applicable). The letter should also describe the Department's long-term goals for your career.

A letter of institutional support is *optional* for the Team Principal(s) and Investigator(s), but highly encouraged, especially if there are considerations beyond the information included in Institutional Support (Section 7C) and the required letter of support from these key personnel or if these team members are at different institutions than the Lead PI.

### **14. APPENDIX TO APPLICATION**

You may upload and submit other key documents as part of your application. However, applicants are urged to keep this section as brief as possible.

Appended materials may include:

- Letters of support
- Recent reprints or preprints (optional)
- Clinical Protocols (if applicable)

It is not necessary to number the pages of the Appendix, but please list by categories (i.e., reprints, preprints, etc.) in the Table of Contents of the application.



## **II. REVIEWER GUIDELINE CRITERIA**

For each section, focus on the strengths and weaknesses. Your final score should align with your written critique.

### **1. ALIGNMENT WITH ACS RESEARCH PRIORITY AREAS AND CONSORTIUM GOALS**

Has the team identified and appropriately justified how their project fits within one or more ACS research priority areas? Have they appropriately justified how their project aligns with the goals of the consortium to advance the understanding of cancer stem cells and leverage this knowledge to accelerate patient impact?

### **2. CANDIDATES/TEAM**

Provide an overall evaluation of the candidacy of key research team members. Specifically, assess the Lead PI's academic, clinical, and/or scientific qualifications and their commitment to cancer-related research. Evaluate his/her qualifications considering the following items: education; training (board-eligible or board-certified, if applicable); research experiences; and scholarly successes including the number and impact of peer-review publications. Do the Team Principal(s) and Team Investigator(s) bring a diversity of skills, expertise, and perspectives to the team? Does their education, training, research program, and collaborations (past and current) provide evidence of productivity and distinction?

### **3. REPLY TO PREVIOUS REVIEWS [IF APPLICABLE]**

Note whether this is a resubmission and comment on adequacy of response to critiques.

### **4. RESEARCH PLAN**

Provide a brief overview of the project. In the following sections focus on the strengths and weaknesses, rather than summarizing.

### **5. RESEARCH PLAN – SIGNIFICANCE AND CANCER RELEVANCE**

Does the project address an important problem or a critical barrier to progress in the field? If the aims of the project are achieved, how will scientific knowledge, technical capability, and/or clinical practice improve? How will successful completion of the aims change the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field? How is this research relevant or how will it impact persons at risk for, or living with, cancer or their family/caregivers? The relevance to cancer may be indirect, but the connection must be clearly articulated by the applicant.

### **6. RESEARCH PLAN – INNOVATION/IMPROVEMENT**

What is the potential that the proposed team science will challenge and seek to shift current research understanding or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions? Does the research propose meaningful improvements or address critical gaps?

### **7. RESEARCH PLAN – LEAD PI/RESEARCH TEAM**

Does the research team have the training and experiences needed to carry out the proposed research? Are there feasible and well-articulated plans for communicating as well as the sharing resources and data amongst the team?

## 8. RESEARCH PLAN – APPROACH

Are the study design, methods for implementation, data collection and analysis appropriate for answering the research question(s)? Where appropriate, are proposed recruitment and/or case ascertainment methods well developed? If applicable, is there a plan for recruiting under-represented subjects? Is the sample size adequate? Is the research timeline realistic? Are potential pitfalls, alternative approaches, and future plans articulated?

## 9. RESEARCH PLAN – ENVIRONMENT AND RESOURCES

Will the scientific environment and institutional support contribute to the probability of success? Will the project benefit from unique features of the scientific environment, subject populations, or collaborative arrangements? If Team Investigator(s) are early-stage researchers, are there competitive start-up funds to support the proposed subproject(s)?

## 10. STATEMENT OF SCIENCE OUTREACH AND ADVOCACY

FEEDBACK OPTIONAL, THIS SECTION SHOULD NOT BE CONSIDERED IN SCORING.

Does the outreach and advocacy plan present any concerns (including, but not limited to, research compliance, participant safety, and/or feasibility)? Do you have any suggestions to improve the plan?

## 11. BUDGET

NOT TO BE CONSIDERED IN SCORING

Evaluate the overall budget and individual budget categories with respect to the award cap and the project aims. Are the budget items justified, specified, and accurate? Is the project duration and the percent effort of key personnel appropriate? Is there potential overlap with other funded research of the Lead PI, Team Principal(s), or Team Investigator(s)? If the budget includes a request for funds to be expended outside the United States or its territories, is there an explanation of why such costs are essential for the successful conduct of the project, and why there are no alternatives? Describe any suggested budget changes using specific amounts or percentages.

***It is the policy of the American Cancer Society not to fund projects that are supported all or in part by another agency.***

## 12. COMPLIANCE STATEMENTS

NOT TO BE CONSIDERED IN SCORING

- 1. Human Subjects:** If applicable, evaluate the plans for protection of human subjects from research risks justified in terms of the scientific goals and research strategy proposed. For example, are the potential benefits and risks to subjects articulated reasonable and appropriate given the study design? Are their plans for conducting sub-analysis by group, data security and confidentiality, biohazards and data and safety monitoring adequate?
- 2. Inclusion of Women, Minorities, and Children:** When the proposed project involves human subjects, evaluate the adequacy of the proposed plans for inclusion or exclusion of minorities, male and female genders, as well as children.
- 3. Vertebrate Animals:** Evaluate the plan for live, vertebrate animals as part of the scientific assessment according to the following points: 1) necessity for the use of the animals and species proposed; 2) appropriateness of the strains, ages, and gender; 3) justifications for, and appropriateness of, the numbers of animals.

- 4. Biohazards:** Assess whether materials or procedures proposed are potentially hazardous to research personnel and/or the environment, and if needed, determine whether adequate protection is proposed.

## RESEARCH SCHOLAR GRANT INSTRUCTIONS

### I. PREPARING THE APPLICATION

#### 1. COVER PAGES

Complete all fields, which include mandatory e-signature for the PI. We provide text boxes for e-signatures for the departmental chair (or equivalent) and institutional officials to accommodate institution-specific requirements for proposal submissions, but neither is required for submission to ACS. Note: the PI must enable other users' access to the application on proposalCENTRAL to permit their e-signatures. If you have received a letter from the ACS Eligibility Committee, indicate that in the Program Eligibility information section and upload the correspondence in the Appendix. See Part A General Instructions for more details.

#### 2. APPLICATION TEMPLATES

Once an application is started on proposalCENTRAL, all necessary application templates are available to download. Complete off-line (described in individual sections below) and upload as .pdf documents before submitting the online application. *For assistance, see proposalCENTRAL's FAQ or call support at 1-800-875-2562.*

#### 3. TABLE OF CONTENTS (PAGE 1.1)

Complete the Table of Contents by indicating the appropriate page numbers for the Research Plan section; limit the length of the Table of Contents to 2 pages.

#### 4. BIOGRAPHICAL SKETCH OF APPLICANT (PAGE 2.1)

Complete the current NIH Biosketch template, following the formats and instructions provided by the NIH. The Biographical Sketch may not exceed 5 pages.

#### 5. REPLY TO PREVIOUS REVIEW (PAGE 3.1)

*IF THE APPLICATION IS A NEW SUBMISSION, upload the provided template with "Not Applicable" in the body.*

**All resubmissions must create a new application on proposalCENTRAL.**

For resubmissions, address the points raised in the previous critiques and direct the reviewer to the specific sections of the text, figures, or tables where edits have been made. Revisions should be easily identifiable in the revised application (e.g.: bold type, italicized, or underline type). This section should not exceed 3 pages.

#### 6. PREVIOUS CRITIQUES (resubmissions only)

Go to the "Submitted" page, select "View Review Info," click "Print" to save it as a .pdf. Upload the document to your new application with the other proposal sections.

#### 7. RESEARCH PLAN AND ENVIRONMENT (PAGE 4.1)

Section (A) below (Specific Aims) should not exceed 1 page. Sections (B) through (E) below must not exceed 12 pages. This page limit does not include Sections (F) through (I).

The same proposal may be submitted to multiple funding agencies on an “either/or” basis, but ACS proposals must conform to our guidelines (including term and budget). If not, a proposal may be returned without review.

- A. Specific Aims** (*not to exceed 1 page*). List the objectives and goals of your proposed research and briefly describe the scientific aims.
- B. Background and Significance.** Concisely summarize and critically evaluate relevant work done by your laboratory and others. Specifically state how the successful completion of the work proposed will advance scientific knowledge to advance the understanding of cancer stem cells and to leverage this knowledge to design and test innovative strategies to prevent cancer stem cells from contributing to treatment resistance, metastasis, disease recurrence, and/or cancer mortality.
- C. Innovation.**
- If applicable, explain how the application challenges and seeks to shift current research or clinical-practice paradigms.
  - Describe any novel theoretical concepts, approaches, methodologies, instrumentation, or intervention(s) to be developed or used, and the advantage they offer over existing ones.
  - Explain any refinements, improvements, or new applications of theoretical concepts, approaches, methodologies, instrumentation, or interventions.
- D. Preliminary Studies.** Provide results of your prior research that are relevant to this proposal; reprints or preprints may be included in the Appendix. Note that the entire research plan is considered confidential.
- E. Research Design.** Describe your overall hypothesis, proposed methods, procedures, and data analysis in sufficient detail to permit evaluation by other scientists; include your rationale for approaches and analysis. Explain your project’s feasibility and how the experiments proposed will address the Specific Aims. Discuss potential difficulties and limitations of your proposed methods and provide alternative approaches. Inclusion of an experimental timeline can be helpful.
- F. Experimental Details** (*optional – not to exceed 3 pages*). This section is available if more in-depth descriptions of the experimental design, technologies, or assays are needed to convey the specific approaches and procedures proposed.
- G. Environment.** Briefly describe the space and equipment available to carry out the proposed research (e.g., space designated specifically for your research program, shared space and/or core facilities). Investigators must have an institutional commitment of research facilities, and the amount of committed space must be verified (see Statement of Institutional Support in Section 14 below). This section is required and especially important for all non-tenure track applicants.
- H. Statement of Science Outreach and Advocacy** (*not to exceed 1 page*). ACS considers it important that scientists communicate the results of their research to a wide range of communities. Explain the potential impact of your proposed project on your community and to the ACS’s mission to save lives, celebrate lives, and lead the fight for a world without cancer. Share any previous experiences in science outreach and advocacy. Describe your plans for disseminating your work in the cancer arena through advocacy, awareness, education, or service.

Please include your plans for sharing your research and research findings with your (non-academic) community members and for engaging with community partners in the dissemination process.

- I. **References.** Each literature citation should include title, authors, book or journal, volume number, page numbers, and year of publication. There is no page limitation; this section is not included in the 12-page limit of Sections (B) through (E).

## 8. DETAILED BUDGET

Complete the budget page located online at proposalCENTRAL.

- A. **Personnel.** Names and positions of all key personnel must be individually listed, and the percentage of time to be devoted to the project by each person should be entered. List all key personnel (defined as individuals who will participate actively in the design and/or execution of the studies) other than the PI. Details of contractual arrangements with key personnel should be provided in the Justification of Budget section.

If the individual has not been selected, please list as "vacancy." Personnel may receive salary support up to a maximum that equals the NIH salary cap, prorated according to their percent effort on the project. If a Key Person is not receiving salary, you can request \$0 for salary, but their percent effort is still required. Their effort and contribution to the project should be outlined in the Budget Justification even if they are not being compensated.

The costs to the institution of employee fringe benefits should be indicated as a percent of the employee's salary. The amount of fringe benefits requested must be prorated to the salary requested. For example, if 50 percent of an individual's annual salary is requested, then no more than 50 percent of that individual's annual cost for fringe benefits can be requested.

**NOTE:** The Society does not cover the costs of student tuition or fees for graduate or undergraduate students.

### B. Equipment

- **Permanent equipment.** Defined as items of nonexpendable property with a purchase cost per unit that equals or exceeds \$5,000 with a useful life of more than one year. List separately and justify the need for each item of permanent equipment. Note: the cost of permanent equipment is not included in the direct cost total used to calculate indirect costs.
- **Small or expendable equipment.** Defined as expendable property with a purchase cost per unit that is less than \$5,000 and/or that has a short service life (<1 year). Note: Equipment that equals or exceeds \$5,000 with a useful life of more than one year is not included in the direct cost total used to calculate indirect costs.
- **General purpose equipment.** Equipment such as computers used primarily or exclusively in the actual conduct of the proposed scientific project are considered direct costs and may be included in the direct cost total used to calculate indirect costs. Computers or other general-purpose equipment that will be used on multiple projects or for personal use are not allowable expenditures.

- C. **Supplies.** Group supplies into major categories (e.g., glassware, chemicals, radioisotopes, survey materials, animals, etc.).

