

LOI Guidance Document – 2027 Arnold O. Beckman Postdoctoral Fellowship

The Arnold O. Beckman (AOB) Postdoctoral Fellowship **letter of intent** (LOI) includes a short pre-proposal that is designed to layout the scientific problem or question that you hope to address, the reason that this particular challenge is important (i.e., why is the current state of the art not sufficient?), and your approach to the problem or question. You will want to provide enough technical content and detail to convince the reviewers that you know the field and have a unique approach to addressing the issue. While the pre-proposal is not the space for you to discuss every experiment that will be done or why, it is a place where you will want to highlight your approach, broken down into its significant aims, and any key experiments, strategies, or new methods that you plan to use to address this question.

General Guidance

- Be sure to propose interesting science that is not already being done in your mentor's lab, but don't stop there! Make sure that you also place that science **within a broader context**. What is the **need** for what you are proposing and why is what you are proposing useful and exciting? What will be achieved technically if this work is successful? Will it have a societal impact? What will change if this project is successful? These are good questions to guide your thought process and answering at least some of them clearly within your pre-proposal will help the reviewers to understand the potential impact of the proposed work. In fact, reminding the reviewers of the shortfalls of current technology and the advantages of your solutions throughout your pre-proposal will help to keep the relevance and importance of what you are proposing in the front their minds. It might also help you to stay focused on what makes your proposed science so important!
- The best scientific creativity comes from **boundaryless thinking**. Try not to worry about what others are doing or proposing. Rather focus on presenting a good way to approach a problem of scientific import that excites you. Then, using your own style, explain your approach clearly so that a general scientific audience can understand.
- A proposal that is written in your own **personal voice** will always be most compelling. While your proposal needs to follow the outline set out in the applicant instructions (e.g., specific aims, background, significance (chemical sciences), proposed strategy and approach, and instrument dissemination and sustainability plan (chemical instrumentation only)), using your own voice and demonstrating your excitement for the proposed work will help the reviewers get excited about your proposal, too!
- Think about **potential issues and contingency plans** (i.e., why might my initial really cool idea not work, and if it doesn't, how might I get around this issue and still accomplish the goals of the proposal?). This is especially important if your second or third aim relies heavily on the successful completion of an earlier part of the proposal. Identifying potential challenges doesn't mean naming everything you could possibly try or everything that might go wrong. Rather, focus your attention on what aspects of your proposed science **MUST** be

accomplished for the remainder of the work to be possible. For these critical outcomes, are there things that might cause the science, as proposed, not to work? If so, can you come up with another approach that could realistically be used to circumvent the issue? By recognizing potential issues and building tunable or diverse strategies into your proposal, you show the reviewers that you recognize the key parts of your strategy and are a scientist who is able to adapt and overcome the challenges that are always part of the research process.

The Fine Print: A Few Tips About the Details

Which program should I apply to? If you are interested in developing a new instrument to address a need or deficiency in a field directly related to the chemical sciences, then you should apply for an AOB Postdoctoral Fellowship in Chemical Instrumentation. Through this program, you will receive an additional \$200K designated for the materials and supplies you will need to build your new instrument.

If you are someone who wants to solve a chemical problem and will use existing or slightly modified instruments to do so, you will want to apply for an AOB Postdoctoral Fellowship in the Chemical Sciences. While these awards do not include the extra instrumentation monies, they also don't require you to demonstrate that you have built a new instrument.

Requirements. Every fellowship program differs in who is eligible to apply. You will want to keep in mind that you must meet the following requirements to be considered for an AOB Postdoctoral Fellowship:

- Must complete your PhD by no later than May 1 of the program year
- Must have completed no more than 18 months of post-doctoral work by the application deadline
- If you received your PhD more than 3 years ago, you are only eligible to apply if you experienced a leave of absence/stop the clock disruption (e.g. military service, child rearing, or similar)
- Must be a US citizen, permanent resident, or hold Deferred Action for Childhood Arrivals (DACA) recipient status
- Research must be conducted at a university or research institute; research at national labs and the like are not eligible.
- The underlying proposed research and innovation must be chemistry-focused, although the project can have applications in other fields such as biology or physics.
- Mentors must be identified prior to application submission, hold a PhD or MD/PhD, and be a full-time tenure track or tenured professor with at least a 25% appointment in chemistry, chemical physics, chemical engineering, or material science. Mentors may only support one applicant per review cycle.

Using AI Tools. The Arnold and Mabel Beckman Foundation supports the use of AI tools as supplementary resources. However, while their use in your application is at your discretion, we expect that you will use these AI tools in an ethical and responsible manner. As the applicant, you are expected to comply with best practices in research and publishing ethics, take full responsibility for any errors made by an AI tool, and to cooperate by responding to any questions

that may arise relating to the accuracy or integrity of any part of your work, including data analyses and representation. *If AI tools are used in producing any part of your application or in assisting with the writing process, a brief statement describing this use must be included with the references.*

In order to protect your information from AI algorithms during the review process, the Foundation's reviewers are NOT allowed to use or upload your materials into an AI tool. In addition, the Foundation does not use AI tools for screening or evaluating applications.

