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#### **Business & Entrepreneurship**

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How do ideas make it from the lab to the real world? Discover the ins and outs of the chemical industry whether you are looking to start a business or desire a priceless industry-wide perspective.

https://www.acs.org/content/acs/en/acs-webinars/videos.html



**Learn from the best and brightest minds in chemistry!** Hundreds of webinars on diverse topics presented by experts in the chemical sciences and enterprise.

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www.acs.org/acswebinars







acsoncampus.acs.org/resources











# ACS Career Navigator: Your Home for Career Services



Whether you are just starting your journey, transitioning jobs, or looking to brush up or learn new skills, the **ACS Career Navigator** has the resources to point you in the right direction.

We have a collection of career resources to support you during this global pandemic:



Professional Education



Virtual Career Consultants



ACS Leadership Development System



Career Navigator LIVE



ChemIDP



College to Career



ACS Webinars



Virtual Classrooms

Visit www.ACS.org/COVID19-Network to learn more!

# Join us in our efforts to increase the diversity of chemistry.



Valued donors like you have sustained ACS educational programs that are welcoming students from diverse backgrounds into our profession.

www.acs.org/donate



#### **A Career Planning Tool For Chemical Scientists**





ChemIDP is an Individual Development Plan designed specifically for graduate students and postdoctoral scholars in the chemical sciences. Through immersive, self-paced activities, users explore potential careers, determine specific skills needed for success, and develop plans to achieve professional goals. ChemIDP tracks user progress and input, providing tips and strategies to complete goals and guide career exploration.

https://chemidp.acs.org

# **ACS Bridge Program**

### Are you thinking of Grad School?

If you are from an underrepresented racial or ethnic group, we want to empower you to get your graduate degree!

#### The ACS Bridge Program offers:

- A FREE common application that will highlight your achievements to participating Bridge Departments
- Resources to help write competitive grad school applications and connect you with mentors, students, and industry partners!

Learn more and apply at <a href="www.acs.org/bridge">www.acs.org/bridge</a>
Email us at <a href="mailto:bridge@acs.org">bridge@acs.org</a>







#### **ACS Department of Diversity Programs**



Advancing ACS's Core Value of Diversity, Inclusion & Respect

We believe in the strength of diversity in all its forms, because inclusion of and respect for diverse people, experiences, and ideas lead to superior solutions to world challenges and advances chemistry as a global, multidisciplinary science.

#### **Contact Us:**

https://app.suggestionox.com/r/DI\_R Diversity@acs.org



@ACSDiversity



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**ACS Diversity** 

acsvoices.podbean.com/



www.acs.org/diversity



Apply by May 31 for the ACS LEADS Conference, a 3-day event focused on preparing high-potential early career professionals and students for successful and impactful careers in the chemical enterprise. This event, conceived by ACS Past-President, Luis Echegoyen, will bring together highly esteemed chemists, scientists, professionals, and Nobel Laureates for networking, self-reflection, career exploration, mentoring, and technical discussions.

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Date: Friday, May 28, 2021 @ 1-2pm ET

Speakers: Zhenan Bao, Stanford University and H.N. Cheng, ACS President Moderator: Young-Shin Jun, Washington University in St. Louis

#### What You Will Learn:

- . What is the current status of skin-inspired electronics
- How materials are designed for skin-inspired electronics
- · How skin-inspired electronics are interfaced with biological systems

Co-produced with: ACS Committee on Science

"Frontier Fridays" Webinar Series are organized by ACS President H.N. Cheng. Michael Morello (Division Representative, ACS Committee on Science) Retired formerly PepsiCo R&D, Young-Shin Jun of Washington University in St. Louis, and Co-produced with: CAS

# **Artificial** Intelligence

Current Trends and **Future Opportunities** 

Speakers: James Collins, MIT / Jürgen Cox, Max Planck Institute of Biochemistry / Yugal Sharma, CAS Moderator: Angela Zhou, CAS

#### What You Will Learn:

- What are the categories of machine learning (supervised, unsupervised, and reinforcement learning) and emerging trends within chemistry
- . Why certain areas of machine learning have grown faster than others in the
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Supply Chain Woes and is Industry "Sprouting" Green?