- D. Travel.** Domestic travel only; special consideration will be given for attendance at scientific meetings held in Canada.
- E. Miscellaneous Expenditures.** List specific amounts for each item. Examples of allowed expenditures include publication costs and special fees (e.g., pathology, computer time and scientific software, and equipment maintenance).
- F. Subcontracts.** If any portion of the proposed research is to be carried out at another institution, enter the total costs (direct) on the online budget detail page on proposalCENTRAL. Then provide a categorical breakdown of costs using the Subcontractor Budget and Justification form, using one form per subcontractor. Upload the form(s) when complete, entering the subcontractor's name in the "describe attachment" field.

Subcontracts for the research project may be with public or private institutions, provided they do not violate ACS policies. Subcontracts involving a contractor residing outside the borders of the United States are not permitted, unless the applicant can document that it is not feasible to have the work performed within the United States.

Administrative pages: A Letter of Agreement between institutions pertaining to the subcontract should be included in the Appendix.

- G. Indirect Costs.** To help the institution provide proper laboratory and clinical facilities, the Society will permit an indirect cost allowance of up to 20% of the direct costs, excluding permanent equipment. If there is a subaward(s), indirect costs can be provided to the secondary institution through negotiation with the Principal Investigator's institution but the total amount of indirect costs, inclusive of subcontracts, may not exceed 20% of the award.
- H. Total Amount Requested.** Budget totals should reflect a maximum duration of 4 years. The maximum allowable budget is \$792,000: \$165,000 direct costs per year and 20% indirect costs for the 4-year project period.
- The Society and its peer review committees expect applicants to show judicious use of proposed funds in all grant applications. Enter the sum of all years of requested support, including indirect costs, and round to the nearest thousand dollars. Transfer this figure to the title page of the online application.

## 9. JUSTIFICATION OF BUDGET

Provide budget justification on the template provided. Justify all items of permanent equipment costing over \$5,000, as well as your needs for personnel, supplies, travel, and other miscellaneous items. If the budget includes a request for funds to be expended outside the United States or its territories, include an explanation of why such costs are essential for the successful conduct of the project, and why there are no alternatives.

Provide details of contractual arrangements with key personnel in this section.

## 10. BIOGRAPHICAL INFORMATION OF KEY PERSONNEL (PAGE 5.1)

Provide information for all key personnel involved in the project. Complete the NIH Biosketch template. **NOTE: Follow the format and instructions provided by the NIH.**

## 11. OTHER SUPPORT (PAGE 6.1)

The ACS does not fund projects that are supported all or in part by another agency. Projects are considered to overlap if there are any shared *Specific Aims or areas of budgetary overlap*. The ACS Scientific Director makes final decisions regarding any questions of overlap.

The only exceptions are:

- Funds provided by the institution as start-up support to develop a new laboratory or to gather pilot data; and
- Awards that provide only salary support for the PI. In the latter case, if the salary support for the PI's contribution to the project is covered by the other agency, no additional salary support for the PI may be requested from the ACS.

Provide the following information separately for the PI and all other Key Personnel:

- i. **Current Support.** List all current funding from intramural and extramural sources (e.g., institutional awards and grants from for-profit and not-for-profit agencies, including other grants from the ACS). Provide for each award:
  - a. Source of funds
  - b. Grant number
  - c. Project title
  - d. Inclusive dates of approved or proposed project. For example, in the case of NIH support, provide the dates of the approved or proposed competitive segment.
  - e. Total direct costs
  - f. Percent effort or person-months. For an active project, use person months, even if unsalaried for the current budget period. Classify person-months as academic, calendar, and/or summer.
  - g. An outline of the goals of the project in a brief paragraph.
  - h. A clear indication of overlap and differences between this grant and the proposed study. If necessary, include an explanatory letter in the Appendix.
  
- B. **Pending Support.** List all pending applications for funding from intramural and extramural sources (e.g., institutional awards and grants from for-profit and not-for-profit agencies, including other grants from the ACS).
  - a. Source of funds
  - b. Project title
  - c. Inclusive dates of approved or proposed project. For example, in the case of NIH support, provide the dates of the approved or proposed competitive segment.
  - d. Total direct costs
  - e. Percent effort or person-months. For an active project, use person months, even if unsalaried, for the current budget period. Classify person-months as academic, calendar, and/or summer.
  - f. An outline of the goals of the project in a brief paragraph.
  - g. A clear indication of overlap and differences between this grant and the proposed study. If necessary, include an explanatory letter in the Appendix. In such cases, you may accept only one award if both are approved for



funding. The ACS does not negotiate partial funding of grants with overlapping specific aims.

Please notify the Scientific Director if a pending extramural grant, that affects the feasibility of the PI's proposed effort or imposes scientific overlap, is funded during ACS peer review.

**C. Institutional Support.** Provide the following information for the Principal Investigator only:

- a. For early-stage investigators, a description of any start-up funds provided by the institution to the applicant. An award of start-up funds does not decrease the likelihood of ACS support, and can be important evidence of institutional commitment.
- b. Details of the institutional commitment to support the applicant's salary.
- c. The current term of the applicant's appointment.

These details should be confirmed by the Department Chair in the Statement of Institutional Support included in Section 14, below.

Non-tenure track applicants should also include a more detailed description of the space committed to the project. If the applicant is in the same department as a previous mentor, provide information on the relationship between the mentor's research space, and the space available for the project, and the relationship between funded research projects in the mentor's laboratory and the present application. Documentation should be included in the Statement of Institutional Support (Section 14, below) written by the Department Chair.

## **12. LIST OF LETTERS OF SUPPORT FROM COLLABORATORS/CONSULTANTS (PAGE 7.1)**

Provide a list of collaborators and consultants. Directly upload the letter from each individual collaborator or consultant after page 7.1. The letter should outline the role that person will play with sufficient detail for evaluation of the value of the individual contribution.

## **13. COMPLIANCE STATEMENTS (PAGES 8.1 – 8.3)**

### **Human Subjects**

**Selection of study population.** When conducting research on humans, provide the rationale for selecting your target population. Include the involvement of children, minorities, and especially vulnerable populations such as neonates, pregnant women, prisoners, institutionalized individuals, or others who may be considered vulnerable populations or others who may be considered vulnerable populations. The institution is required to ensure IRB approval is obtained for the grant to start, and the approval documentation is uploaded into proposalCENTRAL within 3 months of grant activation.

On the planned enrollment form, estimate the total number of subjects by primary ethnicity and race, race/ethnicity subgroup (if applicable), and gender. Include a rationale for excluding any population. Estimate the planned enrollment based on these calculations.

Also include estimates of the sample distribution by gender, race, and ethnicity (if available). For example, if your sample size is 200, to complete the *total number of subjects* column by race

(based on what you know about the population demographics or the existing dataset you plan to analyze), multiply by the estimated percentage.

Estimated percentage of the population by race	Estimated total number of subjects
50% White	100 (200 x 0.50)
49% AA	98 (200 x 0.49)
1% Asian	2 (200 x 0.01)

For applicants performing research with non-human subjects, check the box that most appropriately describes your research.

**Potential benefits, risks, and knowledge gained.** Succinctly describe the potential benefits and risks to subjects (physical, psychological, financial, legal, or other). Explain why the risks are reasonable in relation to the anticipated benefits, both to research participants and others. Where appropriate, describe alternative treatments and procedures, including the risks and potential benefits to participants.

**Research specimens and data.** If the proposed research involves biospecimens, explain how the research material will be obtained from living subjects and what materials will be collected. List any specific non-biological data, such as demographic information, and how it will be collected, managed, and protected. Specify who will have access to such data and what measures you will maintain to keep personally identifiable private information confidential.

**Collaborating sites.** Where appropriate, list any collaborating sites where research on human subjects will be performed and describe the role of those sites and collaborating investigators in performing the proposed research. Explain how data from the site(s) will be obtained, managed, and protected.

\*For additional protections for vulnerable populations, see <http://www.hhs.gov/ohrp/policy/populations/index.html>.

### **Vertebrate Animals**

IACUC approval must be obtained before animal work begins. An IACUC approval letter must be uploaded to proposalCENTRAL immediately upon approval.

Provide your rationale for using live vertebrate animals including the:

1. Necessity for using the animals and species proposed;
2. Appropriateness of the strains, ages, genders of the animals to be used;
3. Justifications for, and appropriateness of, the numbers of animals proposed. When completing the Targeted Enrollment Table, select non-human subjects research and check the box that most appropriately describes your research.

### **Biohazards**

Briefly describe whether any materials or procedures proposed are potentially hazardous to research personnel, equipment, and/or the environment. What protections will mitigate such risks? Include biological and chemical hazards, if applicable.

### **Authentication of Key Biological and/or Chemical Resources**

Briefly describe methods to ensure the identity and validity of key biological and/or chemical resources to be used in the proposed studies.

These resources may or may not be generated with ACS funds and:

- may differ from laboratory to laboratory or over time;
- may have qualities and/or qualifications that could influence the research data; and
- must be integral to the proposed research.

These may include, but are not limited to, cell lines, specialty chemicals, antibodies, and other biologics. Researchers should transparently report how they have authenticated key resources, so consensus can emerge.

Standard laboratory reagents that are not expected to vary do not need to be included in the plan (e.g., buffers and other common biologicals or chemicals). After reviewers assess the information you provide in this Section, their questions will need to be addressed prior to an award.

In this section, focus only on authentication and/or validation of key resources to be used in the study. Include all other information within the page limits of the research strategy. Applications that fail to comply may be dismissed.

#### **14. STATEMENT OF INSTITUTIONAL SUPPORT (PAGE 9.1)**

To be completed by the Department Chair (or equivalent); Provide the following information for the Principal Investigator only:

- A description of any start-up funds provided by the institution to the applicant. An award of start-up funds does not decrease the likelihood of ACS support, and can be important evidence of institutional commitment.
- Details of the institutional commitment to support the applicant's salary and research program.
- The current term of the applicant's appointment.

Non-tenure track applicants should also include a more detailed description of the space committed to the project. If the applicant is in the same department as a previous mentor, provide information on the relationship between the mentor's research space, and the space available for the project, and the relationship between funded research projects in the mentor's laboratory and the present application. Documentation should be included as well.

#### **15. APPENDIX TO APPLICATION**

In addition to the application templates, other key documents may be uploaded and submitted as part of the application. However, applicants are urged to keep this section as brief as possible. Appended materials may include:

- Letter from ACS Eligibility Committee confirming eligibility (if applicable)
- Recent reprints or preprints (optional)
- Clinical protocols (if applicable)

## **II. REVIEWER GUIDELINE CRITERIA**

For each section, focus on the strengths and weaknesses. Your final score should align with your written critique.

### **1. ALIGNMENT WITH ACS RESEARCH PRIORITY AREAS AND CONSORTIUM GOALS**

Has the applicant identified and appropriately justified how their project fits within one or more ACS research priority areas? Has the applicant appropriately justified how their project aligns with the goals of the consortium to advance the understanding of cancer stem cells and leverage this knowledge to accelerate patient impact?

## **2. CANDIDATE**

Provide an overall evaluation of the candidate's academic, clinical, and/or scientific qualifications and their commitment to cancer-related research. Assess the qualifications of the applicant considering the following items: goals and commitment to cancer-related research; past education; past training (board-eligible or board-certified), if appropriate; past research experience and number and impact of previous publications.

The RSG award is intended for independent scientists with clear evidence of institutional commitment as confirmed in the Letter of Support from their Department Chair (in grant application STATEMENT OF INSTITUTIONAL SUPPORT – See Section 14).

## **3. REPLY TO PREVIOUS REVIEWS [IF APPLICABLE]**

Note whether this is a resubmission and comment on adequacy of response to critiques.

## **4. RESEARCH PLAN**

Provide a brief overview of the project. In the following sections focus on the strengths and weaknesses, rather than summarizing.

## **5. RESEARCH PLAN – SIGNIFICANCE AND CANCER RELEVANCE**

Does the project address an important problem or a critical barrier to progress in the field? If the aims of the project are achieved, how will scientific knowledge, technical capability, and/or clinical practice improve? How will successful completion of the aims change the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field? How is this research relevant or how will it impact persons at risk for, or living with, cancer or their family/caregivers? The relevance to cancer may be indirect, but the connection must be clearly articulated by the applicant.

## **6. RESEARCH PLAN – INNOVATION/IMPROVEMENT**

What is the potential that the proposed study will challenge and seek to shift current research understanding or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions? Does the research propose meaningful improvements or address critical gaps?

## **7. RESEARCH PLAN – INVESTIGATOR/RESEARCH TEAM**

Does the PI and research team have the training and experience needed to carry out the proposed research?

## **8. RESEARCH PLAN – APPROACH**

Are the study design, methods for implementation, data collection and analysis appropriate for answering the research question(s)? Where appropriate, are proposed recruitment and/or case ascertainment methods well developed? For clinical studies, is there a plan for recruiting under-represented subjects? Is the sample size adequate? Is the research timeline realistic? Are potential pitfalls, alternative approaches, and future plans articulated?