Reviewers. The reviewers for your proposal will be active researchers in the chemical sciences or related fields, but it is unlikely that the whole committee will be experts in your specific field or sub-specialty. As such, make sure to present your proposed work so that its import and relevance can be understood by a more general scientific audience. Too much technical detail or jargon can be off-putting and tiring for reviewers who are reading multiple applications. That doesn't mean that the specifics of a particular experiment shouldn't be included; for key experiments, including the details and why that experiment is so important, might be critical. Regardless, writing a proposal that is all about the fine details of your experiments can lead to a dense proposal that is hard to read, and which will often review less favorably.

Plan Ahead and Secure Institutional Support. It is a good idea to start the writing and planning process early. In order to officially submit a Letter of Intent to the AOB Postdoctoral Fellowship program, you will need a letter of support from the Dean of the Department or Academic Unit that you will be working in. You will be responsible for uploading this letter to the application portal, and the letter needs to include very specific information in the first section. The details can be found in the application instructions and should be communicated to the appropriate Dean directly. In addition, your sponsored research office may have other internal requirements and deadlines. Contacting these institutional offices and representatives early will ensure that you know what they need, and by when, in order to complete the application process on time.

Graphics. Using schemes and graphics to help explain your proposal is critical but using too many or not enough can make your pre-proposal feel out of balance. On average, consider using one well thought out scheme per page or section of your pre-proposal. Given that you only have a few pages to describe your work, utilizing high impact graphics will help you to guide the reviewers through your science without using more space than is absolutely required.

Be sure that your graphics are large enough to be read easily. Making a graphic smaller so that there is more room for either another graphic or more text might seem like a good idea, but if a reviewer has to strain to see the details or to decipher the labels, it is likely to reduce their enthusiasm for your work.

Blinding. All AOB Postdoctoral Fellowship pre-proposals are reviewed blind, which means that the reviewers will not know who you are. Be sure to review the instructions for writing a blinded pre-proposal on the program website and within the application instructions prior to beginning your proposal. Writing a proposal that clearly lays out an important and exciting scientific problem and why your strategy is a good way (or perhaps even the best way!) to solve it, without obviously leaning into your prior work and accomplishments, can be challenging. To help you get

a feel for what constitutes appropriate blinding, we have provided a few examples below. Be sure to give yourself plenty of time to draft and edit.

Example #1

Poorly Blinded

I will begin by screening hundreds of the Mouse laboratory's proteins for catalyzing various transfer reactions.^{14,35,47,53} The Mouse laboratory has accumulated a short list of protein active-site residues that play crucial roles in altering reaction selectivity. This vast wealth of institutional knowledge is one of the great benefits of pursuing this research under the tutelage of Professor Mickey Mouse.

****References 14,35,47,53 are all to work done in Professor Mickey Mouse's lab.**

Appropriately Blinded

I will begin by screening hundreds of the proteins that have been previously identified to catalyze various transfer reactions.^{Ref to mentor's work as well as that of other labs} Our initial studies will target a short list of protein active-site residues that are known to play crucial roles in altering reaction selectivity.

Example #2

Poorly Blinded

Using the structure-property relationships established by my group, we will tune the optical performance of the target complexes.²³ Potential pitfalls in the proposed research, include: 1) complexes that cannot be detected; and 2) the absence of the targeted effect in the proposed complexes. However, given the Duck group's previous efforts to use structure-property relationships to tune the photophysical properties of each complex and preliminary data for complex **1**, we do not believe that these will be issues.

****Reference 23 is to work done in the applicant's, Professor Donald Duck's, group.**

Appropriately Blinded

Using the structure-property relationships that have already been established,^{Ref to work done by the Duck group and other labs} we will tune the optical performance of the target complexes. Potential pitfalls in the proposed research, include: 1) complexes that cannot be detected; and 2) the absence of the targeted effect in the proposed complexes. However, given the precedent for using structure-property relationships to tune the photophysical properties of complexes and our preliminary data for complex **1**, we do not believe that these will be issues.

In addition to these examples, we caution the use of language like the following:

- “My mentor is uniquely specialized in...”
- “My mentor is a world-renowned expert in...”
- “Our laboratory is the only lab in the United States that...”
- References to exclusive equipment, facilities, or programs that would clearly identify your institution or research group
- References to your/mentor's publication in association with preliminary results in the proposal

If specialized expertise, resources, or infrastructure are essential to describing your project, please refer to them in **general, non-identifying terms** (e.g., “access to specialized imaging equipment” rather than naming or uniquely describing the facility).

Proofreading. Be sure to carefully proofread and edit your proposal before submission. Errors in spelling, grammar, and numbering can annoy a reviewer, decreasing their excitement for the work that you are presenting.

Tip 1: If possible, ask a colleague or prior awardee to review your pre-proposal before submission.

Tip 2: It can be helpful to have someone non-technical or very far from your field review your draft. In a good proposal, these non-specialists should be able to understand the potential big picture impacts of your work, even if they don’t understand the technical details. They can also give you good feedback on the overall flow and style of the writing.

Tip 3: Read your proposal a sentence at a time backwards. After writing and rereading something over and over, your brain begins to auto-correct errors that may be present. Reading the proposal sentence by sentence backwards will help you to catch these errors.

Use the Beckman Network. Feel free to reach out to former awardees for help and guidance as you think about your research proposal and prepare your LOI. A full list of former awardees can be found on the Beckman Foundation website at <https://www.beckman-foundation.org/awarded-scientists/>

Connecting to the Legacy. Given the importance of Arnold O. Beckman’s career and the initiatives of the Foundation, you might want to read up on his life and accomplishments to see how his legacy intersects with the goals of your proposal.