1/12/2026 @ NTU COM

Applying for NHRI Grants:
Lessons Learned from Experience

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Why this talk?

- **Target audience**

  Early-career PIs (newly independent)

  Postdocs planning to apply within 2–5 years

  Applicants with NSTC experience but limited NHRI success

- **Goal**

  Share practical strategies, pitfalls, and reviewer mindset

Overview of NHRI grant mechanisms

1. Individual investigator grants (IRG, CDG)
2. Multi-year / continuous grants
3. Team / program projects (if applicable)
4. Who should apply at each career stage?

My NHRI grant journey

1. When I first applied
2. Successes and failures
3. How my strategy evolved over time

What NHRI reviewers really look for?

1. Long-term scientific vision
2. PI track record and independence
3. Feasibility and continuity
4. Fit with NHRI mission (health impact + science depth)

Key message: *NHRI funds people and programs, not just projects.*

Choosing the right topic

1. Avoid “trend chasing”
2. Emphasize:
   - Core expertise
   - Logical extension of prior work
   - Multi-year sustainability

One-sentence central question matters more than many aims.

Example 1: Research topic framing

X Less effective

This project aims to comprehensively investigate inflammation, metabolism, cell death, and regeneration in cardiovascular disease and to develop multi-level therapeutic strategies.

Reviewer reaction-- too broad, no clear expertise, no long-term focus

O NHRI-friendly

This project focuses on how stress-induced metabolic reprogramming determines cardiac repair capacity and establishes a sustainable research direction.

Reviewer reaction-- clear boundaries, depth over breadth, obvious long-term vision

Framing the proposal as a program

1. Difference between:
   - "A good paper project"
   - "An NHRI-worthy program"

2. Show:
   - Past → present → future trajectory
   - How this grant enables the *next 5-7 years*

Novelty!

If a reviewer cannot clearly identify what is novel by the end of the Background & Specific Aims, the proposal is already in trouble.

Structure of NHRI grant proposal

1. Title *(should already imply novelty)*
2. Background & Significance
   - Knowledge gap
   - Limitations of existing work
   - Novelty & innovation of this proposal
3. Hypothesis *(logically derived from the innovation)*
4. Specific Aims *(each aim reflects innovation)*
5. Experimental Designs
6. Anticipated Results
7. Alternative Approaches
8. Future Plan *(innovation → program building)*
9. References

Example 2: Specific Aims structure

X Common mistake

Aim 1: Identify new molecules

Aim 2: Perform animal studies

Aim 3: Analyze clinical relevance

Reads like three unrelated papers.

O Effective structure

Aim 1: Define the core biological mechanism

Aim 2: Validate its role in disease models

Aim 3: Assess translational feasibility

One coherent scientific story.

Specific Aims: Less is more

1. 3 tightly connected aims
2. Avoid over-fragmentation
3. Each aim should:
   - Be hypothesis-driven
   - Be feasible within funding period
   - Generate future leverage

First priority – The Specific Aims page

1. This is where the process starts….
2. Create some drama or tension to grab the reader's attention.
3. You must distill your entire project into this type space.
4. If you can't focus here you are cooked!
5. First write down the Hypothesis to be tested.
6. Limit the number of Hypotheses to 1 or 2.
7. For each hypothesis list the Specific Aims and make them CLEAR!
8. Make a reasonable timeframe.

Myocardial Regeneration Using *Survivin*-- A Translational Approach

SPECIFIC AIMS:

The dominant cause of heart failure is regional loss of myocardium due to coronary artery disease. Cardiomyocytes die immediately following ischemia and are not adequately replaced, leading to a loss of ventricular function. Myocardial regeneration aims at protecting cardiomyocyte death to prevent cardiac fibrosis and at regrowing new cardiomyocytes to improve cardiac performance. However, this enthusiasm is often tempered by the recognition that the mammalian myocardium has very limited capability of endogenous regeneration (**Hsieh et al. *Nature Medicine*; 2007**). Since in newts and zebrafish, spontaneous myocardial regeneration may occur by de-differentiation and proliferation of the existing cardiomyocytes and ultimately replace the lost tissue, signals that regulate cardiomyocyte viability and proliferation may provide clues for myocardial regeneration in mammals.

"**Survivin**" is the smallest member of the inhibitor of apoptosis (IAP) gene family. Previous studies have shown that survivin is a key modulator of cell cycle progression and cell death inhibition. In mammals, survivin is widely expressed in the embryos but becomes undetectable in most terminally differentiated tissues. However, reactivation of survivin has been demonstrated in almost every human malignancy and survivin has been proven to be a reliable marker of progression and prognosis of cancer. Nevertheless, the role of survivin in cardiac development and the potential of manipulating survivin for cardiac regeneration remains largely unexplored.