## 9. RESEARCH PLAN – ENVIRONMENT AND RESOURCES

Will the scientific environment and institutional support contribute to the probability of success? Will the project benefit from unique features of the scientific environment, subject populations, or collaborative arrangements? For early-stage PIs, are there competitive start-up funds to support the candidate's independent research program?

## 10. STATEMENT OF SCIENCE OUTREACH AND ADVOCACY

FEEDBACK OPTIONAL, THIS SECTION SHOULD NOT BE CONSIDERED IN SCORING.

Does the outreach and advocacy plan present any concerns (including, but not limited to, research compliance, participant safety, and/or feasibility)? Do you have any suggestions to improve the plan?

## 11. BUDGET

NOT TO BE CONSIDERED IN SCORING

Evaluate the overall budget and individual budget categories with respect to the award cap and the project aims. Are the budget items justified, specified, and accurate? Is the project duration and the percent effort of key personnel appropriate? Is there a potential overlap with the PI's other funded research? If the budget includes a request for funds to be expended outside the United States or its territories, is there an explanation of why such costs are essential for the successful conduct of the project, and why there are no alternatives? Describe any suggested budget changes using specific amounts or percentages.

***It is the policy of the American Cancer Society not to fund projects that are supported all or in part by another agency.***

## 12. COMPLIANCE STATEMENTS

NOT TO BE CONSIDERED IN SCORING

5. **Human Subjects:** If applicable, evaluate the plans for protection of human subjects from research risks justified in terms of the scientific goals and research strategy proposed. For example, are the potential benefits and risks to subjects articulated reasonable and appropriate given the study design? Are their plans for conducting sub-analysis by group, data security and confidentiality, biohazards and data and safety monitoring adequate?
6. **Inclusion of Women, Minorities, and Children:** When the proposed project involves human subjects, evaluate the adequacy of the proposed plans for inclusion or exclusion of minorities, male and female genders, as well as children.
7. **Vertebrate Animals:** Evaluate the plan for live, vertebrate animals as part of the scientific assessment according to the following points: 1) necessity for the use of the animals and species proposed; 2) appropriateness of the strains, ages, and gender; 3) justifications for, and appropriateness of, the numbers of animals.
8. **Biohazards:** Assess whether materials or procedures proposed are potentially hazardous to research personnel and/or the environment, and if needed, determine whether adequate protection is proposed.

## CLINICIAN SCIENTIST DEVELOPMENT GRANT

### INSTRUCTIONS

#### I. PREPARING THE APPLICATION

##### 1. COVER PAGES

Complete all fields, which include mandatory e-signature for the principal investigator. We provide text boxes for e-signatures for the departmental chair (or equivalent) and institutional officials to accommodate institution-specific requirements for proposal submissions, but neither is required for submission to ACS. Note: the PI must enable other users' access to the application on proposalCENTRAL to permit their e-signatures. If you have received a letter from the ACS Eligibility Committee, indicate that in the Program Eligibility information section and upload the correspondence in the Appendix. See Part A General Instructions for more details.

##### 2. APPLICATION TEMPLATES

An application consists of several sections that must be downloaded, completed offline, and uploaded before the online application is submitted. Once an application is started on proposalCENTRAL, all necessary application templates are available to download. Complete off-line (instructions described in individual sections below) and upload as .pdf documents before submitting the online application. *For assistance, see proposalCENTRAL's FAQ or call support at 1-800-875-2562.*

##### 3. TABLE OF CONTENTS (PAGE 1.1)

Complete the Table of Contents by indicating the appropriate page numbers for each section.

**Note: limit the length to 2 pages.**

##### 4. STATEMENT OF EXPERIENCE AND CAREER GOALS OF THE APPLICANT (PAGE 2.1)

In 3 pages or less, describe:

- A. Clinical and research experiences that have been impactful and why. For all research experience, state the nature, results, location, time frame, with whom the work was conducted, and your role;
- B. The training potential of the fellowship beyond graduate work. Include new technical and conceptual approaches the training will offer;
- C. Short- and long-term career goals in cancer research and how the proposed training and research plans align with these goals.

##### 9. BIOSKETCH OF THE APPLICANT (PAGE 3.1)

Complete the NIH Biosketch template, following the format and instructions provided by the NIH. In addition, please provide all post-doctoral research experience in the Mentored Training section. **Note: The Biographical Sketch may not exceed 5 pages.**

##### 10. LIST OF RECOMMENDERS (PAGE 4.1)

List the name, title, and email address of three persons, other than your proposed mentor(s), who can critically appraise your qualifications. Also provide this contact information on proposalCENTRAL so that they can access the site to upload their letters.

They should be able to comment on your character, motivation, maturity, general knowledge, ability to use research techniques, originality, specialized experience, and training.

There are specific instructions on the site for you and your recommenders. Your application cannot be submitted until these letters have been uploaded on proposalCENTRAL.

**Please Note for Resubmissions Only:** Letters of recommendation can be reused, but recommenders *are required to upload the letters to proposalCENTRAL again.*

### **11. REPLY TO PREVIOUS REVIEW (resubmissions only) (PAGE 5.1)**

IF YOUR APPLICATION IS A NEW SUBMISSION, upload this template with “Not Applicable” in the body and upload to proposalCENTRAL

**All resubmissions must create a new application on proposalCENTRAL.** For Resubmissions: Address the points raised in the previous critiques and direct the reviewer to the specific sections of the text, figures, or tables where edits have been made. Revisions should be easily identifiable in the revised application (e.g., bold type, underlined type, italicized type). This section should not exceed 3 pages.

### **12. PREVIOUS CRITIQUES (resubmissions only)**

Go to the “Submitted” page, select “View Review Info,” click “Print” to save it as a .pdf. Upload the document to your new application following the Reply to Previous Review section.

### **13. RESEARCH PLAN AND ENVIRONMENT (PAGE 6.1)**

The same proposal may be submitted to multiple funding agencies on an "either/or" basis, but ACS proposals must conform to our guidelines (including term and budget); if not, a proposal may be returned without review.

The total length of the RESEARCH PLAN section should not exceed 13 pages. **Section A below (Specific Aims) should not exceed 1 page. Sections (B) through (E) below must not exceed 12 pages. This page limit does not include Sections (F) through (I).**

- A. Specific Aims** (*not to exceed 1 page*). List the objectives, and goals of your proposed research and briefly describe the specific aims.
- B. Background and Significance.** Concisely summarize and critically evaluate relevant work done by others. Specifically state how your successful completion of the proposed work will advance scientific knowledge to advance the understanding of cancer stem cells and to leverage this knowledge to design and test innovative strategies to prevent cancer stem cells from contributing to treatment resistance, metastasis, disease recurrence, and/or cancer mortality.
- C. Innovation.**
  1. If applicable, explain how the application challenges and seeks to shift current research or clinical practice paradigms.
  2. Describe any novel theoretical concepts, approaches, methodologies, instrumentation, or intervention(s) you propose to develop or use, and any advantages or advances they offer over existing ones.
  3. Explain any refinements, improvements, or new applications of theoretical concepts, approaches, methodologies, instrumentation, or interventions.
- D. Preliminary Studies.** Provide results of your prior research, if any, that are relevant to this proposal; reprints or preprints may be included in the Appendix. **Note** that the entire application is considered confidential.

**E. Research Design and Methods.** Describe your overall specific aims, proposed methods, procedures, and plan for data collection and analysis in sufficient detail to permit evaluation by other scientists. Include your rationale for approaches and analysis. Explain your project's feasibility and how the proposed research will address the Specific Aims. Discuss potential difficulties and limitations of your proposed methods and provide alternative approaches. Inclusion of a study timeline can be helpful. Order your priorities and estimate the length of time that you believe will be required to complete each specific aim. Although the time estimated should not exceed the term for which support is requested, it is helpful to state how this project fits in with your long-term research goals.

**F. Experimental Details** (*3 pages or less*). This section is available if more in-depth descriptions of the experimental design, technologies, or assays are needed to convey the specific approaches and procedures proposed.

**G. Environment for Research and Training.** Document the existence of an appropriate academic and research environment for the proposed research study and training program, including:

- departmental and other institutional personnel;
- ongoing research and other relevant activities;
- facilities and resources;
- access to any populations or individuals to be studied;
- relevant collaborative relationships; and
- any relevant accreditation from professional societies or organizations.

Describe how the presence of these resources will directly benefit you and your research.

**H. Statement of Science Outreach and Advocacy** (*not to exceed 1 page*). ACS considers it important that scientists communicate the results of their research to a wide range of communities. Explain the potential impact of your proposed project on your community, and to the American Cancer Society's mission to save lives, celebrate lives, and lead the fight for a world without cancer. Share any previous experiences in science outreach and advocacy. Describe your plans for disseminating your work in the cancer arena through advocacy, awareness, education, or service. Please include your plans for sharing your research and research findings with your (non-academic) community members and for engaging with community partners in the dissemination process.

**I. References (no page limit).** Each literature citation should include the title, authors, book or journal, volume number, page numbers, and year of publication. This section is not included in the 12-page limit of Sections (B) through (E).

## 10. DETAILED BUDGET

Please complete the budget page located online at [proposalCENTRAL](#)

**A. Personnel.** Names and positions of all Key Personnel must be individually listed, and the percentage of time to be devoted to the project by each person noted. List all Key Personnel other than the PI (defined as individuals who will participate actively in the design and/or execution of the studies). Details of contractual arrangements with Key Personnel should be provided in the Justification of Budget section. If a Key Person is not receiving salary, you can request \$0 for salary, but their percent effort is still required. Their effort and contribution to the project should be outlined in the Budget Justification even if they are not being compensated.



If the individual has not been selected, please list as "vacancy." Personnel may receive salary support up to a maximum that equals the NIH salary cap, prorated according to their percent effort on the project.

For each study team member, indicate the proposed percent effort and the salary and fringe benefits for which the total requested salary is based. The costs to the institution of employee fringe benefits should be indicated as a percent of the employee's salary. The amount of fringe benefits requested must be prorated to the salary requested. For example, if 50 percent of an individual's annual salary is requested, then no more than 50 percent of that individual's annual cost for fringe benefits can be requested.

**Note:** For definitions of Key Personnel refer to General Policies - Required Information.

**Mentor(s):** List all mentor(s), defined as those individuals who will provide guidance, support and mentoring to you on this award; \$10,000 per year is the maximum allowable for mentor(s), regardless of the number of mentors on the application.

## **B. Equipment**

**Permanent equipment:** Defined as items of nonexpendable property with a purchase cost per unit that equals or exceeds \$5,000 with a useful life of more than one year. List separately and justify the need for each item of permanent equipment. **Note:** the cost of permanent equipment is not included in the direct cost total used to calculate indirect costs.

**Small or expendable equipment:** Defined as expendable property with a purchase cost per unit that is less than \$5,000 and/or has a short service life (<1 year). **Note:** the cost of small or expendable equipment may be included in the direct cost total used to calculate Indirect costs.

**General purpose equipment:** Equipment such as computers or laptops used primarily or exclusively in the actual conduct of the proposed scientific project are considered direct cost and may be included in the direct cost total used to calculate indirect costs. Computers or other general-purpose equipment that will be used on multiple projects or for personal use are not allowable expenditures.

- C. Supplies.** Group into major categories (e.g. glassware, chemicals, radioisotopes, survey materials, animals).
- D. Travel.** Domestic travel only; special consideration will be given for attendance at scientific meetings held in Canada.
- Please include funds (approximately \$1,500 per year) for the PI to travel to national meetings and conferences.
- E. Miscellaneous Expenditures.** List specific amounts for each item. Examples of allowed expenditures include publication costs and special fees (e.g., pathology, computer time, scientific software, and equipment maintenance).
- F. Subcontracts.** If any portion of the proposed research is to be carried out at another institution, enter the total costs (direct) on the online budget detail page on proposalCENTRAL. Then provide a categorical breakdown of costs using the Subcontractor Budget and Justification form, using one form per subcontractor. Upload the form(s) when complete, entering the subcontractor's name in the "describe attachment" field. If there is a subaward(s), indirect costs can be provided to the secondary institution through negotiation with the Principal Investigator's institution but the total amount of indirect costs, inclusive of subcontracts, may not exceed 8% of the award.

Subcontracts for the research project may be with public or private institutions, provided they do not violate ACS policies. Subcontracts involving a contractor residing outside the borders of the United States are not permitted, unless the applicant can document that it is not feasible to have the work performed within the United States.

**Administrative pages.** A Letter of Agreement between institutions pertaining to the subcontract should be included in the Appendix.

**G. Indirect Costs.** To help the institution provide proper laboratory and clinical facilities, the Society will permit an indirect cost allowance of up to 8% of the direct costs, excluding permanent equipment. Indirect costs can be provided to the secondary institution through negotiation with the Principal Investigator's institution but the total amount of indirect costs, inclusive of subcontracts, may not exceed 8% of the award.

