



# Jan 31 Template

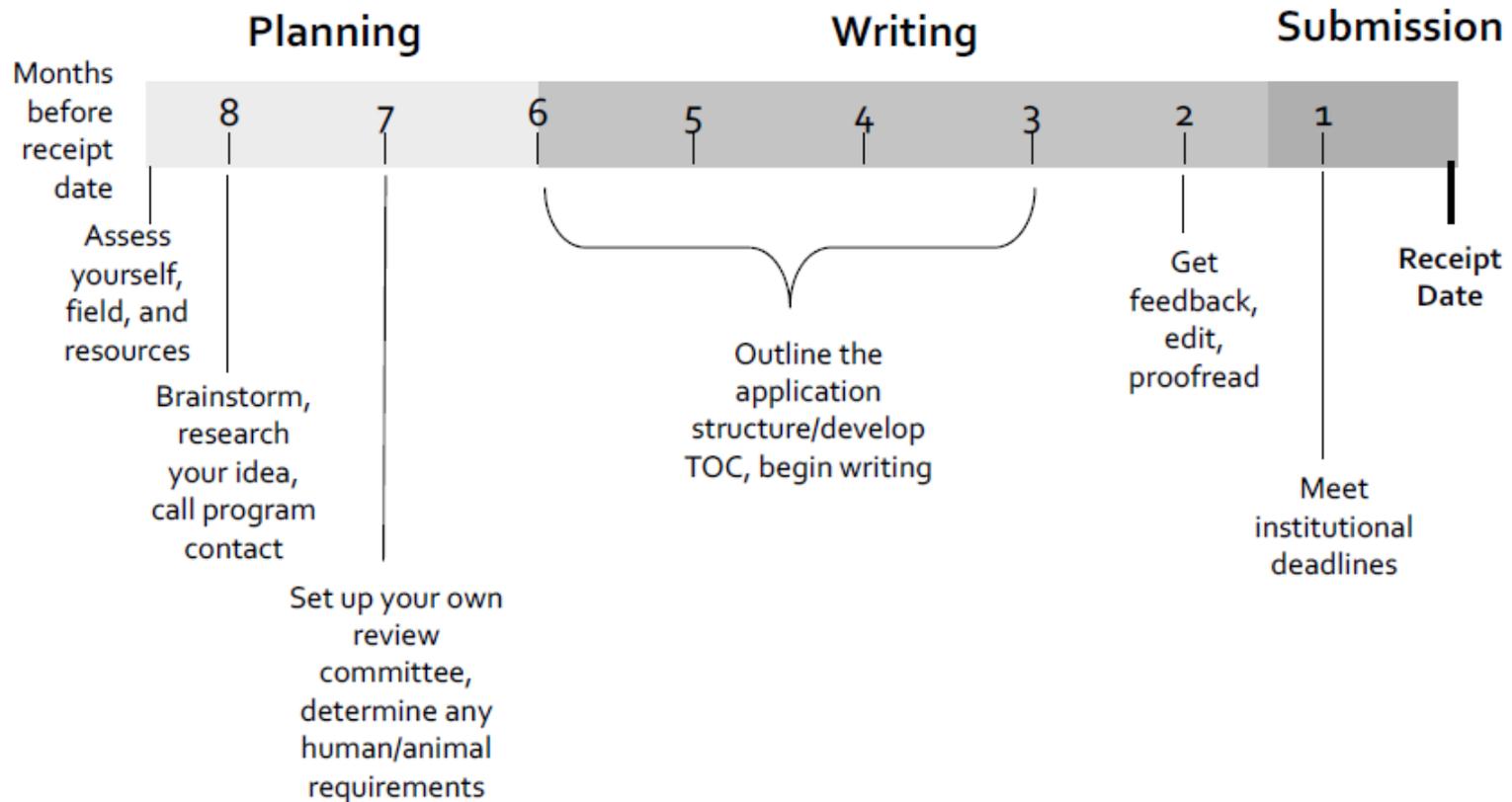
PERSON NAME

Their Title Here

University of Memphis



# Timeline



# REVIEW PROCESS

# Who Reviews

- ▶ Each funding agency has its own review process
- ▶ Federal agencies generally have formalized review panels of experts—peer review
- ▶ State agencies generally use staff as reviewers
- ▶ Foundations generally rely on staff and boards for review and funding decisions

# “Heilmeier Catechism

- ▶ What are you trying to do? Articulate your objectives using absolutely no jargon.
- ▶ How is it done today, and what are the limits of current practice?
- ▶ What is new in your approach and why do you think it will be successful?
- ▶ Who cares? If you are successful, what difference will it make?
- ▶ What are the risks?
- ▶ How much will it cost?
- ▶ How long will it take?
- ▶ What are the mid-term and final “exams” to check for success?

# Review Criteria

Mandatory criteria reviewers consider

- ▶ Reviewers are provided a proposal scoring/rating form and instructed to review proposals based on how well the mandatory review criteria are met
- ▶ Recent NSF criteria emphasizes transformative and interdisciplinary research
- ▶ Recent NIH criteria emphasize clinical, interdisciplinary, and translational research; add'l components added for rigor & transparency and clinical trials

# NIH Proposal Review

- ▶ The most transparent and detailed process of all agencies
  - ▶ Review Criteria & Considerations
  - ▶ Scoring
  - ▶ Process
- ▶ Compare/Contrast with other federal agencies

# NIH Review Criteria & Considerations

- ▶ Scored (formerly Core) Review Criteria
  - ▶ 5 criteria scored individually and considered in final Overall Impact score
- ▶ Additional Review Criteria
  - ▶ Not scored individually, but considered in final Overall Impact score
- ▶ Additional Review Considerations
  - ▶ Not scored individually and not considered in Overall Impact score

Great alignment of application structure with review criteria

# Scored Review Criterion: Significance

- ▶ Does the project address an important problem or a critical barrier to progress in the field? If the aims of the project are achieved, how will scientific knowledge, technical capability, and/or clinical practice be improved? How will successful completion of the aims change the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field? **Is the prior research that serves as the key support for the proposed project rigorous?\***

\*Previously “Is there a strong scientific premise for the project?”

