

教師與 TA 教學工作坊

超強的 PowerPoint 投影片編輯技巧



以教育彩繪台灣的未來

教學發展中心 主任
莊榮輝



莊榮輝
↓
投影片

- 1 以 PowerPoint 展示你的演講 – 原則
- 2 注意使用字型
- 3 圖形基本格式與變化
- 4 流程圖設計原則
- 5 以動畫模擬實驗之進行
- 6 PowerPoint 加值妙用
- 7 準備演講及臨場表現
- 8 使用 PowerPoint 心得總結

- 說明文字
- 步驟流程
- 成果摘要
- 向量圖形
- 點陣圖形
- 掃描圖片



▼ 安排劇本及故事流程

把報告的內容寫成劇本

▼ 設計每一張投影片內容

簡潔、明白、正確 (轉譯)

▼ 反覆練習預演

至少預演五次以上

▼ 臨場努力發揮

誠懇地說明、實在地回答
(注意聽眾組成與需求)

知識要經過轉譯才能變成教學

LETTERS

Long-term potentiation depends on release of D-serine from astrocytes

Christian Henneberger¹, Thomas Papouin¹, Stéphane H. R. Oliet^{1,2} & Dmitri A. Rusakov¹

Long-term potentiation (LTP) of synaptic transmission provides an experimental model for studying mechanisms of memory. The classical form of LTP relies on N-methyl-D-aspartate receptors (NMDARs), and it has been shown that astrocytes can regulate their activation through Ca²⁺-dependent release of the NMDAR co-agonist D-serine¹. Release of D-serine from glia enables LTP in cultured astrocytes and explains a correlation between glial coverage of synapses and LTP in the hippocampus. However, because intracellular Ca²⁺ concentration in astrocytes can also release other signalling molecules, most prominently glutamate^{2,3}, ATP⁴ and tumour necrosis factor- α ^{5,6}, whereas astrocytes themselves can synthesize and supply D-serine⁷, Furthermore, loading an astrocyte with exogenous Ca²⁺ buffers does not suppress LTP in hippocampal area CA1 (refs 14–16), and the physiological relevance of experiments in cultured or strong exogenous stimuli applied to astrocytes has been questioned^{8–10}. The involvement of glia in LTP therefore remains controversial. Here we show that clamping internal Ca²⁺ in individual CA1 astrocytes blocks LTP induction in nearby synapses by decreasing the occupancy of the NMDAR on agonist sites. This LTP blockade can be reversed by co-agents to serine or glycine, whereas depletion of D-serine or disruption of exocytosis in an individual astrocyte blocks local LTP. We therefore demonstrate that Ca²⁺-dependent release of D-serine from astrocytes controls NMDAR-dependent plasticity in many thousands of excitatory synapses nearby.

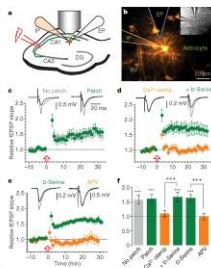


Figure 1 | Clamping astrocytic Ca²⁺ blocks LTP at nearby synapses in a synapse-dependent manner. **a**, Experimental arrangement. EP, extracellular patch pipette; EP, extracellular patch pipette; EP, extracellular patch pipette.

NATURE | Vol 463 | 14 January 2010

LETTERS

Stimulating, clamping the intra-astrocyte Ca²⁺ concentration completely suppressed LTP at nearby synapses, and the addition of D-serine

收集 → 消化 → 摘要 → 呈現

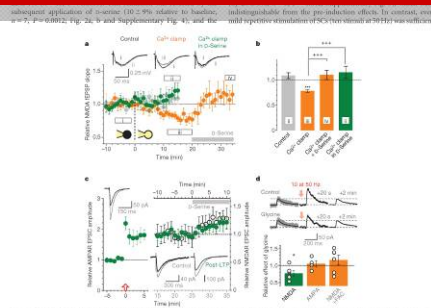


Figure 2 | D-serine release from astrocytes is required for LTP induction. **a**, Experimental arrangement. EP, extracellular patch pipette; EP, extracellular patch pipette; EP, extracellular patch pipette.

presence of D-serine from the start blocked the inhibitory effect of Ca²⁺ clamp 18–12% ($n = 7$; Fig. 2a, b, c). Ca²⁺-dependent astrocyte

LETTERS

to boost the on-agonist occupancy transiently short-term potentiation of the NMDAR-evoked EPSC component 20 s after the train

and did not involve changes in release probability (Supplementary Fig. 10). To explore the tightly 20% decrease of NMDAR responses under astrocytic Ca²⁺ clamp (Fig. 2a, b), we used the selective NMDAR glycine-site blocker 5,7-dichlorokynurenic acid (DCKA) at 750 nM (Fig. 3a and Supplementary Fig. 6). Notably, 750 nM DCKA abolished LTP, similarly to 50 μ M K⁺ (Fig. 3a). Consistent with these observations and with the Ca²⁺ clamp effects, FAC also decreased NMDAR EPSPs by 23.2 \pm 4% ($n = 6$, $P = 0.0007$; Supplementary Fig. 8a, b) and blocked LTP in a D-serine-sensitive manner (Fig. 3b, c). Although the mechanisms and specificity of FAC actions are incompletely understood, we confirmed that the effect of FAC on NMDAR EPSPs paralleled that on LTP (Supplementary Fig. 8c, d), was absent in the presence of glycine,

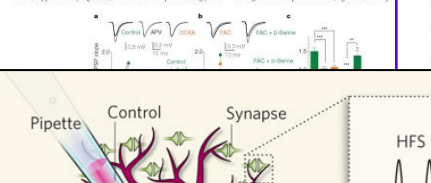


Figure 3 | D-serine release from astrocytes is required for LTP induction. **a**, Experimental arrangement. EP, extracellular patch pipette; EP, extracellular patch pipette; EP, extracellular patch pipette.

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NEWS & VIEWS

NEUROSCIENCE

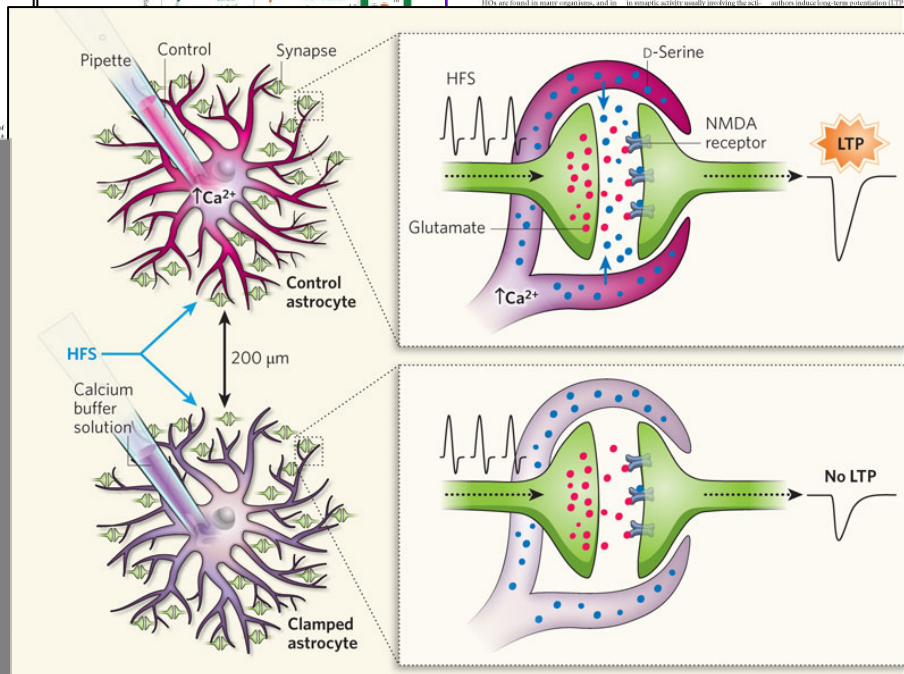
Astrocytes as aide-mémoires

Mirko Santello and Andrea Volterra

Memory formation is known to occur at the level of synaptic contacts between neurons. It therefore comes as a surprise that another type of brain cell, the astrocyte, is also involved in establishing memory.

Memory is the result of long-lasting changes in synaptic activity usually involving the activation of NMDA receptors (NMDARs) — a special class of receptor for the excitatory neurotransmitter glutamate. Memory formation has always been thought to depend on events occurring exclusively in neurons. But the brain possesses another cell population, glial cells, which include the highly ramified, star-shaped astrocytes. Despite their abundance — they make up 90% of all human brain cells — astrocytes have been relatively overlooked in the search for mechanisms of memory formation because they lack electrical excitability and do not communicate like neurons do. But astrocytes are

the first direct evidence for this proposal. The authors induce long-term potentiation (LTP) of excitatory synapses in the hippocampus using a high-frequency-stimulation protocol, which involves applying repetitive electrical stimuli to the presynaptic fibres. LTP is the sustained increase in synaptic strength associated with memory formation, and the authors monitored this synaptic potentiation locally, in domains roughly corresponding to the territories of individual astrocytes. They did this by recording the electrical signal generated by the ensemble of synapses in the territory, using an extracellular electrode or, alternatively, directly through the astrocyte.



NATURE | Vol 463 | 14 January 2010

of NO synthases contain a haem bound to a cysteine amino acid (the base, B, in Fig. 1b). But their activity is confined to the amino acid L-arginine, which it converts to NO — a signalling molecule vital to the nervous, immune and cardiovascular systems. The chemistry involves two sequential oxidations, each requiring oxygen, protons and NADPH. Each step proceeds via oxy, and follows on to either peroxo², hydroperoxo or cpd I intermediates.

In some enzymes, such as haem oxygenases (HOs), ferric hydroperoxide is the oxidizing species¹⁴, and the substrate is the haem itself. HOs are found in many organisms, and in mammals the oxidation products are biologically vital: biliverdin, which acts as an antioxidant; liberated iron(II) ions, which are recycled for use elsewhere (primarily in haems); and carbon monoxide, which is used as a neurotransmitter. Reactions mediated by the enzyme cytochrome c oxidase, a member of the haem-copper oxidase (HCO) superfamily, probably also proceed through a ferric hydroperoxo complex, which then undergoes O–O cleavage and formation of cpd II (ref. 15). HCOs facilitate proton pumping across mitochondrial membranes, which generates a proton

astrocytes suppressed LTP at nearby synapses more than at synapses near the neighbouring control cell (Fig. 4d, e and Supplementary Fig. 12). This astrocyte-specific effect was abolished by the selective inhibition of exocytosis of D-serine¹⁶ in the test astrocyte was suppressed by the high buffer solution (HBS) (Fig. 4d, e and Supplementary Fig. 12). In complementary experiments, we varied the distance between the extracellular recording electrode and the patched astrocyte. In the control astrocyte, LTP rapidly recovered at 70–100 μ m from the patched source, resulting in full strength at approximately 200 μ m, which is consistent with the diffusion of D-serine to neighbouring cells (Fig. 4b, c and Supplementary Fig. 13). With a L-Cl[−] loaded HBS, LTP recovery occurred at much shorter distances (Fig. 4b, c), which is consistent with the ability of L-serine to cross gap junctions.

