

Funding & Publishing Your Scholarly Work

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FACULTY DEVELOPMENT COURSE

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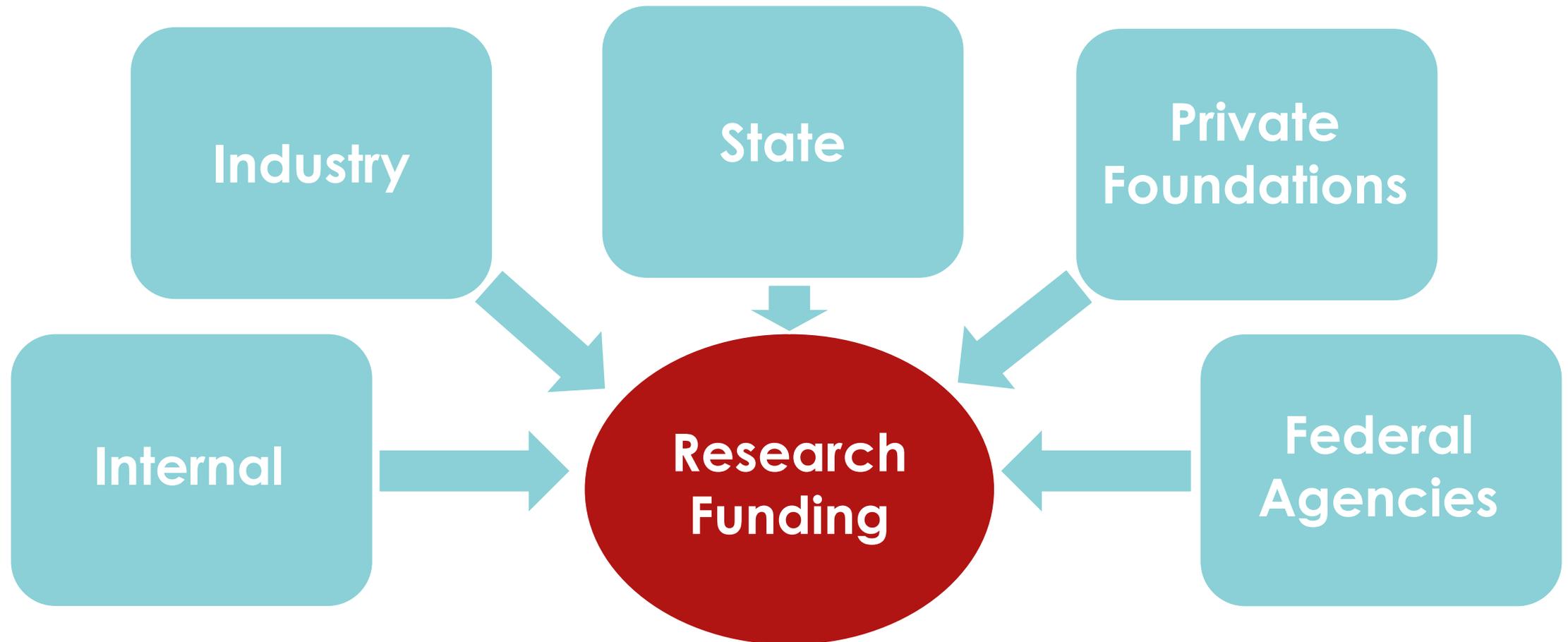
TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER.™
EL PASO

Center of Emphasis in Cancer

Learning Objectives

- ▶ After session 1, “Funding Your Scholarly Work,” participants will be able to:
 - 1) Identify potential sources of funding for research.
 - 2) Discuss strategies for preparation of successful grant applications.

Grant Applications – FUNDING SOURCES



Grant Applications – CHOOSE AN AGENCY

- ▶ **National Institutes of Health**, Active Funding Opportunities and Notices:
 - ▶ <https://grants.nih.gov/funding/searchguide/index.html#/>
- ▶ **proposalCENTRAL**, Private Foundations:
 - ▶ <https://proposalcentral.com/GrantOpportunities.asp>
- ▶ **Institutional Advancement**, TTUHSC El Paso:
 - ▶ <https://elpaso.ttuhsce.edu/ia/>
 - ▶ Sends out a monthly notice of available grant opportunities. Get on the list!!