# Scored Review Criterion: Approach

- ▶ Are the overall strategy, methodology, and analyses well-reasoned and appropriate to accomplish the specific aims of the project? Are potential problems, alternative strategies, and benchmarks for success presented? If the project is in the early stages of development, will the strategy establish feasibility and will particularly risky aspects be managed?
- ▶ Have the investigators presented strategies to ensure a robust and unbiased approach, as appropriate for the work proposed? (Design)
- ▶ **Have the investigators included plans to address weaknesses in the rigor of prior research that serves as the key support for the proposed project? (i.e., rigor of prior research)**
- ▶ Have the investigators presented adequate plans to address relevant biological variables, such as sex, for studies in vertebrate animals or human subjects? (Sex as a biological variable)
- ▶ If the project involves human subjects and/or NIH-defined clinical research, are the plans to address: 1) the protection of human subjects from research risks, and 2) the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion (exclusion) of individuals of all ages (including children and older adults), justified in terms of the scientific goals and research strategy proposed? (Clinical research)

# Scored Review Criterion: Innovation

- ▶ Does the application challenge and seek to shift current research or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions? Are the concepts, approaches or methodologies, instrumentation, or interventions novel to one field of research or novel in a broad sense? Is a refinement, improvement, or new application of theoretical concepts, approaches or methodologies, instrumentation, or interventions proposed?

# Scored Review Criterion: Investigator

- ▶ Are the PD/PIs, collaborators, and other researchers well suited to the project? If Early Stage Investigators or New Investigators, or in the early stages of independent careers, do they have appropriate experience and training? If established, have they demonstrated an ongoing record of accomplishments that have advanced their field(s)? If the project is collaborative or multi-PD/PI, do the investigators have complementary and integrated expertise; are their leadership approach, governance and organizational structure appropriate for the project?

# Scored Review Criterion: Environment

- ▶ Will the scientific environment in which the work will be done contribute to the probability of success? Are the institutional support, equipment and other physical resources available to the investigators adequate for the project proposed? Will the project benefit from unique features of the scientific environment, subject populations, or collaborative arrangements?

# Additional Review Criteria

- ▶ Protections for Human Subjects
- ▶ Inclusion of Women, Minorities, and Children
- ▶ Vertebrate Animals
- ▶ Biohazards
- ▶ Resubmission/Renewal/Revision Applications

# Additional Review Considerations

- ▶ Other Rigor & Transparency (Authentication)
- ▶ Budget and Period Support
- ▶ Select Agent Research
- ▶ Applications from Foreign Organizations
- ▶ Resource Sharing Plans

# Rigor & Transparency: Criteria and Considerations

- ▶ Scored Review Criteria
  - ▶ Significance
    - ▶ Rigor of Prior Research: Is the prior research that serves as the key support for the proposed project rigorous?
  - ▶ Approach
    - ▶ **Rigor of Prior Research:** Have the investigators included plans to address weaknesses in the rigor of prior research that serves as the key support for the proposed project?
    - ▶ **Design:** Have the investigators presented strategies to ensure a robust and unbiased approach, as appropriate for the work proposed?
    - ▶ **Biological Variables:** Have the investigators presented adequate plans to address relevant biological variables, such as sex, for studies in vertebrate animals or human subjects?
- ▶ Additional Review Considerations
  - ▶ Authentication: For projects involving key biological and/or chemical resources, reviewers will comment on the brief plans proposed for identifying and ensuring the validity of those resources.

# Rigor & Transparency: Revisions to Review Criteria Summary

Section	Criteria	Previous language	Current language
Scored Review Criteria	Significance	Is there a strong scientific premise for the project?	Is the prior research that serves as the key support for the proposed project rigorous?
Scored Review Criteria	Approach	Not Applicable	Have the investigators included plans to address weaknesses in the rigor of prior research that serves as the key support for the proposed project?
Scored Review Criteria	Approach	If the project involves human subjects and/or NIH-defined clinical research, are the plans to address 1) the protection of human subjects from research risks, and 2) the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion (exclusion) of children, justified in terms of the scientific goals and research strategy proposed?	If the project involves human subjects and/or NIH-defined clinical research, are the plans to address: 1) the protection of human subjects from research risks, and 2) the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion (exclusion) of individuals of all ages (including children and older adults), justified in terms of the scientific goals and research strategy proposed?
Additional Review Criteria	Protections for Human Subjects	For research that involves human subjects but does not involve one of the six categories of research that are exempt under 45 CFR Part 46, the committee will...	For research that involves human subjects but does not involve one of the categories of research that are exempt under 45 CFR Part 46, the committee will...
Additional Review Criteria	Inclusion of Women, Minorities, and Individuals Across the Lifespan	When the proposed project involves human subjects and/or NIH-defined clinical research, the committee will evaluate the proposed plans for the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion (or exclusion) of children to determine if it is justified in terms of the scientific goals and research strategy proposed.	When the proposed project involves human subjects and/or NIH-defined clinical research, the committee will evaluate the proposed plans for the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion (or exclusion) of individuals of all ages (including children and older adults) to determine if it is justified in terms of the scientific goals and research strategy proposed.

# Clinical Trials Criteria

## New Scored Review Criteria

- ▶ **Significance:** Are the scientific rationale and need for a clinical trial to test the proposed hypothesis or intervention well supported by preliminary data, clinical and/or preclinical studies, or information in the literature or knowledge of biological mechanisms? For trials focusing on clinical or public health endpoints, is this clinical trial necessary for testing the safety, efficacy or effectiveness of an intervention that could lead to a change in clinical practice, community behaviors or health care policy? For trials focusing on mechanistic, behavioral, physiological, biochemical, or other biomedical endpoints, is this trial needed to advance scientific understanding?
- ▶ **Investigator(s):** With regard to the proposed leadership for the project, do the PD/PI(s) and key personnel have the expertise, experience, and ability to organize, manage and implement the proposed clinical trial and meet milestones and timelines? Do they have appropriate expertise in study coordination, data management and statistics? For a multicenter trial, is the organizational structure appropriate and does the application identify a core of potential center investigators and staffing for a coordinating center?

