研究計畫撰寫策略

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科技部專題研究計畫審查流程

計畫

↓

學門

↓

召集人

↓

複審委員

↓

提名初審委員

↓

決定初審委員

↓

初審（兩位） 分數、評語

↓ 差距過大 ==> （第三初審）

複審（一位第一主審，一位第二主審）

新人隨到隨審

複審會議

- 計畫依初審複審分數排序
- 後段班 => 有無特別需要討論？
- 分數差距大 => 討論 （兩位主審表示意見，全體討論）

  => 修改分數或是所有委員打分數
- 其餘 => 逐案或重點案件討論
- 重新排序
- 決定cut off line （第二件計畫?）
- 決定金額

Reviewers 看什麼？

- 過去成果、經驗
- 未來規劃 (proposal)

資深 vs. 新進

（五年的黃金期）

生科司 105 年度專題研究計畫(一般)初審審查表

一、 專題研究計畫：請綜合下列五點審查項目勾選等級及評給分數 (70 分)

☐極優(70-63) ☐優(62-57) ☐可(56-50) ☐差(< 50) **評分：**_____

1.研究主題之重要性與創新性。

2.研究計畫撰寫之完整性及妥適性，實驗設計及重要研究方法之可行性。

3.本計畫可能產生對社會、經濟、學術發展等面向的預期影響性。

4.主持人研究能力及經驗，文獻蒐集之完備性及對國內外相關研究現況是否清楚瞭解。

5.研究人力配置、儀器、經費之申請額度及執行期限之合理性。

二、 主持人近五年內之研究成果及所反映之學術研究能力： 請綜合下列二點審查項目勾選等級及評給分數 (30 分)

☐極優(30-27) ☐優(26-23) ☐可(22-20) ☐差(< 20) **評分：**_____

1.最近一件執行科技部研究計畫之研究報告及成果是否良好。

2.近五年發表之研究成果（論文、專利及技轉等）之質與量，在同研究領域同儕中之相對表現。

※等級參考分數：(A)優先推薦(≥ 90)；(B)推薦(89- 80)；(C)勉予推薦(79-70)；(D)不推薦(< 70)

總分(上兩項評分相加)：_____

三、 本計畫是否涉及國家安全機密或敏感科技？☐是 ☐否

四、 本研究計畫若涉及下列實驗/試驗，須附相關核准或同意進行實驗/試驗之文件：

1. ☐(1)涉及人體試驗/臨床試驗/取用人體檢體； ☐(2)涉及人之問卷、訪談等研究； ☐(3)涉及人類胚胎/人類胚胎幹細胞
   ☐已附「醫學倫理或人體試驗委員會」核准之證明文件 ☐須補送前述證明文件
2. ☐涉及基因重組實驗
   ☐已附「生物實驗安全委員會」同意之證明文件 ☐須補送前述文件
3. ☐涉及基改生物(GMO)田間試驗
   ☐已附相關主管機關同意之證明文件 ☐須補送前述文件
4. ☐涉及動物實驗
   ☐已附「動物實驗管理委員會」同意之證明文件，及動物實驗倫理3R 說明 ☐須補送前述文件
   動物實驗倫理3R 說明內容評審等級：☐極優 ☐優 ☐可 ☐差
5. ☐涉及第二級以上感染性生物材料
   ☐已附相關同意之證明文件 ☐須補送前述文件

五、 本計畫經費編列是否合適？

1.建議本計畫每年合適之總金額：第 1 年_____

第 2 年_____

第 3 年_____

第 4 年_____

2. (1)說明本計畫每年合適金額以及各細項經費刪減或調整等之意見。

(2)本計畫或相似計畫若已獲其他單位經費補助或同時向其他單位申請補助，亦請指明。

審查委員簽名： 年 月 日

六、綜合審查意見：(本綜合意見為複審及計畫主持人的重要參考資料，敬請務必填寫。請對申請計畫優劣做具體且客觀之評述及提供建設性意見與建議，避免使用不當的尖銳文字。請特別留意審查意見及審查評分之優劣應一致，勿造成評語佳而評分低之相互矛盾情形。)

1.本計畫研究內容簡述：

2.審查意見：（請分別就前頁之專題計畫及研究成果等項目審查，針對以下四點列舉具體的審查意見及建議，字數總和至少 200 字以上為原則，篇幅以 4 頁為上限。）

(1) 重要性及新穎性 (Significance & Novelty):

(2) 弱點 (Weakness):

(3) 主持人之研究表現 (PI Performance):

(4) 具體專業意見 (Specific Comment):

七、對初審意見之評等： 請對初審審查意見內容(可點選*連結)，是否針對計畫之重點與創新，學術或應用性之價值，研究方法及實驗設計之可行性，及主持人之研究能力等項目評鑑，請勾選列表等級，如有補充說明亦請於欄位中敘明。

總評	優	佳	尚可	簡略	補充說明或建議
*初審 1					
*初審 2					
*初審 3					

科技部個人型計畫審查重點

For grant

- 1.**研究主題之重要性與創新性**：係指所擬研究計畫主題是否為一項新的生命科學重要問題，而非重複或進行類似他人做過之研究。
- 2.**研究計畫撰寫之完整性及妥適性，實驗設計及重要研究方法之可行性**：係指計畫撰寫是否完整、簡潔、清楚、具新設計或新方法，主題是否前後連貫以深入探討該領域之重要主題，完成系列的研究成果，計畫的理論架構、研究設計、實驗及分析方法等是否具體可行，以及是否考慮計畫執行時的相關困難或限制，及其解決方式。
- 3.**預期成果在學術上或實用上之價值**：研究計畫完成後是否能增進該領域之科學新知或開發新的研究方法或新的應用科技。
- 4.**主持人研究能力及經驗，文獻蒐集之完備性及對國內外相關研究現況是否清楚瞭解**：係針對參與研究計畫之人員是否有良好相關研究能力或經驗，適合執行此研究計畫，或已有初步研究數據，顯示其研究能力；對現有知識或方法以及必須突破的研究瓶頸，有深入的文獻探討並提出合宜的研究步驟。
- 5.**研究人力配置、儀器、經費之申請額度及執行期限之合理性**：專兼任研究助理人員、碩博士生、博士後研究員、共同及協同主持人等研究人力之配置是否合適？業務費是否適當？研究設備購置是否必要或具成本效益？計畫之執行期限是否合適？

For PI

- **主持人近五年內研究成果及所反映之研究能力審查重點**(依據計畫主持人所送『個人資料表』及『生科司學術研究績效表』等資料評估)。
- 1.近五年發表之研究成果（論文、專利及技轉等）之質與量，在同研究領域同儕中之相對表現。

Procedures of proposal writing

- Write down innovative ideas
- Search literatures (including relevant fields)
- Discuss with colleagues and experts
- (Form effective team with synergistic expertise-for PPG)
- Prepare outline and specific aims
- Perform preliminary experiments
- Write first draft
- Improve the draft – continuing process
- Finish complete draft

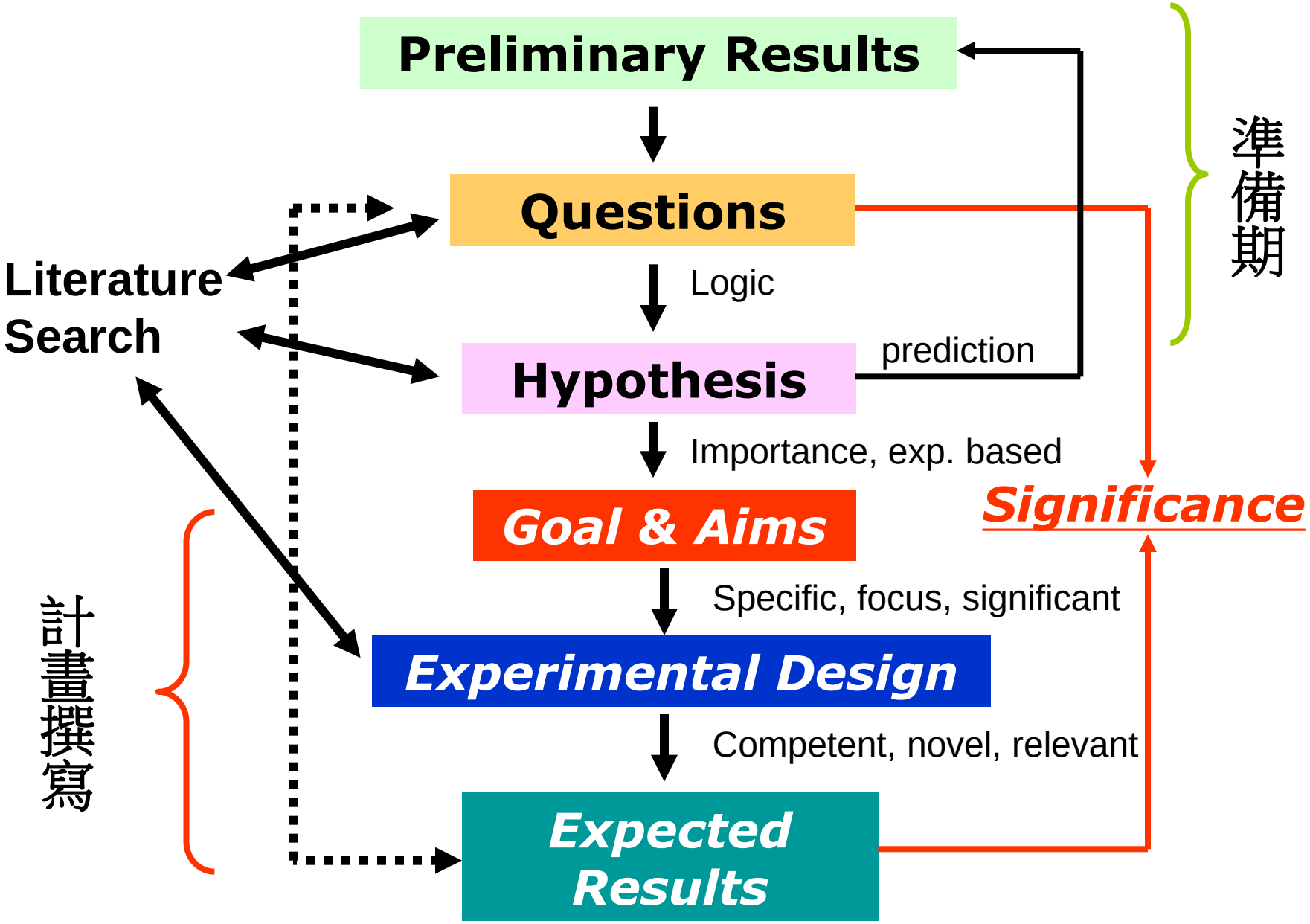
How to start: Ideas first

Problems **and** ***Hypothesis:*** **evidence-based**

Overall Goal **and** ***Specific Aims***

Rationale: **why your proposal is** ***important/interesting*** **that deserves to be supported: Extensive literature search；Convince yourself the significance and contribution of your proposal**

Make a computer file and enter thoughts come up through the preparation period; modify the thoughts


Preliminary Results
Questions
Logic
Literature Search
Hypothesis
prediction
Importance, exp. based
Goal & Aims
Significance
Specific, focus, significant
Experimental Design
Competent, novel, relevant
Expected Results
準備期
計畫撰寫

Tips for getting funded

- Start early (**very** early)! – Finish the first draft one month before the submission deadline
- Get outsider's opinion
- Relevant and supportive preliminary results
- Set priorities. （懂得取捨）(Focus) – Too many specific aims makes proposal non-specific
- Logical sequence of experiments.
- 不要一廂情願，consider alternatives.
  - pros and cons of alternative approaches
  - alternative interpretations of results

Important ethical issues

- Avoid scientific misconduct : Fabrication, falsification, plagiarism
- When using someone else's work, you must provide a citation
- If someone's exact words have to be copied, a quotation mark must be given
- Verbatim copy of a large section of text, including a few sentences, whole paragraph…, is considered as a type of plagiarism, no matter quotation or citation is given

Think from the perspective of the reviewers

- Not necessarily experts in your field.

- May not read your grant carefully. Need to make it easily readable.

- Impress the reviewers.
  Demonstrate 深思熟慮, 嚴謹，操作能力
  (preliminary results)

千里馬未必碰上伯樂

- It is your responsibility to make the reviewers understand the significance of your proposal.
- Consider carefully reviewers' comments.
- Relative ranking.
- **Appeal only if seriously misunderstood.**

Content of the proposal and writing order

- Title(**7**)
- Abstract(**6**)
- Background and significance (**2**)
- Overall Goal and Specific Aims(**1**)
- Preliminary Results (*relevant ones*)(**3**)
- Experimental Design(**4**)
- Expected Results(**5**)
- Budget(**8**)
- ***Check list*** *(for your own use)*

Tips for writing order

Write Only Outline at the first draft; do not start by writing full proposal

Write Abstract at the end

Write Title of Proposal when the proposal is finished

Specific Aims: most important part in proposal

- Need most time to prepare it.
- Use one sentence to describe each Specific Aim.
- Specific Aims need to be specific, original and important.
- Think, design and debate about your major approach in a realistic way- what/why/how.
- Discuss your ideas and approaches with others.
- The inter-relationship between Specific Aims. Avoid to come up with three Aims that have no apparent relationship with each other. Also, avoid to come up with three Aims in which Aim 2 and 3 are strictly dependent on the success of Aim 1

highlight

Specific Aims

brief

- **Specific Aim #1**. Identification of downstream genes involved in ----. The purpose of this aim will test the hypothesis that------- Specifically,--- Yeast two-hybrid technique will be used to ----- Deletion analysis will be used to ----- *This study will be able to allow us to identify -----*

Title

Approaches

Hypothesis

Importance

Approaches

Rationale and hypothesis

<u>Specific Aim 1</u>. ***To determine the role of nucleosomes in the regulation of Igk locus rearrangement.*** Our preliminary results showed that the V(D)J recombinase could not recognize RSS targets if they were arranged into a nucleosome structure. We propose experiments to extend these observations by 1) determining what fraction of the Jk gene segments are in the nucleosomal structure in cells undergoing rearrangement as compared with non-lymphoid cells, 2) determining if nucleosomes are phased across the Jk locus, 3)determining whether nucleosome remodeling complex can alter the accessibility of the Jk cluster in native or reconstituted chromatin. This analysis will give us insight of the mechanism of Igk gene rearrangement.

Significance

Specific Aims: Problems

- No hypothesis; Fishing Expedition
- Wild speculation
- Too complicated, hard to understand

Background & Significance

- What's known? Provide up-to-date and **relevant** knowledge and the rationale of the proposal. This part is not equivalent to a review article.
- What' unknown? Point out the unanswered questions especially for the issues that will be addressed in the proposal (usually included in the end of a paragraph).
- Who cares? Use once paragraph to describe the significance of your proposal.

Preliminary Results

- Show ***only*** the relevant experiments ***supporting*** your hypothesis
- The results should not be ambiguous
- Figure and table legends should be clearly written; figure numbers should correspond to the text; be sure to label the figures
- Do not show published results in this section

Figures and Tables

- Simple and Clarity in presentation
- Visualization and presentation techniques
- Caption must stand-alone
- Error bars
- Resolution and format
- Figure and Table number consistent with text

Figures and Tables: problems

- Complicated figures or tables
- No or Inadequate description in the legends
- Mislabeling
- No markings (units, arrows, mol weight markers etc)
- No correspondence with text

Experimental Design (1)

- ***Do not write as Materials and Methods***
- ***Design the experiments to solve the problems*** posed in the specific aims in logical order
- Be ***realistic***, do not plan too many experiments or out of your expertise; manageable; focus!
- Be ***logical***; step-by-step leading to your goal

Experimental Design (2)

- Updated technologies; Do not re-invent the wheel
- Competence in using techniques proposed
- Evaluate the design critically; alternative approaches, pros and cons
- ***Control! Control! Control!***
- A schematic diagram for the overall design will help the reviewers understand

Results Evaluation & Expectation

- State clearly why good results will be expected because of previous studies, your expertise, novel technology etc
- Reasonable time table for achieving results
- Alternative Interpretations critically evaluated
- How the results will support your hypothesis
- Perspectives

Abstract

- ***First impression*** to the reviewers
- **Summarize key points in the proposal:** Importance and Rationale, Hypothesis, Aims, Approaches (brief), Innovation, Preliminary Results supporting the proposal, Expected Results, Significance
- ***Write it last***, following the logic of the proposal
- Give possible answers to the problems you want to study
- Do not use this section to write long background or discussions

Importance	Early onset breast cancer has been the unique and major health problem in Taiwan with annual increase-----
Outstanding problems	The etiology and mechanisms of breast cancer in young women is unknown. It has been suggested that carcinogenesis in utero may account for the early-onset of this cancer----------
Hypothesis	To test this hypothesis, we have used fed pregnant mice with fatty diet and found increase in incidence of mammary tumors in the new born mice.----------
Experimental approaches	In this proposal, we will examine the alteration of mammary gland differentiation pathway in the mammary tumors derived from the new born mice using microarray, SAGE (serial analysis of gene expression) as well real-time PCR techniques ----------
Summary Answers	This study of alterations in mammary gland differentiation in the mammary tumor of new born mice will allow us to identify the genetic and molecular mechanisms involved in the early-onset breast cancer.
Significance	This information could be useful for diagnosis/treatment of early-onset breast cancer in Taiwan----------

Title

- Informative, clear, concise
- Reflect the central theme
- English and Chinese titles should be consistent

Title and key words are used for assigning reviewers

References

- ***Should correspond to the text***
- ***Updated; don't miss the most relevant ones***
- Consistent format; numbering will help
- Title of article will help the reviewers

Budget

- Be reasonable
- State the ***rationale*** for unusually large request for fund
- State the ***justifications*** for purchasing the equipment needed

Reasons Why Proposal is Rejected- for project (1)

- Importance and rationale not clearly stated
- The problem is outmoded or trivial
- No specific aims! Aims too diffuse or general
- Similar experiments have already been done
- No evidence for competence to carry out the proposal
- Not realistic; overly ambitious plan
- No supportive preliminary data

Reasons Why Proposal is Rejected- for project (2)

- No experimental design! Or no correlation with the specific aims; poor design
- Too many factors or variables; No hypothesis; technique looking for problem
- No Controls
- Proposed study will not give useful information or new contributions
- Proposal depends on a key experiment with uncertain outcome

Reasons Why Proposal is Rejected- for PI

- Performance in the past five years is not satisfactory
- No track record in project-related field
- No experience in key experiment that requires special technique (a co-PI is needed)

致謝

- 錢煦 院士
- 徐明達 教授
- 孫以瀚 教授

謝謝聆聽

祝您成功！