Grant Applications – CHOOSE AN AGENCY

- ▶ **OVPR Seed Grant Program, TTUHSC El Paso:**
 - ▶ <https://el Paso.ttuhsc.edu/research/ovpr/Grants/default.aspx>
 - ▶ Last year the due date was June 3, 2019
 - ▶ Must be within the first 5 years of primary faculty appointment
 - ▶ Faculty are NOT eligible who have current external grant funding
 - ▶ Faculty are NOT eligible who have a start-up package

Grant Applications – CHOOSE AN AGENCY

- ▶ Make sure that your research fits the **mission** of the funding agency!!!
- ▶ Read the **Grant Proposal Guidelines** CAREFULLY!!!
- ▶ Your chosen agency should NOT be the sole source of funding. Funding from other agencies gives credibility to your work!!!

Grant Applications - INSTRUCTIONS

- ▶ Be sure to follow the instructions.
- ▶ A common reviewer's interpretation:

“If the PI cannot follow instructions for the proposal, how can they be trusted to perform elaborate and accurate research?”

Grant Applications – PROPOSAL GUIDELINES

- ▶ Page limit
- ▶ Word limit
- ▶ Budget limit
- ▶ Abstract format
- ▶ Reference format
- ▶ PI and Co-PI eligibility
- ▶ Submission method
(e.g. online vs. hard copies)
- ▶ Font and font size
- ▶ Image resolution
- ▶ Table of contents
- ▶ Research objectives
- ▶ Tables/Figures/Legends

Funding Your Scholarly Work

- ▶ Grant reviewers will not only assess the quality and originality of your proposal. They will also look for:
 - 1) Significance in the field.
 - 2) Innovation
 - 3) Doable but realistic approach.
 - 4) Enthusiasm for the topic.
 - 5) The PI's track record of success in the field
 - 6) Are you showing respect for the funding source to which you are applying?

Grant Applications – WHAT TO CONVEY

- ▶ Your proposal should convey the following attitudes:
 - 1) You have identified an **important problem**, and you are the **right person** to do the work.
 - 2) You will **get the job done** and **find answers** to the problem discussed.
 - 3) You are aware of previous relevant studies.

Grant Applications – KNOW YOUR FIELD

- ▶ What is the current state-of-the-art?
- ▶ What are the top ten researchers in the field doing now?
- ▶ What are the available sources of funding?
- ▶ What are the key research issues?
- ▶ Who would likely review your proposal?

Grant Applications – GENERAL OUTLINE

- I. **Abstract:** Written in more general terms, readable by non-experts.
- II. **Background & Significance:** Demonstrate that you know the field thoroughly and that there is a problem you intend to solve.
- III. **Specific Aims:** 1-2 sentences on each point that you intend to investigate
- IV. **Experimental Plan:** Outline how you plan to investigate the problem and any preliminary data demonstrating you are capable of performing the work.
- V. **Resources:** Explain the resources available and required to complete the work. These can be at your institution or through established collaborations.
- VI. **References:** List all cited references. Be sure to exercise any limitations, as some agencies only allow a specified number of references or pages.

Grant Applications – THE BASICS

- ▶ Tips for successful grant applications:
 - 1) Keep the audience in mind
 - 2) Start preparing the application EARLY
 - 3) Follow the instructions and application guidelines carefully
 - 4) Be brief, concise, and clear
 - 5) Be organized and logical
 - 6) Be careful in the use of appendices
 - 7) Carefully proofread and application
 - 8) Learn how to navigate the online submission forms

Grant Applications – STATE YOUR OBJECTIVE

- ▶ Make clear in the **FIRST PARAGRAPH** exactly what your proposal is about:
 - 1) What is the subject of your proposal?
 - 2) State the problem or gap of knowledge.
 - 3) State why the issue is significant.
 - 4) What is your hypothesis?
 - 5) State what you are going to do.
 - 6) Explain how you will carry out the proposed work.