# Clinical Trials Criteria

## New Scored Review Criteria

- ▶ **Innovation:** Does the design/research plan include innovative elements, as appropriate, that enhance its sensitivity, potential for information or potential to advance scientific knowledge or clinical practice?
- ▶ **Approach:** Does the application adequately address the following, if applicable?
  - ▶ Study Design
    - ▶ Is the study design justified and appropriate to address primary and secondary outcome variable(s)/endpoints that will be clear, informative and relevant to the hypothesis being tested? Is the scientific rationale/premise of the study based on previously well-designed preclinical and/or clinical research? Given the methods used to assign participants and deliver interventions, is the study design adequately powered to answer the research question(s), test the proposed hypothesis/hypotheses, and provide interpretable results? Is the trial appropriately designed to conduct the research efficiently? Are the study populations (size, gender, age, demographic group), proposed intervention arms/dose, and duration of the trial, appropriate and well justified?
    - ▶ Are potential ethical issues adequately addressed? Is the process for obtaining informed consent or assent appropriate? Is the eligible population available? Are the plans for recruitment outreach, enrollment, retention, handling dropouts, missed visits, and losses to follow-up appropriate to ensure robust data collection? Are the planned recruitment timelines feasible and is the plan to monitor accrual adequate? Has the need for randomization (or not), masking (if appropriate), controls, and inclusion/exclusion criteria been addressed? Are differences addressed, if applicable, in the intervention effect due to sex/gender and race/ethnicity?
    - ▶ Are the plans to standardize, assure quality of, and monitor adherence to, the trial protocol and data collection or distribution guidelines appropriate? Is there a plan to obtain required study agent(s)? Does the application propose to use existing available resources, as applicable?
  - ▶ Data Management and Statistical Analysis
    - ▶ Are planned analyses and statistical approach appropriate for the proposed study design and methods used to assign participants and deliver interventions? Are the procedures for data management and quality control of data adequate at clinical site(s) or at center laboratories, as applicable? Have the methods for standardization of procedures for data management to assess the effect of the intervention and quality control been addressed? Is there a plan to complete data analysis within the proposed period of the award?

# Clinical Trials Criteria

## New Scored Review Criteria

### ▶ Environment:

- ▶ If proposed, are the administrative, data coordinating, enrollment and laboratory/testing centers, appropriate for the trial proposed?
- ▶ Does the application adequately address the capability and ability to conduct the trial at the proposed site(s) or centers? Are the plans to add or drop enrollment centers, as needed, appropriate?
- ▶ If international site(s) is/are proposed, does the application adequately address the complexity of executing the clinical trial?
- ▶ If multi-sites/centers, is there evidence of the ability of the individual site or center to: (1) enroll the proposed numbers; (2) adhere to the protocol; (3) collect and transmit data in an accurate and timely fashion; and, (4) operate within the proposed organizational structure?

# Clinical Trials Criteria

## New Additional Review Criteria

- ▶ **Study Timeline:** Is the study timeline described in detail, taking into account start-up activities, the anticipated rate of enrollment, and planned follow-up assessment? Is the projected timeline feasible and well justified? Does the project incorporate efficiencies and utilize existing resources (e.g., CTSA's, practice-based research networks, electronic medical records, administrative database, or patient registries) to increase the efficiency of participant enrollment and data collection, as appropriate? Are potential challenges and corresponding solutions discussed (e.g., strategies that can be implemented in the event of enrollment shortfalls)?

# Overall Impact Score

- ▶ Overall Impact is the synthesis/integration of the five review criteria that are scored individually and the additional review criteria which are not scored individually
- ▶ To evaluate, the reviewer(s) make an assessment of the **likelihood for the project to exert a sustained, powerful influence on the research field(s) involved, in consideration of the scored review criteria, and additional review criteria**
- ▶ Likelihood (i.e., probability) is primarily derived from the investigator(s), approach and environment criteria
- ▶ Sustained powerful influence is primarily derived from the significance and innovation criteria
- ▶ Research field(s) may vary widely, so it would be helpful if reviewers identify in their reviews the research field(s) they believe will be influenced by each project

# Overall Impact Paragraph

- ▶ Reviewers write a paragraph summarizing the factors that informed their Overall Impact score, i.e., their rationale for the score
  - ▶ Not a summary and/or restatement of the strengths and weaknesses outlined in the full critique
  - ▶ This paragraph succinctly informs the reader (e.g., the applicant, program staff, members of council) of the underlying rationale for the Overall Impact score in consideration of the five scored review criteria

# NIH Scoring

- ▶ 9-pt scoring scale, emphasis on impact
  - ▶ 1 = Exceptional, 9 = Poor
  - ▶ 1 to 3 = high impact; 4 to 6 = moderate impact; 7 to 9 = low impact
  - ▶ Exceptional, Outstanding, Excellent, Very Good, Good, Satisfactory, Fair, Marginal, Poor
- ▶ Only whole number ratings
  - ▶ Center for Scientific Review piloted an expanded half-point scale
- ▶ Scored Criteria Ratings
  - ▶ Scoring and critiques per individual Scored Review Criteria
- ▶ Overall Impact Score (individual reviewer)
  - ▶ Paragraph in written critique to explain factors that informed reviewer's Overall Impact score
- ▶ Priority Score (all reviewers, averaged)
- ▶ Percentile Rank (normalized)

# NIH Scoring At-a-Glance

Overall Impact or Criterion Strength	Score	Descriptor
High	1	Exceptional
	2	Outstanding
	3	Excellent
Medium	4	Very Good
	5	Good
	6	Satisfactory
Low	7	Fair
	8	Marginal
	9	Poor
Other Designations for Final Outcome		
AB	Abstention	
CF	Conflict of Interest	
DF	Deferred	
ND	Not Discussed	
NP	Not Present	
NR	Not Recommended for Further Consideration	

# NIH Scoring Summary

High		
1	Exceptional	Exceptionally strong with essentially no weaknesses
2	Outstanding	Extremely strong with negligible weaknesses
3	Excellent	Very strong with only some minor weaknesses
Medium		
4	Very Good	Strong but with numerous minor weaknesses
5	Good	Strong but with at least one moderate weakness
6	Satisfactory	Some strengths but also some moderate weaknesses
Low		
7	Fair	Some strengths but with at least one major weakness
8	Marginal	A few strengths and a few major weaknesses
9	Poor	Very few strengths and numerous major weaknesses
<p><b>Non-numeric score options:</b> NR = Not Recommended for Further Consideration, DF = Deferred, AB = Abstention, CF = Conflict, NP = Not Present, ND = Not Discussed</p>		
<p><b>Minor Weakness:</b> An easily addressable weakness that does not substantially lessen impact  <b>Moderate Weakness:</b> A weakness that lessens impact  <b>Major Weakness:</b> A weakness that severely limits impact</p>		

