

研究計畫撰寫

HOW TO WRITE A FUNDABLE PROPOSAL:

A Reviewer's Perspective

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NSTC Funding rates

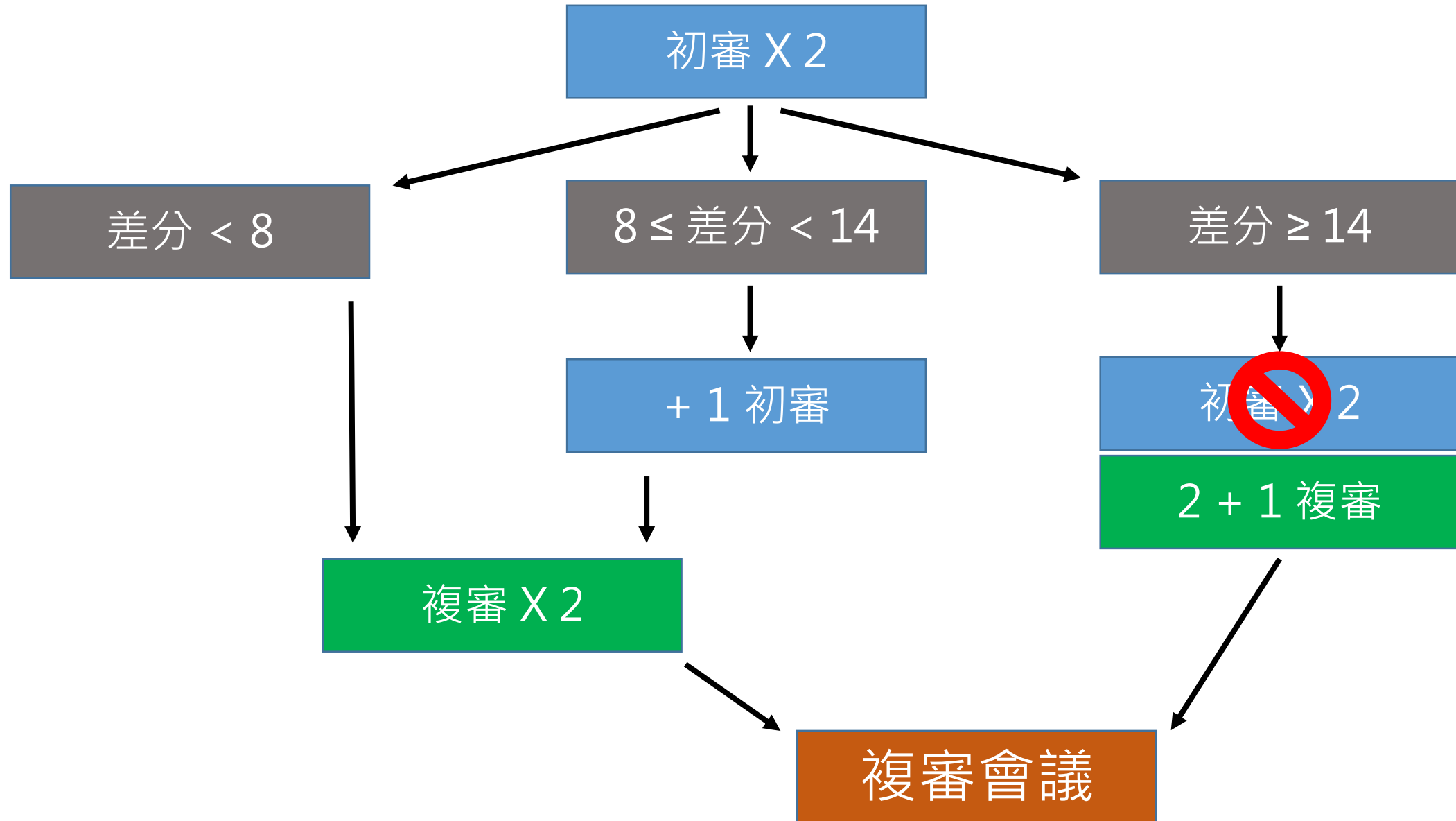
Ranking	Score
沒拿到計畫 (below 40-45%)	< 82
拿到一年期計畫: top 20-45%	82-84
多年期計畫: top 20%	> 85
第二件計畫: top 12%	> 88