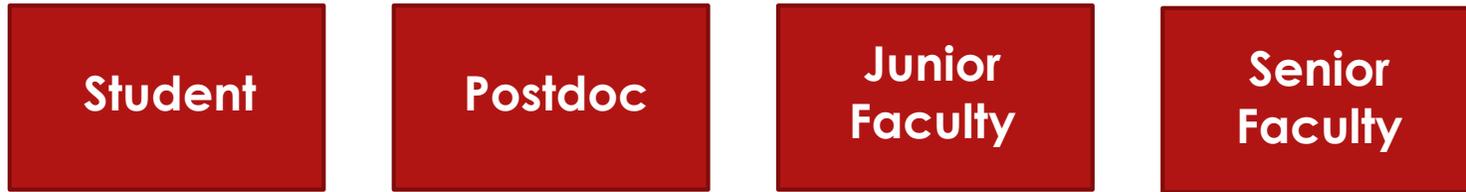
Grant Applications – THINK ABOUT REVIEWERS

▶ Reviewers want to know:

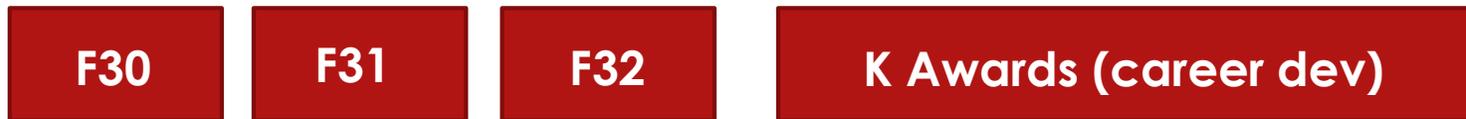
- 1) What is your research about? What is the objective of the work?
- 2) How will you do it? What is the methodology?
- 3) Can you do it? Do you have the facilities and people to do the work?
- 4) Is the work worth doing?
- 5) Are there any secondary objectives relevant to the agency, such as educating students or promoting minorities in science/medicine?
- 6) What are the broader implications of your work?

NIH Grant/Career Timeline

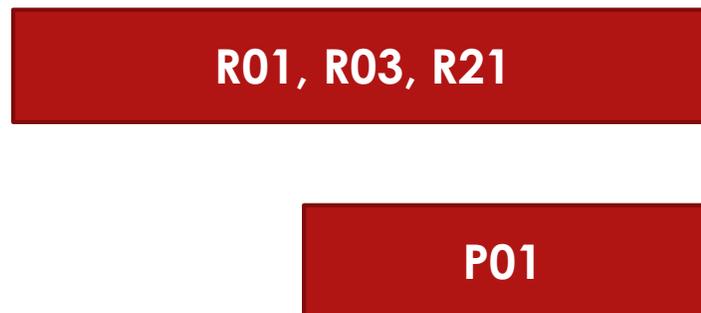
Career Stage:



Training:



Research:



NIH 5 Review Criteria for an R01

- ▶ **Significance:** Relevance to human health and disease
- ▶ **Innovation:** Originality of approach
- ▶ **Approach:** Feasibility of your methods (will it answer the aims?)
- ▶ **Investigator:** PI training and experience
- ▶ **Environment:** Suitability of facilities and adequacy of support from your institution
- ▶ **Overall Impact:** Synthesis/integration of 5 criteria scored from 1-9. Overall, *the likelihood for project to exert a sustained, powerful influence on the research field(s) involved.*

Grant Applications – REVIEW CRITERIA

1) Significance

- ▶ Does the study address an important problem?
- ▶ If the aims of the application are achieved, how will they advance our current scientific knowledge?
- ▶ What will be the effect of the proposed study on concepts, methods, or treatment approaches driving the field?

Grant Applications – REVIEW CRITERIA

2) Approach

- ▶ Are the design/methods/analyses adequately developed?
- ▶ Are they appropriate to the aims of the proposal?
- ▶ Does the applicant acknowledge potential problems and alternative approaches?

Grant Applications – REVIEW CRITERIA

3) Innovation

- ▶ Does the project employ novel concepts, approaches, or methods?
- ▶ Are the aims original and innovative?
- ▶ Does the project challenge existing paradigms or develop novel methodologies or technologies?

Grant Applications – REVIEW CRITERIA

4) Investigator

- ▶ Is the investigator appropriately trained and fit to carry out the work?
- ▶ Is the work proposed relevant to the experience level of the PI?
- ▶ Is there a track record of success (i.e. previous clinical trials, publications, or grant funding)?

The NIH Specific Aims Page (1 page)

PARAGRAPH 1: Define the problem/critical need and gap(s) in knowledge. Give a short background that leads up to the stated problem and knowledge gap (the 'need' to do the work).

PARAGRAPH 2: Define the solution to the stated problem and gap by proposing hypotheses.

PARAGRAPH 3: Specific Aims & Objectives that test the hypothesis addressing the critical need.