Our findings demonstrate that induction of NMDAR-dependent LTP in the hippocampus depends on the availability of NMDARs provided by D-serine. The release of D-serine from astrocytes is a Ca²⁺-dependent process, and it is sensitive to astrocytic free Ca²⁺ concentration. Neighbouring astrocytes may exert distinct effects on local synapses, but they also extend their influence beyond their morphological boundaries. This could potentially give rise to a diffuse mechanism regulating long-term synaptic NMDAR-dependent plasticity across a neuronal domain affected by

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Nature: News & Views Science: Perspectives Scientific American

NATURE | Vol 463 | 14 January 2010

NEWS & VIEWS

of one oxygen atom — derived from the oxygen from cpd II — to a biological substrate. Cytochrome c oxidase uses various heme b_L hemes, heme b_H hemes, and heme b_L hemes, which are involved in the transfer of electrons from the oxygen atom to the oxygen atom. This involves three sequential oxidations, each requiring oxygen and NADPH (a naturally occurring reducing agent). The first two oxidations are thought to be coupled to proton pumping¹⁴. Because astrocytic activity and neuronal levels are elevated in most brain tumors, the enzymes are potential drug targets.

Microscopy (NMR) spectroscopy¹⁵ provides interesting examples of how atoms can adapt to different environments. In the case of the active site of HO, the active site of the enzyme is a heme b_L heme, which is a heme b_L heme. But their activity is confined to the amino acid L-arginine, which it converts to NO — a signalling molecule vital to the nervous, immune and cardiovascular systems. The chemistry involves two sequential oxidations, each requiring oxygen, protons and NADPH. Each step proceeds via oxy, and follows on to either peroxo², hydroperoxo or cpd I intermediates.

In some enzymes, such as haem oxygenases (HOs), ferric hydroperoxide is the oxidizing species¹⁴, and the substrate is the haem itself. HOs are found in many organisms, and in mammals the oxidation products are biologically vital: biliverdin, which acts as an antioxidant; liberated iron(II) ions, which are recycled for use elsewhere (primarily in haems); and carbon monoxide, which is used as a neurotransmitter. Reactions mediated by the enzyme cytochrome c oxidase, a member of the haem-copper oxidase (HCO) superfamily, probably also proceed through a ferric hydroperoxo complex, which then undergoes O–O cleavage and formation of cpd II (ref. 15). HCOs facilitate proton pumping across mitochondrial membranes, which generates a proton

NEUROSCIENCE Astrocytes as aide-mémoires

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work, covers an important message — the contribution of glial cells to synaptic functions cannot be overlooked, and our study of synaptic plasticity will need to consider glial biology if scientists hope to achieve a comprehensive understanding of brain function.

投影片的製作原則：簡潔、明白、正確

Juang RH (2012)

- (1) 使用純色簡單背景，不要附加任何無意義圖案。**
- (2) 每張投影片都有清楚主題，可標在上緣或下緣。**
- (3) 無論中英文打字習慣，務必依照正式打字規則。**
- (4) 注意文字的適當安排，如字距、行距、字型等。**
- (5) 文字不得出現拼字或打字錯誤，注意標點符號。**
- (6) 整個版面不要太過複雜，反之也不要過分貧乏。**
- (7) 安排整個版面的平衡與美感，以及色彩之協調。**
- (8) 適當使用動畫，可提升報告的層次感與故事性。**
- (9) 使用照片、漫畫、圖表提升聽眾的理解與興趣。**
- (10) 多利用流程圖來說明事件，或表達複雜的概念。**

等幅字型

中黑體

粗圓體

Arial

PowerPoint 的確是一個良好的報告工具，很容易學會，功能相當多樣而且強大；每個人都應該學會，而且好好應用在自己的研究進度、成果報告、論文口試上，以後還極可能應用在你的事業。下圖左側說明一張用 PowerPoint 所做出的投影片，可容納何種物件，右側列出製作投影片報告的四個主要步驟；這些要點將一一說明。

正直字型

細明體

超明體

Time New Roman

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弧度字型

標楷體

魏碑體

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中英文之間請空半格

Heavy metals are toxic to most living organisms and cause health problems by contaminating agricultural products. In plant, phytochelatin synthase (PCS) uses glutathione (GSH) as its substrate to catalyze the synthesis of heavy metal-binding peptides, known as phytochelatins (PC). PCS has been described as a constitutive enzyme that may be controlled by post-translational modifications. However, the detailed mechanism of its catalytic activity is not clear. In this study, *in vitro* experiments demonstrate that PCS activity increased following phosphorylation by casein kinase 2 (CK2), and decreases following treatment with alkaline phosphatase.

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PCS 含有 485 個胺基酸，分子有兩個 domains (N-domain 及 C-domain)，其中 N-domain 為催化區所在，而 C-domain 有很多 Cys-Cy 或 Cys-X-Cys 序列，可能可與鎘結合 (圖三上)。藍綠藻也表現有 PCS，比較有趣的是這種 PCS (NsPCS) 只有 N-domain 部份，因此分子量大約只有一般 PCS 的一半 (Tsuji et al., 2004)。NsPCS 雖然也會合成 PC，但其效率非常差，反而只會進行上述的 acylation 半反應，去除 GSH 的 Gly 後生成 γ -Glu-Cys (γ EC)。NsPCS 因為分子較小，因此已經被解出 X-ray 結構 (Vivares et al., 2005)，證實具有 Cys-His-Asp 催化 triad，也看到了 γ EC 的結合位置 (圖三下 B)。雖然如此，整個催化機制仍然不清楚，尤其是第二個 GSH 如何進入活性區，更眾說紛紜。甚至有人認為第二個 GSH 先結合到 C-domain 上，然後再與 γ EC 連結。這就開闢了我們探索 PCS 的切入點。

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大家都知道英文單字之間要空格

因此中文與英文之間也要空半格

打字規則建議

Juang RH (2012)

This is an example~~x~~, we should type correctly~~x~~.

Avoid using Chinese font in English.

5mL 2M 100~~x~~% 3 7~~x~~°C

玉米 (~~x~~Zea mays~~x~~) 是重要作物

如何分辨DNA與RNA?

細節會影響整體觀感

This is an example, we should type correctly.

Avoid using Chinese font in English

5 mL 2 M 100% 37°C α β γ

玉米 (*Zea mays*) 是重要作物

如何分辨 DNA 與 RNA? → 如何分辨 DNA 與 RNA?

標點符號
適當空格

英文字句不要
使用中文字型

數字與單位之
間要注意空格

這些都是
細明體英文

有些要空格
有些不能空
(%, °C)

括號外側要空半格
括號內側不能空格

小括號請用
英文字型

勿用全
形數字

希臘字母
用 symbol

中英文混用時
中英間要空格

注意斜體

Time New
Roman

Chymotrypsin 的活性區

Catalytic triad: Asp 102 ← His 57 ← Ser 195 *charge relay*

(1) 環境 pH 對酵素活性有極大影響 → 活性區的 胺基酸 受影響：

His 57 ($pK_a = 6$): 當環境 $pH > 6$, imidazole 失去 H^+ (charged)

Ile 16 (new N-terminal): 當環境 $pH > 9$, NH_3^+ 失去 H^+ (不帶電)

Ser 195: DIFP 可與 Ser-OH 反應 → 失去活性

(2) 催化機制：兩個步驟

▼ Acylation: 切開後 N-peptide 共價結合在酵素上 (Ser 195)

▼ Deacylation: 加水分解後釋出 N-peptide (slow step)

Nitrophenyl acetate (作用很慢的基質類似物)

(3) 穩定過渡狀態：

-C-O⁻ 可與 Gly 193 與 Ser 195 的 -N-H 產生氫鍵而穩定之

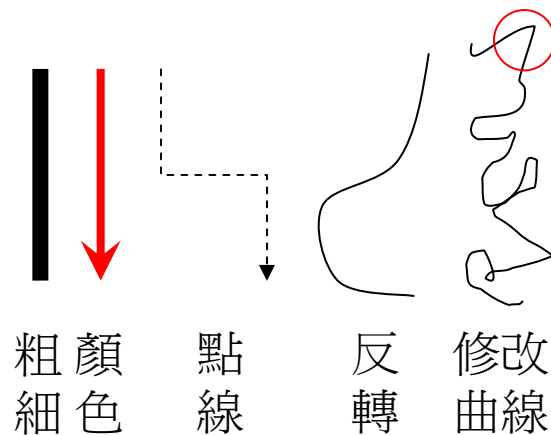
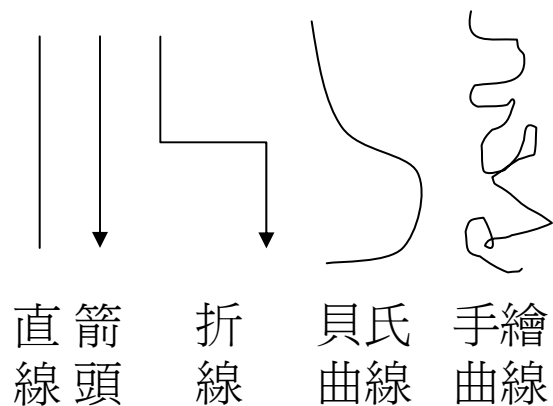
(4) 專一性結合區：活性區附近有 non-polar pocket 辨識基質

基本向量圖

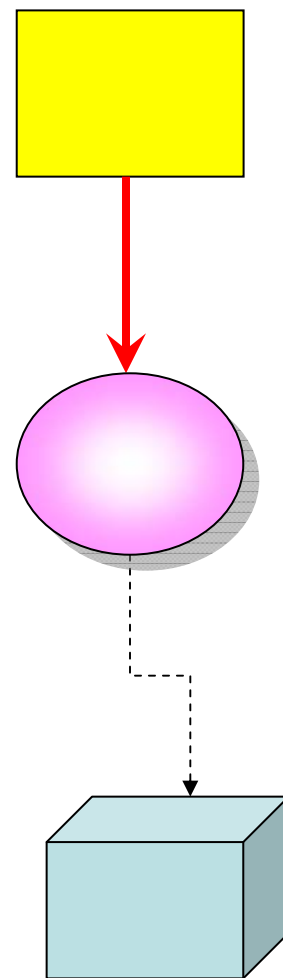
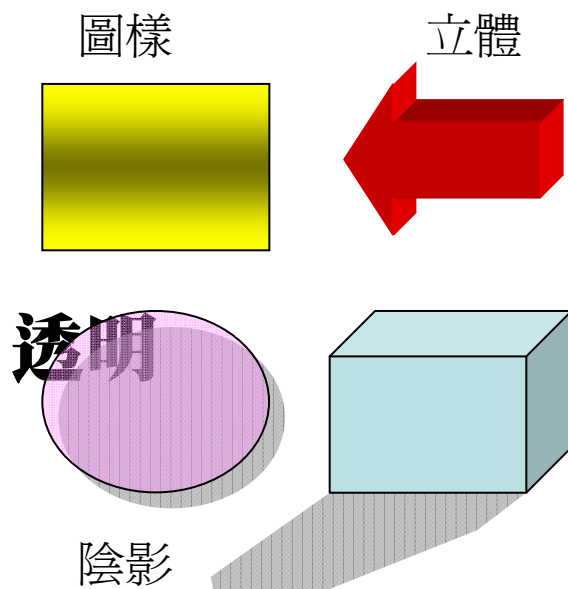
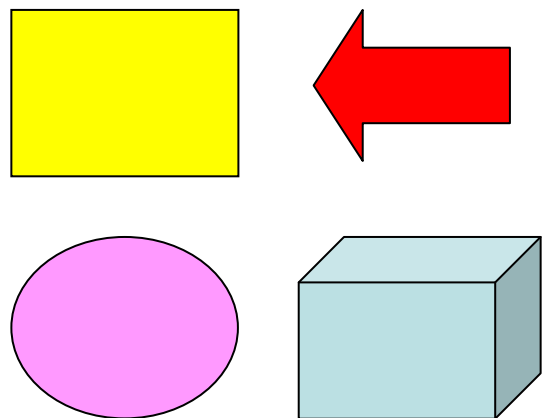
修飾

