

# Strategies for Securing External Grants for Quality Research

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# Learning Objectives

At the end of this presentation, participants will:

- Understand the basics of grant writing
- Identify a grant source or opportunity suitable for their research



To perform research that can not be done otherwise



To derive data for publications



To support yourself and others



To receive salary increases



To be promoted and/or tenured



To obtain increased status as a scientist

# What does it take to excel in grant writing?



Have a strong science



Strengthen your team



Develop a compelling hypothesis



Write a responsive proposal

# Your Ideas Should Be



- Innovative
- Addressing an Important Problem
- Realistic
  - How much you can reasonably expect?
- Doable
- Measurable
  - Time-specific results
  - Based on realistic expectations

Do you  
have what  
it takes?

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Topic with relevance to society

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Substantial hypothesis

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Appropriate approach

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Ability and means to perform the work

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Skills for grant writing

## Funding sources

Federal agencies

International bodies

Foundations (philanthropic)

Industry

# Search for Funding



[Browse Funders A-Z](#)

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## Tips & Resources

If you have questions, please [Contact Us](#).

The following tips and resources are available to help you:

- "How to" documentation: Visit the [Knowledge Center](#)
- Tips for searching for [Funding](#) and [Profiles](#)
- [Videos](#): Short YouTube videos to help you learn how to edit your profile, search for funding, set-up alerts and other features. [Visit the YouTube channel](#).



- Title
- Project Summary
- Specific Aims
- Research Strategy, Part 1: Significance
- Research Strategy, Part 2: Innovation
- Research Strategy, Part 3: Approach
- Investigators, environment, and other components



English ▾

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# Getting organized/writing a proposal

- Collect all the scientific information you need.
- Write a one-sentence hypothesis and a 1-pager.
- Share your plans with your supervisor/mentor and with departmental administrative staff.
- Contact the appropriate Program Official.
- Contact the OSP, IRB, and/or IACUC and stay in touch.
- Identify and collect all needed attachments.





Prepare an outline (who, what, when, where, how, and why?).



Develop a 'chain of reasoning.' (Why?)



Sort information by sections.



Write freely without editing, and make changes over time.



Make notes of missing information.



An understanding of the literature



Strengths and weaknesses of methods



Resources that are available



Institutional support



Capacity to lead



Independence in publications



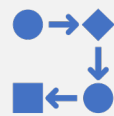
Data supporting hypotheses and Specific Aims



Specific, attainable, and time-bound objectives



A reasonable budget for a modest amount of work



That progress will continue after the project ends

# Characteristics of an effective proposal

Logical

Crisp, organized, and neat

Readable

Presented in a standard format

Shows a need, urgency, and impact



# Tips for a successful grant application:

- Tell a story.
- Engage the reviewer.
- Anticipate questions (who, what, where, when, how, and why?)
- Present a balanced view.
- Don't take things for granted.
- Provide a concise take-home message.
- Deliver the grant 'on a silver platter.'