申請到國科會博士後: top 15%
新進人員計畫通過率: 55%
隨到隨審計畫通過率: 89%

Score Breakdown

	計畫書寫	主持人學術表現
新進人員	80%	20%
非新進人員	70%	30%

Review



Study Section (複審會議)

- 學門召集人提出總分在前40-50%，但初複審評分差距大者討論
- 初審分數不可在複審會議調整
- 複審可討論是否調整複審評分，如有調整多在1-2分(原始分數)以內
- 複審可評判初審之審查品質與評語

撰寫研究計劃的心態

- 初複審大多都不會是同領域的專家，因此計畫撰寫必須簡單易懂
- 研究計畫在於展現邏輯與可行性，不是實驗程序或文獻整理
- 審查委員時間有限，你寫得越複雜冗長，他看得挫折感越深

Simple, Short, Clear

Major Elements of A Grant Proposal

• Novelty & Significance • Background	Motivation
• Preliminary data	Validation
• Aims • Experimental designs • Alternative hypothesis and difficulties	Execution

Novelty & Significance

Novelty of

- The biological phenomenon
- The mechanisms
- The technology

Significance that impacts

- Our understanding of a fundamentally important question?
- Our scientific practice (technology, treatment)?

Background

A **concise** summary of relevant literature

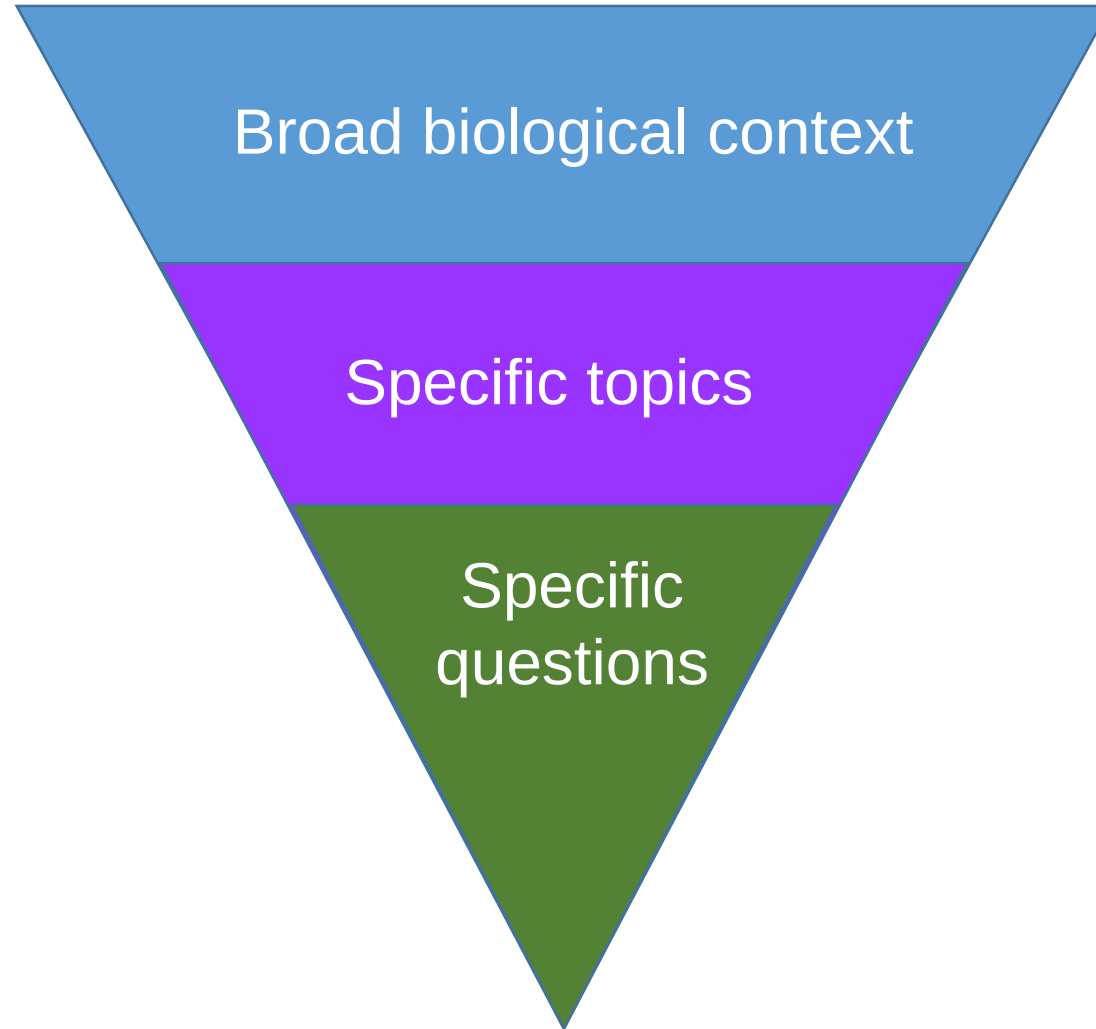
- Keep it around **2 pages** at most

Specify the **knowledge gaps**

- Don't just vaguely say "the mechanisms are unclear". Specify what the unknown part is.

