



# BCB



**Instructions for the written component of the  
Biochemistry and Cancer Biology  
Comprehensive examination**



---

**This document is a modified excerpt of the U.S. Department  
of Health and Human Services Public Health Service:**

**SF424 (R&R) Individual Fellowship  
Application Guide**

**A guide developed and maintained by NIH for  
preparing and submitting individual fellowship  
applications to NIH using the SF424 (R&R)**

---

## General Formatting Instructions:

**Preparation of all applications must adhere to the following guidelines. Altering margins or fonts in order to circumvent page limits will affect grading of the proposal.**

### **Font**

Use an Arial, Helvetica, Palatino Linotype, or Georgia typeface, a black font color, and a font size of 11 points or larger. (A Symbol font may be used to insert Greek letters or special characters; the font size requirement still applies.)

Type density, including characters and spaces, must be no more than 15 characters per inch. Type may be no more than six lines per inch.

### **Paper Size and Page Margins**

Use *standard paper size* (8 ½" x 11).

Use at least one-half inch margins (top, bottom, left, and right) for all pages. No information should appear in the margins, including the PI's name and page numbers.

### **Page Formatting**

Since a number of reviewers will be reviewing applications as an electronic document and not a paper version, applicants are strongly encouraged to use only a standard, single-column format for the text. Avoid using a two-column format since it can cause difficulties when reviewing the document electronically.

Do not include any information in a header or footer of the attachments.

### **Figures, Graphs, Diagrams, Charts, Tables, Figure Legends, and Footnotes**

You may use a smaller type size but it must be in a black font color, readily legible, and follow the font typeface requirement. Color can be used in figures; however, all text must be in a black font color, clear and legible.

### **Grantsmanship**

Use English and avoid jargon.

If terms are not universally known, spell out the term the first time it is used and note the appropriate abbreviation in parentheses. The abbreviation may be used thereafter.

### **Page Limits**

The total number of pages for all applications will be the same, but the relative number of pages dedicated to each component of the proposal will vary between individual proposals..

|                             |  |
|-----------------------------|--|
| <b>1. Specific Aims</b>     | <p>State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved.</p> <p>List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology.</p> <p><i>Specific Aims are limited to one page.</i></p>   |
| <b>2. Research Strategy</b> | <p>Organize the Research Strategy in the specified order using the instructions provided below. Start each section with the appropriate section heading—Significance, Innovation, Approach. Cite published experimental details in the Research Strategy section and provide the full reference in the Bibliography and References Cited section. <i>Research Strategy is limited to six pages.</i></p> <p><b><u>(a) Significance</u></b></p> <ul style="list-style-type: none"><li>• Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.</li><li>• Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.</li><li>• Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.</li></ul> <p><b><u>(b) Approach</u></b></p> <ul style="list-style-type: none"><li>• Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate.</li><li>• Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.</li><li>• If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.</li><li>• Point out any procedures, situations, or materials that may be hazardous to personnel and precautions to be exercised.</li><li>• Include any courses that you plan to take to support the research training experience.</li></ul> |

| Field Name                          | Instructions  |
|-------------------------------------|---|
|                                     | <p>If an applicant has multiple Specific Aims, then the applicant may address Significance, and Approach for each Specific Aim individually, or may address Significance and Approach for all of the Specific Aims collectively.</p> <p>As applicable, also include the following information as part of the Research Strategy, keeping within the sections listed above: Significance and Approach.</p> <p><b>Preliminary Studies for New Applications.</b></p> <p>Include information on preliminary studies, if any. Discuss the applicant's preliminary studies, data and/or experience pertinent to this application.</p> <p>When applicable, provide a succinct account of published and unpublished results, indicating progress toward their achievement.</p> <p>A list of publications, manuscripts accepted for publication, patents, and other printed materials should be included in the appendix.</p>   |
| <p><b>3. References</b></p>         | <p>References should be listed in a separate section that does not contribute to the overall page limits set for the application.</p>   |
| <p><b>4. Vertebrate Animals</b></p> | <p>If Vertebrate Animals are involved in the project, address each of the five points below. This section should be a concise, complete description of the animals and proposed procedures. While additional details may be included in the Research Strategy, the responses to the five required points below must be cohesive and include sufficient detail to allow evaluation by reviewers .</p> <p>The five points are as follows:</p> <ol style="list-style-type: none"> <li>1. Provide a detailed description of the proposed use of the animals in the work outlined in the “Research Strategy” section. Identify the species, strains, ages, sex, and numbers of animals to be used in the proposed work.</li> <li>2. Justify the use of animals, the choice of species, and the numbers to be used. If animals are in short supply, costly, or to be used in large numbers, provide an additional rationale for their selection and numbers.</li> <li>3. Provide information on the veterinary care of the animals involved.</li> <li>4. Describe the procedures for ensuring that discomfort, distress, pain, and injury will be limited to that which is unavoidable in the conduct of scientifically sound research. Describe the use of analgesic, anesthetic, and tranquilizing drugs and/or comfortable restraining devices, where appropriate, to minimize discomfort, distress, pain, and injury.</li> <li>5. Describe any method of euthanasia to be used and the reasons for its selection. State whether this method is consistent with the recommendations of the Panel on Euthanasia of the American Veterinary Medical Association (AVMA) Guidelines on Euthanasia. If not, present a justification for not following the recommendations.</li> </ol> |

| Field Name         | Instructions   |
|--------------------|--|
| <b>E. Appendix</b> | <p>Only one copy of appendix material should be included.</p> <p>A maximum of 10 PDF attachments is allowed in the Appendix. Grants.gov defaults to a maximum of 10 separate attachments.</p> <p>Do not use the Appendix to circumvent the page limitations of the Research Strategy section of the Research Training Plan.</p> <p>A summary sheet listing all of the items included in the appendix is also encouraged but not required. When including a summary sheet, it should be included in the first appendix attachment.</p> <ul style="list-style-type: none"><li>• <b>Publications</b> –Fellowship applicants may submit up to 3 of the following types of publications:<ul style="list-style-type: none"><li>○ <b>Manuscripts and/or abstracts accepted for publication but not yet published.</b></li><li>○ <b>Manuscripts and/or abstracts published.</b></li><li>○ <b>Poster/Oral presentations directly relevant to the project.</b></li></ul></li></ul> <p><b>Do not include unpublished theses, or abstracts/manuscripts submitted (but not yet accepted) for publication.</b></p> <ul style="list-style-type: none"><li>• Letters from collaborators expressing their interest in helping your project by providing either reagents or expertise.</li></ul> |

### **Additional Proposal Writing Resources:**

#### **Grant Writing Tips and Sample applications**

[http://grants.nih.gov/grants/grant\\_tips.htm](http://grants.nih.gov/grants/grant_tips.htm)

[http://grants.nih.gov/grants/grants\\_process.htm](http://grants.nih.gov/grants/grants_process.htm)

#### **Grants Information**

<http://grants.nih.gov/grants/giwelcome.htm>

Email: [GrantsInfo@nih.gov](mailto:GrantsInfo@nih.gov)

Telephone: (301) 435-0714; (301) 451-5936 (TTY)

#### **Grants.gov User Guide**

The Grants.gov User Guide is a comprehensive reference to information about Grants.gov.

<http://www.grants.gov/assets/ApplicantUserGuide.pdf>.

#### **Office of Laboratory Animal Welfare (OLAW)**

<http://olaw.nih.gov>

Information about animal welfare policy requirements, Institutional Animal Care and Use Committees (IACUC), and Animal Welfare Assurances

Telephone: (301) 496-7163