**H. Total Amount Requested.** Budget totals should reflect a duration of 3-5 years (see table below). The allowable per year direct cost is \$135,000 per year and the indirect costs rate is 8% (\$10,800 max), making the total cost per year cap \$145,800. Personnel costs are included in the direct cost per year cap of \$135,000.

The Society and its peer review committees expect applicants to show judicious use of proposed funds in all grant applications. Enter the sum of all years of requested support, including indirect costs, and round to the nearest thousand dollars. Transfer this figure to the title page of the online application.

## 11. JUSTIFICATION OF BUDGET

Please provide budget justification on the template provided.

Clearly justify each item listed in the budget. This includes all permanent equipment costing over \$5,000, personnel, supplies, travel, and other miscellaneous items. If the budget includes a request for funds to be expended outside the United States or its territories, this section should include an explanation of why such costs are essential for the successful conduct for this project, and why there are no alternatives. Provide details of contractual arrangements with key personnel in this section.

**Additional Mentors:** If there is more than one mentor on the application, clearly specify the role of each mentor, even if there is no associated cost.

## 12. BIOGRAPHICAL INFORMATION OF KEY PERSONNEL (PAGE 7.1)

Complete the NIH Biosketch template. **Note:** Follow the format and instructions provided by the NIH. This is a required field. Therefore, if no Key Personnel are included, a blank form must be uploaded. Do not include the Mentor's Biosketch in this section.

## 13. OTHER SUPPORT (PAGE 8.1)

The ACS does not fund projects that are supported all or in part by another agency. Projects are considered to overlap if there are any shared *Specific Aims or areas of budgetary overlap*. Scientific Directors make final decisions regarding any questions of overlap.

The only exceptions are:

- Funds provided by the institution as start-up support to develop a new laboratory or to gather pilot data; and
- Awards that provide only salary support for the Principal Investigator. In the latter case, if the salary support for the PI's contribution to the project is covered by the other agency,

no additional salary support for the PI may be requested from the American Cancer Society.

Provide the following information separately for the PI and all other Key Personnel:

- A. Current Support.** List all current funding from intramural and extramural sources (e.g., institutional awards and grants from for-profit and not-for-profit agencies, including other grants from the ACS). Provide for each award:
- a. Source of funds
  - b. Grant number
  - c. Project title
  - d. Inclusive dates of approved or proposed project. For example, in the case of NIH support, provide the dates of the approved or proposed competitive segment.
  - e. Total direct costs
  - f. Percent effort or person-months. For an active project, use person months, even if unsalaried, for the current budget period. Classify person-months as academic, calendar, and/or summer.
  - g. An outline of the goals of the project in a brief paragraph.
  - h. A clear indication of overlap and differences between this grant and the proposed study. If necessary, include an explanatory letter in the Appendix.
- B. Pending Support.** List all pending applications for funding from intramural and extramural sources (e.g., institutional awards and grants from for-profit and not-for-profit agencies, including other grants from the ACS).
- a. Source of funds
  - b. Project title
  - c. Inclusive dates of approved or proposed project. For example, in the case of NIH support, provide the dates of the approved or proposed competitive segment.
  - d. Total direct costs
  - e. Percent effort or person-months. For an active project, use person months, even if unsalaried, for the current budget period. Classify person-months as academic, calendar, and/or summer.
  - f. An outline of the goals of the project in a brief paragraph.
  - g. A clear indication of overlap and differences between this grant and the proposed study. If necessary, include an explanatory letter in the Appendix. In such cases, you may accept only one award if both are approved for funding. The ACS does not negotiate partial funding of grants with overlapping specific aims.

Please keep the Scientific Director current on the status of pending applications that have scientific overlap and could interfere with the PI's budgeted effort on the ACS proposal, or could compromise CSDG eligibility (i.e., an NIH K-award or an R01 or R01-like grant as PI at the time of application).

- C. Institutional Support.** Provide the following information for the PI only:
- a. Details of the institutional commitment to support the applicant including protected time, salary support and other financial resources, administrative support and available space.
  - b. The current term of the applicant's appointment.

- c. Describe resources available to support the successful research career development of the applicant.

Documentation should be included in the Faculty or Specific Appointment or Candidate (Section 14, below) written by the Department Chair. **There is no requirement that the PI have start-up funds or independent laboratory space.**

Sections 14-18 must be prepared by the proposed **primary mentor**. Use the templates provided.

#### **14. FACULTY OR SCIENTIFIC APPOINTMENT (OF CANDIDATE) (PAGE 9.1)**

A letter from the Department Chair (or equivalent) must be included in the application (upload in this section). This letter should clearly indicate the commitment of the institution to the support of the applicant and their research program. Details should include, but are not limited to, faculty rank, salary support, available space for the research proposal, the amount of protected time for clinical researchers, administrative support, core facilities, institutional faculty development, research training, resources to support coursework or travel or other resources to foster the successful career development of the applicant. The letter should also describe the Department's long-term goals for the applicant's career.

#### **15. PROGRAM GOALS AND PROPOSED TRAINING (PAGE 10.1)**

Describe the overall goals of the proposed program and indicate how the grant, if awarded, will advance the candidate's career as an independent researcher. Provide a description of the specific plans for research training, including core curriculum studies, courses, and lectures. For each mentor, describe their role, area of expertise, and the frequency and mode of contact with the Candidate should be provided. Explain in detail the activities planned for the period of the award, including clinical, research, teaching, coursework, administrative duties, etc., and skills the candidate will gain from the mentoring experience. Estimate the percentage of time allocated to each area. The primary mentor is expected to compose the mentoring and training plan. If an additional mentor is involved in the candidate's training, describe this person's participation as well. Include a table indicating the timeline of implementation and completion of the Training Plan. Limit this section to 5 pages.

#### **16. TRAINING EXPERIENCE OF MENTOR(S) (PAGE 11.1)**

Document your background and experience in training clinical and applied cancer researchers. Describe *in detail* (table format preferred) your mentoring experience (e.g., list the researchers you have trained, the extent of their training, and their current involvement in clinical or applied cancer research). Fully describe your current professional responsibilities and activities.

#### **17. BIOGRAPHICAL SKETCH OF MENTOR(S) (PAGE 12.1)**

Provide biographical information requested for *all mentors*. Complete the NIH Biosketch template. Follow the format and instructions provided by the NIH. Use a separate "Biographical Sketch" template for each mentor. **Note:** The Biographical Sketch may not exceed 5 pages.

#### **18. MENTOR(S) COMMITMENT LETTER(S) (PAGE 13.1)**

A letter of commitment must be provided from each mentor. The letter should include assessment of the Candidate's research ability and potential, motivation, ability to plan and conduct research, knowledge of the field of study, and ability to work as a member of a research team. Letters may also include other attributes of the Candidate such as character or motivation. The letters will need to be uploaded as an attachment to your application.

## 19. COMPLIANCE STATEMENTS (PAGE 14.1)

### Human Subjects

**Selection of study population.** When conducting research on humans, provide the rationale for selecting your target population. Include the involvement of children, minorities, and especially vulnerable populations such as neonates, pregnant women, prisoners, institutionalized individuals, or others who may be considered vulnerable populations or others who may be considered vulnerable populations. The institution is required to ensure IRB approval is obtained for the grant to start, and the approval documentation is uploaded into proposalCENTRAL within 3 months of grant activation.

On the planned enrollment form, estimate the total number of subjects by primary ethnicity and race, race/ethnicity subgroup (if applicable), and gender. Include a rationale for excluding any population. Estimate the planned enrollment based on these calculations.

Also include estimates of the sample distribution by gender, race, and ethnicity (if available). For example, if your sample size is 200, to complete the *total number of subjects* column by race (based on what you know about the population demographics or the existing dataset you plan to analyze), multiply by the estimated percentage.

Estimated percentage of the population by race	Estimated total number of subjects
50% White	100 (200 x 0.50)
49% AA	98 (200 x 0.49)
1% Asian	2 (200 x 0.01)

For applicants performing research with non-human subjects, check the box that most appropriately describes your research.

**Potential benefits, risks, and knowledge gained.** Succinctly describe the potential benefits and risks to subjects (physical, psychological, financial, legal, or other). Explain why the risks are reasonable in relation to the anticipated benefits, both to research participants and others. Where appropriate, describe alternative treatments and procedures, including the risks and potential benefits to participants.

**Research specimens and data.** If the proposed research involves biospecimens, explain how the research material will be obtained from living subjects and what materials will be collected. List any specific non-biological data, such as demographic information, and how it will be collected, managed, and protected. Specify who will have access to such data and what measures you will maintain to keep personally identifiable private information confidential.

**Collaborating sites.** Where appropriate, list any collaborating sites where research on human subjects will be performed and describe the role of those sites and collaborating investigators in performing the proposed research. Explain how data from the site(s) will be obtained, managed, and protected.

\*For additional protections for vulnerable populations, see <http://www.hhs.gov/ohrp/policy/populations/index.html>.

### Vertebrate Animals

IACUC approval must be obtained before animal work begins. An IACUC approval letter must be uploaded to proposalCENTRAL immediately upon approval.

Provide your rationale for using live vertebrate animals including the:

4. Necessity for using the animals and species proposed;
5. Appropriateness of the strains, ages, genders of the animals to be used;
6. Justifications for, and appropriateness of, the numbers of animals proposed. When completing the Targeted Enrollment Table, select non-human subjects research and check the box that most appropriately describes your research.

### **Biohazards**

Briefly describe whether any materials or procedures proposed are potentially hazardous to research personnel, equipment, and/or the environment. What protections will mitigate such risks? Include biological and chemical hazards, if applicable.

### **Authentication of Key Biological and/or Chemical Resources**

Briefly describe methods to ensure the identity and validity of key biological and/or chemical resources to be used in the proposed studies. These resources may or may not be generated with ACS funds and:

- may differ from laboratory to laboratory or over time;
- may have qualities and/or qualifications that could influence the research data; and
- must be integral to the proposed research.

These may include, but are not limited to, cell lines, specialty chemicals, antibodies, and other biologics. Researchers should transparently report how they have authenticated key resources, so consensus can emerge.

Standard laboratory reagents that are not expected to vary do not need to be included in the plan (e.g., buffers and other common biologicals or chemicals). After reviewers assess the information you provide in this Section, their questions will need to be addressed prior to an award. In this section, focus *only* on authentication and/or validation of key resources to be used in the study. Include all other information within the page limits of the research strategy. Applications that fail to comply may be dismissed.

## **20. APPENDIX TO APPLICATION**

In addition to the application templates, other key documents may be uploaded and submitted as part of the application. However, applicants are urged to keep this section as brief as possible.

Appended materials may include:

- Letter from ACS Eligibility Committee confirming eligibility (if applicable)
- Letters of support
- Recent reprints or preprints (optional)
- Clinical Protocols (if applicable)

It is not necessary to number the pages of the Appendix, but please list by categories (e.g., reprints, preprints) in the Table of Contents.

## **II. REVIEW CRITERIA**

Provided below are the guidelines used by reviewers to evaluate Clinician Scientist Development Grant applications. These are meant as general guidelines and are provided here as an aid for preparing your application.

For each section, focus on the strengths and weaknesses. Your final score should align with your written critique.

### **1. ALIGNMENT WITH ACS RESEARCH PRIORITY AREAS AND CONSORTIUM GOALS**

Has the applicant identified and appropriately justified how their project fits within one or more ACS research priority areas? Has the applicant appropriately justified how their project aligns with the goals of the consortium to advance the understanding of cancer stem cells and leverage this knowledge to accelerate patient impact?

### **2. CANDIDATE**

Evaluate the qualifications of applicant considering the following items: goals and commitment to cancer research; past education; past training (board-eligible or board-certified), if appropriate; past research experience; number and relevance of previous publications; and overall appropriateness of candidate for the CSDG. **There is no requirement that the PI have start-up funds or independent laboratory space.**

#### **Letters of Recommendation:**

Provide an assessment of the confidential letters of recommendation, including research ability and potential, ability to plan and conduct research, knowledge of the field relevant to the proposed work, ability to work as a team, and personal characteristics. **Comments on recommendation letters will not be shared with the applicant.**

### **3. REPLY TO PREVIOUS REVIEWS [IF APPLICABLE]**

Note whether this is a resubmission and comment on adequacy of response to critiques.

### **4. RESEARCH PLAN**

Please provide a brief overview of the project. A junior investigator's research is not expected to reflect the breadth and depth of a senior scientist. Nevertheless, the research plan must be fundamentally sound.

### **5. RESEARCH PLAN – SIGNIFICANCE AND CANCER RELEVANCE**

Does the project address an important problem or a critical barrier to progress in the field? How will successful completion of the aims change the concepts, methods, technologies, treatments, services, or interventions that drive this field? How is this research relevant to persons at risk for, or living with, cancer and their family members and/or caregivers and friends?