Date: Thursday, June 3, 2021 @ 2-3pm ET Speaker: Paul Hodges, New Normal Consulting Moderator: Bill Carroll, Caroll Applied Science

#### What You Will Learn:

- · How businesses can be more successful by taking a more holistic view of the
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- A macro examination of the state of the global economy and the implications for the US and other countri

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**ACS** Graduate & Postdoctoral **Scholars Office** 



# **How to Win Funding**

**Compelling Grant and** Fellowship Applications





FREE Webinar | TODAY at 2pm ET



THIS WEBINAR WILL SHORTLY... A C S BEGIN





#### How to Win Funding: Compelling Grant and Fellowship Applications



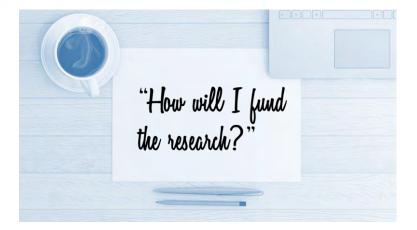


Presentation slides are available now! The edited recording will be made available as soon as possible.

www.acs.org/acswebinars

This ACS Webinar is co-produced with ACS Graduate & Postdoctoral Scholars Office and Petroleum Research Fund.

# The Greatest Pragmatic Question in All Science is...









### For a successful proposal all I need is a great idea

- True
- False



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# The Two Essential Elements of a Successful Grant Application



- A Great Research Idea
- Effective Presentation of the Idea





# Outline of Topics

- Basic Guidelines and Resources
- ☐ Funding Sources and Agency Information
- Specific Writing Pointers
- ☐ Common Pitfalls
- ☐ Facing Rejecting
- ☐ Final Thoughts





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# Outline of Topics

#### ✓ Basic Guidelines and Resources

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# #6 Demonstrate Managerial Skills



- Set forth a clear pragmatic research plan
- Show wise use of resources people, money, and facilities
- Be well organized





2.

# #5: Know the Agency's Mission

- Every funding agency has ideas and rules about what it wants to fund.
- A proposal for one agency typically is not suitable to send to other agencies, because the overall goals are different.
- Don't attempt to contort the agency's mission to fit your research project.





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# **#4:** Read All Instructions Carefully

#### Be sure to follow the instructions.

#### A Common Reviewer's View:

If the PI can't follow instructions for the proposal, then the PI probably can't follow instructions to do elaborate research.

Be sure that you have the current version of agency guidelines





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### #3: Write with Confidence, But Don't Disregard Other Ideas

### Your proposal should convey the attitude that:

- You have identified an important problem, and you are the right person to do the work and find the answers.
- You are aware of previous relevant studies.





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### #2: Have A Great Scientific Idea

One that is novel, has relevance to an identified target and can be investigated thoroughly, within the context of the institutional resources available to the PI, and within a reasonable time-frame.

• Novelty often derives from **detailed study** or **observation** and understanding of a problem or challenge.





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### #1: If in Doubt, Contact the Program Officer

Preferably, **before** you spend the time writing an uncompetitive or non-compliant proposal.

 Always be polite, respectful, and honest when communicating with a program officer





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# Still Have Questions?



- Contact the Program Officer by email or phone
- Be Ready to Answer:
- What is your research objective?
- How does this meet the agency's mission?





2

# Framing Your Questions

### **Questions NOT to Ask a Program Officer:**

- Will you fund my research?
- Is this a good research topic?
- What research topic should I work on?
- What are my odds of being funded?
- Who are the reviewers?





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# Outline of Topics

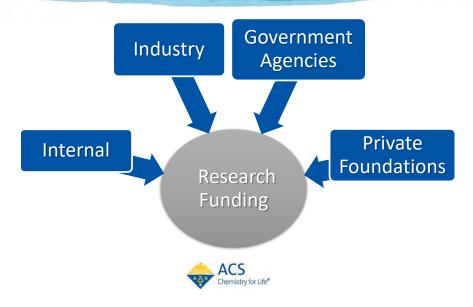
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# Funding Resources



ACS PRF

# Finding the Right Agency



Make sure that your research fits the mission of the funding agency!