# NIH Review Criteria At-a-Glance

- ▶ A table of Scored Review Criteria, Additional Review Criteria, and Additional Review Considerations for all types of proposals:
  - ▶ Research
  - ▶ Training
  - ▶ Other (Shared Instrumentation, Administrative Centers)

# NIH Scoring for Research Awards

**Overall Impact:**  
The likelihood for a project to exert a sustained, powerful influence on research field(s) involved

Overall Impact	High	Medium	Low
Score	1 2 3	4 5 6	7 8 9

## Evaluating Overall Impact:

Consider the 5 criteria: significance, investigator, innovation, approach, environment (weighted based on reviewer's judgment) and other score influences, e.g. human subjects, animal welfare, inclusion plans, and biohazards

e.g. Applications are addressing a problem of high importance/interest in the field. May have some or no weaknesses.

e.g. Applications may be addressing a problem of high importance in the field, but weaknesses in the criteria bring down the overall impact to medium.

e.g. Applications may be addressing a problem of moderate importance in the field, with some or no weaknesses

e.g. Applications may be addressing a problem of moderate/high importance in the field, but weaknesses in the criteria bring down the overall impact to low.

e.g. Applications may be addressing a problem of low or no importance in the field, with some or no weaknesses.

5 is a good medium-impact application, and the entire scale (1-9) should always be considered.

# Spreading Scores

- ▶ The entire scale (1-9) should always be considered
- ▶ NIH expects that scores of 1 or 9 to be used less frequently than the other scores
- ▶ A score of 5 is a good, medium-impact application

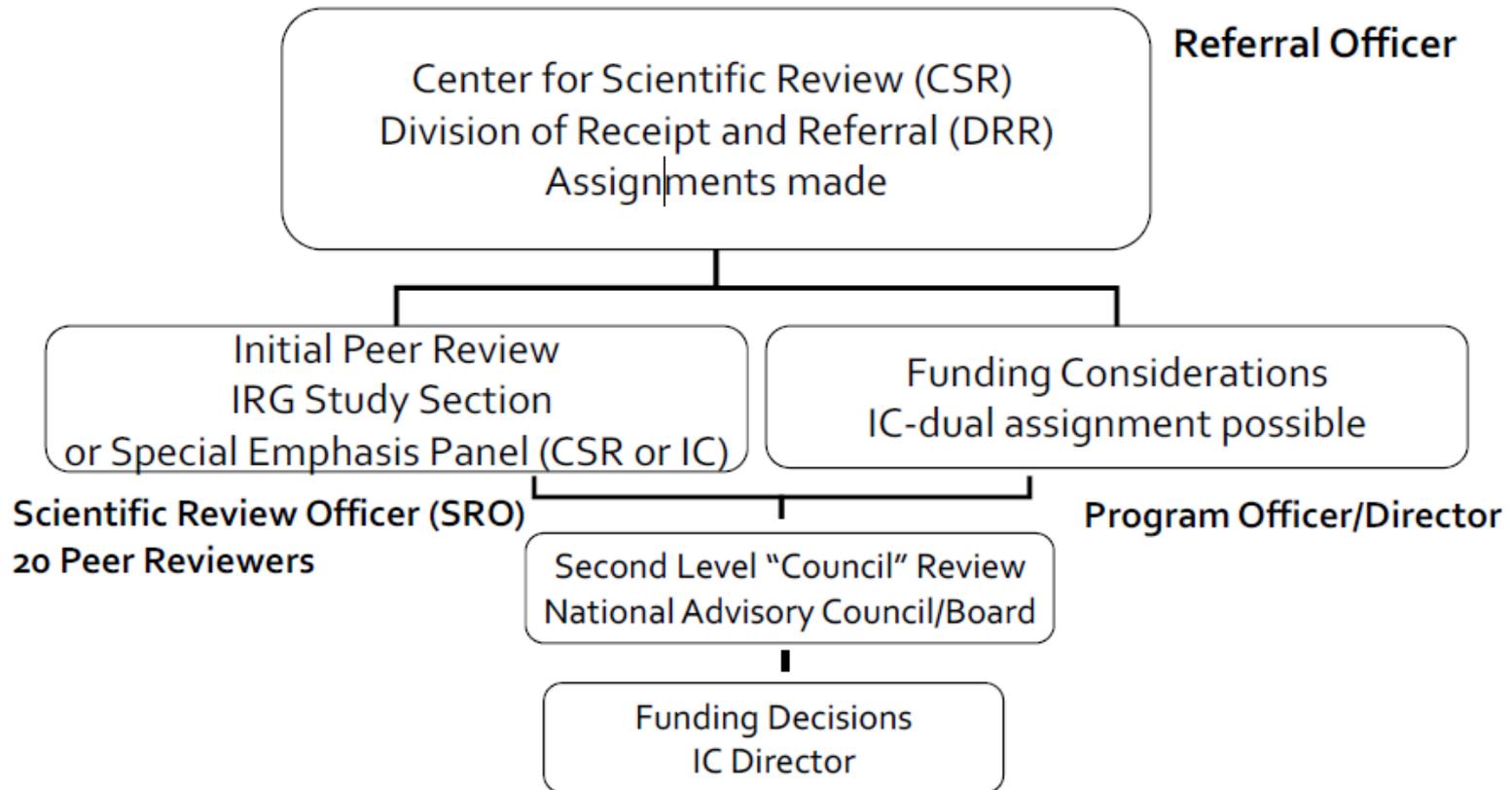
# Paylines & Success Rates

- ▶ Priority Score
- ▶ Percentile Rank
- ▶ Payline
- ▶ Success Rates
- ▶ Streamlining, unscored or “triaged”
  - ▶ ~50% R01s, ~40% shared instrumentation, 30% fellowships, Pre-arranged for RFAs
  - ▶ Preliminary score for streamlined applications

# Review Purview

- ▶ Center for Scientific Review (CSR)
  - ▶ Most R01s, fellowships, and small business applications
  - ▶ Some Program Announcements (PA, PAR, RFA)
- ▶ Institute/Center Review
  - ▶ IC-specific features
  - ▶ Program Project Grants (PPG; P01)
  - ▶ Training grants
  - ▶ Career development awards
  - ▶ Most RFAs

# NIH Bifurcated Review Process



# CSR Referral Officers

- ▶ Division of Receipt and Review
- ▶ 12-15 referral officers
- ▶ Checks for completeness
- ▶ Determines area of research
- ▶ Assigns an identification number
- ▶ Assigns a grant number
- ▶ Assigns application to specific NIH IC for possible funding
- ▶ Assigns a Scientific Review Group
- ▶ Receives over 92,000 applications/year!