### **6. RESEARCH PLAN – INNOVATION/IMPROVEMENT**

What is the potential that the proposed study will challenge and seek to shift current research understanding or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions? Does the research propose meaningful improvements or address critical gaps?

### **7. RESEARCH PLAN – CANDIDATE/RESEARCH TEAM**

Does the PI and research team (including mentor(s)) have the training and experience needed to carry out the proposed research? Do team members have complementary skills and qualifications needed for successful implementation and analysis of the proposed research? Has the research team previously collaborated on research or publications? If not, are members of the proposed study team appropriate to carry-out the research?

## **8. RESEARCH PLAN – APPROACH**

Are the hypothesis and aims appropriate for answering the research question? Are the overall strategy, methodology, analyses, and timeline well-reasoned and appropriate to accomplish the specific aims of the project? Are potential problems, alternative strategies, and benchmarks for success presented? If the project is in the early stages of development, will the strategy establish feasibility, and will particularly risky aspects be managed?

## **9. RESEARCH PLAN – ENVIRONMENT AND RESOURCES**

Will the scientific environment in which the work will be done contribute to the probability of success? Are the institutional support, equipment, and other physical resources available to the investigators adequate for the project proposed? Will the project benefit from unique features of the scientific environment, subject populations, or collaborative arrangements?

## **10. BUDGET**

NOT TO BE CONSIDERED IN SCORING

Evaluate the overall budget and individual budget categories with respect to the award cap and the project aims, mentoring plan, and training plan. Are the budget items justified, specified, and accurate? Is the project duration and PI percent effort (**minimum of 50%**) appropriate? Is there a potential overlap with the PI's other funded research? Describe any suggested budget changes (i.e., could relate to personnel, research material and/or animals). Use specific amounts and/or percentages.

***It is the policy of the American Cancer Society not to fund projects that are supported all or in part by another agency.***

## **11. TRAINING AND MENTORING PLAN**

Assess the appropriateness of the proposed core curriculum, courses, and lectures in enhancing the research training of the applicant, and their relevance to the applicant's career objectives.

## **12. INSTITUTIONAL RESOURCES AND ENVIRONMENT FOR TRAINING**

Evaluate the appropriateness of the environment (academic and research) for the proposed training program. Include departmental and other institutional personnel, ongoing research and other relevant activities, facilities, resources, access to any populations or individuals to be studied, relevant collaborative relationships, etc. Reference any relevant accreditation from professional societies or organizations. Describe how access to these resources will directly benefit the candidate.

## **13. TRAINING EXPERIENCE, BIOSKETCH(ES), SUPPORT, AND COMMITMENT LETTER(S) OF MENTOR(S)**

Evaluate the appropriateness of the mentor(s) experiences for their respective roles in the proposed training and mentoring plans. Consider the qualifications and reputation of mentor(s) in cancer research and in training cancer researchers, the commitment of mentor(s) to the plan, and the overall appropriateness of the mentor(s) and mentor(s) qualifications for the proposed research project.

## **14. COMPLIANCE STATEMENTS**

NOT TO BE CONSIDERED IN SCORING



1. **Human Subjects.** If the project involves research on humans, are the plans for protection of human subjects from research risks justified in terms of the scientific goals and research strategy proposed? For example, are the potential benefits and risks to subjects articulated reasonable and appropriate given the study design, are there plans to conduct sub-analysis by group, are there plans for data security and confidentiality, biohazards and data and safety monitoring (if applicable) adequate?
2. **Inclusion of Women, Minorities, and Children.** When the proposed project involves human subjects, evaluate the adequacy of the proposed plans for inclusion or exclusion of minorities, male and female genders, as well as children.
3. **Vertebrate Animals.** The peer review committee will evaluate the involvement of live, vertebrate animals as part of the scientific assessment according to the following points: 1) necessity for the use of the animals and species proposed; 2) appropriateness of the strains, ages, and gender of the animals to be used for the experimental plan proposed; 3) justifications for, and appropriateness of, the numbers used for the experimental plan proposed.
4. **Biohazards.** Reviewers will assess whether materials or procedures proposed are potentially hazardous to research personnel and/or the environment, and if needed, determine whether adequate protection is proposed.

## POSTDOCTORAL FELLOWSHIP INSTRUCTIONS

### I. PREPARING THE APPLICATION

#### 1. COVER PAGES

Complete all fields, which include mandatory e-signatures for the principal investigator and primary mentor. We provide text boxes for e-signatures for the departmental chair (or equivalent) and institutional officials to accommodate institution-specific requirements for proposal submissions, but neither is required for submission to ACS. Note: the PI must enable other users' access to the application on proposalCENTRAL to permit their e-signatures. If you have received a letter from the ACS Eligibility Committee, indicate that in the Program Eligibility information section and upload the correspondence in the Appendix. See Part A General Instructions for more details.

#### 2. APPLICATION TEMPLATES

Once an application is started on proposalCENTRAL, all necessary application templates are available to download. Complete off-line (described in individual sections below) and upload as .pdf documents before submitting the online application. *For assistance, see proposalCENTRAL's FAQ or call support at 1-800-875-2562.*

#### 3. TABLE OF CONTENTS (PAGE 1.1)

Indicate the appropriate page number for the start of each section. At the bottom of the template, list the documents in the Appendix. Section must not exceed 2 pages.

#### 4. BUDGET

Please complete the budget page located online at proposalCENTRAL. Stipends for Postdoctoral Fellowships are \$52,000, \$54,000, and \$56,000 for the first, second, and third years respectively. Fellows eligible for only two years may request progressive stipends of \$54,000 and \$56,000, respectively.

Each fellow will receive a **yearly allowance of \$4,000** to be used to benefit the fellow (i.e., health insurance, career development or training activities, expenses associated with presenting at a scientific meeting(s), etc.). Costs to attend a scientific conference or meeting, but not present, are limited to \$1,500 per year. In the last year of funding, a \$1,500 **travel allowance** is to be prioritized for travel costs to attend and present at the biennial ACS Jiler Professors and Fellows Conference, if offered that year, or expenses to present at a domestic scientific meeting of choice. **Institutional indirect costs may not be recovered from these funds. No allowance funds may be used for any international activities.**

#### 5. PENDING FELLOWSHIP APPLICATIONS (Page 2.1)

List all sources of **current** and **pending** fellowship support with other funding agencies. Indicate the granting agency, start date, and full term of the award. Please notify the Scientific Director immediately if you accept an award from another agency.

#### 6. BIOGRAPHICAL SKETCH OF APPLICANT (PAGE 3.1)

Complete the NIH Biosketch template, following the format and instructions provided by the NIH. In addition, please provide all post-doctoral research experience in the Mentored Training section. **Note: The Biographical Sketch may not exceed 5 pages.**

#### 7. REPLY TO PREVIOUS REVIEW (PAGE 4.1)

*IF APPLICATION IS A NEW SUBMISSION* upload the provided template with “Not Applicable” in the body.

**All resubmissions must create a new application on proposalCENTRAL.**

**For Resubmissions:** Address the points raised in the previous critiques and direct the reviewer to the specific sections of the text where edits have been made. Revisions should be easily identifiable in the revised application (e.g., bold, italicized, or underline type). This section should not exceed 3 pages.

#### **8. PREVIOUS CRITIQUES (resubmissions only)**

Previous critiques must be included with resubmissions. Go to the “Submitted” page, select “View Review Info,” click “Print” to save it as a .pdf, and then upload the critiques with your application.

#### **9. STATEMENT OF EXPERIENCE, TRAINING POTENTIAL OF THIS FELLOWSHIP, AND CAREER GOALS OF APPLICANT (PAGE 5.1)**

In 3 pages or less, describe:

- A. Research experiences that have been impactful and why;
- B. The training potential of the fellowship beyond graduate work. Include new technical and conceptual approaches the training will offer;
- C. Career goals in cancer research and how the proposed training and research plans align with these goals.

#### **10. PLANS FOR WORK UNDER FELLOWSHIP (PAGE 6.1)**

- A. Research Plan.** The total length of this section should not exceed 9 pages, excluding references. Proposals should be realistic in terms of work to be accomplished in the time period for which support is requested. Failure to conform to the guidelines on type size, page length, or project scope may result in the application being returned to the investigator without review.
  - I. Specific Aims.** List the objectives and goal of the research proposed and describe the specific aims briefly in order of priority.
  - II. Background and Significance.** Concisely summarize and critically evaluate related work done by others and specifically state how the successful completion of the proposed work will advance the understanding of cancer stem cells and to leverage this knowledge to design and test innovative strategies to prevent cancer stem cells from contributing to treatment resistance, metastasis, disease recurrence, and/or cancer mortality.
  - III. Preliminary Studies (if available; not required).** Provide results of research accomplished by you and/or others that are relevant to this proposal in a sufficiently comprehensive manner to indicate their significance. *Carefully attribute the source of any preliminary data included.*
  - IV. Research Design and Methods.** Describe your proposed methods and procedures in sufficient detail to permit scientific evaluation. Discuss potential difficulties and limitations of the methods and procedures and provide alternative approaches.

- V. **References** should be listed numerically, in order of their appearance in the text. Each reference listed must include the title, names of all authors, book or journal, volume number, page numbers, and year of publication. The page limit does not include references.

## 11. STATEMENT OF SCIENCE OUTREACH AND ADVOCACY (PAGE 7.1)

ACS considers it important that scientists communicate the results of their research to a wide range of communities. Explain the potential impact of your proposed project on your community, and to the ACS's mission to save lives, celebrate lives, and lead the fight for a world without cancer. Share any previous experiences in science outreach and advocacy. Describe your plans for disseminating your work in the cancer arena through advocacy, awareness, education, or service. Please include your plans for sharing your research and research findings with your (non-academic) community members and for engaging with community partners in the dissemination process.

## 12. LETTERS OF RECOMMENDATION (PAGE 8.1)

In the Letter of Recommendation section, list the name, title, and email addresses of three individuals, ***other than the designated mentor(s) on this application***, who can critically appraise your qualifications. You will also provide this contact information on proposalCENTRAL so that they can access the site to upload their letters. There are specific instructions on the site for applicants and designated recommenders.

Ideally, letters will be provided by a graduate mentor, a member of a former dissertation committee, and a former research mentor. The letters should address character, motivation, maturity, general knowledge, ability to use research techniques, originality, specialized experience, and training.

You cannot submit your application until these letters have been provided on proposalCENTRAL.

**For Resubmissions Only:** Letters of recommendation can be reused, but your recommenders must upload the letters on proposalCENTRAL again.

Sections 13-16 must be prepared by the **primary mentor** (even if there are co-mentors).

## 13. PROPOSED TRAINING AND MENTORING (PAGE 9.1)

In 3 pages or less, describe the training and mentoring plan proposed for the applicant covering the full period of training requested, including all phases of training, research and didactic. Describe how this plan is tailored for the applicant.

***This information will be used to evaluate the quality of the training experience and is an integral part of the overall assessment of the application. To aid in this evaluation, consider including the following information:***

- The numbers of Postdoctoral Fellows and Graduate Students in the laboratory, and, if applicable, indicate approximately how many graduate students and fellows have completed their training in the mentor's laboratory during the past 3-5 years, and where they have landed in their careers.
- The importance of the proposed research to cancer.
- Whether the proposed research plan was prepared independently by the applicant or in collaboration with you.

Any comments about the postdoctoral applicant should be included here rather than in a separate letter. The Primary Mentor should explain the roles of the Co-Mentor(s) in the training plan. The Co-Mentors may provide a separate letter of support, which can be placed in the Appendix.

This plan is to be completed by the primary mentor. If there are co-mentors (or a mentoring team), only the primary mentor should complete PART II. All mentors must submit the Biographical Information requested in Section 14.

#### **14. FACILITIES AVAILABLE (PAGE 10.1)**

In 3 pages or less, describe the facilities available for the training program proposed.

#### **15. BIOGRAPHICAL SKETCH OF MENTOR(S) (PAGE 11.1)**

All mentors must complete the NIH Biosketch template, following the formats and instructions provided by the NIH. The Biographical Sketch may not exceed 5 pages

#### **16. SUPPORT OF MENTOR (PAGE 12.1)**

List all active and pending grant support including granting agency, title of project, direct costs (clearly indicate whether the amount reflects per year or total), and term.

#### **17. COMPLIANCE STATEMENTS (PAGE 13.1)**

##### **Human Subjects**

**Selection of study population.** When conducting research on humans, provide the rationale for selecting your target population. Include the involvement of children, minorities, and especially vulnerable populations such as neonates, pregnant women, prisoners, institutionalized individuals, or others who may be considered vulnerable populations or others who may be considered vulnerable populations. The institution is required to ensure IRB approval is obtained for the grant to start, and the approval documentation is uploaded into proposalCENTRAL within 3 months of grant activation.

On the planned enrollment form, estimate the total number of subjects by primary ethnicity and race, race/ethnicity subgroup (if applicable), and gender. Include a rationale for excluding any population. Estimate the planned enrollment based on these calculations.