組合

線條



形狀

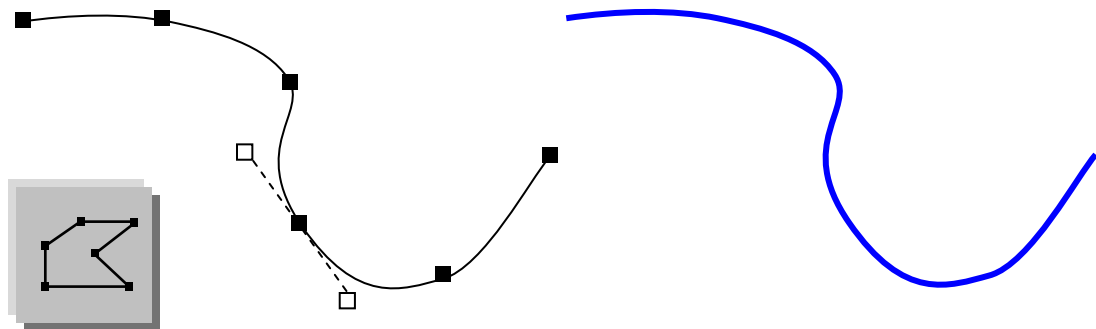
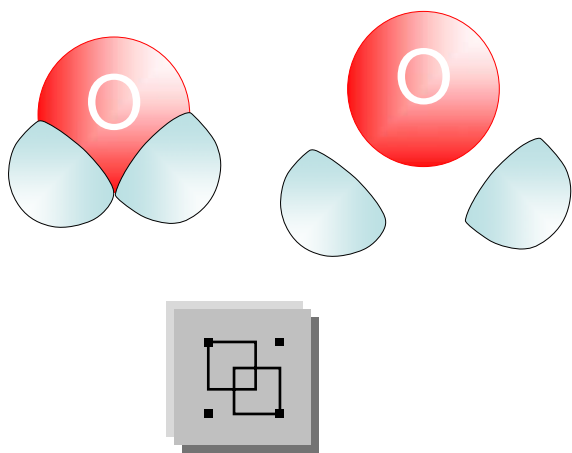


組合若干圖形會出現新的意義

3.1 向量圖的應用比想像還廣大

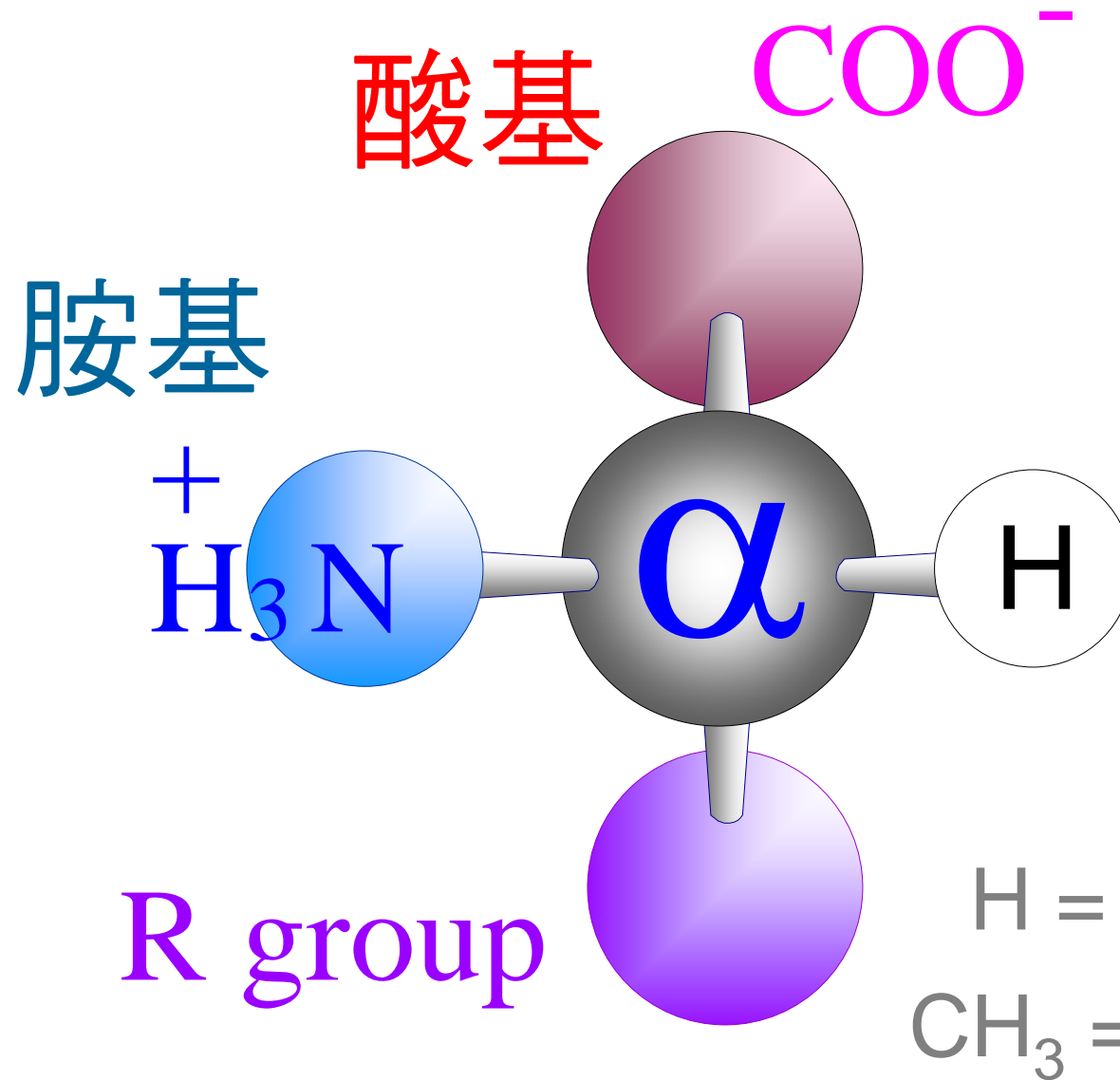
Juang RH (2012)

- (1) 複雜圖形都可由數個基本圖案組成。
- (2) 善用『**群組**』功能管理圖形之層次。
- (3) 利用『**編輯端點**』可做出各種形狀。
- (4) 特殊形狀先大致畫出輪廓後再修改。
- (5) 移動物件若同時按 **Alt** 可隨意遊走。



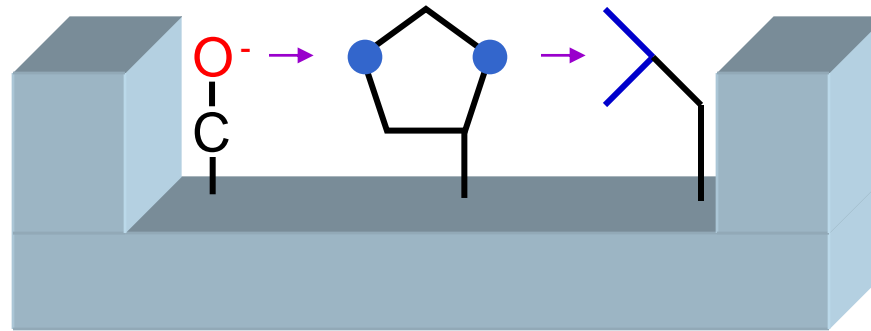
↑ 可先把這個 icon 放到繪圖工具列

L-Form Amino Acid



組合若干圖形會出現新的意義

不同酵素可能採取類似的催化機制



←有用的組合

Hi, Everybody!

↙有趣的組合



Sesame Triad

3.2 把點陣圖變得更清晰亮麗

Juang RH (2012)

- (1) 把照片、掃描圖放在同一個檔案夾。
- (2) 在視窗工具列顯示常用的繪圖按鈕。
- (3) 先把點陣圖貼到投影片的大概位置。
- (4) 修飾每張圖片：對比、亮度、裁剪。
- (5) 圖片儘量放大，**切勿改變長寬比例**。
- (6) 再把各點陣圖排好，注意版面平衡。
- (7) 在『設定圖片格式』可壓縮點陣圖。

再糟糕的照片都可用專業軟體整修為堪用品。

Microsoft PowerPoint [wksp powerpoint 3.ppt]

檔案(F) 編輯(E) 檢視(V) 插入(I) 格式(O) 工具(T) 投影片放映(D) 視窗(W) 說明(H) Adobe PDF(B)

輸入需要解答的問題

新細明體 18

點陣圖可以變得更亮麗

- (1) 把照片、掃描圖等收集放在檔案夾。
- (2) 在 PowerPoint 顯示重要修飾按鈕。
- (3) 把點陣圖貼到投影片的大概位置上。
- (4) 調整對比、亮度、裁切。
- (5) 再成為堪用作品。

自訂

工具列(T) 指令(C) 選項(O)

若要新增指令到工具列: 請選取一種類別, 然後將指令從這個對話方塊中拖到工具列上。

類別(G): 檔案 編輯 檢視 插入 格式 工具 投影片放映 表格 視窗及說明 繪圖 快速圖案

指令(I): 色彩 提高對比 降低對比 提高亮度 降低亮度 裁切

修改選取範圍(M) 重新整理指令(R)...

關閉

16

繪圖(R) 快取圖案(U) 繪圖工具列

預設簡報設計 中文(台灣)

原圖



對比 ↑



明亮 ↓



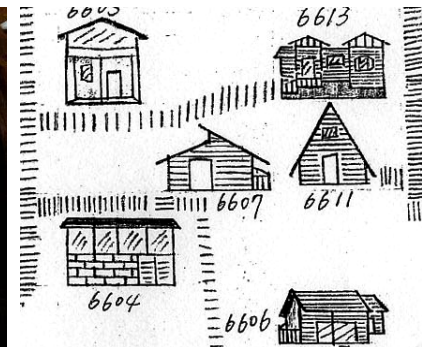
對比 ↑
明亮 ↓



2008 整體滿意度 (Final evaluations = 4.6)

專題與論壇

Over one hundred participants



some feedbacks...

原本以為三天兩夜應該是浪費時間之旅，但結果發現確實大部分內容都非常有用。

... 認識學院夥伴建議時間可以延長 ... 創始個人研究室時的困難與需求 ...

... 可安排新進教師與已進入台大 2~3 年面臨評估及升等之助理教授 ...