# Scientific Review Officer (SRO)

- ▶ Formerly SRA
- ▶ Designated federal officer
- ▶ Extramural scientist
- ▶ IDs and recruits reviewers
- ▶ Manages COI
- ▶ Oversees review meeting arrangements
- ▶ Presides at review meetings
- ▶ Prepares and releases resume + summary statements

# Reivewers

- 3 reviewers/proposal
  - 2 primary, write critiques
  - 1 discussant
- Telephone and mail-in reviews as well
- Chartered
  - Permanent, 4 yrs
  - Ad hoc member
- Special Emphasis Panel
- ~18,000/yr
- Expertise
- Stature in field
- Mature judgment
- Impartiality
- Geographic balance
- Diversity
- Workload
  - 6-8 as reviewer
  - 2-3 as discussant
- No COI

# Pick Your Reviewers



Applications are reviewed by the Center for Scientific Review (CSR). Integrated Review Groups (IRGs) are assigned to review research applications based on scientific merit.

Home > Study Sections

Review activities are organized into Integrated Review Groups (IRGs). Each IRG represents a cluster of study sections around a general scientific area. Applications generally are assigned first to an IRG, and then to a specific study section within that IRG for evaluation of scientific merit.

Find a Study Section

## Integrated Review Groups

Review activities of the Center for Scientific Review (CSR) are organized into Integrated Review Groups (IRGs). Each IRG represents a cluster of study sections around a general scientific area. Applications generally are assigned first to an IRG, and then to a specific study section within that IRG for evaluation of scientific merit.

## Fellowship Study Sections

Recurring special emphasis panels (SEPs) review individual fellowship grant applications - F30, F31, F32, F33. Temporary members are recruited based on expertise needed for each meeting.

## Integrated Review Groups

- AIDS and Related Research
- Biobehavioral and Behavioral Processes
- Biological Chemistry and Macromolecular Biophysics IRG - BCMB
- Biology of Development and Aging
- Brain Disorders and Clinical Neuroscience
- Bioengineering Sciences and Technologies
- Cell Biology
- Cardiovascular and Respiratory Sciences
- Digestive, Kidney and Urological Systems
- Endocrinology, Metabolism, Nutrition and Sciences
- Emerging Technologies and Training Needs
- Genes, Genomes, and Genetics
- Healthcare Delivery and Methodologies

## Biological Chemistry and Macromolecular Biophysics IRG - BCMB

The Biological Chemistry and Macromolecular Biophysics IRG will review research applications on biochemical, biophysical and chemical approaches to biomedical problems.



**Dr. Raymond Jacobson**  
Chief

### IRG Summary

The IRG has special expertise in macromolecular mechanisms of structural biology, enzymology, biophysical methods, and biological molecules and their interactions. This IRG also includes studies that underlie biology at the molecular level. The IRG also includes studies with a molecular focus and their applications.

## Study Sections

Biochemistry and Biophysics of Membranes Study Section	BBM	Synthetic and Biological Chemistry
Macromolecular Structure and Function A Study Section	MSFA	Synthetic and Biological Chemistry
Macromolecular Structure and Function B Study Section	MSFB	Small Business: Drug Discovery
Macromolecular Structure and Function C Study Section	MSFC	Fellowship: Synthetic and Biological Chemistry
Macromolecular Structure and Function D Study Section	MSFD	Fellowship: Macromolecular Biophysics

## Biochemistry and Biophysics of Membranes Study Section - BBM

The Biochemistry and Biophysics of Membranes (BBM) Study Section reviews research applications concerned with all biochemical and biophysical aspects of membrane structure and function, and with their constituent protein and lipid components. Emphasis is on the molecular details of processes that occur on or within membranes. Areas include use of biochemical and biophysical techniques to understand the structure and function of membranes and membrane proteins.



**Dr. Nuria Asa-Munt**  
Scientific Review Officer  
asa@univ.nih.gov  
202-431-1323

The List of Reviewers lists all present, whether permanent or temporary, to provide the full scope of expertise present on that date. Lists are posted 30 days before the meeting and are tentative, pending any last minute changes.

- Review Dates
- > List of Reviewers on 09/27/2018
  - > List of Reviewers on 09/30/2018
  - > List of Reviewers on 11/01/2018

### Membership Panel

The membership panel is a list of chartered members only.

- > View Membership Panel

## Topics

- Membrane architecture: lipid-protein interactions, membrane protein folding, assembly, structure, and dynamics.
- Methods for membrane protein structure determination, including crystallization, solid state NMR and cryo-electron microscopy.
- Biophysics of membrane fusion mechanisms, of membrane interfaces, and signaling.
- Enzyme mechanisms within membranes and interfaces: membrane-based energy transduction, membrane-bound enzymes, function of transporters, channels, receptors, glycoproteins, lipid metabolism and lipid function.
- Computational and modeling approaches to membranes and membrane proteins.

## Shared Interests and Overlaps

There are shared interests for applications involving macromolecular biophysics and structural biology with Macromolecular Structure and Function A (MSFA), B (MSFB), C (MSFC), D (MSFD). Applications focused on structural or biophysical analyses of RNA molecules, complexes or ribozymes, protein-nucleic complexes, biophysical properties of proteins, misfolded or unstructured proteins, or posttranslational modifications of proteins may be assigned to (MSPE).

