
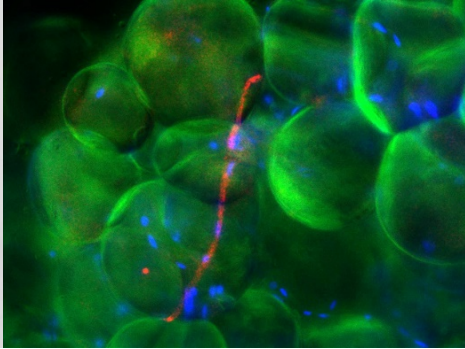


# 生物策略表

類別	生物策略 (Strategy)	
生物策略 STRATEGY	細胞代謝產熱 (Cell metabolism produces heat)	
生物系統 LIVING SYSTEM	哺乳綱動物 (Mammalia Class)	
功能類別 FUNCTIONS	#熱能轉型 #Transform thermoenergy	
作用機制標題	哺乳類和鳥類的棕色脂肪組織內的細胞通過粒線體呼吸作用的解偶聯產熱 (Cells within brown adipose tissues of mammals and birds produce heat by uncoupling of mitochondrial respiration.)	
生物系統/作用機制 示意圖		
作用機制摘要說明 (SUMMARY OF FUNCTIONING MECHANISMS)		
文獻引用 (REFERENCES)		
<p>「哺乳類和鳥類是內溫動物 (endotherm)，會對寒冷的環境反應而調節產熱，包括顫抖或不顫抖 (shivering or non-shivering) 的方式。在後者情況下，通過粒線體呼吸作用的解偶聯，可以把細胞能量的消耗當作熱量。解偶聯蛋白 [UCPs] (Uncoupling protein) 屬於粒線體載體家族，能夠傳遞質子，因此可假設具有產熱功能。現在已充分了解哺乳類的 UCP1 之生理功能，並為棕色脂肪組織提供了產熱之能力。但最近發現的同類型 UCP2 和 UCP3 真的也類似嗎？此外，越來越多的證據顯示鳥類中也存在非顫抖的產熱，禽鳥的 UCP 是否也參與了對寒冷暴露的反應？在這篇回顧中，我們檢討了 UCP 生物學領域的最新進展，並提出了 UCP1 同系物 (homologues) 的假定功能。」 (Mozo et al. 2005: 227)</p> <p>“Mammals and birds are endotherms and respond to cold exposure by the means of regulatory thermogenesis, either shivering or non-shivering. In this latter case, waste of cell energy as heat can be achieved by uncoupling of mitochondrial respiration. Uncoupling proteins [UCPs], which belong to the mitochondrial carrier family, are able to transport protons and thus may assume a thermogenic function. The mammalian UCP1 physiological function is now well understood and gives to the brown adipose tissue the capacity for heat generation. But is it really the case for its more recently discovered isoforms UCP2 and UCP3? Additionally,</p>		

whereas more and more evidence suggests that non-shivering also exists in birds, is the avian UCP also involved in response to cold exposure? In this review, we consider the latest advances in the field of UCP biology and present putative functions for UCP1 homologues.” (Mozo et al. 2005: 227)

#### 參考文獻清單與連結 (REFERENCE LIST)

Mozo, J., Y. Emre, F. Bouillaud, D. Ricquier and F. Criscuolo. (2005). Thermoregulation: what role for UCPs in mammals and birds? *Biosci Rep.* 25: 227-249.  
(<https://www.ncbi.nlm.nih.gov/pubmed/16283555>)

#### 延伸閱讀

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

<https://en.wikipedia.org/wiki/Mammalia>

#### 撰寫/翻譯/編修者與日期

陳宥盈翻譯 (2019/04/29)；譚國鎔編修 (2020/04/16)；施習德編修 (2020/12/15)

#### AskNature 原文連結

<https://asknature.org/strategy/cell-metabolism-produces-heat/>