# Impact of Genetic susceptibility along the continuum from MGUS to MM (Supplement)

Project Number  
3U01CA271014-01S1

Former Number  
1U01CA271014-01

Contact PI/Project Leader  
VACHON, CELINE M  
Other PIs

Awardee Organization  
MAYO CLINIC ROCHESTER

## Description

### Abstract Text

ABSTRACT This application is being submitted in response to the Notice of Special Interest (NOSI), NOT-CA-22-057. Racial disparities exist for multiple myeloma (MM) and its precursor, monoclonal gammopathy of undetermined significance (MGUS); both MGUS and MM are at least twice as common in Black compared with White populations, including at younger ages. A similar two-fold increase in MGUS has been seen in a population-based sample of Black men in Ghana compared to a White reference population, suggesting that the disparity is similar outside of the US. MGUS also is familial, with 2-3-fold increased prevalence in first-degree relatives of MM or other hematologic malignancies. Although MGUS is usually benign, it is common in those ages 50 and older, progresses to MM or other lymphoproliferative disorders at rates of 1-1.5% per year, and is associated with increased risk of infection, fracture, osteoporosis, renal impairment, and thrombosis, with resultant morbidity and mortality. Thus, understanding the development of MGUS and MGUS progression to MM is important, particularly among those with the highest risk, including people of African ancestry (AA) and first-degree relatives of MM and hematologic disorders. Our parent grant (U01 CA271014) proposes a comprehensive evaluation of genetic susceptibility to MGUS and MGUS progression to MM using established epidemiologic and genomic studies. Due to the importance of racial predisposition, for the first time, we propose to evaluate known MM susceptibility variants and identified novel variants for MGUS and MGUS progression in an AA population (Parent U01, Aim 3). In this supplement application, we establish a new global collaboration with Dr. Rotimi at Covenant University in Nigeria to conduct complementary studies of MGUS in West Africa to enhance the genetic investigations of MGUS and MGUS progression among people of AA. In Aim 1, we will estimate the prevalence of MGUS using a novel mass spectrometry assay, in two risk groups ages 40 and older in Nigeria [a community-based sample (N=300) and first-degree relatives of MM and hematologic cancer patients (N=100)] and compare to US population-based rates. This aim leverages the experience and existing infrastructure of the Prostate Cancer Transatlantic Consortium network that recruited over 1000 participants and first-degree relatives, including ten Nigerian clinical sites. In Aim 2, we will conduct genotyping (GWAS) of MM (N=25), MGUS identified through screening Aim 1 samples (N=66), and a sample of unaffected participants (N=100) to contribute to the validation of genetic risk factors for MGUS risk and MGUS progression to MM in AA populations, as proposed in our parent U01. Finally, we will establish a family study of MGUS, MM and related disorders and perform whole exome sequencing on 25 relatives to identify rare variants. Understanding the prevalence of MGUS and genetic determinants of MGUS and progression will have high impact for West African populations, as life expectancies continue to see a steady rise, and more individuals will develop MGUS, MM, and other diseases associated with aging.

# General Considerations

<b>Put</b>	Put yourself in the role of the reviewer
<b>Recognize</b>	Recognize that reviewers are your audience
<b>Write</b>	Write a project summary that scientists and lay persons can understand
<b>Make</b>	Make the entire application clear so that a non-expert can understand

# Major thematic areas for research grant

- Health and wellbeing
- Agriculture and Food
- Human capital development
- Peace and Security
- Environment



# Peer Learning

- Grant application experience
- Grant winning experience
- Networking experience

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An understanding of the literature

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Strengths and weaknesses of methods

---

Resources that are available

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Institutional support

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Capacity to lead

---

Independence in publications

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Data supporting hypotheses and Specific Aims

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Specific, attainable, and time-bound objectives

---

A reasonable budget for a modest amount of work

---

That progress will continue after the project ends

# Choice and Style of words



# Choice and Use of Words

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Scientific writing is not the same as literary English.

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The fewer words you use to express an idea, the more effect the idea will have. Make every word count.

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The more words, the less the meaning, and how does that profit anyone? - Ecclesiastes

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“Blessed is the man, who, having nothing to say, abstains from giving us words evidence of the fact.” - George Eliot

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Don't use long words when short ones will do.

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Wordy language and fancy words convey shallow thought.

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Convey information without being boring.

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# Choice and Use of Words

- Use familiar and specific words.
- Use a thesaurus to find appropriate words, but avoid words that are not mainstream.
- Don't use the same word repeatedly.
- Use only one non-scientific word, e.g., “vast” or “unacceptable,” to describe the problem.
- Demonstrate commitment, excitement, passion, and confidence

# Weak and/or vague words:

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attempt

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examine, explore

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characterize

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Potential

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Suggest

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Details

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Indicate, affect, impact

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Might, can, could, possibly, eventually

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Some

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Several

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study



## Powerful words indicating action:

- Strategy
- Create
- Determine, establish, identify
- Elucidate
- Achieve
- Enhance
- Decrease/increase
- Improve
- produce



ANALYSIS



EVALUATION



EXPERIMENTS



INQUIRY



INVESTIGATION



SURVEY



(RESEARCH)  
EFFORT



WORK

# Overused (and imprecise) words

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novel

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unique

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major

---

key

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Role

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Recently

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Using

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Specifically

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while

- Poor: The authors conclude that there is evidence that the limiting diameter lies between sixteen and twenty angstroms in these cells taken from mammals.
- Better: Thus, these mammalian cells have a limiting diameter of 16-20 Å.

# Concise Writing – part 2 of 3

Poor: An excessive amount of solar radiation received at a rapid rate has been shown by a large body of data to have the capability of inflicting epidermal damage.

Better: Too much sunlight burns the skin.



# Concise Writing – part 3 of 3

Poor: Glipizide, thiazolidinediones, and metformin and have all three been shown to be effective at lowering blood sugar in larval zebrafish.

Better: In larval zebrafish, glipizide, thiazolidinediones, and metformin lower blood sugar.