3.3 由點陣圖轉繪向量圖

Juang RH (2012)

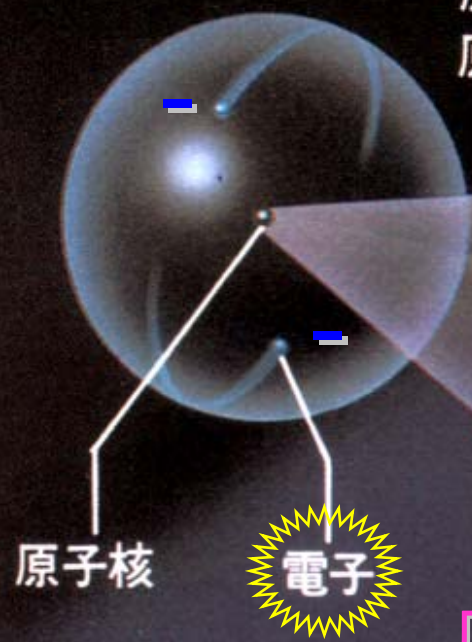
- (1) 把所要的點陣圖掃描下來存為 jpg 。**
- (2) 貼到所編輯 PowerPoint 投影片上 。**
- (3) 依照點陣圖之圖形外框畫出向量圖 。**
- (4) 完成向量圖後把原來的點陣圖去掉 。**
- (5) 所得各向量圖物件可個別指定動畫 。**

不需美術根基就可以畫出像樣的圖形 。

由基本粒子到原子

原子

原子是由
原子核和電子組成。



原子核

電子

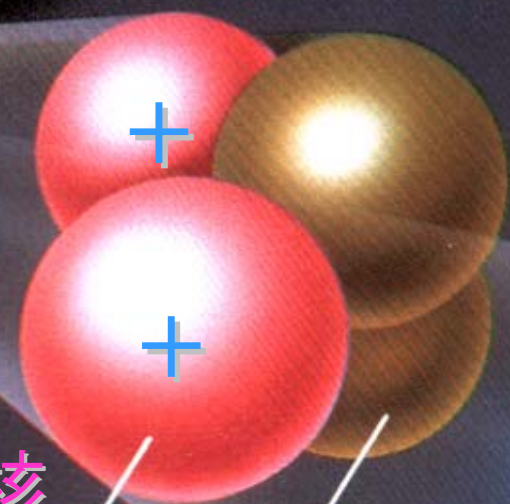
原子核是由
質子和中子構成。

基本粒子

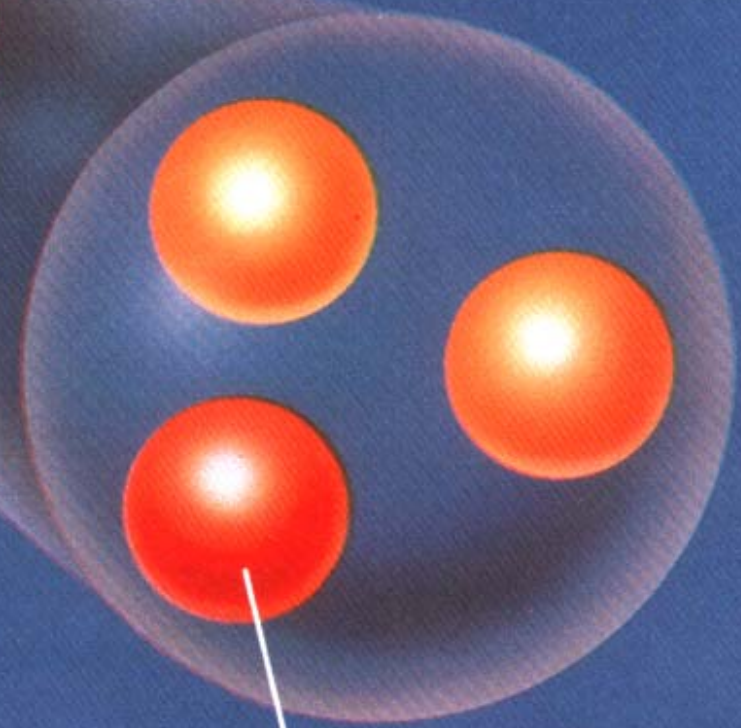
原子核

質子

中子



質子和中子
分別由三個夸克形成。

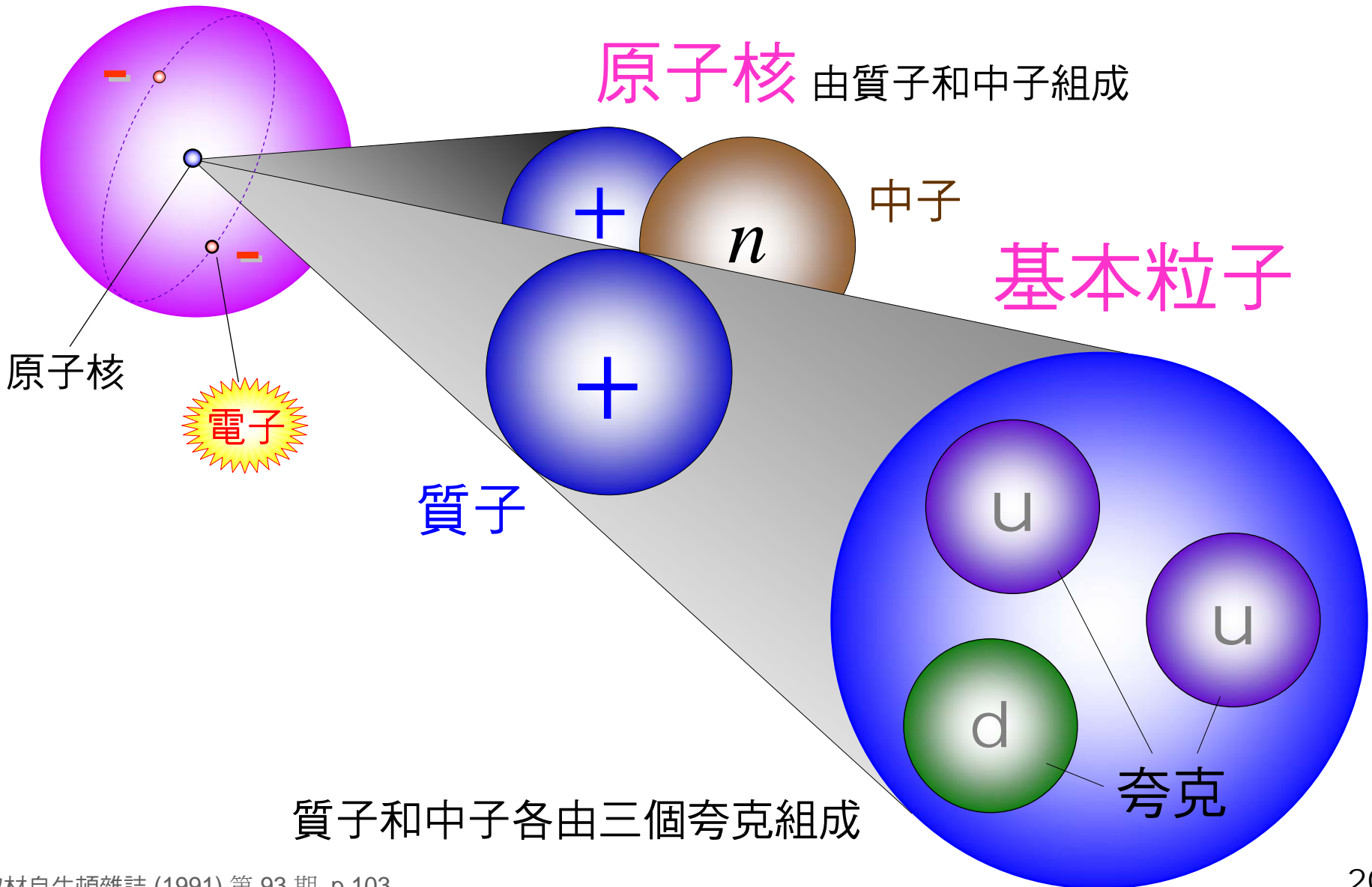


夸克

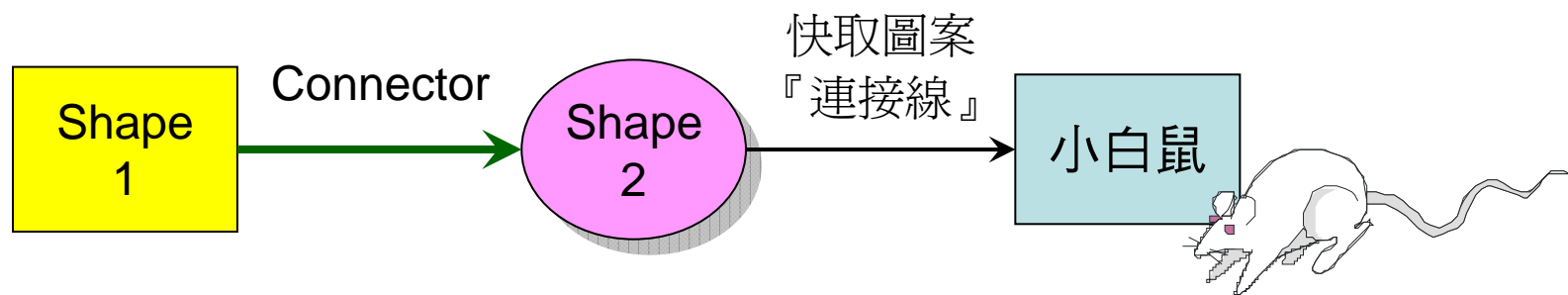
由基本粒子到原子

Juang RH (2012)

