


# 生物策略表

類別	生物策略 (Strategy)
生物策略 STRATEGY	細胞在極度失水中倖存下來 (Cells Survive Extreme Water Loss)
生物系統 LIVING SYSTEM	復甦蕨 (resurrection fern) <i>Polypodium polypodioides</i>
功能類別 FUNCTIONS	#防止液體流失 (Protect From Loss of Liquids)
作用機制標題	由於脫水蛋白，復甦蕨類植物的細胞可以在極度失水的情況下存活下來。 (The cells of resurrection ferns may survive extreme water loss thanks to dehydrin proteins.)
生物系統/作用機制 示意圖 (確認版權、註明出處；畫質)	 <p>From: AskNature Team Free non-commercial use 出處: AskNature 團隊，非商業應用</p>
作用機制摘要說明 (SUMMARY OF FUNCTIONING MECHANISMS)	

一種植物名副其實地被命名為“復甦蕨” (*Polypodium polypodioides*)，可以存活在水分極端流失的情形下，甚至可高達植物體 95% 的水分含量流失。那麼這些耐乾燥植物的細胞是如何保持活力呢？

Ronald Balsamo 發現這種脫水蛋白 (dehydrins)，一種特殊的蛋白質，它在乾燥條件下更為顯現，而且他們首次發現它在細胞壁附近也普遍地存在著。這種蛋白因為其吸引、隔離 (sequester) 和定位 (localize) 水的能力而得名叫做脫水蛋白。這種細胞之所以這樣，是因為脫水蛋白中的負電荷。

這項發現使研究人員得出結論，他們認為這些水包圍的脫水蛋白實際上可以讓水在植物細胞膜和植物細胞壁之間，甚至在單個細胞壁層之間充當潤滑劑 (lubricant)。

Some plants, like the aptly named ‘resurrection fern’ (*Polypodium polypodioides*), can survive extreme measures of water loss, even as much as 95% of their water content. How do the cells in these desiccation-tolerant plants remain viable?

(Ronald Balsamo found that not only is a particular class of proteins, called dehydrins, more prevalent during dry conditions, but, for the first time, they found that it was also prevalent near the cell walls. Dehydrins earned their name for their ability to attract, sequester, and localize water. They behave this way because of their negative charge.)

(The finding led the researchers to the conclusion that these water-surrounded dehydrins may actually allow water to act as a lubricant between either the plant cell membrane and the plant cell wall or even between individual cell wall layers.)

#### 文獻引用 (REFERENCES)

(Bringing dehydrated plants 'back to life': possible key to desiccation-tolerant plants)

#### JOURNAL ARTICLE

Dehydration-induced expression of a 31-kDa dehydrin in *Polypodium polypodioides* (*Polypodiaceae*) may enable large, reversible deformation of cell walls

*American Journal of Botany* | 10/03/2010 | B. E. Layton, M. B. Boyd, M. S. Tripepi, B. M. Bitonti, M. N. R. Dollahon, R. A. Balsamo)

#### 參考文獻清單與連結 (REFERENCE LIST) **Harvard 或 APA 格式**

延伸閱讀: **Harvard 或 APA 格式** (取自 AskNature 原文; 若為翻譯者補充, 請註明)

#### 生物系統延伸資訊連結 (LEARN MORE ABOUT THE LIVING SYSTEM/S)

撰寫/翻譯/編修者與日期

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AskNature 原文連結

<https://asknature.org/strategy/cells-survive-extreme-water-loss/>