Tips for NSF GRF Success

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Most proposals do not fail because of bad science—

- Failure to follow instructions
  - Not submitted by deadline
  - Exceeds page or budget limits
  - Missing signatures and certifications
  - Mandatory information not supplied
- Poor logical organization
- Lack of detail
- Failure to anticipate reviewers' questions and objections
- Failure to consider the funder's mission and objectives

Make these three rules your mantra

Rule #1:

Witlessly follow the proposal preparation instructions to the letter—*no exceptions*!

Rule #2:

Don't write anything that you don't *thoroughly* understand.

Rule #3:

Details matter. Funding decisions are made on the margins.

Rule #1: Follow the rules

Make sure you're eligible

Submit all required components

Conform to formatting requirements

Adhere to page limits

No links to material outside the application

Submit by the deadline (early)!
includes all academic transcripts

Rule #2: Make sure you (and the reviewers) understand

Don’t write *anything* that you don’t thoroughly understand

Don’t assume the reviewers will be experts in your narrow subfield

Provide explanations and examples; eschew jargon

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Rule #3: Little things can make a BIG difference

- Use your spell-checker after every change to the text
- Triple-check your math
- Provide clear, reproducible figures
- Define all acronyms and abbreviations
- Use one of the allowed fonts
- Adhere to word and page counts
- *Profreed—proofreed—proofread!*

Use the Elliott equation* to estimate the time it will take

$$t = 3h + \varepsilon\,, \qquad [1]$$

where *t* is the time it actually takes to prepare, check, and submit a proposal, and *h* is the number of hours you think any idiot ought to be able to do it in.

***based on >17 years of solid empirical data**

Be aware of the realities of review

- Reviewers are experts, and they're very busy
- They are not compensated for their work
- They read proposals under less-than-ideal conditions
- They are looking for mistakes, omissions, objections
- They will be reading several proposals on the same topic—how will yours compare to your competitors'?

You want to convince the NSF of two things:

- The merits of your project
- Your ability to carry it out successfully

Make an outline of your key points

Arrange them in order so that one point leads logically and inevitably to the next

Give equal emphasis to research & education

Anticipate reviewer objections and answer them in the narrative

Anticipate reviewer objections

- If others have tried to solve the problem and failed, emphasize how your approach is different and more likely to succeed
- Candidly discuss alternative approaches and explicitly explain why your approach is better
- Make sure reviewers have all the facts they need to make a positive decision
- Provide a timeline to show that you have carefully thought through your project

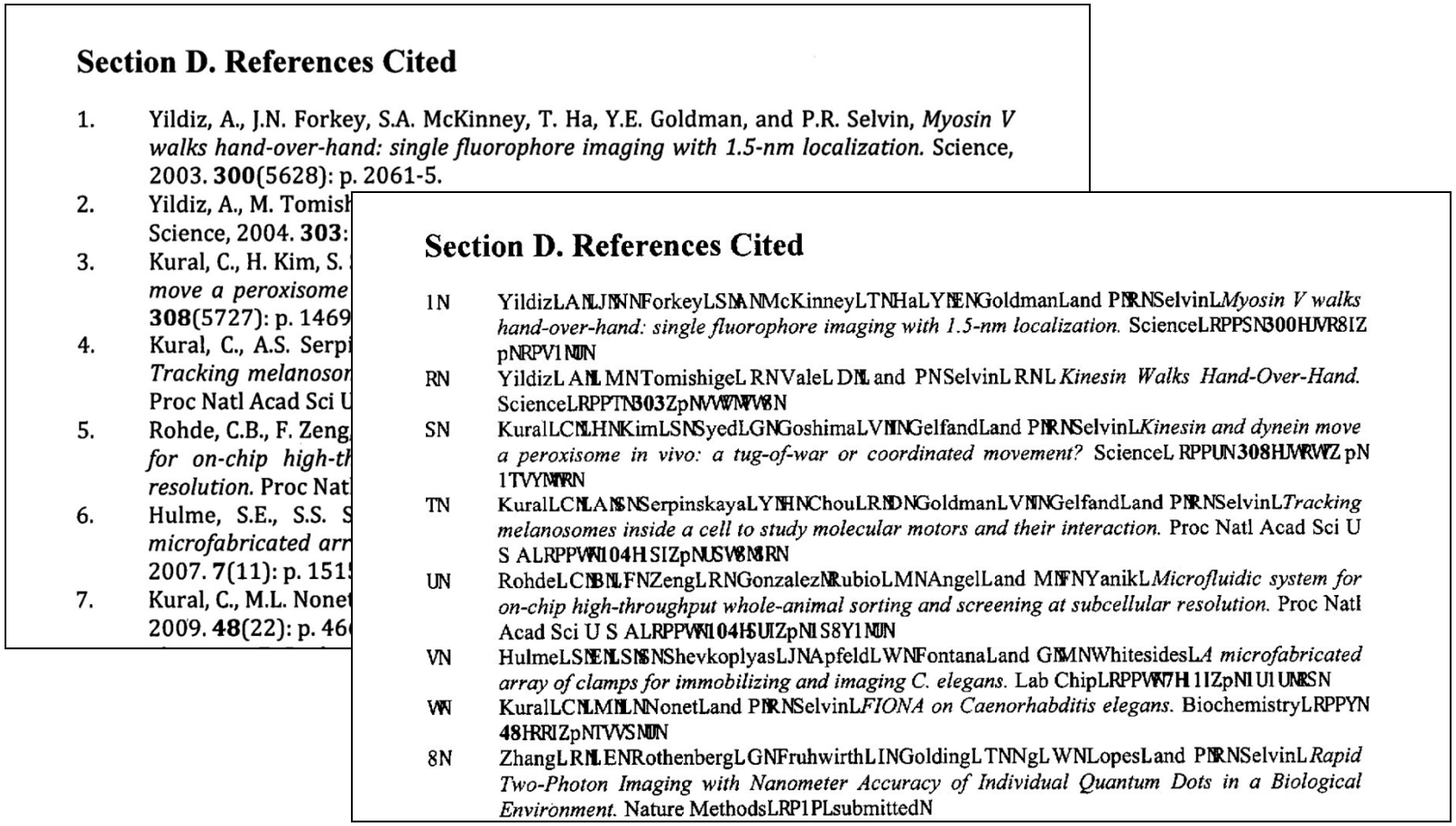
Make it easy to identify the important features of your project