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# Information on Federal Grants

Federal funding sources, and application procedures at "grants.gov":





















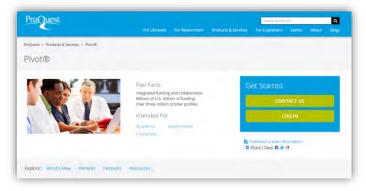




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# Information on Other Funding Sources

**PIVOT** – Web based subscription service with extensive information on funding sources.





http://www.proquest.com/products-services/Pivot.html

**General Internet Searches** 





# Information on other Funding

Funding sources available for Students and Post Docs <a href="https://www.acs.org/GradFunding">www.acs.org/GradFunding</a>





### Sources of Information on Successful Topics



#### For Petroleum Research Fund (see Annual Reports):

https://www.acs.org/content/acs/en/funding-and-awards/grants/prf.html



#### For Research Corporation for Scientific Advancement

(see Awards Database): http://rescorp.org/awards-database





3.

# Sources of Information on Successful Topics



**For NSF** (search for funded projects): https://www.nsf.gov/awardsearch

#### **NSF Award Search Guide:**

https://www.nsf.gov/awards/award-search-guide.jsp



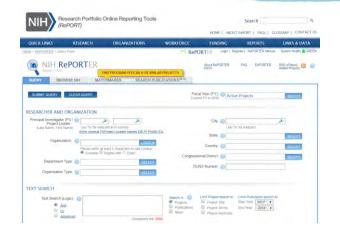
# For NSF also see NSF Merit Review Report to the National Science Board (NSB): https://www.nsf.gov/nsb/publications/pubmeritreview.isp







# Sources of Information on Successful Topics



#### **For National Institutes of Health**

(see Research Portfolio Online Reporting Tool - RePORTER):

https://projectreporter.nih.gov/reporter.cfm





3.

# Outline of Topics

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# Now that you have an idea...



...how do you go about writing the proposal?



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# Clear Presentation

- State:
- the problem or hypothesis.
- why the issue is significant.
- what you are going to do.
- Explain how you will carry out the proposed work.
- Address relevant potential challenges and alternatives.
- Address relevant literature





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# State Your Research Objective

- Make clear in the first paragraph exactly what your proposal is about.
- The statement of your research objective should lead you directly to your methodology.





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### **Audience Survey Question**

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT

Which of the following do you think is the best way to convey the overarching general nature of your research?

- A) The proposed research is directed to the synthesis of analogs of dimethyl chicken wire a natural product known to have antimicrobial properties.
- B) The proposed research includes building a library of compounds and testing them for antibiotic activity and cancer prevention properties.
- C) The proposed research is directed to the synthesis of fluorinated analogs of dimethyl chicken wire a natural product known to have antimicrobial properties.
   The analogs are projected to have better bioavailability and accordingly higher potency than the natural product.



### **Audience Survey Question**

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT



# Which of the following do you think is the best way to convey the "newness" of your idea to reviewers?

- A) The proposed research has never been done before and will revolutionize organic synthesis.
- B) The proposed research provides a new method for functionalization of heterocyclic compounds in a one-pot synthesis using an iron catalyst.
- C) The proposed research provides a novel approach to functionalization of heterocyclic rings.

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### **Audience Survey Question**

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT



# Which of the following do you think is the best way to start the proposal section on experimental plan?

- A) In this project, we will study the functionalization of hydrocarbons and aromatic compounds and test their physical properties, bioactivity and shelf stability by a variety of methods.
- B) In this project, we will study the functionalization of sp3 carbon atoms of aliphatic alkanes, cyclic alkanes and alkenes.
- C) In this project, we will initially focus on the functionalization of sp3 carbon atoms in hexane molecules with an iron catalyst.

# **Exemplary Hypothesis**

• The proposed research will test the hypothesis that a new xyz catalyst will oxidize compounds having AB functionalization.

OR

We hypothesize that.....





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# **Exemplary Objectives**

- The first objective of the research is to construct the new catalyst xyz from metal x and ligands y and z.
- The second objective is to use the new xyz catalyst to oxidize compounds having AB functionalization including AB substituted aromatic compounds and AB substituted cyclohexene compounds.





# **Exemplary Proposal Writing Process**

- Create a topical outline.
- Develop subtopics and expand the outline.
- Draft main graphics.
- Develop the first draft of the text.
- Review, revise, and complete the draft.
- Submit a copy to administrators for approval.
- Critical review of graphics and text.
- Finalize text and graphics.
- Complete and submit to agency significantly ahead of the deadline.





