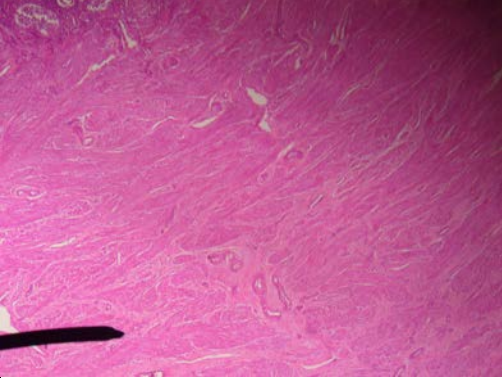


生物策略表

類別	生物策略 (Strategy)
生物策略 STRATEGY	子宮的舒張與收縮 (Uterus expands/contracts)
生物系統 LIVING SYSTEM	哺乳類 (Mammals)
功能類別 FUNCTIONS	#防止破裂/斷裂 #Prevent fracture/rupture
作用機制標題	雌性哺乳類動物的子宮可以擴張和收縮來適應其內容物，這都要歸功於子宮肌層中央的螺旋肌肉纖維 (The uterus of female mammals can expand and contract to accommodate its contents thanks to spiral muscle fibers in its central myometrial layer.)
生物系統/作用機制 示意圖	

作用機制摘要說明 (SUMMARY OF FUNCTIONING MECHANISMS)

雌性哺乳類動物的子宮都很相似，必須要隨著妊娠和分娩擴張和收縮，通常收縮舒張的程度可以是十倍的數量級。蝗蟲中幾丁質組成的環狀纖維和子宮內部的環狀肌肉纖維是相似的。子宮的三層結構中，中央的子宮肌層 (myometrial layer) 負責子宮的擴張和收縮。它由結締組織組成，主要是平滑肌纖維，其外層呈縱向排列，內層在底部呈環狀排列，呈兩向的螺旋狀環繞在子宮體（甚至可能是對數螺旋形…）。

這些環狀幾丁質纖維和螺旋肌肉纖維的作用可作為聚合物包裝材料的參考，即根據其大小允許包裝的膨脹和收縮。如此一來，如果將多種物品裝箱，可以只利用包裝自身使空隙最小化。另外，同一種包裝可以適用於多種尺寸的物品，即容納嬰兒鞋的袋子與容納籃球鞋或足球的袋子即可以是相同的存貨單位 (SKU)。

（仿生 3.8 未出版報導）

Similarly, the uterus of female mammals must expand and contract with gestation and birth, often an order of magnitude (ten-fold). The hooped fibers of chitin in the locust are paralleled in the interior circular muscle fibers of the uterus. Of the three layers of the uterus, the central myometrial layer is responsible for the expansion and contraction of the uterus. It is composed of connective tissue, mainly smooth muscle fibers with an external layer laid

longitudinally and an internal layer laid circularly at the base which then spirals in both directions around the uterine body (which might even be a logarithmic spiral...).

The lessons from these 'hooped' chitin fibers and spiral muscle fibers could be incorporated into a polymer packaging material, thereby allowing for expansion and contraction of the packaging depending on the size of its contents. The result of packing multiple items into a shipping case would be the absolute minimization of air space between objects created by the packaging alone. Additionally, the same packaging product could be specified for a large variety of object sizes, i.e. the bag holding the baby shoe would be the same SKU as the one holding the basketball shoe or the soccer ball.

(Biomimicry 3.8 unpublished report)

文獻引用 (REFERENCES)

參考文獻清單與連結 (REFERENCE LIST)

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/Mammal>

https://www.onezoom.org/life/@Amniota=229560?img=best_any&anim=flight#x1065.y-444,w2.2543

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李沛安翻譯 (2020/04/19)；譚國鏊編修 (2020/06/02)；許秋容編修 (2020/06/23)

AskNature 原文連結

<https://asknature.org/strategy/uterus-expandscontracts/>