PARAGRAPH 4: Payoff for NIH. Expected outcomes leading to impact in the field. Addressing and NIH need? Impact both inside and outside of your field.

Grant Applications – FORMATTING

- ▶ REVIEWERS ARE TIRED!!!!
- ▶ They want to find a reason to skip your proposal
- ▶ Wording that completely fills the space, without line spaces or indentations, affords a repulsive aspect for a tired reviewer.
- ▶ Wording that is separated by line spaces and contains words like **Hypothesis** and **Specific Aims** in bold catches the eye and has a positive impact on the reviewer.

Grant Applications – FORMATTING

Magnesium (Mg) deficiency may play an important role in the pathogenesis of enhanced vascular reactivity in hypertension. The overall hypothesis to be evaluated is that Mg deficiency caused by glucose intolerance, insulin resistance, or other factors in hypertensives leads to increased vasomotor tone via altered release of vasoactive cyclooxygenase lipooxygenase products of arachidonic acid and enhanced angiotensin II (All) action. To evaluate the effects of Mg deficiency in normal subjects we will induce the condition by administration of low Mg diet. Vascular and adrenal sensitivity to All, platelet aggregation, and eicosanoid levels will be studied prior to and after Mg deficiency is established. Since evidence suggests that Mg deficiency can modulate insulin action, the effect of this deficiency on glucose tolerance will also be studied. In another project the effect of insulin on intracellular Mg levels will be studied using a new fura 2 Mg dye technique. These studies will be performed in groups of subjects with varied blood pressure and insulin levels. Also the effects of acute intravenous and chronic oral Mg loading on the above parameters will be studied in similar subject groups. We will directly study the effect of Mg on All, insulin, and insulin-like growth factor action in isolated and cultured adrenal glomerulosa cells. Concentration of Mg will be varied and signal transduction and steroidogenic effects will be evaluated. These studies will provide insight into mechanisms important to the pathogenesis of altered vascular reactivity of subjects with hypertension or hyperinsulinemia.

Magnesium (Mg) deficiency may play an important role in the pathogenesis of enhanced vascular reactivity in hypertension. The overall **HYPOTHESIS** to be evaluated is that Mg deficiency caused by glucose intolerance, insulin resistance, or other factors in hypertensives leads to increased vasomotor tone via altered release of vasoactive cyclooxygenase lipooxygenase products of arachidonic acid and enhanced angiotensin II (All) action.

Specific Aims: (1) Determine the effects of low Mg on vascular and adrenal sensitivity to All (platelet aggregation and eicosanoid levels, and glucose tolerance). (2) Determine the effect of insulin on intracellular Mg levels (fura 2 Mg dye technique). These studies will be performed in subjects with varied blood pressure and insulin levels. (3) Determine the effects of acute intravenous and chronic oral Mg loading on the above parameters. (4) Determine the signal transduction and steroidogenic effects of Mg on All, insulin, and insulin-like growth factor action in isolated and cultured adrenal glomerulosa cells.

Significance: These studies will provide insight into mechanisms important to the pathogenesis of altered vascular reactivity of subjects with hypertension or hyperinsulinemia.

HELP OUT THE REVIEWER!!!

Grant Applications – COMMON ERRORS

- ▶ Doesn't fit the agencies mission(s).
- ▶ Violates one or more proposal guidelines.
- ▶ Proposal is beyond the capabilities of the PI, the trainees, or the institution.
- ▶ Over ambitious!!!!
- ▶ Lack of proofing. Blatant grammar, spelling, or other errors will kill an otherwise great application.

**If the PI cannot follow instructions for the proposal,
how can they be trusted to perform elaborate and
accurate research?**

Grant Applications – COMMON ERRORS

- ▶ Missing pages, figures, tables, or signatures
- ▶ Unfocused
- ▶ Poorly organized
- ▶ Not enough people to do the work
- ▶ Low impact – results will not be publishable

Communicating for Scientists

- ▶ A strong foundation in science and medical research methodologies is essential for any researcher.
- ▶ But an equally essential, but often ignored skill, is clear writing.
- ▶ Disorganized and sloppy writing is interpreted by reviewers as disorganized thinking and sloppy research.

Communicating for Scientists

- ▶ The success/failure of your academic position is directly linked to clearly communicating the science in written and oral formats.
- ▶ Your grant/manuscript is the only representation of your work to those who matter – reviewers and editors.

Funding Your Scholarly Work

Questions?