原子 由原子核與電子組成

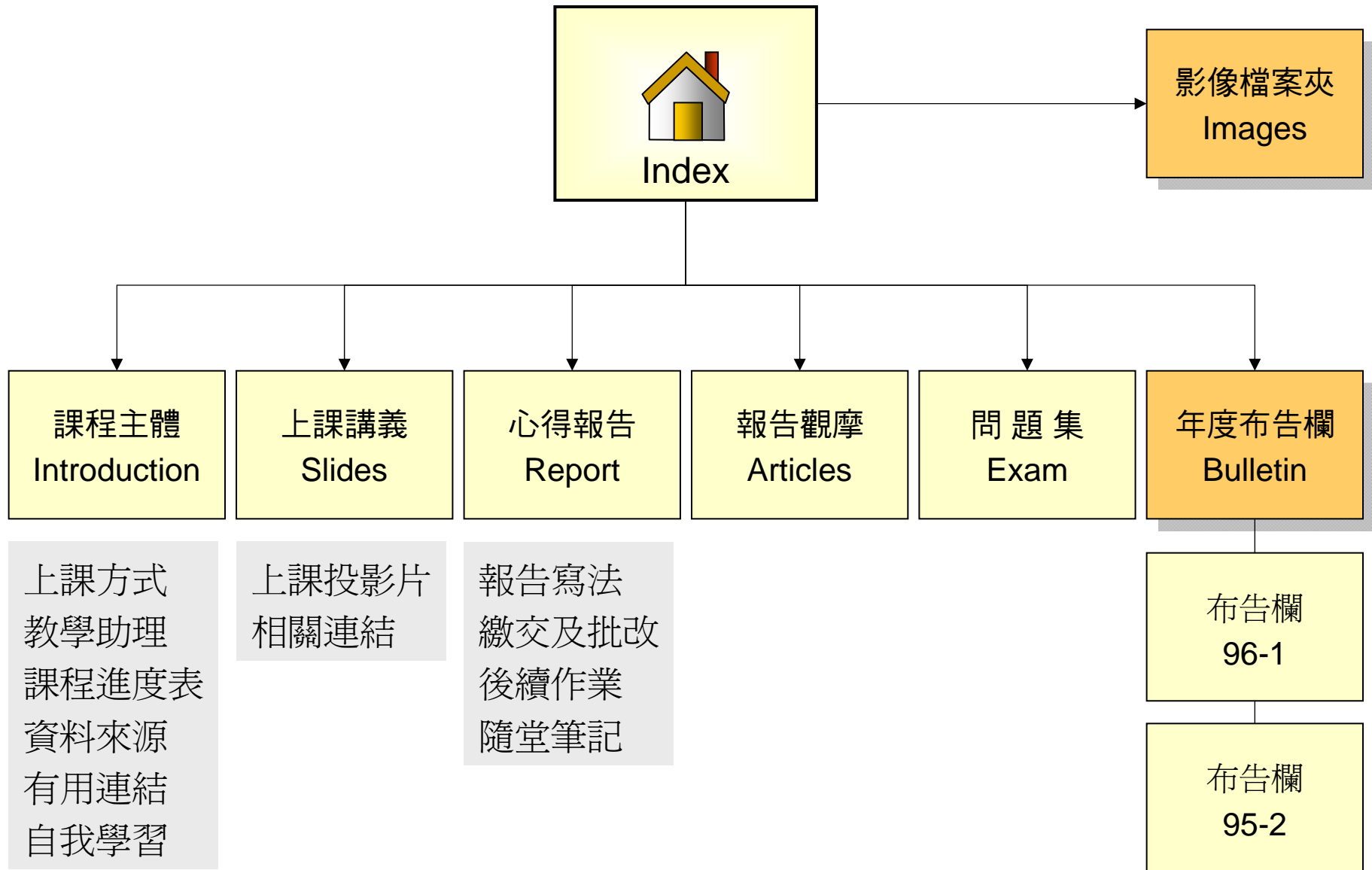


- (1) 把複雜的觀念或程序轉成流程圖。
- (2) 先在白紙大致擬出整個流程草圖。
- (3) 流程由 **shape** 與 **connector** 組合。
- (4) Shape 可使用基本圖案也可自製。
- (5) 流程以動畫播出可強化邏輯層次。



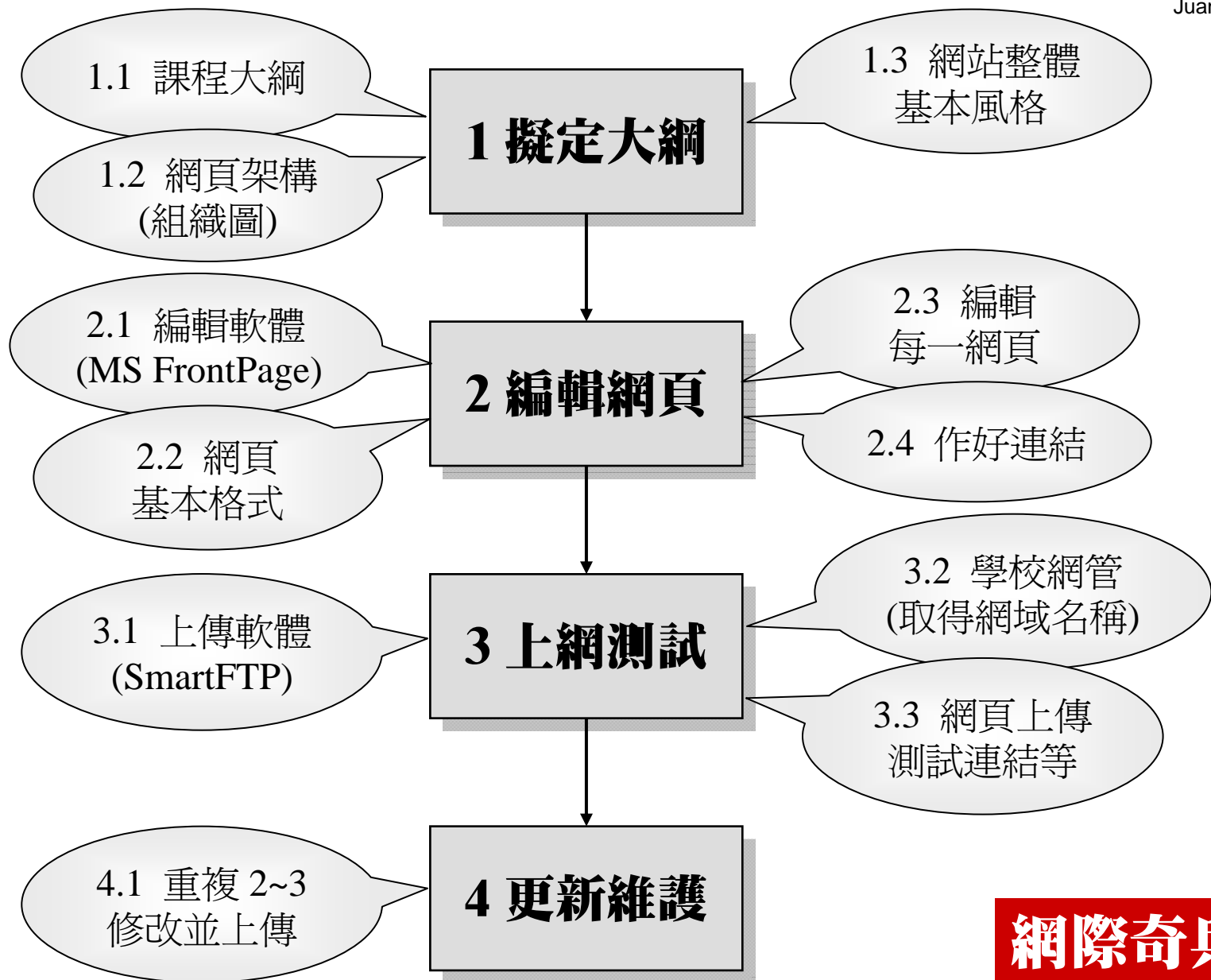
網頁架構

Juang RH (2012)



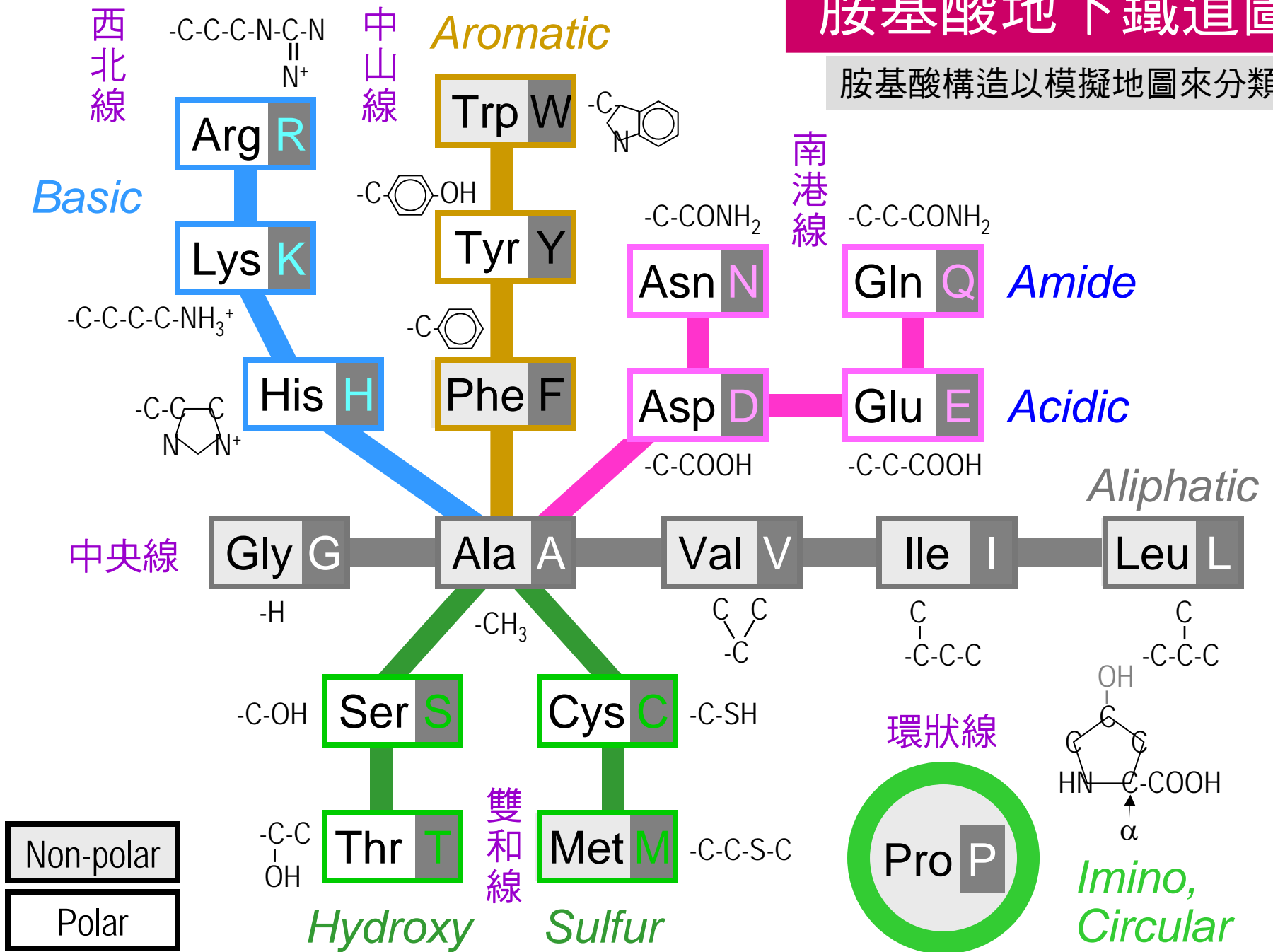
網頁製作四大階段

Juang RH (2012)

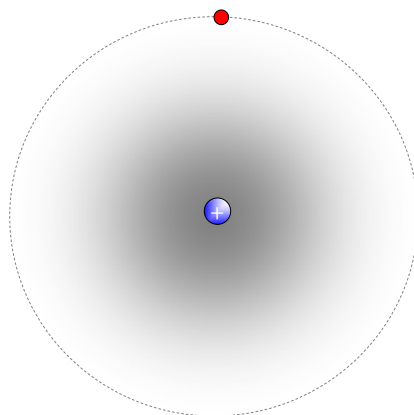
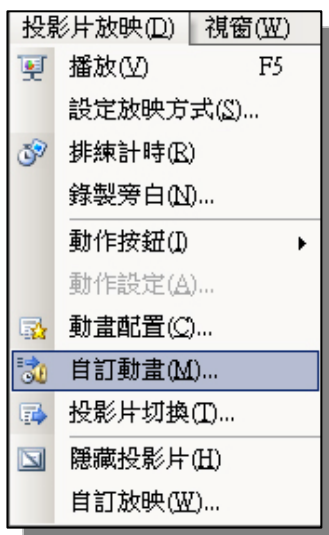