There are shared interests with Membrane Biology and Protein Processing (MBPP) in membrane biology. Studies involving structural and functional analysis of membranes using biophysical and computational approaches are reviewed in Biochemistry and Biophysics of Membranes (BBM). Studies focused on the organization and interaction of proteins, carbohydrates and lipids in membrane oligomers are reviewed in MBPP.

There are shared interests with Biophysics of Neural Systems (BPN) in the areas of structure function and computational studies of neural membranes and associated proteins complexes and receptors.

There are shared interests with Molecular and Integrative Signal Transduction (MIST) for applications investigating structure-function relationship of G-protein coupled receptors and other transmembrane signaling complexes.

# Discussion Format

- ▶ Members with conflicts excused
- ▶ Initial level of enthusiasm of assigned reviewers (Overall Impact Score)
- ▶ Primary reviewers explain project, strengths, and weaknesses
- ▶ Other assigned reviewers discuss
- ▶ Open discussion (full panel)
- ▶ Revised levels of enthusiasm from assigned reviewers
- ▶ Completion of ballots
- ▶ ~14 min/application

# NIH Enhancing Peer Review

- ▶ Only one resubmission\*
- ▶ New 1-9 scoring scale
- ▶ Enhanced review criteria
- ▶ Critiques for each Core Review Criterion in a structured summary statement
- ▶ A paragraph in written critiques to explain factors that informed reviewer's Overall Impact score
- ▶ Preliminary score for streamlined applications
- ▶ Separate precentiling of new vs. resubmissions
- ▶ Revised “New Investigator” designation, clustered (along with Early Stage Investigator proposals) during review
- ▶ Shorter (12 page) R01 applications
- ▶ Applications restructured to align with review criteria

# CSR Applicant & Reviewer Resources

- ▶ Applicant Resources
- ▶ Reviewer Resources
  - ▶ Become a Reviewer
  - ▶ Meeting Overview
  - ▶ General Review Guidelines
  - ▶ Specific Review Guidelines
  - ▶ Tools and Technology
  - ▶ Online Briefings for Applicants and Reviewers (live and archived)
- ▶ Become a Reviewer
- ▶ Subscribe to receive monthly Peer Review News newsletter

# NSF Proposal Review

- ▶ Guiding Review Principles
- ▶ Merit Review Criteria
- ▶ Review Elements
- ▶ Additional Solicitation Specific Review Criteria
- ▶ Rating
- ▶ Process

# NSF Guiding Review Principles

- ▶ All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- ▶ NSF projects, in the aggregate, should contribute more broadly to achieving societal goals.
- ▶ Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects.

# NSF Merit Review Criteria

- ▶ **Intellectual Merit:** This criterion encompasses the potential to advance knowledge
- ▶ **Broader Impacts:** This criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes
- ▶ When evaluating proposals, reviewers should consider the following issues, which apply both to the technical aspects of the proposal (Intellectual Merit) and the way in which the project may make broader contributions (Broader Impact):
  - ▶ What the proposers want to do
  - ▶ Why they want to do it
  - ▶ How they plan to do it
  - ▶ How they will know if they succeed
  - ▶ What benefits would accrue if the project is successful

# NSF Review Elements

Elements considered in the review for both Merit Review Criteria:

- ▶ What is the potential for the proposed activity to
  - ▶ Advance knowledge and understanding within its own field or across different fields (Intellectual Merit);
  - ▶ Benefit society or advance desired societal outcomes (Broader Impacts)?
- ▶ To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
- ▶ Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
- ▶ How well qualified is the individual, team, or institution to conduct the proposed activities?
- ▶ Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?

# Additional Solicitation Specific Review Criteria

- ▶ Augment the two standard NSB-approved Merit Review Criteria of Intellectual Merit and Broader Impacts
- ▶ Specific for the individual solicitation
- ▶ Not included for all solicitations

# All the Same Review

NIH Scored Review Criteria	NSF Review Elements – Intellectual Merit
Significance : ...project address an important problem or a critical barrier to progress in the field	Potential of the activity to advance knowledge and understanding, and benefit society
Approach: ...overall strategy, methodology, and analyses well-reasoned and appropriate to accomplish the specific aims of the project	Well-reasoned, well-organized plan for proposed activities and mechanism to assess success
Innovation: ...challenge and seek to shift current research or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions	Originality, creativity and transformative nature of proposed activities
Investigators: ...PD/PIs, collaborators, and other researchers well suited to the project	Qualifications of individual(s), team, or institution
Environment: ...scientific environment in which the work will be done contribute to the probability of success	Adequate resources to carry out proposed activities
NIH Overall Impact	NSF Review Elements – Broader Impact
Likelihood for the project to exert a sustained, powerful influence on the research field(s) involved	The potential to benefit society and contribute to the achievement of specific, desired societal outcomes

# NSF Rating Scale

- ▶ Excellent: Outstanding proposal in all respects; deserves highest priority for support
- ▶ Very Good: High quality proposal in nearly all respects; should be supported if at all possible
- ▶ Good: A quality proposal, worthy of support
- ▶ Fair: Proposal lacking in one or more critical aspects; key issues need to be addressed
- ▶ Poor: Proposal has serious deficiencies

# NSF Review Process

- ▶ Proposal arrives electronically, assigned to the appropriate program(s) for review
- ▶ Review process overseen by a Division Director
- ▶ Program officer (or team of POs) reviews the proposal and assigns it to reviewers
  - ▶ Ad hoc and advisory panel reviews
  - ▶ Most programs use a combination of ad hoc and advisory panel, but some use either one or the other
  - ▶ 2-3 reviewers/proposal
  - ▶ No external review required: RAPID/EAGER, small conferences, workshops, symposia

# NSF Program Officers

- ▶ Selects ad hoc reviewers and advisory panel members
- ▶ Checks for COI
- ▶ Synthesizes the comments of the reviewers and panel
- ▶ Makes recommendation to award/decline proposal
  - ▶ External proposal reviews
  - ▶ Support for potentially transformative advances in a field
  - ▶ Novel approaches to significant research questions
  - ▶ Capacity building in a new and promising research area
  - ▶ Potential impact on the development of human resources and infrastructure
  - ▶ NSF core strategies, such as 1) the integration of research and education and 2) broadening participation
  - ▶ Achievement of special program objectives and initiatives
  - ▶ Other available funding sources
  - ▶ Geographic distribution