## **Repetition of words:**

Poor: Dr. Chen established that MDM2 was over-expressed by use of Western blots. Western blots measure the amount of protein present. The amount of this protein relates to the capacity of cells to divide.

Better: By use of Western blots, which measure the amount of protein present, Dr. Chen established that MDM2 was over-expressed and thereby determined the capacity of the cells to divide.

## Use of jargon:

Poor: The experiment was carried out in our lab with dose preps provided by Dr. Yates.

Better: The experiment was accomplished in our laboratory with dose preparations provided by Dr. Yates.

## **Stacked modifiers:**

Poor: The three patients had histologically confirmed malignant metastatic intra-abdominal tumors.

Better: The three patients had, in their abdomens, tumors that were histologically confirmed to be malignant and metastatic.

## **Dangling modifier:**

Poor: A fasting urine specimen was collected.

Better: A urine specimen was collected after the patient had fasted for 12 hours.

## **Inconsistent tense:**

Poor: Dr. Li evaluated the test results, which show that protein expression was enhanced.

Better: Dr. Li evaluated the test results, which showed enhanced expression of protein.

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## Parallel Construction

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Poor: The remaining fluid was drawn off and the kidneys washed.

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Better: The remaining fluid was drawn off, and the kidneys were washed.

# Sentence Structure

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The average length of effective sentences is 15-20 words

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Variety in sentence structure changes the rhythm in a paragraph and keeps the reader's attention.

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Don't let sentences (paragraphs, sections) die at the end.



# Sentence Structure

Poor: We determined the correlation between the development of colorectal cancers and SNPs associated with colorectal cancer risk for these samples.

Better: For these samples, we determined the correlation between the development of colorectal cancers and SNPs associated with colorectal cancer risk.



A paragraph should have four or five related sentences and cover about one-half of a double-spaced page.



Paragraphs usually contain 50-250 words, averaging about 100 words



A paragraph should be unified, containing one set of information



An effective paragraph could have an “hourglass” structure, with the content moving from general (wide), to specifics (narrow) to the conclusion (wide).

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**Addition:** moreover, further, furthermore, in addition

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**Comparison:** similarly, likewise

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**Contrast:** however, nevertheless, conversely, in contrast, otherwise

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**Repetition:** in other words

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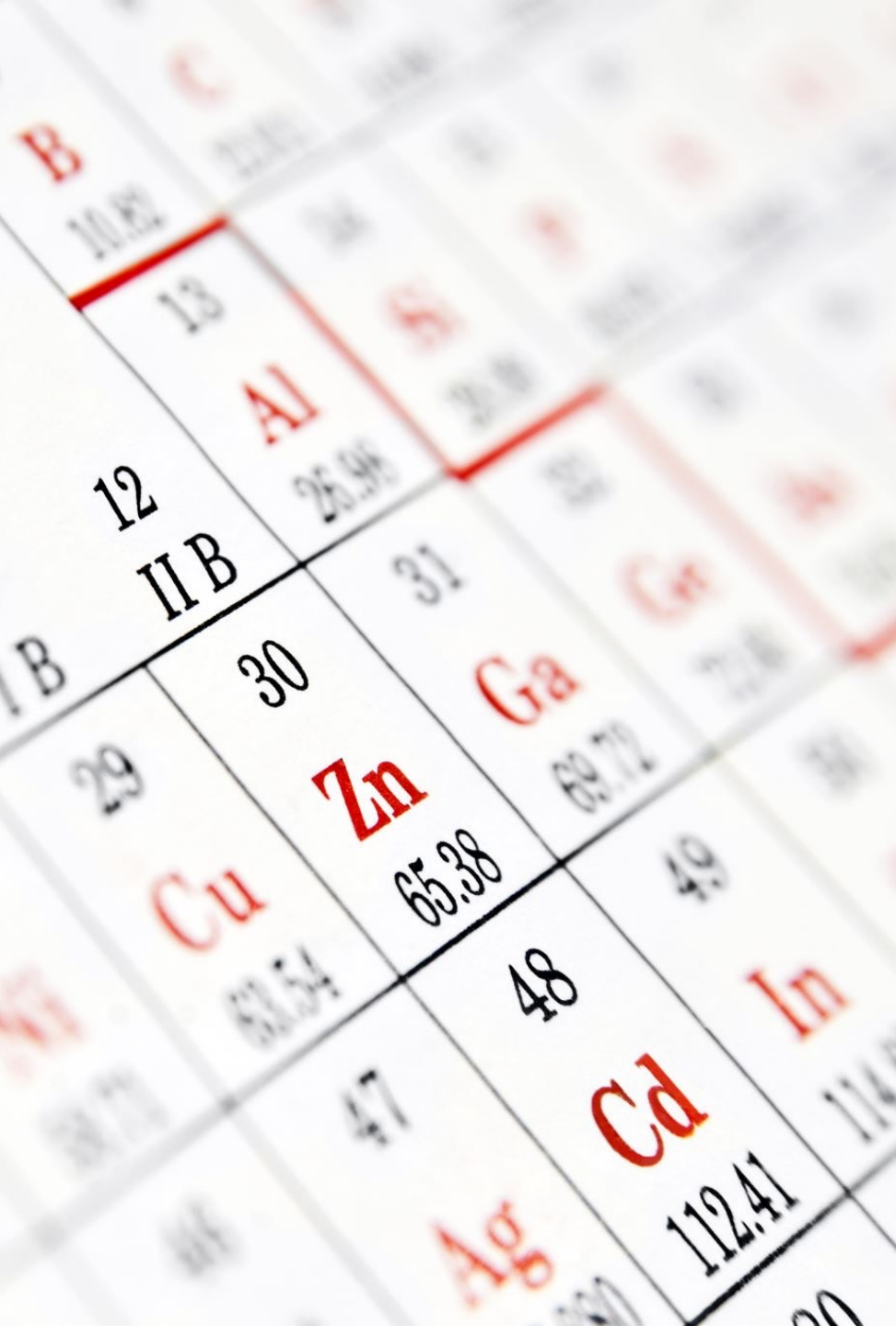
**Exemplification:** for example