Make your questions clear, which correspond to your aims

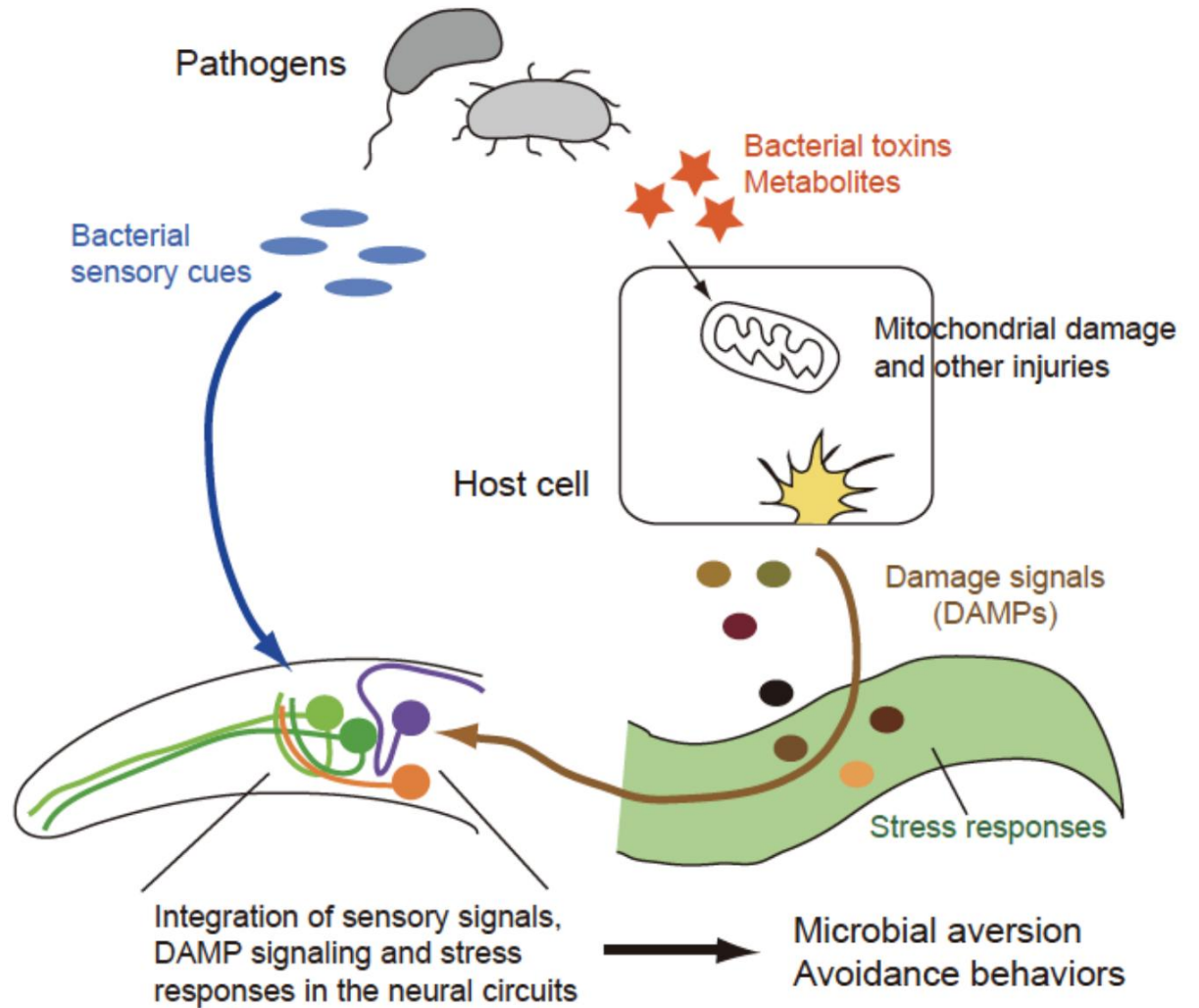
Background



Background

Propose your **hypothesis/model**

- **Hypothesis-driven proposals** are favored over open-ended ones
- **Visualize** your model/hypothesis



How Preliminary is Preliminary Data?

- The amount and quality of preliminary data should warrant publications soon (~ 50% of full data for a paper)
- 國科會：計畫主持人使用自己已發表之近期學術論文或自己指導之學生學位論文研究成果，應有引註且比例適度。

Aims

The Aims should be **independent** but **coherent**.

For example,

- Aim 1 (with 2-3 subaims): genetics
- Aim 2 (with 2-3 subaims): biochemistry and cell biology
- Aim 3 (with 2-3 subaims): physiology and animal study

Do not base other Aims on an open-ended experiment!!!

- Screens or omics-experiments should not be Aim 1

Coherence within Aim

Example 1

Aim: Mechanisms of adhesion molecule signaling

- 1.1 Phenotypes of mutants that lack specific domains (genetics)
- 1.2 Aggregation assays using culture cells (cell biology)
- 1.3 Examination of downstream signaling (biochemistry)

Example 2

Aim: Mechanisms of dendrite self-repulsion

- 1.1 Generation of dendrite markers for live imaging (dynamic imaging)
- 1.2 Membrane activity and dendrite repulsion (calcium imaging)
- 1.3 Cytoskeletal remodeling and dendrite repulsion (genetics)

Experimental Designs

For each sub-aim,

- Explain the **rationale/hypothesis** first
- Use **diagrams** whenever applicable
- Include proper **control experiments**
- Discuss **anticipated results** and **alternative models**

DO NOT:

- Describe detailed methods or procedures without designs
- Simply say “we will do the same things as those in Aim 2.1”