胺基酸地下鐵道圖

胺基酸構造以模擬地圖來分類

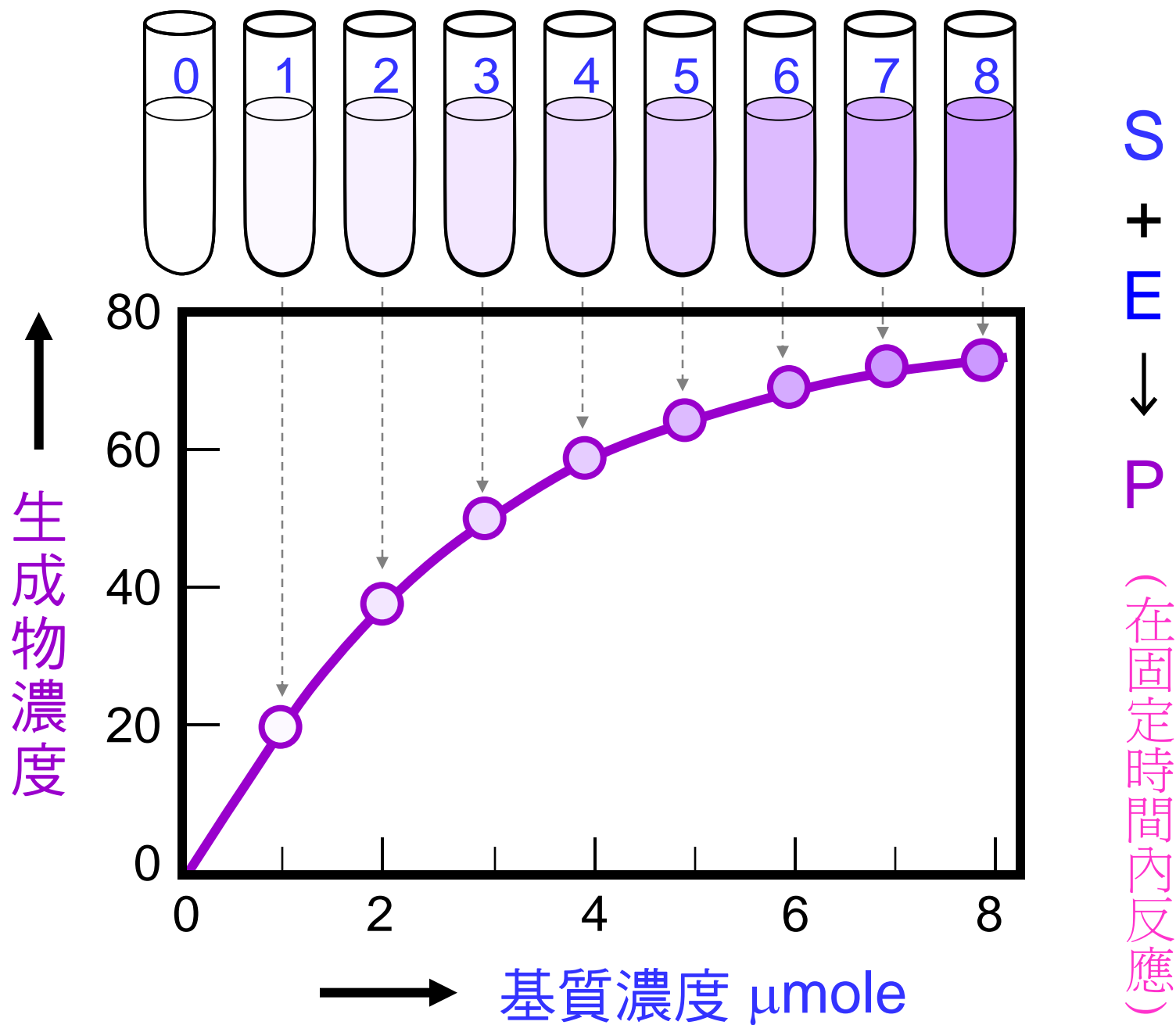


- (1) 加入動畫可說明動作之先後次序。
- (2) 很多實驗設計可以利用動畫解說。
- (3) 儀器的操作流程以動畫模擬說明。
- (4) 動畫可系統性地整理出實驗結果。
- (5) 原子軌域可用動畫顯示電子環繞。



這個氫原子由三個正圓形組成

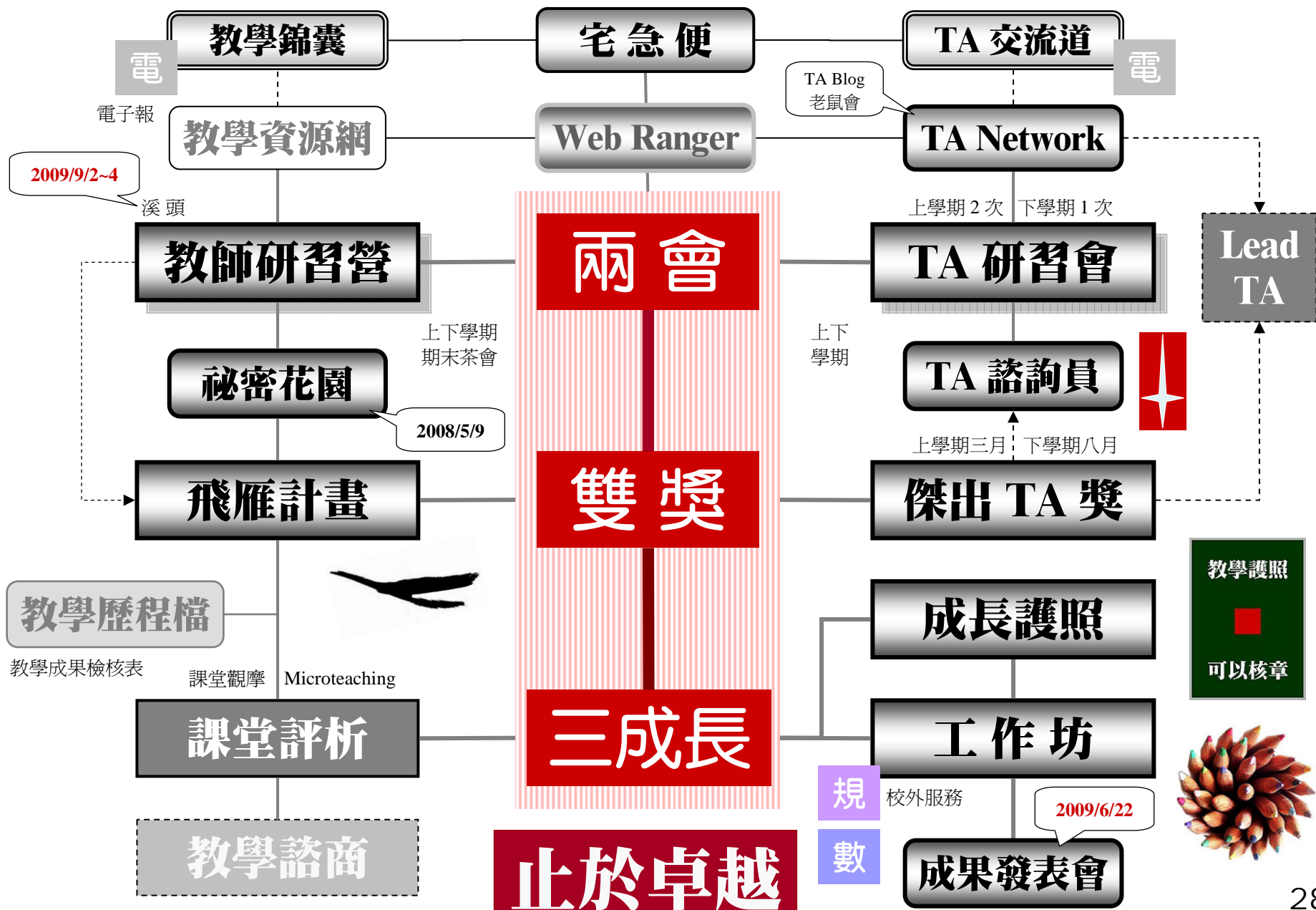
提高基質濃度增強酵素活性表現



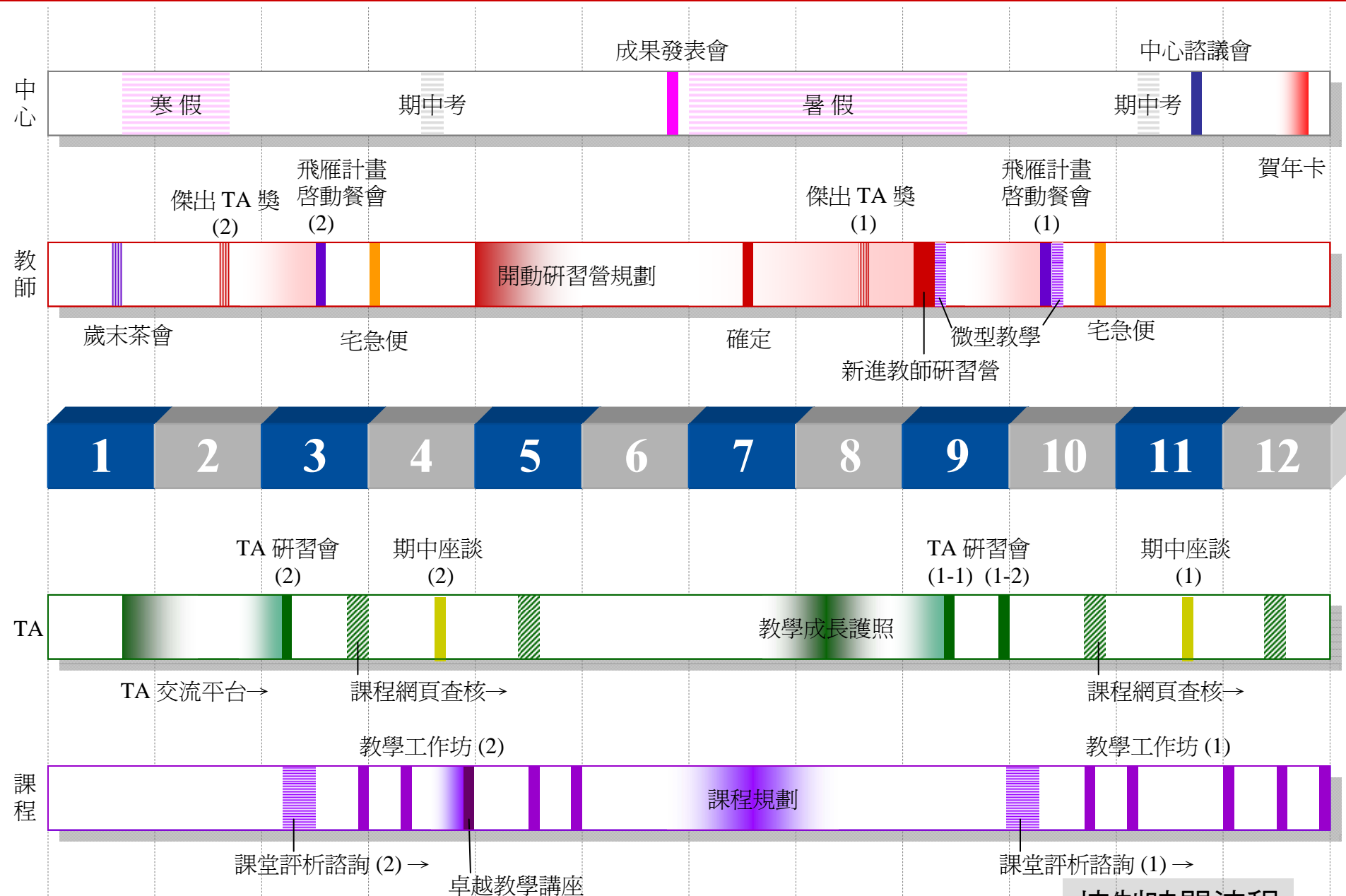
以動畫說明動力學實驗操作過程

- (1) 計畫、專案等可直接在 PowerPoint 規劃。
- (2) 設計、編排投影片過程就是一種思考磨練。
- (3) 各種成果都以 PowerPoint 格式整理出來：
 - (a) 學生實驗課以『One-Page Show』精簡報告
 - (b) 研究生實驗進度以 PowerPoint 與老師討論
- (4) 可以製作很多圖表，並方便地轉成海報：
流程圖、組織圖、甘特圖、時間表、配置圖
- (5) 每張投影片可直接轉 jpg 與網頁編輯接軌。
- (6) PowerPoint Show 可自動播放圖文與音樂。
- (7) 保留一些空白，讓學生在課堂上現場抄下。

教師發展組 工作主軸 2009



教師組年度紀事及分工



6.1 實驗成果以 PowerPoint 整理及報告

Juang RH (2012)

Tools for Proteomics

B1 洪櫻姿 黃婉婷

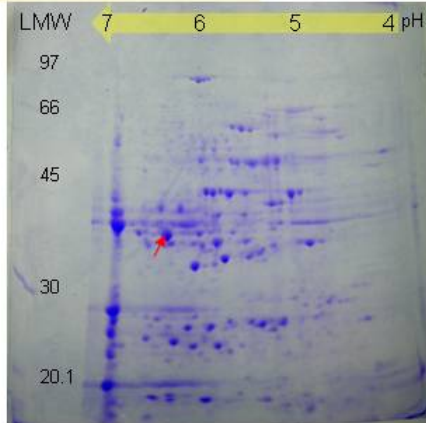
Sample: 竹筴 (50 g)

Protocol X → 2DE → CBR staining → spot picking → In-gel digestion (trypsin) → LC/MS/MS

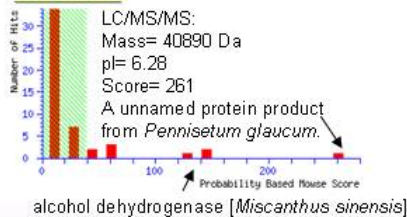
Protocol Y → 2DE → Western transfer → spot picking → Edman sequencing (N-terminal sequencing)

Protocol Z → 2DE → Western transfer → immunostaining

One-Page Show



Results



Discussion

1. 免疫染色時，皆清洗 5-6 次，為
2. Marker 不清楚，如何改進以避

X2-Gel filtration and 原態蛋白質分子量測定 D4 石少岡 毛怡文

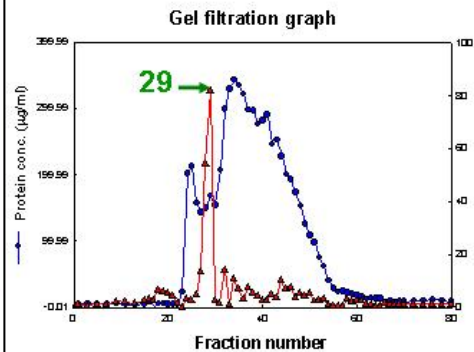


Fig. 1. GF 分割之蛋白質定量與 SP 分析

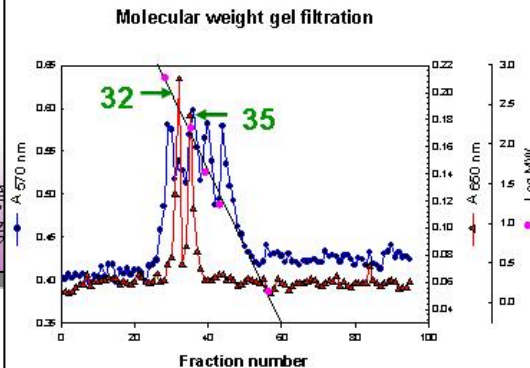


Fig. 4. 原態蛋白質分子量初步測定

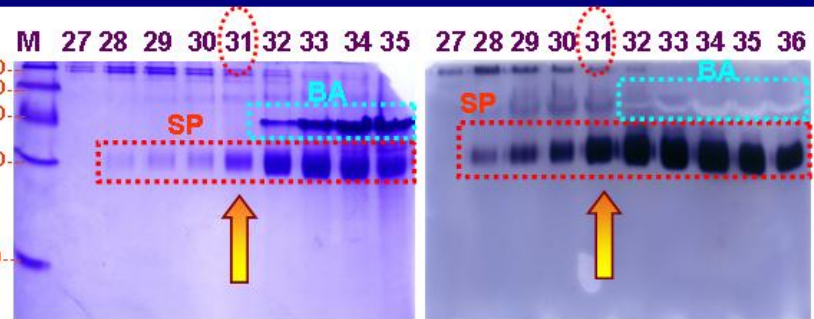


Fig. 2. GF 分割之 CBR 染色

Fig. 3. GF 分割之活性染色

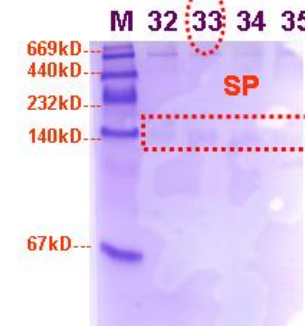


Fig. 5. 分子量測定之 CBR 染色

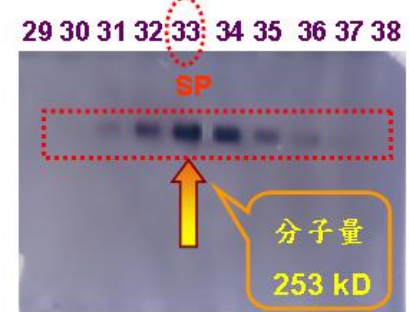


Fig. 6. 分子量測定之活性染色

結論

- ★ Gel filtration 選定第 31 管進行原態蛋白質分子量測定
- ★ 選定第 33 管，初步求得 SP 分子量為 253 kD
- ★ 原態蛋白質分子量測定出現二支峰值之可能原因

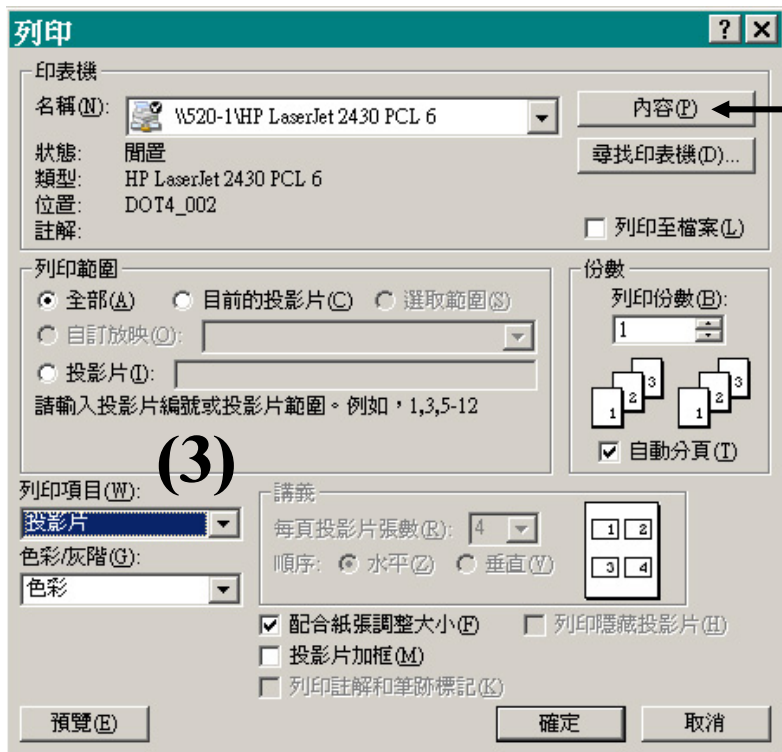
6.2 製作海報要先調大投影片 size

How?

- (1) 到『檔案-版面設定』
在『**投影片大小**』設定：
例如：寬 91 高 128 公分
- (2) 編輯海報內容。
- (3) ppt 檔案直接送印。
- (4) 或轉存成 jpg 檔案。



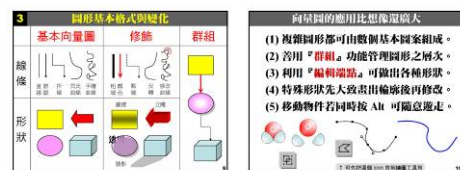
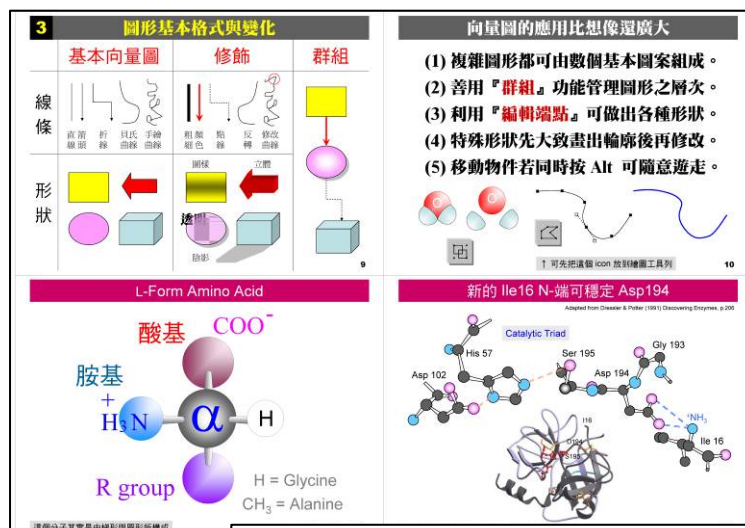
6.3 善用列印設定可完美呈現成果



(2) 設定頁數 在印表機

一張四頁的列印成果

4×4×2



- (1) 以『一張一頁』存為 pdf 格式。
- (2) 在『印表機』內容選一張多頁。
- (3) 在列印項目選『投影片』列印。
- (4) 若以『講義』列印則圖片較小。

Juang RH (2012)

投影片的製作原則

- (1) 使用純色簡單背景，不要附加任何無意義圖案
- (2) 每張投影片都有清楚主題，可標在上緣或下緣。
- (3) 無論中英文打字習慣，務必依照正式打字規則。
- (4) 注意文字的適當安排，如字距、行距、字型等。
- (5) 文字不得出現拼字或打字錯誤，注意標點符號。
- (6) 整個版面不要太過複雜，反之也要過分貧乏。
- (7) 安排整個版面的平衡與美感，以及色彩之協調。
- (8) 適當使用動畫，可提升報告的層次感與故事性。
- (9) 使用照片、漫畫、圖表提升聽眾的理解與興趣。
- (10) 多利用流程圖來說明事件，或表達複雜的概念。

這張全是用字形排成的

ATCG

包括動物、植物、微生物之所有生物，以及病毒等，都是使用這四種遺傳密碼單位；這是天地萬物合一，以及眾生皆平等的最佳說明。

胺基酸也是一樣

ACDEFGHIKLMNPQRSTVWY

新的 Ile16 N-端可穩定 Asp194

Adapted from Dresser & Fodor (1995) *Discovering Enzymes*, p 29

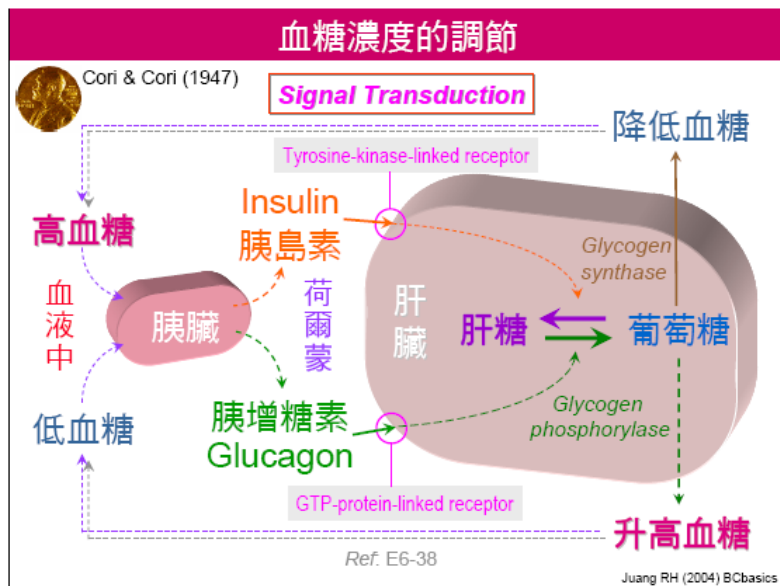
Catalytic Triad

Asp 102, His 57, Ser 195, Gly 193, Asp 194, Ile 16

- (1) 把照片、掃描圖等收集放在檔案夾。
- (2) 在 PowerPoint 顯示重要修飾按鈕。
- (3) 把點陣圖貼到投影片的大概位置上。
- (4) 亮度、裁切
- (5) 主要版面均衡

再 成為單用作品。

6.5 以『備忘稿』模式提供內容摘要



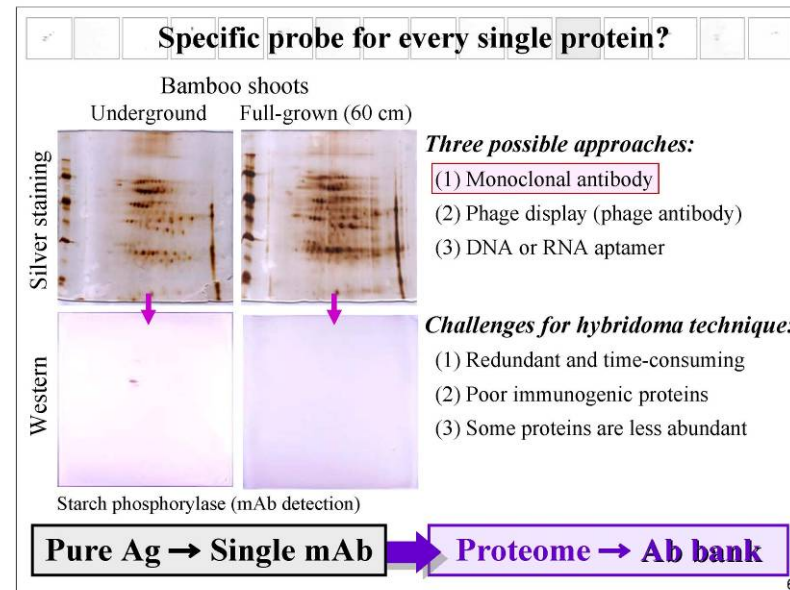
血糖 太高或太低對人體都有不好的影響，因此體內有極為複雜的血糖調節系統，主角是合成肝糖的肝糖合成酶 (glycogen synthase, GS)，以及降解肝糖以生成葡萄糖的肝糖磷解酶 (glycogen phosphorylase, GP)。此二酵素分別受到荷爾蒙胰島素 (insulin) 及胰增糖素 (glucagon) 的影響，人體便可利用控制荷爾蒙的濃度來調節血糖濃度。

這兩種荷爾蒙分子到達目標細胞時，細胞膜上有此荷爾蒙的接受體，當兩者接合之後信息便可傳入細胞內，引發酵素活性，進行所需要的糖類代謝。這些信息是如何傳導給最終的酵素 GS 及 GP？這即是最近極為蓬勃的信息傳導，以及典型的酵素調控機制。以下就以肝糖磷解酶為主要對象及實例，說明酵素如何以磷酸化、信息傳導分子以及迴饋控制的方式，進行其活性的調節。

肝糖磷解酶具有以上各種調控機制，很少有酵素如此密集地被調控著，因為肝糖磷解酶在糖類的利用實在是太重要。以下我們先瞭解肝糖磷解酶的分子構造及生化性質。

可以撰述詳細文字說明

E6-27



When comparing the 2-DE patterns, it was evidently that a specific probe could simplify the complex pattern into neat and clear contrast for a better comparison. In order to obtain specific probes, generally, there are three possible approaches: [1~3].

We preferred the hybridoma technique which takes the advantage of the natural immune response to generate **huge diversity** of the antibodies. However, technical challenges do exist to this 30-year old method, as following: [1~3].

Nonetheless, we decided to test the idea of **transforming** the conventional “pure Ag to produce single mAb” into “immunize the whole proteome to obtain the Ab bank.” At least, to run a pilot test to prove this idea.

做英文簡報時很有用

6.6 在投影片中插入影片

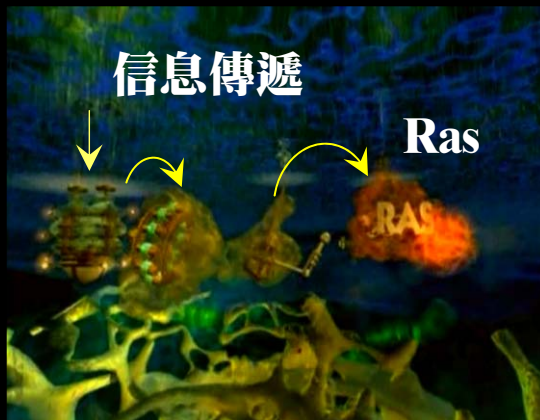
Juang RH (2012)

- (1) 盡量把影片的檔案大小與長度減小。
- (2) 把檔案轉換成 **mpg 1** 或 **wmv** 格式。
- (3) 儘量把 ppt 檔與影片檔案放在一起。
- (4) 投影片是以**連結**方式記住影片位置。
- (5) 換電腦時要同時帶影片並修正連結。
- (6) 除非必要，否則不要插入太多影片。
- (7) 若影片很重要，還是獨立放映較好。

細胞外



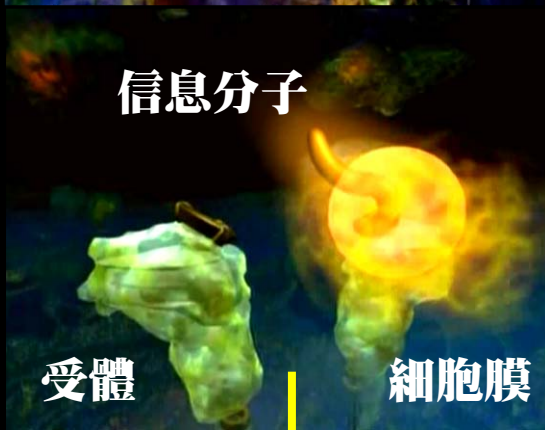
信息傳遞



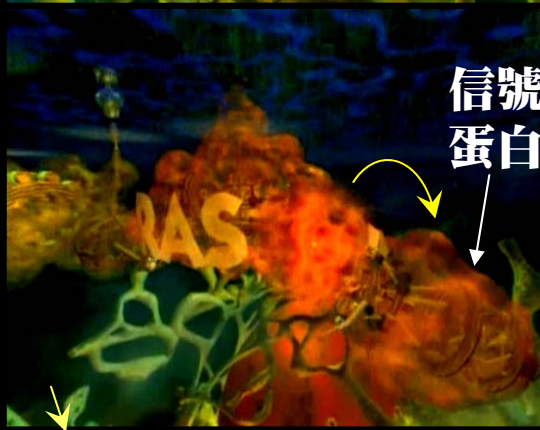
信號結合抑制者
核內



信息分子



信號
蛋白



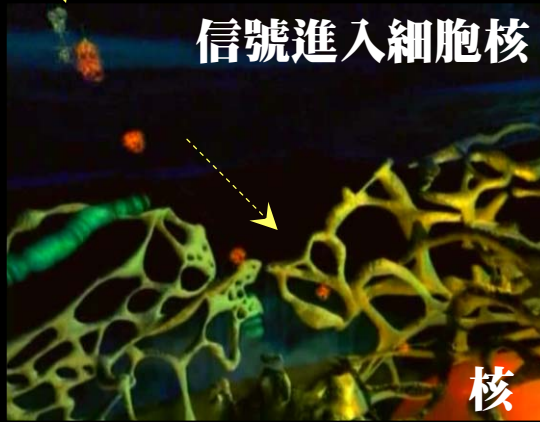
抑制者放
開 E2F



細胞膜內面



信號進入細胞核



E2F 打開基因



- (1) 一定要儘早準備好，尤其新手更要提早。
- (2) 整體規劃要隨時記得聽眾的組成與需求。
- (3) 使用『story board』把故事內容畫出來。
- (4) 儘快完成『**First draft**』然後反覆修改。
- (5) 使用有版權資料時，要附加出處或許可。
- (6) 所有投影片請依序編上頁碼，方便討論。
- (7) 至少要練習五次，並熟悉投影片的次序。
- (8) 演講前要檢查投影機、簡報器、雷射筆。
- (9) 大家都會緊張，勤加練習可降低焦慮感。
- (10) 演講時不要忘記隨時用雷射筆指示重點。

- (1) 最厲害的上課方式是一個人加一張嘴單刀赴會。
- (2) 但使用投影片確有傳統演講所無法達致的效果。
- (3) 無論用何種方式，熱誠與努力是最根本的條件。
- (4) 做出優秀的投影片，要花費龐大的工夫與時間。
- (5) 設計過程可促進深度思考、創新、整合與琢磨。
- (6) 缺點是部份學生因為太輕易瞭解而引發輕忽感。
- (7) 若多數學生有投影片就不上課，要想辦法改進。
- (8) 今年準備好投影片，明年就可高枕無憂？**大錯！**
- (9) PowerPoint 不只是簡報，還匯集很多有用功能。
- (10) 把 PowerPoint 做為轉譯、創新、規劃的平台。

教師宅急便

TA 宅急便

莊榮輝
↓
下載中心

國立台灣大學
數學發展中心



Juang RH (2012)

教師與 TA 教學工作坊

十二月每週四晚間 6:30~8:30 的教學修煉

日期	研習主題	主講人	
12 / 07	超強的 PowerPoint 投影片編輯技巧	生化科技系	莊榮輝 教授
12 / 14	如何讓討論課欲罷不能	政治系	江宜樺 教授
12 / 21	教學原理與教學技巧	師資培育中心	符碧真 教授
12 / 28	示範教學：生命是什麼？	生命科學系	齊肖琪 教授

地點：本校計算機中心 106 室



以教育彩繪臺灣的未來



以教育彩繪臺灣的未來

即刻起請向教學發展中心報名

<http://ctld.ntu.edu.tw/>