Also include estimates of the sample distribution by gender, race, and ethnicity (if available). For example, if your sample size is 200, to complete the *total number of subjects* column by race (based on what you know about the population demographics or the existing dataset you plan to analyze), multiply by the estimated percentage.

Estimated percentage of the population by race	Estimated total number of subjects
50% White	100 (200 x 0.50)
49% AA	98 (200 x 0.49)
1% Asian	2 (200 x 0.01)

For applicants performing research with non-human subjects, check the box that most appropriately describes your research.

**Potential benefits, risks, and knowledge gained.** Succinctly describe the potential benefits and risks to subjects (physical, psychological, financial, legal, or other). Explain why the risks are reasonable in relation to the anticipated benefits, both to research participants and others.

Where appropriate, describe alternative treatments and procedures, including the risks and potential benefits to participants.

**Research specimens and data.** If the proposed research involves biospecimens, explain how the research material will be obtained from living subjects and what materials will be collected. List any specific non-biological data, such as demographic information, and how it will be collected, managed, and protected. Specify who will have access to such data and what measures you will maintain to keep personally identifiable private information confidential.

**Collaborating sites.** Where appropriate, list any collaborating sites where research on human subjects will be performed and describe the role of those sites and collaborating investigators in performing the proposed research. Explain how data from the site(s) will be obtained, managed, and protected.

\*For additional protections for vulnerable populations, see <http://www.hhs.gov/ohrp/policy/populations/index.html>.

### **Vertebrate Animals**

IACUC approval must be obtained before animal work begins. An IACUC approval letter must be uploaded to proposalCENTRAL immediately upon approval.

Provide your rationale for using live vertebrate animals including the:

10. Necessity for using the animals and species proposed;
11. Appropriateness of the strains, ages, genders of the animals to be used;
12. Justifications for, and appropriateness of, the numbers of animals proposed. When completing the Targeted Enrollment Table, select non-human subjects research and check the box that most appropriately describes your research.

### **Biohazards**

Briefly describe whether any materials or procedures proposed are potentially hazardous to research personnel, equipment, and/or the environment. What protections will mitigate such risks? Include biological and chemical hazards, if applicable.

### **Authentication of Key Biological and/or Chemical Resources**

Briefly describe methods to ensure the identity and validity of key biological and/or chemical resources to be used in the proposed studies. These resources may or may not be generated with ACS funds and:

- may differ from laboratory to laboratory or over time;
- may have qualities and/or qualifications that could influence the research data; and
- must be integral to the proposed research.

These may include, but are not limited to, cell lines, specialty chemicals, antibodies, and other biologics. Researchers should transparently report how they have authenticated key resources, so consensus can emerge.

Standard laboratory reagents that are not expected to vary do not need to be included in the plan (e.g., buffers and other common biologicals or chemicals). After reviewers assess the information you provide in this Section, their questions will need to be addressed prior to an award.

In this section, focus only on authentication and/or validation of key resources to be used in the study. Include all other information within the page limits of the research strategy. Applications that fail to comply may be dismissed.

## **18. APPENDIX TO APPLICATION**

In addition to the application templates, other key documents may be uploaded and submitted as part of the application. However, applicants are encouraged to include only highly relevant supporting documents. Appended materials may include:

- Letter from ACS Eligibility Committee confirming eligibility (if applicable)
- Recent reprints or preprints (optional)
- Clinical protocols (if applicable)

**It is not necessary to number the pages of the Appendix, but list in order by categories, (i.e., reprints, preprints, etc.), at the bottom of the Table of Contents.**

## **II. REVIEWER GUIDELINE CRITERIA**

Provided below are the guidelines used by reviewers to evaluate Postdoctoral Fellowship applications. These are meant as general guidelines and are provided here as an aid for preparing your application.

For each section, focus on the strengths and weaknesses. Your final score should align with your written critique.

### **1. ALIGNMENT WITH ACS RESEARCH PRIORITY AREAS AND CONSORTIUM GOALS**

Has the applicant identified and appropriately justified how their project fits within one or more ACS research priority areas? Has the applicant explained how the proposed science aligns with the goals of the consortium to advance the understanding of cancer stem cells and to leverage this knowledge to accelerate clinical impact?

### **2. CANDIDATE**

- A. STATEMENT OF EXPERIENCE AND CAREER GOALS OF APPLICANT
- B. BIOSKETCH OF APPLICANT
- C. LETTERS OF RECOMMENDATION [Provided online at proposalCENTRAL]
- D. TRAINING POTENTIAL

Relying on the contents of sections (A) through (D) above, critically evaluate the qualifications of the applicant considering the following items: goals and commitment to cancer research; past education; past training (board-eligible or board-certified); past research experience; number and impact of previous publications; and overall suitability of the candidate for this award.

Provide an assessment of the confidential letters of recommendation, including research ability and potential, ability to plan and conduct research, knowledge of the field relevant to the proposed work, ability to work as part of a team, and personal characteristics. **To maintain confidentiality, please include this evaluation in the “Critique Summary” section of the webform so this information will not be released to the applicant.**

Assess whether the fellowship broadens the training and experience of the applicant beyond what was obtained in their graduate work and aligns with the applicant’s stated career goals.

### **3. REPLY TO PREVIOUS REVIEWS [IF APPLICABLE]**

Note whether this is a resubmission and comment on the adequacy of the response to the prior critiques.

#### **4. PLANS FOR WORK UNDER FELLOWSHIP**

Provide a brief overview of the project. A junior investigator's research is not expected to reflect the breadth and depth of a senior scientist. Nevertheless, the research plan must be fundamentally sound.

#### **5. RESEARCH PLAN – SIGNIFICANCE AND CANCER RELEVANCE**

Does the project address an important problem or a critical barrier in the field? How will successful completion of the aims change the concepts, methods, technologies, treatments, services, or interventions that drive this field? Is the proposed research important to cancer research? How is this research relevant to persons at risk for, or living with, cancer or their family members/caregivers? The relevance to cancer may be indirect, but the connection must be clearly articulated by the applicant.

#### **6. RESEARCH PLAN – APPROACH**

Are the hypothesis and aims appropriate for answering the research question(s)? Is the overall strategy, methodology, analyses, and timeline well-reasoned and appropriate to accomplish the specific aims? Are potential problems, alternative strategies, and benchmarks for success presented? If the project is in the early stages of development, will the strategy establish feasibility? How will particularly risky aspects be managed?

#### **7. PLANS FOR WORK UNDER FELLOWSHIP – CANDIDATE/RESEARCH TEAM**

Does the PI and research team (including mentors) have the training and experience needed to carry out the proposed research? Do team members have complementary skills and qualifications needed for successful implementation and analysis of the proposed research? Has the research team previously collaborated on research or publications? If not, are members of the proposed study team appropriate to carry-out the research?

#### **8. PLANS FOR WORK UNDER FELLOWSHIP – ENVIRONMENT**

Will the scientific environment, in which the work will be done, contribute to the probability of success? Are the institutional support, equipment, and other physical resources available to the investigators adequate for the project proposed? Will the project benefit from unique features of the scientific environment, subject populations, or collaborative arrangements?

#### **9. PLANS FOR WORK UNDER FELLOWSHIP – STATEMENT OF SCIENCE OUTREACH AND ADVOCACY**

FEEDBACK OPTIONAL; THIS SECTION SHOULD NOT BE INCLUDED FOR CONSIDERATION OF SCORING. Does the outreach and advocacy plan present any concerns (including, but not limited to, research compliance, participant safety, and/or feasibility)? Do you have any suggestions to improve the plan?

#### **10. PROPOSED TRAINING AND MENTORING PLAN**

Evaluate the appropriateness of the training activities, (i.e., core curriculum studies, courses and lectures), in enhancing the research training of the applicant, and their relevance to the applicant's career objectives.



## 11. INSTITUTIONAL RESOURCES AND ENVIRONMENT FOR TRAINING

Assess the suitability of the academic and research environment for the proposed training program. Consider departmental and other institutional personnel, ongoing research and other relevant activities, facilities, resources, access to any populations or individuals to be studied, relevant collaborative relationships, etc. Reference any relevant accreditation from professional societies or organizations. Assess whether the availability of these resources will directly benefit the candidate.

## 12. TRAINING EXPERIENCE, BIOSKETCH(ES), SUPPORT, AND COMMITMENT LETTER(S) OF MENTOR(S)

Evaluate the appropriateness of the mentor(s) experiences for their respective roles in the proposed training and mentoring plans. Consider the qualifications and reputation of the mentor(s) in cancer research and in training cancer researchers, the commitment of the mentor(s) to the plan, and the overall appropriateness of the mentor(s) and mentor(s) qualifications for the proposed research project. Consider the funding support of the mentor. This is critical because the budget for a PF award is predominantly stipend support.

## 13. COMPLIANCE STATEMENTS

NOT TO BE CONSIDERED IN SCORING

- 1. Human Subjects.** If the project involves research on humans, assess whether the plans for protection of human subjects from research risks is justified in terms of the scientific goals and research strategy proposed. For example, are the potential benefits and risks to subjects reasonable and appropriate given the study design? If applicable, are the plans to conduct sub-analysis by group, for data security and confidentiality, biohazards and data and safety monitoring adequate?
- 2. Inclusion of Women, Minorities, and Children.** When the proposed project involves human subjects, evaluate the adequacy of the proposed plans for inclusion or exclusion of minorities, male and female genders, as well as children.
- 3. Vertebrate Animals.** Evaluate the involvement of live, vertebrate animals as part of the scientific assessment according to the following points: 1) necessity for the use of the animals and species proposed; 2) appropriateness of the strains, ages, and gender of the animals; 3) justifications for, and appropriateness of, the numbers of animals proposed.
- 4. Biohazards.** Assess whether materials or procedures proposed are potentially hazardous to research personnel and/or the environment, and if needed, determine whether adequate protection is proposed.

## APPENDIX A: EXAMPLE OF A GENERAL AUDIENCE SUMMARY

Title: Characterization of Early Breast Cancer by Contrast-Enhanced MRI

Magnetic resonance imaging (MRI) shows great promise as a supplementary tool to mammography and clinical exam for diagnosis and staging of breast cancer. Most research in this area has focused on diagnosis of invasive breast cancer. We have been interested in improving the ability of MRI to characterize early cancer, particularly at the pre-invasive stage. At the present time, the accuracy of MRI to for diagnosing pre-invasive breast disease, or ductal carcinoma in situ (DCIS) is low, mainly because the pattern of contrast enhancement for DCIS is difficult to distinguish from that of benign proliferative disease in the breast. An important emerging application for MRI is screening and surveillance in women at increased risk of developing breast cancer. There are now genetic tests and statistical models that can accurately predict a woman's risk. However, there are few effective options for prevention and early detection. Women with a genetic risk of developing cancer are also likely to develop cancer at an early age when breast tissue is dense and mammography effectiveness is limited. MRI is very sensitive to small cancers and not limited by breast density. The studies we propose will address the specificity of MRI for early cancer and will have direct application to MRI screening and surveillance methods. We believe that in the future, a better understanding of the biological basis of patterns on MRI may lead to new methods for identifying breast tissue that is at risk for developing cancer.

## APPENDIX B: EXAMPLE OF STRUCTURED TECHNICAL ABSTRACT

**Title:** Structure and Function of DNA Replication Origins in Yeast

**Background:** The initiation of DNA replication marks a crucial step in the eukaryotic cell cycle. Entering S phase commits the cell to a full round of cell division. Studies in the budding yeast, *Saccharomyces cerevisiae*, have driven the field during the past decade, although our data and work by others suggest that many aspects of DNA replication are highly conserved in all eukaryotes, including humans. Origin structure has been best described for autonomously replicating sequence (ARS) function. Different origins have a different domain organization, and it is unclear how these differences impact the initiation of DNA replication. Recently, we have shown that initiation events occur at distinct nucleotide positions in yeast, a feature that appears to be conserved in humans.

**Objective/Hypothesis:** Our preliminary studies indicate that origin organization dictates where replication initiates. Therefore, we propose to define how features of ARS elements contribute to the precise initiation mechanism.

**Specific Aims:** (1) To determine whether chromosomal origins other than ARS1 initiate DNA replication at a distinct site; (2) to identify what determines the replication start point within origins; and (3) to determine if chromatin structure affects the initiation pattern at ARS elements.

**Study Design:** Using a technique that we have recently developed, replication initiation point mapping, we will first map the nucleotide positions at which replication initiates in wild-type and mutant ARS elements. To address the issue of what role chromatin configuration plays in origin activation, we will analyze the nucleosome organization of different ARS loci in relation to those regions where the parental DNA double-strand unwinds first. We will correlate the sites of initiation with sites of unwinding and place those into context with the overall chromatin structure at a given chromosomal ARS locus.