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# Outline of Topics

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# Proposal Guidelines

#### Carefully follow all instructions provided by the funding agency

- Page Limit
- Word Limit
- Budget Limit
- Abstract Format
- Reference Format
- PI (Co-PI) Eligibility

- Font Size
- Minimum Resolution
- Table of Contents
- Research Objectives
- Tables/Figures
- Submission Method (file types, size, etc.)





### **Audience Survey Question**

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT



# Plagiarism only applies to literature articles authored by other researchers

- True
- False



# Avoid Plagiarism



- Cut and paste copying from published work
- Copying from your own published work
- ✓ Properly note and credit copied passages





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# Review Bibliography

- Did you used the required form?
- Age of References
- Number of Different Research Groups cited





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# Major Pitfall

# TYographiKal eRros are a biG Pr0blem

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# Reviews of Uncompetitive Proposals



"The PI has failed to refer to important studies published in the past 2-3 years."



"Much important information on experimental procedures, and equipment for measurements is omitted. I can't really tell what is going to be done and how."



"This proposal is a simple extension of the PI's Ph.D. thesis."





# Reviews of Uncompetitive Proposals



"The PI seems to feel only one outcome of these studies is possible and fails to consider others. If that were true, the studies would be unnecessary."



"This work can certainly be carried out, but it does not address any topic of broad current interest. I would probably not read a paper describing the results."





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# Facing Rejection

### **Rejected Proposals are Inevitable**

Number of Applications > Available funding

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# Facing Rejection

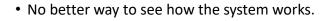
### Responding to Rejection as a Learning Experience

- Don't be overcome by emotions
- Get Feedback
- Mind the details

**Article:** "After the Fall: What to Do when your Grant is Rejected" Nature, February 20, 2020 Vol578, p 477—479.

# Facing Rejection

#### Learn about Writing Proposals by becoming a reviewer





- Not a major time commitment.
- Web-based FREE training with focus on publication reviews at: acsreviewerlab.org





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# Agency Expectations for Grantees

- Follow the experimental plan and budget set out in your approved proposal
- If changes are needed work with your program officer before making changes
- Make all required reports in a timely fashion
- Publish results

# Questions









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#### **A Career Planning Tool For Chemical Scientists**





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ASK YOUR QUESTIONS AND MAKE YOUR COMMENTS IN THE QUESTIONS PANEL NOW!





How to Win Funding: Compelling Grant and Fellowship Applications





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# ACS Office of Research Grants: Additional Resources



Nancy J. Jensen: n\_jensen@acs.org Phone 202-872-6186



ACS Petroleum Research Fund www.acsprf.org Inquiries: prfinfo@acs.org

#### **Additional Contact Information**



**Dean Dunn:** d dunn@acs.org
Geochemistry, Geology, geophysics



Thomas C. Clancy: t clancy@acs.org

Polymer Science and Chemical and Petroleum Engineering



Askar Fahr: a fahr@acs.org

Physical Organic Chemistry and Physical Chemistry/Chemical Physics

Burt Lee: b lee@acs.org
Surface and Materials Science







"Frontier Fridays" Webinar Series are organized by ACS President H.N. Cheng, Michael Morello (Division Representative, ACS Committee on Science) Retired





**Chemistry** and the Economy Supply Chain Woes and is Industry "Sprouting" Green?

Date: Wednesday, June 2, 2021 @ 2-3pm ET Speakers: James Collins, MIT / Jürgen Cox, Max Planck Institute of Biochemistry / Yugal Sharma, CAS Moderator: Angela Zhou, CAS

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- . How businesses can be more successful by taking a more holistic view of the
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- . A macro examination of the state of the global economy and the implications for the US and other countri-

Co-produced with: ACS Industry Member Programs and ACS Division of Business Development and Management

What You Will Learn:

- What are the categories of machine learning (supervised, unsupervised, and reinforcement learning) and emerging trends within chemistry
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### **Artificial** Intelligence in Chemistry

**Current Trends and Future Opportunities** 

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- Why certain areas of machine learning have grown faster than others in the chemical space
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Supply Chain Woes and is Industry "Sprouting" Green?



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