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**Cause/result:** therefore, consequently, thus

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**Summary:** in brief, in sum, finally



## Prepositional Phrases

Try to use no more than two prepositional phrases in a row.

- Poor: A deficiency in the number of people in this category . . .
- Better: A deficient number of people in this category . . .

# Which and That

- Use the word “which,” preceded by a comma, to introduce a nonrestrictive clause (one that is not essential to the meaning of a sentence).  
Example: The NF- $\kappa$ B signaling pathway, which is constitutively active, drives the malignant phenotype.
- Use the word “that,” without a comma, to introduce a restrictive clause (one that is essential to the meaning of the sentence).  
Example: Of these pathways, the one that is constitutively active drives the malignant phenotype.

- Use of “emotion-based” words:

Poor: Surprisingly, the MDM2 protein with a C-terminal deletion down-regulated the p21 protein.

Poor: Unfortunately, the MDM2 protein with a C-terminal deletion down-regulated the p21 protein.

Poor: Interestingly, the MDM2 protein with a C-terminal deletion down-regulated the p21 protein.

Better: Nevertheless, the MDM2 protein with a C-terminal deletion down-regulated the p21 protein.

# Words and Phrases to Avoid (1)

Avoid	Preferred
in the event that	if
due to the fact that	because
it is often the case that	frequently
to be of the opinion	believe
in spite of the fact that	although
in advance of	before
had occasion to be	was
so as to	to
one of the most	a (an)
take into consideration	consider
at the present time	now
in order to	to
in a number of cases	(state number)
subsequent to	after
in many cases	often

Avoid	Preferred
in view of the fact that	since
it has been reported by Ajayi	Ajayi reported
paradigm	pattern
causal factor	cause
during the time that	when or while
fewer in number	fewer
in spite of the fact	despite
with regard to	concerning
it is often the case that	(state how often)
a sufficient number of	enough
very	(omit)
much	(omit)
accounted for by the fact	because
important	(define)
importantly	(omit)

# Words and Phrases to Avoid (1)

Avoid	Preferred
more/most importantly	(omit)
it has been found that	(omit)
a considerable number of	(state the number)
recent studies have indicated that	(omit)
a majority of	most
hopefully, dramatically, strongly	(omit)
above (as an adjective)	define
aforementioned	define
critical	define
crucial	define
so as to	to

Avoid	Preferred
significant	substantial
for the purpose of	for
on a daily basis	daily
of great theoretical and practical importance	useful
It is clear that much additional work will be required before there is a complete understanding	(omit)



# Redundant words

- exact same
- possibly may
- possibly suggest
- total absence
- true fact
- pooled together
- eliminate completely
- absolutely essential
- refer back to

“If ye know these things, happy  
are ye if ye do them.” John 13:17

Thank you