**Cancer Relevance:** These studies will contribute to our understanding of the mechanism underlying origin activation in yeast and will aid us in understanding origin function in more complex, higher eukaryotes. Since uncontrolled origin activity directly translates into uncontrolled growth, the long-term goal of our studies is to apply our knowledge and techniques to human DNA replication in order to inhibit proliferation of cancerous cells.

## APPENDIX C: CLASSIFICATION CATEGORIES - AREAS OF RESEARCH

The areas of research are based on seven broad categories called the Common Scientific Outline (CSO) developed by the International Cancer Research Partnership (ICRP):

1. Biology
2. Etiology
3. Prevention
4. Early Detection, Diagnosis and Prognosis
5. Treatment
6. Cancer Control, Survivorship and Outcomes Research

Applicants are asked to select from the following codes:

### 1 – BIOLOGY

Research included in this category looks at the biology of how cancer starts and progresses as well as normal biology relevant to these processes.

#### 1.1 Normal Functioning

*Examples of science that would fit:*

- Developmental biology (from conception to adulthood) and the biology of aging
- Normal functioning of genes, including their identification and expression, and the normal function of gene products, such as hormones and growth factors
- Normal formation of the extracellular matrix
- Normal cell-to-cell interactions
- Normal functioning of apoptotic pathways
- Characterization of pluripotent progenitor cells (e.g., normal stem cells)

#### 1.2 Cancer Initiation: Alterations in Chromosomes

*Examples of science that would fit:*

- Abnormal chromosome number
- Aberration in chromosomes and genes (e.g., in chronic myelogenous leukemia)
- Damage to chromosomes and mutation in genes
- Failures in DNA repair
- Aberrant gene expression
- Epigenetics
- Genes and proteins involved in aberrant cell cycles

#### 1.3 Cancer Initiation: Oncogenes and Tumor Suppressor Genes

*Examples of science that would fit:*

- Genes and signals involved in growth stimulation or repression, including oncogenes (Ras, etc.), and tumor suppressor genes (p53, etc.)
- Effects of hormones and growth factors and their receptors such as estrogens, androgens, TGF-beta, GM-CSF, etc.
- Research into the biology of stem cell tumor initiation

#### **1.4 Cancer Progression and Metastasis**

*Examples of science that would fit:*

- Latency, promotion, and regression
- Expansion of malignant cells
- Interaction of malignant cells with the immune system or extracellular matrix
- Cell mobility, including detachment, motility, and migration in the circulation
- Invasion
- Malignant cells in the circulation, including penetration of the vascular system and extravasation
- Systemic and cellular effects of malignancy
- Tumor angiogenesis and growth of metastases
- Role of hormone or growth factor dependence/independence in cancer progression
- Research into cancer stem cells supporting or maintaining cancer progression
- Interaction of immune system and microbiome in cancer progression

#### **1.5 Resources and Infrastructure**

*Examples of science that would fit:*

- Informatics and informatics networks
- Specimen resources
- Epidemiological resources pertaining to biology
- Reagents, chemical standards
- Development and characterization of new model systems for biology, distribution of models to scientific community or research into novel ways of applying model systems, including but not limited to computer-simulation systems, software development, in vitro/cell culture models, organ/tissue models or animal model systems. Guidance note: this should only be used where the focus of the award is creating a model. If it is only a tool or a methodology, code to the research instead.
- Education and training of investigators at all levels (including clinicians and other health professionals), such as participation in training workshops, conferences, advanced research technique courses, and Master's course attendance. This does not include longer-term research-based training, such as Ph.D. or post-doctoral fellowships.

## **2 – ETIOLOGY**

Research included in this category aims to identify the causes or origins of cancer - genetic, environmental, and lifestyle, and the interactions between these factors.

## 2.1 Exogenous Factors in the Origin and Cause of Cancer

*Examples of science that would fit:*

- Research into the role of lifestyle factors such as smoking, chewing tobacco, alcohol consumption, parity, diet, sunbathing, and exercise in the origin and cause of cancer or increasing the risk of cancer
- Research into the social determinants of cancer such as crime, housing dilapidation, (poor housing), neighborhood level, socio-economic status, and services and their relationship to cancer incidence and mortality, etc.
- Studies on the effect(s) of nutrients or nutritional status on cancer incidence
- Development, characterization, validation, and use of dietary/nutritional assessment instruments in epidemiological studies and to evaluate cancer risk
- Environmental and occupational exposures such as radiation, second-hand smoke, radon, asbestos, organic vapors, pesticides, and other chemical or physical agents
- Infectious agents associated with cancer etiology, including viruses (Human Papilloma Virus-HPV, etc.), and bacteria (helicobacter pylori, etc.)
- Viral oncogenes and viral regulatory genes associated with cancer causation
- Contextual Factors Contributing to Cancer Incidence (e.g., race/ethnicity, socioeconomic status, neighborhood factors, community factors, built environment)

## 2.2 Endogenous Factors in the Origin and Cause of Cancer

*Examples of science that would fit:*

- Free radicals such as superoxide and hydroxide radicals
- Identification /confirmation of genes suspected of being mechanistically involved in familial cancer syndromes; for example, BRCA1, Ataxia Telangiectasia, and APC
- Identification/confirmation of genes suspected or known to be involved in "sporadic" cancer events; for example, polymorphisms and/or mutations that may affect carcinogen metabolism (e.g., CYP, NAT, glutathione transferase, etc.)
- Investigating a role for stem cells in the etiology of tumors

## 2.3 Interactions of Genes and/or Genetic Polymorphisms with Exogenous and/or Endogenous Factors

Examples of science that would fit:

- Gene-environment interactions, including research into the role of the microbiome
- Interactions of genes with lifestyle factors, environmental, and/or occupational exposures such as variations in carcinogen metabolism associated with genetic polymorphisms

- Interactions of genes and endogenous factors such as DNA repair deficiencies and endogenous DNA damaging agents such as oxygen radicals or exogenous radiation exposure

## 2.4 Resources and Infrastructure Related to Etiology

*Examples of science that would fit:*

- Informatics and informatics networks; for example, patient databanks
- Specimen resources (serum, tissue, etc.)
- Reagents and chemical standards
- Epidemiological resources pertaining to etiology
- Statistical methodology or biostatistical methods
- Centers, consortia, and/or networks
- Development, characterization and validation of new model systems for etiology, distribution of models to the scientific community or research into novel ways of applying model systems, including but not limited to computer-simulation systems, software development, in vitro/cell culture models, organ/tissue models or animal model systems. Guidance note: this should only be used where the focus of the award is creating a model. If it is only a tool or a methodology, code to the research instead.
- Education and training of investigators at all levels (including clinicians and other health professionals), such as participation in training workshops, conferences, advanced research technique courses, and Master's course attendance. This does not include longer term research-based training, such as Ph.D. or post-doctoral fellowships.

### 3 – PREVENTION

Research included in this category looks at identifying individual and population-based primary prevention interventions, which reduce cancer risk by reducing exposure to cancer risks and increasing protective factors.

#### 3.1 Interventions to Prevent Cancer: Personal Behaviors (Non-Dietary) that Affect Cancer Risk

Examples of science that would fit:

- Research on determinants of personal behaviors, such as physical activity, sun exposure, and tobacco use, known to affect cancer risk and interventions (including educational and behavioral interventions directed at individuals as well as population-based interventions including social marketing campaigns, environmental supports, and regulatory, policy and legislative changes), to change determinants or to target health inequalities.
- Directed education to specified populations of patients, health care providers, and at-risk groups about cancer risk and prevention and relevant interventions with the intent of promoting increased awareness and behavioral change. This includes communication of lifestyle models that reduce cancer risk, such as communicating smoking and tobacco cessation interventions, genetic counselling, or targeting/addressing health inequalities.

### **3.2 Dietary Interventions to Reduce Cancer Risk and Nutritional Science in Cancer Prevention**

*Examples of science that would fit:*

- Quantification of nutrients, micronutrients, and purified nutritional compounds in cancer prevention studies
- Development, characterization, validation, and use of dietary/nutritional assessment instruments to evaluate cancer prevention interventions
- Research on determinants of dietary behavior and interventions to change diet, including educational and behavioral interventions directed at individuals as well as population-based interventions including social marketing campaigns, environmental supports, and regulatory and legislative changes, to change diet
- Education of patients, health care providers, at-risk populations, and the general population about cancer risk and diet
- Communicating cancer risk of diet to underserved populations, at-risk populations, and the general public
- Communication of nutritional interventions that reduce cancer risk
- Nutritional manipulation of the microbiome for cancer prevention

### **3.3 Chemoprevention**

*Examples of science that would fit:*

- Chemopreventive agents and their discovery, mechanism of action, development, testing in model systems, and clinical testing
- Other non-vaccine, preventive measures such as prophylactic surgery (e.g., mastectomy, oophorectomy, prostatectomy etc.), use of antibiotics, immune modulators/stimulators or other biological agents
- Manipulation of the microbiome for cancer prevention (e.g. fecal transplant)

### **3.4 Vaccines**

*Examples of science that would fit:*

- Vaccines for prevention, their discovery, mechanism of action, development, testing in model systems, and clinical testing (e.g., HPV vaccines)

### **3.5 Complementary and Alternative Prevention Approaches**

*Examples of science that would fit:*

- Discovery, development, and testing of complementary/alternative medicine (CAM) approaches or other primary prevention interventions that are not widely used in conventional medicine or are being applied in different ways as compared to conventional medical uses
- Mind and body medicine (e.g., meditation, acupuncture, hypnotherapy), manipulative and body-based practices (e.g., spinal manipulation, massage therapy), and other practices (e.g., light therapy, traditional healing) used as preventive measures



### 3.6 Resources and Infrastructure Related to Prevention

*Examples of science that would fit:*

- Informatics and informatics networks; for example, patient databanks
- Specimen resources (serum, tissue, etc.)
- Epidemiological resources pertaining to prevention
- Clinical trials infrastructure
- Statistical methodology or biostatistical methods
- Centers, consortia, and/or networks
- Development and characterization of new model systems for prevention, distribution of models to scientific community or research into novel ways of applying model systems, including but not limited to computer-simulation systems, software development, in vitro/cell culture models, organ/tissue models or animal model systems. Guidance note: this should only be used where the focus of the award is creating a model. If it is only a tool or a methodology, code to the research instead.
- Education and training of investigators at all levels (including clinicians and other health professionals), such as participation in training workshops, conferences, advanced research technique courses, and Master's course attendance. This does not include longer term research-based training, such as Ph.D. or post-doctoral fellowships.

## 4 – EARLY DETECTION, DIAGNOSIS, AND PROGNOSIS

Research included in this category focuses on identifying and testing cancer markers and imaging methods that are helpful in detecting and/or diagnosing cancer as well as predicting the outcome or chance of recurrence or to support treatment decision making in stratified/personalized medicine.

### 4.1 Technology Development and/or Marker Discovery

*Examples of science that would fit:*

- Discovery or identification and characterization of markers (e.g., proteins, genes, epigenetic), and/or technologies (such as fluorescence, nanotechnology, etc.) that are potential candidates for use in cancer detection, staging, diagnosis, and/or prognosis
- Use of proteomics, genomics, expression assays, or other technologies in the discovery or identification of markers
- Defining molecular signatures of cancer cells, including cancer stem cells (e.g., for the purposes of diagnosis/prognosis and to enable treatment decision planning in personalized/stratified/precision medicine)

### 4.2 Technology and/or Marker Evaluation With Respect to Fundamental Parameters of Method

*Examples of science that would fit:*

- Development, refinement, and preliminary evaluation (e.g., animal trials, preclinical, and Phase I human trials) of identified markers or technologies such as genetic/protein

biomarkers (prospective or retrospective) or imaging methods (optical probes, PET, MRI, etc.)

- Preliminary evaluation with respect to laboratory sensitivity, laboratory specificity, reproducibility, and accuracy
- Research into mechanisms assessing tumor response to therapy at a molecular or cellular level

#### **4.3 Technology and/or Marker Testing in a Clinical Setting**

*Examples of science that would fit:*

- Evaluation of clinical sensitivity, clinical specificity, and predictive value (Phase II or III clinical trials), including theranostics and prediction of late/adverse events
- Quality assurance and quality control
- Inter- and intra-laboratory reproducibility
- Testing of the method with respect to effects on morbidity and/or mortality
- Study of screening methods, including compliance, acceptability to potential screenees, and receiver-operator characteristics. Includes education, communication (e.g., genetic counselling and advice on screening behavior based on cancer risk factors), behavioral and complementary/alternative approaches to improve compliance, acceptability or to reduce anxiety/discomfort, and evaluation of new methods to improve screening in healthcare settings.
- Research into improvements in techniques to assess clinical response to therapy

#### **4.4 Resources and Infrastructure Related to Detection, Diagnosis, or Prognosis**

*Examples of science that would fit:*

- Informatics and informatics networks; for example, patient databanks
- Specimen resources (serum, tissue, images, etc.)
- Clinical trials infrastructure
- Epidemiological resources pertaining to risk assessment, detection, diagnosis, or prognosis
- Statistical methodology or biostatistical methods
- Centers, consortia, and/or networks
- Development, characterization and validation of new model systems for detection, diagnosis or prognosis, distribution of models to the scientific community or research into novel ways of applying model systems, including but not limited to computer-simulation systems, software development, in vitro/cell culture models, organ/tissue models or animal model systems. Guidance note: this should only be used where the focus of the award is creating a model. If it is only a tool or a methodology, code to the research instead.
- Education and training of investigators at all levels (including clinicians and other health professionals), such as participation in training workshops, conferences, advanced

research technique courses, and Master's course attendance. This does not include longer term research-based training, such as Ph.D. or post-doctoral fellowships.