# NSF Higher Order Review

- ▶ Division Director reviews all program officer recommendations
- ▶ Large awards may receive additional review
  - ▶ Director's Review Board reviews award recommendations with an average annual award amount of 2.5 percent or more of the awarding Division's annual budget
  - ▶ National Science Board reviews recommended awards with an annual award amount of one percent or more of the awarding Directorate's annual budget

# NSF Review & Rolling Deadlines

- ▶ Ad Hoc Review: Proposal will be sent out for review shortly after it's received. Once reviews are received, POs will assess and make a decision about funding.
- ▶ Advisory Panel: When POs receive a critical mass of proposals, they then convene a panel meeting to consider them. Scheduling of panel meetings is also balanced against NSF's 6-month dwell time ideal – i.e., notifying PIs about funding recommendation within 6 months of when a proposal was submitted.
- ▶ Regardless of when a proposal is submitted, you are likely to have notification of its disposition within 6 months.
- ▶ Understanding that proposals are received over the course of a FY, program officers will keep some monies in reserve to fund well-reviewed proposals submitted later in the year. Often in late April/May there are unspent funds available that divisions and programs look to spend. So, whatever advantage of early year submission might exist, latter year funding also has its advantages. And, even if a proposal is submitted in July – by which time most fiscal year funds are committed – it will be considered for funding in the next fiscal year. Sometimes well-reviewed proposals are “held” by POs beyond the 6-month period so that they can be funded with new FY funds. When this happens, PIs are usually notified.

# NEH Application Review Criteria

- ▶ Intellectual Significance
- ▶ Quality of Work; Feasibility of Work Plan
- ▶ Innovation
- ▶ Project Staff Qualifications
- ▶ Overall Value to Humanities Scholarship

# Still All the Same Review

NIH Scored Review Criteria (and Overall Impact)	NEH Application Review Criteria
Significance	Intellectual Significance
Approach	Quality of Project; Feasibility of Work Plan
Innovation	Quality of Innovation
Investigators	Project Staff Qualifications
Overall Impact	Overall Value to Humanities Scholarship

# Always All the Same Review

- ▶ Why does it matter?
  - ▶ Importance/Significance/Premise
- ▶ How are you going to do it?
  - ▶ Approach/Plan/Methodology/Objectives/Aims
- ▶ How will you know you've been successful?
  - ▶ Evaluation/Assessment
- ▶ What's new?
  - ▶ Novelty/Innovation/Creativity
- ▶ What's special about the human capital involved?
  - ▶ Organization/People/Investigators/Partners/Collaborators/Staff
- ▶ What's the context?
  - ▶ Resources/Environment/Populations
- ▶ What's the return on investment?
  - ▶ Impact/Value/Relevance
- ▶ How effectively will you manage the financial resources?
  - ▶ Budget

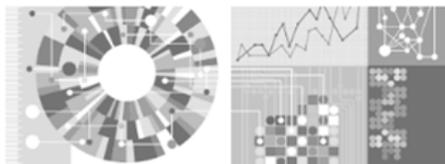
# Quick Guide

## Research Grant Proposal Review Criteria

...understanding the rules of the grantsmanship game

Eight key questions that funders ask reviewers to consider when they evaluate your research grant proposals, and the associated review criteria terms used across various funding agencies:

- Why does the research matter?
  - Significance
  - Importance
- How is the research new?
  - Innovation
  - Novelty
  - Creativity
- How will the research be conducted?
  - Approach
  - Plan
  - Methodology
  - Objectives
  - Aims
- In what context will the research be done?
  - Environment
  - Resources
  - Populations
  - Facilities
- Who's involved in the research and what's special about those people?
  - Investigators
  - Personnel
  - Organization
  - Partners
  - People
  - Collaborators
  - Researchers
  - Staff
- What is the return on investment?
  - Impact
  - Value
  - Relevance
  - Return on investment (ROI)
- How will success be determined?
  - Evaluation
  - Assessment
- How effectively will the financial resources be managed?
  - Budget



Content prepared by Holly K. Sullivan, PhD, Elsevier Global Academic Relations and Communications University School of Professional Studies, and Susan C. Sabin, PhD, Principal, The Sabin Group, Inc. Material originally reported in: Sabin, Susan, Holly K. Sullivan, and Susan C. Sabin. 2015. "How Do I Review This? Let Me Count the Ways: A Comparison of Research Grant Proposal Review Criteria Across US Federal Funding Agencies." *Journal of Research Administration* 44 (3): 71-86.

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### Top tips and tricks

Understand the funder: It's important that your research aligns with the funder's goals. Read the funder's mission statement to consider synergies between its goals and your research program.

Recognize that funders share the same goal when evaluating research proposals: Funders that offer research grants want to support research that fits within their mission (relevant) and will bring a strong return on their financial investment (impactful).

Know that it's really all the same review: Despite the use of funder-specific jargon to describe review criteria, reviewers are asked to evaluate proposals based on a common set of fundamental review questions—the eight key questions listed to the left.

Use the review criteria as your roadmap: The funder's review criteria directly inform how the proposal content should be presented and how much space should be afforded for each section of the proposal.

Use the key questions as a guide: If a funder does not provide transparent information about its review criteria in its proposal guidance, reach out to the program officer to ask about the eight key questions and which might best apply to the particular opportunity to which you're applying.

### Use Review Criteria to Guide Proposal Development

A funder's goals are to identify research that is:

- 1) Relevant – fits the funder's mission
- 2) Impactful – high return on investment

Proposal Review Criteria  
Based on 8 Key Questions

Use as a Guide to Develop your Research Grant Proposal

### And remember...

- To succeed in the highly competitive landscape of research grant funding, you should consider diversifying your funding portfolio.
- Understanding that different agencies use a similar set of review criteria will help you develop proposals for a wide range of funders.

- ▶ Grantsmanship Guide on Elsevier Researcher Academy at <https://researcheracademy.elsevier.com/sites/default/files/2017-11/Successful%20grant%20writing.pdf>

# Even in Canada!

## Comparing merit criteria across Canadian funding agencies

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### INTRODUCTION

Proposal development requires a clear understanding of a funding agency's peer-review criteria. While eligibility criteria, weighing scheme, and language may differ, Falk-Krzesinski and Tobin (2015) showed that similar criteria are used by 10 U.S. federal agencies. So, how do merit criteria compare across Canadian funding agencies?