Visualize Your Experimental Designs



wild type



rde-1 mutant
RNAi-resistant

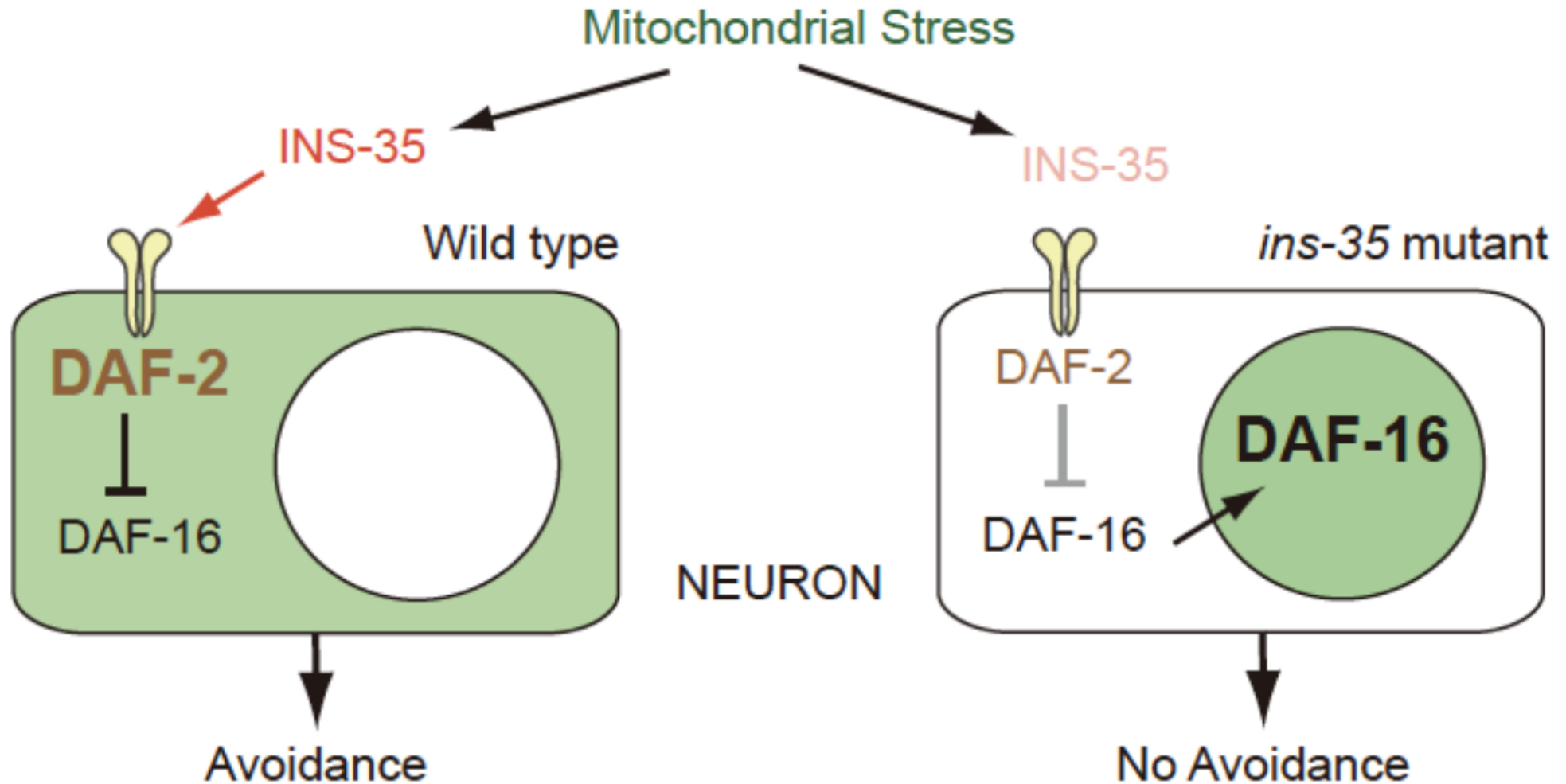


rde-1; Pelt-2::RDE-1
intestine-specific RNAi



rde-1; Pdpi-7::RDE-1
hypodermis-specific RNAi

Make Predictions based on Models



Alternative Hypothesis & Controls

- Discuss alternative hypothesis/results in each aim/subaim
- Propose controls for all experiments that apply

Tips for Writing

Persuasive writing:

- **Conclusion goes first** (in the “topic sentence”)
- List several lines of supporting evidence

Avoid long and complex sentences

Avoid jargons

Do not write up to page limit (25 pages) – too long!!

Things that Sink Your Grant

- Long Materials & Methods section
- Little experimental designs
- -Omics studies without a hypothesis
- Dense & lengthy writing full of grammatical errors

Schedule Your Writing

Start writing no later than October
(NSTC submission system opens in November)

Do not do the last-minute submission

Apply your IRB or other permits ahead of time

Rejection

Successful rebuttal is very rare

Common reasons for rejection

- Lack of novelty or significance
- Poor writing: little rationale, lengthy methodology
- Unsatisfactory publication record
 - Long publication hiatus
 - Lots of papers in black-list journals
 - Lack of research focus

Resubmission

- New publications are necessary but not sufficient
- Be prepared for one more round of rejection
 - Get funding from other sources
- Improve your rejected grant proposal
 - Respond to the reviewers' comments
 - New data
 - Reorganization
 - Polished writing