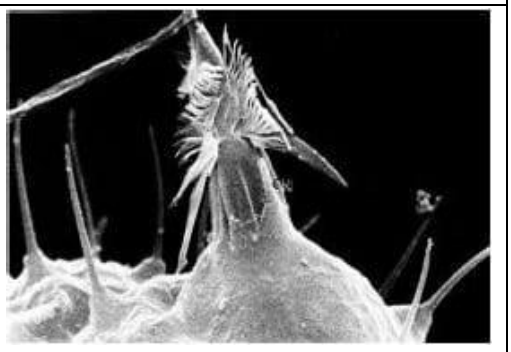
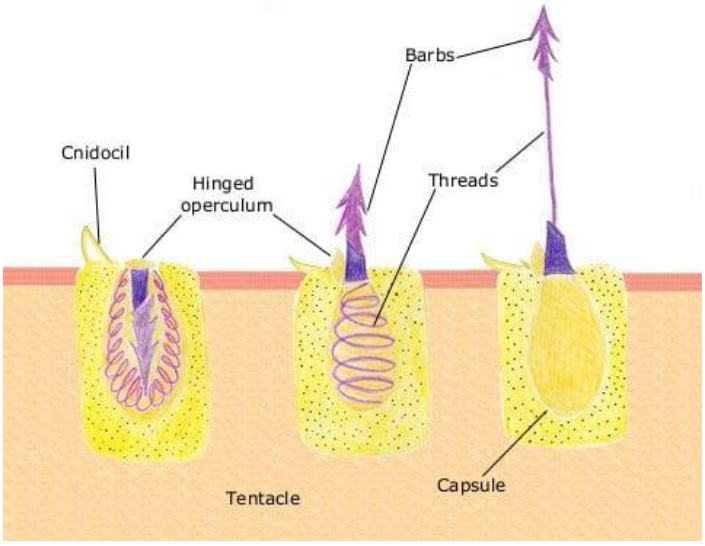
生物策略表

類別	生物策略 (Strategy)
生物策略 STRATEGY	刺細胞瞄準獵物 (Stinging Cells Target Prey)
生物系統 LIVING SYSTEM	綠海葵 (Green sea anemone)
功能類別 FUNCTIONS	#獲取、吸收或過濾生物 #排出固體 #感應生命系統中的觸覺及機械力 #感應環境中的化學物質（氣味、味道等）#對訊號反應 #Capture, Absorb, or Filter Organisms #Expel Solids #Sense Touch and Mechanical Forces in a Living System #Sense Chemicals (Odor, Taste, etc.) From the Environment #Respond to Signals
作用機制標題	海葵的刺細胞利用物理和化學線索有效地瞄準獵物 (Stinging cells of sea anemones effectively target prey using a combination of physical and chemical cues.)
生物系統/作用機制示意圖 (確認版權、註明出處；畫質)	  
作用機制摘要說明 (SUMMARY OF FUNCTIONING MECHANISMS)	

在條紋海葵 (anemone) 中，*Diadumene lineata* (縱條磯海葵)，專門用於捕捉獵物的觸手 (tentacle) 對獵物產生的特定化學物質很敏感。例如，甲殼類動物和魚類等小型獵物被一層薄薄的粘液覆蓋。這種粘液含有被海葵觸鬚中的化學感應細胞（化學感受器）識別的特定分子。當粘液使化學感受器活化時，這會觸發刺胞細胞 (cnidocyte) 內部和周圍的一系列細胞活動，最終導致毛髮狀觸發器延長。這種拉長會導致毛狀物在較低頻率下更容易振動或共振，就像鋼琴中較長的琴弦演奏低音符的方式一樣。類似毛狀物的觸發器似乎對與小型獵物游泳的頻率相匹配的低頻運動變得更加敏感。在沒有粘液的情況下，類似毛狀物的觸發器通常對高頻運動很敏感。因此，海葵的化學感受器可以微調刺胞細胞對身體接觸的反應。當穿過觸鬚的物體是被粘液覆蓋的游泳獵物時，刺細胞更有可能發射。

In the striped anemone, *Diadumene lineata*, the tentacles specialized for capturing prey are sensitive to specific chemicals that prey produce. For instance, small prey animals like crustaceans and fish are covered in a thin layer of mucus. This mucus contains specific molecules recognized by chemical-sensing cells (chemoreceptors) in the anemone’s tentacles. When mucus activates the chemoreceptors, this triggers a series of cellular activities in and around the cnidocyte that eventually cause the hair-like trigger to lengthen. This lengthening causes the hair to vibrate, or resonate, more readily at lower frequencies, much like how longer strings in a piano play lower notes. The hair-like trigger seems to become more sensitive to lower-frequency movements that match the frequencies at which small prey swim. In the absence of mucus, the hair-like trigger is normally sensitive to higher-frequency movements. The anemone’s chemoreceptors thus fine-tune how cnidocytes respond to physical touch. Cnidocytes are more likely to fire when the object moving through the tentacles is a mucus-covered swimming prey.

文獻引用 (REFERENCES)

“在海葵中，每個刺細胞機械感受器的纖毛都來自刺細胞，而靜纖毛 (stereocilia) 和 N-乙酰化糖 (N-acetylated sugar) 受體位於支持細胞上。N-乙酰化糖的支持細胞化學感受器調節參與釋放線蟲囊的機械感受器，可能通過誘導靜纖毛長度的變化。因此，刺胞細胞支持細胞複合物通過根據它們存在的化學和物理線索的組合來區分潛在的獵物來選擇獵物”(Watson and Hessinger 1989:1591)

(“In sea anemones, the cilium of each cnidocyte mechanoreceptor originates from the cnidocyte, whereas the stereocilia and the receptors for N-acetylated sugars are located on supporting cells. Supporting cell chemoreceptors for N-acetylated sugars tune mechanoreceptors involved in discharging nematocysts, possibly by inducing a change in the length of the stereocilia. Thus, cnidocyte-supporting cell complexes select prey by discriminating among potential prey according to a combination of the chemical and physical cues they present.”) (Watson and Hessinger 1989:1591)

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

Cnidocyte mechanoreceptors are tuned to the movements of swimming prey by chemoreceptors
Science, 243: 1589‐1591 | 24/03/1989 | Watson GM; Hessinger DA
https://www.science.org/doi/10.1126/science.2564698

Frequency specificity of vibration‐dependent discharge of nematocysts in sea anemones
Journal of Experimental Zoology, 281: 582‐593 | 15/08/1998 | Watson GM; Mire P; Hudson RR
https://pubmed.ncbi.nlm.nih.gov/9697323/

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