Through a cardiac specific survivin deletion using Cre-Lox system, we have recently reported that survivin may modulate cardiac function in mice through regulating the amount of cardiomyocytes (**Levkau et al. *Circulation*; 2008**). Our studies additionally showed that adenoviral overexpression of survivin protected cardiomyocyte apoptosis and induced DNA synthesis. Interestingly, a recent report also showed survivin expression in the peri-infarcted myocardium in patients with acute myocardial infarction. These results imply that re-activation of survivin signal in adult cardiomyocytes may shed light on the hope for cardiac regeneration. Therefore, we propose to use a combined cellular, molecular and genetic engineering to test the **hypothesis** that **increasing survivin expression in the heart may promote myocardial survival and regeneration**. Our Aims are:

Aim 1. To investigate the mechanisms by which survivin regulates cardiomyocyte viability and proliferation.

Aim 2. To determine whether inducible cardiomyocyte-targeted survivin deletion reveals a functional role for survivin in postinfarction ventricular remodeling using inducible Cre-Lox transgenic mice.

Aim 3. To define the role of intramyocardial survivin delivery in myocardial survival and regeneration under pathophysiologic stress, using gene transfer or controlled protein release.

We anticipate that both gain-of-function and loss-of-function studies will reveal that survivin is a critical modulator for cardiomyocyte survival and growth, and for adult myocardial regeneration. Furthermore, we intend to identify signaling molecules regulating survivin expression in cardiomyocytes, both upstream and downstream, which we believe will lead to important discovery of novel therapeutic targets for heart failure.

Preliminary data: What is enough?

1. Quality > quantity
2. Show:
   - Proof of concept
   - Technical competence
   - Logical momentum
3. Negative data: when and how to include

Example 3: Preliminary data presentation

X Weak

Many figures, many conditions, no clear conclusion.

Reviewer reaction-- “They worked hard, but what does this prove?”

O Strong

2-3 key findings, one clear message per figure, directly supports the aims.

Reviewer thinks-- “This direction is solid and feasible.”

Innovation: How to be convincing?

1. Innovation ≠ new buzzwords
2. Emphasize:
   - New mechanism
   - New framework
   - New integration
3. Avoid exaggerated claims

Feasibility and risk management

1. Anticipate reviewer concerns
2. Explicit alternative strategies
3. Show you've "seen this movie before"

Budget strategy

1. Reasonable, justified, defensible
2. Personnel > equipment
3. Match ambition to budget reality

Common reasons NHRI proposals get rejected

1. Too broad, unfocused
2. Weak continuity with PI's track record
3. Overambitious aims
4. Poorly articulated significance

Responding to reviewer comments

1. Do not argue emotionally
2. Acknowledge concerns directly
3. Clarify, refine, strengthen, not defend

Resubmission strategy

1. When to resubmit?
2. When to pivot?
3. How to know whether feedback is “fixable”?

Mentorship & team building

1. Senior advisor input matters
2. Internal mock reviews
3. Strategic collaborations vs cosmetic co-authorship

NHRI vs NSTC: Key differences

1. Depth vs breadth
2. Stability vs productivity metrics
3. Long-term program vs short-cycle projects

Top 5 practical tips

1. Write for *reviewers*, not yourself
2. One clear story > many good ideas
3. Show continuity and maturity
4. Address weaknesses proactively
5. Start early and revise ruthlessly

Advice for early-career PIs & Postdocs

- NHRI does not expect you to do everything
  → It expects you to know *what you will focus on*.
- Your first NHRI grant is not your peak
  → It defines your research identity.
- Stability beats flashiness
  → A clear trajectory matters more than trendy techniques.
- Acknowledging limitations builds trust
  → Reviewers worry more about “too perfect” proposals.
- Write for the next 10 years, not just this review cycle

The NHRI reviewers' perspective

What NHRI reviewers are really asking?

1. Will this PI still be working on this topic in 5 years?
2. Is this direction worth long-term investment?
3. Can this PI execute and complete the work?
4. What would Taiwan lose if this proposal is not funded?

Signals that reassure reviewers

1. Clear continuity: past → present → future
2. Focused and manageable scope
3. Identified risks with realistic alternatives

Take-home message

NHRI grants are not about who is the smartest--

they are about who is most trustworthy for long-term support.

What's the most important factor for real estate?

Location

What are the 2nd-100th most important factors for real estate?

Location

What's the most important rule for grant writing?

Focus

What are the 2nd-100th most important rules for grant writing?

Focus

What's the most important factor for improving your skills in scientific communication?

Practice

What are the 2nd-100th most important factors for improving your skills in scientific communication?

Practice