

You may use a symbol font to insert Greek letters or special characters, but the font size requirement still applies. In addition, there can be no more than 15 characters — including characters *and* spaces — per inch. And there can be no more than six lines of text per inch, using at least half-inch margins on all sides of the 8½" x 11" page.

## Overcome Specific Aims Challenges

There are several common challenges that applicants face — and proven ways to overcome them — that specifically apply to their Specific Aims, including the following:

**Challenge 1:** If your reviewer reads your Specific Aims and finds them interesting but remains unconvinced, she likely will read the rest of your application to determine if your project is feasible. Therefore, be sure to end the page with a brief paragraph that states your work's impact — that is, how your project, if successful, will change your field of research. Spelling this out for the reviewer allows them to easily grasp your proposal's strengths without having to work for it.

For example: "These two innovative methods, as well as the expertise of the team assembled, will combine to examine whether microparticles can offer important windows on the physiologic world of pregnancy and preeclampsia and set the stage for further longitudinal studies that seek to predict preeclampsia to allow for early treatment." ✓

**Challenge 2:** Reviewers often make the following comment on the summary statement: "If the first specific aim doesn't work, the whole proposal goes out the window. If the researcher doesn't get a positive result with it, he or she can't do aims 2 or 3, so we're not going to fund this until we see the data that have basically finished Aim 1."

If the aims follow each other so that Aim 2 follows Aim 1 and Aim 3 follows Aim 2, you must tell the reviewers what you intend to do if you get an unexpected result with Aim 1. Convince them that there is a future to your proposal nonetheless.

The best grant applications are those with interconnected — but not interdependent — aims. Reviewers look for those experiments where the results do not particularly matter because the various outcomes are equally interesting.



## STRATEGY:

If the aims follow each other so that Aim 2 follows Aim 1 and Aim 3 follows Aim 2, you must tell the reviewers what you intend to do if you get an unexpected result with Aim 1.



For example, interconnected Specific Aims might include the following:

**Specific Aim 1:** Test the hypothesis that plasma microparticles detected in pregnant women will reveal physiologic events during gestation and preeclampsia.

**Specific Aim 2:** Test the hypothesis that proteomics performed on microparticles over gestation and on subsets of microparticles from normal and preeclamptic women will reveal key differences in protein expression patterns associated with preeclampsia.

**Challenge 3:** If you are submitting a competitive renewal and change the thrust of your research from the original proposal, tell reviewers why you changed the Specific Aims, and detail your new directions. The reviewer will see the summary statement from the initial award and know your original award's Specific Aims.

Some reviewers are very particular about that, wondering, "Did the Principal Investigator succeed in the first five years?" If not, they likely will not give that PI for a second chance. As a result, you must inform reviewers why you changed directions, such as because something came up that was more interesting to pursue or a new technology became available.

## Crafting Your Specific Aims

The three or four Specific Aims that make up the body of your research plan are the real engine that drives your application. Why is it usually three or four aims?

There is no rule regarding how many aims your proposal should have, but three or four is the average for most NIH R01 applications.

An application with only one or two aims leaves the reviewer to weigh only one or two strategies to test your hypothesis, which means it likely does not have a broad enough scope to truly impact the field.●

With more than four aims, space limitations will not allow you to sufficiently describe your aims to convince reviewers you have fully developed them: Three to four aims support enough hypothesis-testing strategies and description within the application and better support the number of researchers under the budget and likely four-year project duration.

## TIP:

Three to four aims support enough hypothesis-testing strategies and description within the application and better support the number of researchers under the budget and likely four-year project duration.





You might consider using a standard format for each of your aims using separate sections. One reviewer recommends breaking your aims down into the following:

- **Rationale** — This provides the strategic context, meaning what you are trying to show and why. This is also the place where you defend the specific approach you plan to use, consider alternatives and begin to describe your logic in designing your experiments.
- **Experimental Approach** — Here, detail how the experiments will be performed. Try to build reviewer confidence that you can perform them. For established investigators, you can highlight key papers in your bibliography that support your experience in the proposed techniques. New investigators either must show preliminary data demonstrating such familiarity or recruit collaborators with widely-acknowledged expertise in the method.
- **Outcomes and Alternatives** — Use this section to describe your experiments' potential results and their implications for your proposed model(s).

You should also consider including an experimental flow chart that provides a glimpse into the broader strategic thinking guiding your project. Such flow charts can illustrate how your plan to prioritize between the different approaches, which outcomes confirm — or undermine — your model, and available alternatives if an experiment fails.

## Rely on This Example

Here is a Specific Aims example from a successful NIH grant application (Combining Anti-Invasive and Anti-Angiogenic Therapies for the Treatment of GBM, Principal Investigator: Panagiotis Z. Anastadiadis, PhD). Keep in mind that as originally submitted, this section takes up just over one page but here appears on two pages because of our formatting changes: