



如何撰寫學術 論文

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學術論文的特質

證據

文句

何謂科學

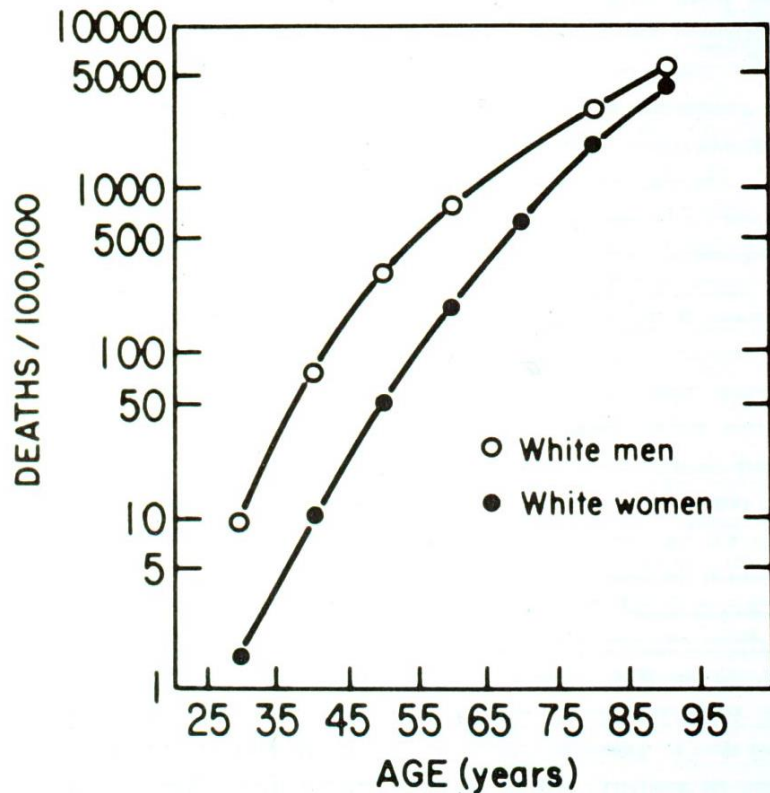
- 觀察
- 假說
- 實驗

如何動手寫文章？

你想講甚麼故事？

你想傳達甚麼訊息？

Clinical observation



Furman RH Ann NY Acad. Sci. 1968

Pre-menopausal women have a much lower mortality from atherosclerotic cardiovascular disease than men. However, during their postmenopausal years, cardiovascular disease in women gradually approaches that of men.

Hypothesis

Female sex hormones may have a cardiovascular protective effect in pre-menopausal women.

Hypothesis是對一觀察現象
提出的可能合理解釋

Supporting evidence

Estrogen replacement reduces the incidence of cardiovascular diseases in the postmenopausal women.

Stampfer MJ et al., N Engl J Med. 1991 325(11):756-62.

實驗結果的好壞，除了結果的可信度外，更重要的是是否有足夠的證據可以支持假說的成立

科學論文的基本架構

- **Title page**
- **Abstract**
- **Introduction**
- **Materials and Methods**
- **Results**
- **Discussion**
- **Acknowledgement**
- **References**
- **Figure Legends**

可從**Results**開始寫起

先建立起故事的架構

最好事先有故事再去找證據

避免在現有的數據中去編故事

撰寫每個實驗結果前最好
先說明進行此實驗的

Rationale

Progesterone receptors in arterial smooth muscle cells

The presence of progesterone receptor in the medial layer of the aorta (Ingegno et al., 1988) suggests that they are expressed by human aortic smooth muscle cells. To confirm that such progesterone receptor-positive cells are indeed smooth muscle cells, we double-stained human and rat tissue for progesterone receptor and smooth muscle cell-specific α -actin.

Results可以直述實驗結果，無須對結果做討論

**Results section後可以開始
寫 Figure Legends**

**Figure Legend的要點是
可以讓讀者了解實驗的
步驟、條件與結果**

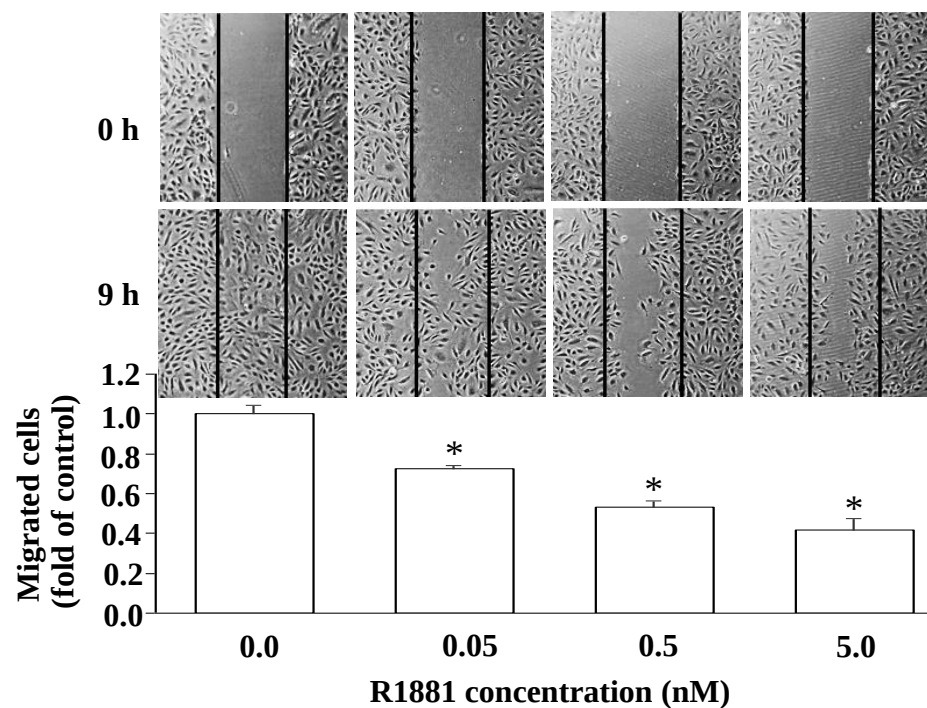


Figure 1. Androgen receptor activation reduces the migration activity in HUVECs. The cell migration was examined using wound healing assay at 9 h after R1881 treatment. **R1881 (0.05-5.0 nM) concentration-dependently reduced HUVECs migration.** Top panel: representative photographs of wound healing migration assay. Bottom panel: quantified results expressed by fold of control. Values represent the means $\pm$ s.e.mean. (n = 3). * $p < 0.05$ different from DMSO-treated group. HUVECs, human umbilical venous endothelial cells.

**Figure Legend的Title一般
是描述實驗的發現**

**Figure Legends後可以開始
寫 Materials and Methods**

此部分的内容要提供實驗的方法及所採用的物質讓其他研究者可以重複你的實驗的**再現性**

Material and Methods的內容

- 材料的來源 〈廠商〉
- 實驗的過程
- 統計的方法

**Materials and methods後
可以開始寫 Introduction**

Introduction

前言

Introduction 重點在幫助讀者對該領域一些基本認識

Introduction的內容

- 研究的緣由(該領域所關切的問題)
- 本研究主題過去已知的發現
- 欲解決的問題
- 要證實的假說
- 簡述此研究的重要發現

Cardiovascular disease, the principal cause of death in the developed world, affects men far more frequently than premenopausal women of the same age. Because the incidence of cardiovascular disease in postmenopausal women gradually approaches that in age-matched men (1), estrogen or progestins appear to have a protective effect in premenopausal women. A large, 10-year prospective study supports a cardioprotective effect for estrogens by showing that postmenopausal estrogen replacement therapy reduces both the incidence of coronary heart disease and mortality from cardiovascular disease (2). **As for progestins, however, there has been little information about a cardioprotective effect until the recent report by Grodstein et al. (3), showing that the risk of coronary heart disease is significantly lower in women who take estrogens and progestins together rather than estrogens alone. Again, however, there has been little evidence of an independent effect of progestins in animal studies, other than an acute effect on vascular tone (4, 5).**

We show in this study that progesterone, the nature hormone, has a direct and specific inhibitory effect on the proliferation of subcultured arterial smooth muscle cells.... Arterial smooth muscle cells contain abundant progesterone receptor that may mediate this inhibitory effect, and **inhibition occurs at a range of progesterone concentrations (5-500 nM) that overlaps the physiologic range of plasma progesterone concentrations in premenopausal women.** We also show that levels of cyclin A and E mRNA decline in the presence of progesterone in rat aortic cell smooth muscle cells, **which suggests that progesterone interrupts the cell cycle at the G₁/S transition.**

**Introduction後可以開始寫
Discussion**

Discussion

Discussion的內容

- 陳述此研究發現的重要性
- 討論與先前研究的比較
- 解釋結果
- 結論
- 賦予意義

**Interestingly, our data suggest that the SOC channel is involved in the Ca^{2+} increase triggered by GPR40 activation in neonatal cardiomyocytes. However, Shapiro et al. reported that the SOC channel is not involved in the Ca^{2+} increase triggered by GPR40 in INS-1E cells (Shapiro et al., 2005).
(different results need to be discussed)**

Studies of Takata et al. (11) who used an antibody against amino acids 564-575 of rabbit SGLT1 indicated that SGLT1 is expressed in S1, S2, and S3 segments. The antibody, however, was raised against a peptide corresponding to a region of SGLT1 (residues 564-575) which is conserved among SGLT1-related sequences, suggesting that it might have reacted with other transporters of the SGLT1-family.

Discussion section 避免

重複陳述實驗結果

如何下結論

- 要強調其原創性
- 要表達其興奮性
- 要顯現其重要性
- 切勿要言過其實
- 結論要使用假設語氣

**Conclusions往往是要回應
本研究的Hypothesis**

文章的結語

告訴讀者文章的賣點

對於研究發現要說明其學術
或實用價值

Although animal studies of magnolol-mediated anti-tumoral action are still ongoing, the findings from the present in vitro and in vivo studies in magnolol anti-cancer effect suggest the potential applications of magnolol in the treatment of human cancer.

Abstract可在最後才寫

**Abstract 像整篇論文的縮小版，
它包含以下幾個重點：**

(1) Objectives

(2) Methods

(3) Results

(4) Conclusions (significance of the results)

好的摘要能讓讀者很快地了解到此文章的重點，而決定是否進一步去讀整篇文章

Acknowledgement

Content in Acknowledgement

- 研究經費的支援
- 對此研究有幫助者

Author contributions

- **conceived the experiments**
- **performed experiments**
- **analyzed the results**
- **wrote the paper**

Acknowledgement

vs.

Authorship

References

References

- 格式要依規定且要一致
- 引用文獻要得當
 - 要最新的
 - 要可信度高的
 - 要廣為接受的

科學性故事除了邏輯性
要強外，還要會鋪陳

剽竊/抄襲

(Plagiarism)

Citation vs. Quotation

Pre-menopausal women have a much lower mortality from atherosclerotic cardiovascular disease than men.

“Pre-menopausal women have a much lower mortality from atherosclerotic cardiovascular disease than men.”
(Lee et al., ...)

The mortality from atherosclerotic cardiovascular disease in pre-menopausal women is much lower than men. (Lee et al., ...)

練習是唯一的途徑