- Follow the outline presented in the RFP, using the same section headings and numbering system
- Use graphical highlighting (boldface or *italic*) to emphasize key points
- Use bulleted lists, graphs, and tables
  - For emphasis
  - To save space
- Use figures to add visual interest and to give the reviewer something to remember
- Provide “quotable” quotes

Make a checklist

- ✓ Is the objective clearly and persuasively stated?
- ✓ Is the scope of the project reasonable?
- ✓ Is the technical narrative scientifically sound?
- ✓ Has enough detail been provided to allow reviewers to evaluate the project?
- ✓ Are all required parts of the application included?
- ✓ Are all parts compliant with font, spacing, and margin requirements?

Check a hard copy printed from the portal's server



Section D. References Cited

1. Yildiz, A., J.N. Forkey, S.A. McKinney, T. Ha, Y.E. Goldman, and P.R. Selvin, *Myosin V walks hand-over-hand: single fluorophore imaging with 1.5-nm localization.* Science, 2003. **300**(5628): p. 2061-5.
2. Yildiz, A., M. Tomish
Science, 2004. **303**:
3. Kural, C., H. Kim, S.
move a peroxisome
308(5727): p. 1469
4. Kural, C., A.S. Serpi
Tracking melanosor
Proc Natl Acad Sci U
5. Rohde, C.B., F. Zeng
for on-chip high-th
resolution. Proc Nat
6. Hulme, S.E., S.S. S
microfabricated arr
2007. **7**(11): p. 151
7. Kural, C., M.L. Nonet
2009. **48**(22): p. 46

Section D. References Cited

1N YildizLANLJNNForkeyLSNANMcKinneyLTNHaLYNENGoldmanLand PNRNSelvinL*Myosin V walks hand-over-hand: single fluorophore imaging with 1.5-nm localization.* ScienceLRPPSN300HJVR8IZ pNRPV1NJN

RN YildizLANLMNTomishigeLRNValeLDNLand PNSelvinLRNL*Kinesin Walks Hand-Over-Hand.* ScienceLRPPTN303ZpNVVWWV8N

SN KuralLCNLHNKimLSNSyedLGNGoshimaLVNNGelfandLand PNRNSelvinL*Kinesin and dynein move a peroxisome in vivo: a tug-of-war or coordinated movement?* ScienceLRPPUN308HJWRWZpN 1TVYWRN

TN KuralLCNLANSNSerpinskayaLYNHNChouLRNDNGoldmanLVNNGelfandLand PNRNSelvinL*Tracking melanosomes inside a cell to study molecular motors and their interaction.* Proc Natl Acad Sci U S ALRPPWN104H1SIZpNUSW8NRN

UN RohdeLCNBNLFNZengLRNGonzalezNRubioLMNAngelLand MNFNYanikL*Microfluidic system for on-chip high-throughput whole-animal sorting and screening at subcellular resolution.* Proc Natl Acad Sci U S ALRPPWN104H5UIZpNIS8Y1NJN

VN HulmeLSNENLSNSNShevkoplyasLJNApfeldLWNFontanaLand GNMNWhitesidesL*A microfabricated array of clamps for immobilizing and imaging C. elegans.* Lab ChipLRPPWN7H11ZpNIUIUNRSN

WN KuralLCNLMNLNNonetLand PNRNSelvinL*FIONA on Caenorhabditis elegans.* BiochemistryLRPPYN 48HRRIZpNTVVSNJN

8N ZhangLRNLENRothenbergLGNFruhwirthLINGoldingLTNNgLWNLopesLand PNRNSelvinL*Rapid Two-Photon Imaging with Nanometer Accuracy of Individual Quantum Dots in a Biological Environment.* Nature MethodsLRP1PLsubmittedN

…and don't use proscribed fonts, either

To recap:

Include everything you're supposed to; omit everything else

Don't neglect other sections of the proposal by focusing only on the technical narrative

Read the directions (and follow them witlessly)

Remember $t = 3N + \varepsilon$!

Never stop selling

Questions? cmelliot@illinois.edu