## **5 – TREATMENT**

Research included in this category focuses on identifying and testing treatments administered locally (such as radiotherapy and surgery) and systemically (treatments like chemotherapy which are administered throughout the body) as well as non-traditional (complementary/alternative) treatments (such as supplements, herbs). Research into the prevention of recurrence and treatment of metastases are also included here.

### **5.1 Localized Therapies - Discovery and Development**

*Examples of science that would fit:*

- Discovery and development of treatments administered locally that target the organ and/or neighboring tissue directly, including but not limited to surgical interventions, cryotherapy, local/regional hyperthermia, high-intensity, focused ultrasound, radiotherapy, and brachytherapy
- Therapies with a component administered systemically but that act locally (e.g., photodynamic therapy, radioimmunotherapy, radiosensitizers and theranostics)
- Development of methods of localized drug delivery of systemic therapies e.g., Pressurized Intraperitoneal Aerosol Chemotherapy (PIPAC), direct intratumoral polymers/gels/nanoparticles/microsomes etc.
- Research into the development of localized therapies to prevent recurrence
- Guidance note: localized therapies are considered to be localized when the site of action is the same as the site of administration.

### **5.2 Localized Therapies - Clinical Applications**

*Examples of science that would fit:*

- Clinical testing and application of treatments administered locally that target the organ and/or neighboring tissue directly, including but not limited to surgical interventions, cryotherapy, local/regional hyperthermia, radiotherapy, and brachytherapy.
- Clinical testing and application of therapies with a component administered systemically but that act locally (e.g., photodynamic therapy, radiosensitizers and theranostics, Pressurized Intraperitoneal Aerosol Chemotherapy (PIPAC), direct intratumoral polymers/gels/nanoparticles/microsomes etc.)
- Phase I, II, or III clinical trials of promising therapies that are administered locally
- Side effects, toxicity, and pharmacodynamics
- Clinical testing of localized therapies to prevent recurrence and prevent and treat metastases

### **5.3 Systemic Therapies - Discovery and Development**

*Examples of science that would fit:*

- Discovery and development of treatments administered systemically such as cytotoxic or hormonal agents, novel systemic therapies such as immunologically directed therapies (treatment vaccines, antibodies), gene therapy, angiogenesis inhibitors, apoptosis inhibitors, whole body hyperthermia, bone marrow/stem cell transplantation, differentiating agents, adjuvant and neo-adjuvant treatments, systemically-delivered nanoparticles/microsomes, cell-based therapies, manipulation of the microbiome etc.
- Identifying mechanisms of action of existing cancer drugs and novel drug targets, including cancer stem cells for the purposes of treatment/identifying drug targets
- Drug discovery and development, including drug metabolism, pharmacokinetics, pharmacodynamics, combinatorial chemical synthesis, drug screening, development of high throughput assays, and testing in model systems, including that which may aid treatment planning in stratified/personalized medicine
- Investigating the molecular mechanisms of drug resistance (including the role of cancer stem cells) and pre-clinical evaluation of therapies to circumvent resistance
- Development of methods of drug delivery
- Research into the development of systemic therapies to prevent recurrence

#### **5.4 Systemic Therapies - Clinical Applications**

*Examples of science that would fit:*

- Clinical testing and application of treatments administered systemically such as cytotoxic or hormonal agents, novel systemic therapies such as immunologically directed therapies (treatment vaccines, antibodies, antibiotics, theranostics or other biologics), gene therapy, angiogenesis inhibitors, apoptosis inhibitors, whole body hyperthermia, bone marrow/stem cell transplantation, and differentiating agents, adjuvant and neo-adjuvant treatments, systematically-delivered nanoparticles/microsomes, cell-based therapies, manipulation of the microbiome etc.
- Phase I, II, or III clinical trials of promising therapies administered systemically
- Side effects, toxicity, and pharmacodynamics
- Clinical testing of systemic therapies to prevent recurrence and prevent and treat metastases

#### **5.5 Combinations of Localized and Systemic Therapies**

*Examples of science that would fit:*

- Development and testing of combined local and systemic approaches to treatment (e.g., radiotherapy and chemotherapy, or surgery and chemotherapy)
- Clinical application of combined approaches to treatment such as systemic cytotoxic therapy and radiation therapy
- Development and clinical application of combined localized and systemic therapies to prevent recurrence and prevent and treat metastases

#### **5.6 Complementary and Alternative Treatment Approaches**

*Examples of science that would fit:*

- Discovery, development, and clinical application of complementary/alternative medicine (CAM) treatment approaches such as diet, herbs, supplements, natural substances, or other interventions that are not widely used in conventional medicine or are being applied in different ways as compared to conventional medical uses
- Complementary/alternative or non-pharmaceutical approaches to prevent recurrence and prevent and treat metastases

## 5.7 Resources and Infrastructure Related to Treatment and the Prevention of Recurrence

*Examples of science that would fit:*

- Informatics and informatics networks; for example, clinical trials networks and databanks
- Mathematical and computer simulations
- Specimen resources (serum, tissue, etc.)
- Clinical trial groups
- Clinical treatment trials infrastructure
- Epidemiological resources pertaining to treatment
- Statistical methodology or biostatistical methods
- Drugs and reagents for distribution and drug screening infrastructures
- Centers, consortia, and/or networks
- Development and characterization of new model systems for treatment, distribution of models to scientific community or research into novel ways of applying model systems, including but not limited to computer-simulation systems, software development, in vitro/cell culture models, organ/tissue models or animal model systems. Note: this should only be used where the focus of the award is creating a model. If it is only a tool or a methodology, code to the research instead.
- Reviews/meta-analyses of clinical effectiveness of therapeutics/treatments
- Education and training of investigators at all levels (including clinicians and other health professionals), such as participation in training workshops, conferences, advanced research technique courses, and Master's course attendance. This does not include longer term research-based training, such as Ph.D. or post-doctoral fellowships.

## 6 - CANCER CONTROL, SURVIVORSHIP, AND OUTCOMES RESEARCH

Research included in this category includes a broad range of areas: patient care and pain management; tracking cancer cases in the population; beliefs and attitudes that affect behavior regarding cancer control; ethics; education and communication approaches for patients, family/caregivers, and health care professionals; supportive and end-of-life care; and health care delivery in terms of quality and cost effectiveness.

### 6.1 Patient Care and Survivorship Issues

*Examples of science that would fit:*

- Research into patient-centered outcomes
- Quality of life

- Pain management
- Psychological impacts of cancer survivorship
- Rehabilitation, including reconstruction and replacement
- Economic sequelae, including research on employment, return to work, and vocational/educational impacts on survivors and their families/caregivers
- Reproductive issues
- Long-term issues (morbidity, health status, social and psychological pathways)
- Symptom management, including nausea, vomiting, lymphedema, neuropathies, etc.
- Prevention and management of long-term treatment-related toxicities and sequelae, including symptom management (e.g., physical activity or other interventions), prevention of mucosities, prevention of cardiotoxicities, opportunistic infections, cachexia etc.
- Psychological, educational or complementary/alternative (e.g., hypnotherapy, relaxation, transcendental meditation, imagery, spiritual healing, massage, biofeedback, herbs, spinal manipulation, yoga, acupuncture) interventions/approaches to promote behaviors that lessen treatment-related morbidity and promote psychological adjustment to the diagnosis of cancer and to treatment effects
- Burdens of cancer on family members/caregivers and interventions to assist family members/caregivers
- Educational interventions to promote self-care and symptom management
- Research into peer support, self-help, and other support groups
- Behavioral factors in treatment compliance

## 6.2 Surveillance

*Examples of science that would fit:*

- Epidemiology and end results reporting (e.g., SEER)
- Registries that track incidence, morbidity, co-morbidities/symptoms, long-term effects and/or mortality related to cancer
- Surveillance of established cancer risk factors in populations such as diet, body weight, physical activity, sun exposure, and tobacco use, including method development
- Analysis of variations in established cancer risk factor exposure in populations by demographic, geographic, economic, or other factors
- Trends in use of interventional strategies in populations (e.g., geographic variation)

## 6.3 Population-based Behavioral Factors

*Examples of science that would fit:*

- Research into populations' attitudes and belief systems (including cultural beliefs) and their influence on behaviors related to cancer control, outcomes and treatment. For example, how populations' beliefs can affect compliance/interaction with all aspects of the health care/service provision

- Research into the psychological effects of genetic counselling
- Research into behavioral barriers to improving cancer care/survivorship clinical trial enrollment

#### **6.4 Health Services, Economic and Health Policy Analyses**

*Examples of science that would fit:*

- Development and testing of health service delivery methods
- Interventions to increase the quality of health care delivery
- Impact of organizational, social, and cultural factors on access to care and quality of care, including studies on variations or inequalities in access among racial, ethnic, geographical or socio-economic groups
- Studies of providers such as geographical or care-setting variations in outcomes
- Effect of reimbursement and/or insurance on cancer control, outcomes, and survivorship support
- Health services research, including health policy and practice and development of guidelines/best practice for healthcare delivery across the diagnostic/preventive/treatment spectrum
- Analysis of health service provision, including the interaction of primary and secondary care
- Analyses of the cost effectiveness of methods used in cancer prevention, detection, diagnosis, prognosis, treatment, and survivor care/support
- Ethical, legal or social implications of research/health service delivery (e.g. genetic counselling)
- Research into systemic or operational barriers to trial enrollment

#### **6.5 Education and Communication Research**

*Examples of science that would fit:*

- Development of generic health provider-patient communication tools and methods (e.g., telemedicine/health)
- Tailoring educational approaches or communication to different populations (e.g., social, racial, geographical, or linguistic groups)
- Research into new educational and communication methods and approaches, including special approaches and considerations for underserved and at-risk populations
- Research on new methods and strategies to disseminate cancer information/innovation to healthcare providers (e.g., web-based information, telemedicine, smartphone apps, etc.) and the effectiveness of these approaches
- Research on new communication processes and/or media and information technologies within the health care system and the effectiveness of these approaches
- Media studies focused on the nature and ways in which information on cancer and cancer research findings are communicated to the general public

- Education, information, and assessment systems for the general public, primary care professionals, or policy makers
- Research into barriers to successful health communication

## **6.6 End-of-Life Care**

*Examples of science that would fit:*

- Hospice/end-of-life patient care focused on managing pain and other symptoms (e.g., respiratory distress, delirium) and the provision of psychological, social, spiritual and practical support through either conventional or complementary/alternative interventions/approaches throughout the last phase of life and into bereavement
- Quality of life and quality of death for terminally ill patients
- Provision of psychological, social, spiritual, and practical support to families/caregivers through either conventional or complementary/alternative interventions/approaches
- Research into the delivery of hospice care

## **6.7 Research on Ethics and Confidentiality**

*Examples of science that would fit:*

- Informed consent modeling/framing and development
- Quality of Institutional Review Boards (IRBs)
- Protecting patient confidentiality and privacy
- Research ethics
- Research on publication bias within the cancer research field

## **6.8 – Historical code [no longer used]**

## **6.9 Resources and Infrastructure Related to Cancer Control, Survivorship, and Outcomes Research**

*Examples of science that would fit:*

- Informatics and informatics networks
- Clinical trial groups related to cancer control, survivorship, and outcomes research
- Epidemiological resources pertaining to cancer control, survivorship, and outcomes research
- Statistical methodology or biostatistical methods pertaining to cancer control, survivorship and outcomes research
- Surveillance infrastructures
- Centers, consortia, and/or networks pertaining to cancer control, survivorship and outcomes research
- Development and characterization of new model systems for cancer control, outcomes or survivorship, distribution of models to scientific community or research into novel ways of applying model systems, including but not limited to computer-simulation



systems, software development, in vitro/cell culture models, organ/tissue models or animal model systems. Guidance note: this should only be used where the focus of the award is creating a model. If it is only a tool or a methodology, code to the research instead.

- Psychosocial, economic, political and health services research frameworks and models
- Education and training of investigators at all levels (including clinicians and other health professionals), such as participation in training workshops, conferences, advanced research technique courses, and Master's course attendance. This does not include longer-term research-based training, such as Ph.D. or post-doctoral fellowships.