### METHODS

The merit criteria of 8 Canadian operating grant competitions were analyzed, first looking for content alignment with Falk-Krzesinski and Tobin's U.S.-based merit categories, then refining the categories based on a comparative thematic analysis of the Canadian agencies' peer-review guidelines.

### RESULTS

The Canadian merit criteria are:

- Similar across funding competitions.
- Translatable into 5 thematic merit categories evaluating the quality and value of a research proposal's significance, originality, approach, research environment, and people involved.

### CONCLUSION

Results showed that there are a limited number of ways to evaluate research proposals. Formulating merit criteria into a set of generalizable categories or questions, as in the table's 1<sup>st</sup> column, is helpful for:

- Research Administrators developing funding guidelines and evaluation criteria.
- Research Facilitators teaching novice grant writers reviewer-focused grantsmanship.

To date, this simple and generalizable proposal development framework for operating grants has been taught to graduate students, postdoctoral fellows, and early career investigators, across a range of scientific disciplines.

Merit criteria are **similar** across Canadian funding agencies and fit within **5** thematic categories:

- Significance
- Originality
- Feasibility of the Approach
- Suitability of the Research Environment
- Right People Involved

Merit Categories/Questions	CIHR <sup>a</sup>	NSERC <sup>b</sup>	SSHRC <sup>c</sup>	NFRF <sup>d</sup>	Polar Knowledge Canada <sup>e</sup>	Genome Canada <sup>f</sup>	Parkinson Canada <sup>g</sup>	SHRF <sup>h</sup>
<b>Significance</b> How is it significant?	Significance (idea) Impact Advance knowledge	Significance (outcomes) Impact Advance knowledge Quality of HQP training	Significance (challenge) Contribution to knowledge Impact and Influence HQP training	High-reward	Significance (impacts) Relevance to themes Addresses a priority/pop Capacity building Training opportunities	Relevance to users Leads/extends knowledge Achievable societal/economic benefits	Potential for excellence Leads/advances knowledge	Importance Translational Career establishment
<b>Originality</b> How is it new?	Innovative New Creativity High-risk	Originality Innovation	Originality	High-risk Novel approach	Originality Avoids duplication	Creative, original thinking	Original and innovative Novel concepts/methods	Originality
<b>Feasibility of the Approach</b> How feasible is it?	Feasible plan SGBA <sup>+</sup>	Merit of the proposal Appropriate methodology Anticipated problems SGBA <sup>+</sup>	Feasibility Appropriate approaches	Feasible interdisciplinary approach SGBA <sup>+</sup>	Achievable objectives Community-relevant Culturally appropriate	Appropriate methods, approaches, budget Appropriate knowledge, resource sharing plans	Appropriate design and methods Alternative tactics Reasonable budget, timeline, ethics	Design quality and feasibility Appropriate budget
<b>Suitability of the Research Environment</b> How suitable is it?	Appropriate resources and environment	Accessibility to equipment and resources	Appropriate resources	Suitability of the research environment	Builds on existing resources and activities	Feasible deliverables given resources, co-funding plan	Environment supports success	Suitability of the research environment and supports
<b>Right People Involved</b> How are the right people involved?	Scientific excellence Appropriate expertise Engagement Evidence of EDI	Excellence of the researcher Evidence of EDI	Capability Quality of training/mentoring Stakeholder engagement Evidence of EDI	Capacity of investigators Engagement Evidence of EDI	Community engagement and support Relevant skills, interest and experience	Appropriate team expertise Collaborations User involvement Integration of new researchers	Experience and expertise	Potential to carry out the work

<sup>a</sup> Adjudication criteria, CIHR 2019 Spring Project grant competition; <sup>b</sup> Merit indicators, NSERC 2019 Discovery grant competition; <sup>c</sup> Evaluation criteria, SSHRC 2018 October Insight grant competition; <sup>d</sup> Selection criteria, New Frontiers in Research Fund 2018 December Inaugural Exploration competition; <sup>e</sup> Assessment criteria, Polar Knowledge Canada 2020-21; <sup>f</sup> Review criteria, Genome Canada 2019 Genomics in Society Interdisciplinary Research Teams RFA; <sup>g</sup> Review criteria, Parkinson Canada 2019 Pilot Project Program RFA; <sup>h</sup> Review criteria, SHRF 2019-20 Establishment grant competition

This study was inspired by:  
 Falk-Krzesinski, M and Tobin, SC (2015). How do I review them? Let me count the ways: A comparison of research grant proposal review criteria across US federal funding agencies. J Res Adm 46(2): 79-94.



# Are All Scores Equal?

- ▶ Studies to examine correlation between Core Review Criteria (now Scored Review Criteria) scoring and Overall Impact score
  - ▶ Preliminary 2010/11 NIGMS study examined correlation between individual criteria scores and Overall Impact score
  - ▶ April 2015 study from NIH CSR examined the correlation between individual criteria scores and Overall Impact score
  - ▶ June 2016 study from NIH OER examined the key criterion scores that drive impact score and funding outcomes
- ▶ Findings
  - ▶ All of the criteria are influential despite score range restriction good scores are necessary on all 5 Core Review Criteria for a good Overall Impact score, but...
  - ▶ **Approach** > Significance > Innovation > Investigator > Environment
- ▶ Conclusion: **The quality of ideas matter more than reputation** (good for new investigators!)

# Weighted Review

## ED NIDDR

- ▶ Importance of the problem (15 pts)
- ▶ Plan of Evaluation (10 pts)
- ▶ **Design of Research Activities (50 pts)**
- ▶ Project Staff (15 pts)
- ▶ Adequacy and Accessibility of Resources (10 pts)

## OJJDP

- ▶ Statement of the problem (20 points)
- ▶ Definition of objectives (10 points)
- ▶ **Project design (30 points)**
- ▶ Project management and organizational capability (25 points)
- ▶ Reasonableness of costs (15 points)

- ▶ There is no slide 253.



# Questions?

PERSON TITLE

Email  
Phone

