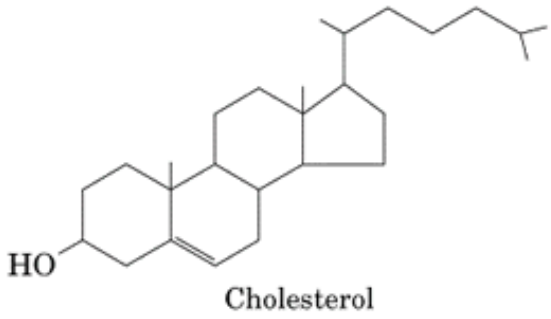
1. 膽固醇如何影響細胞膜流動？



Cholesterol

膽固醇會降低細胞膜的流動性，但卻是細胞膜的朔化劑，有膽固醇從中固定，可以使細胞膜不易受外力的影響而破損，導致細胞崩潰。另外，還可增加細胞膜的穩定性，減少在高溫時膜的液化或冷溫時膜固化。

2. DNA 序列上的相同區域，可否因爲讀法不同而產生不同蛋白質？

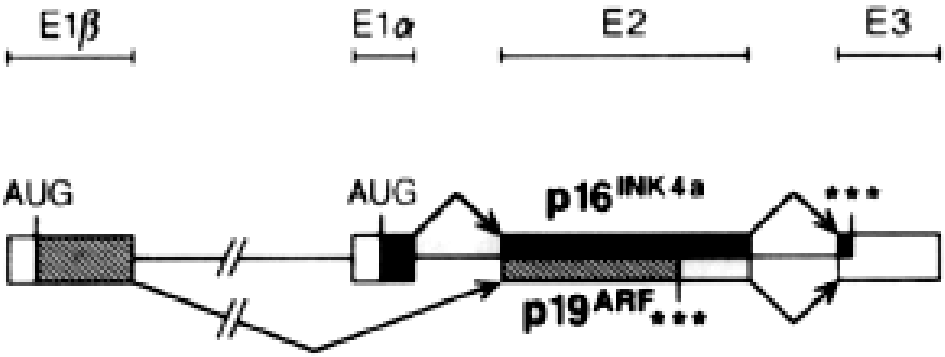


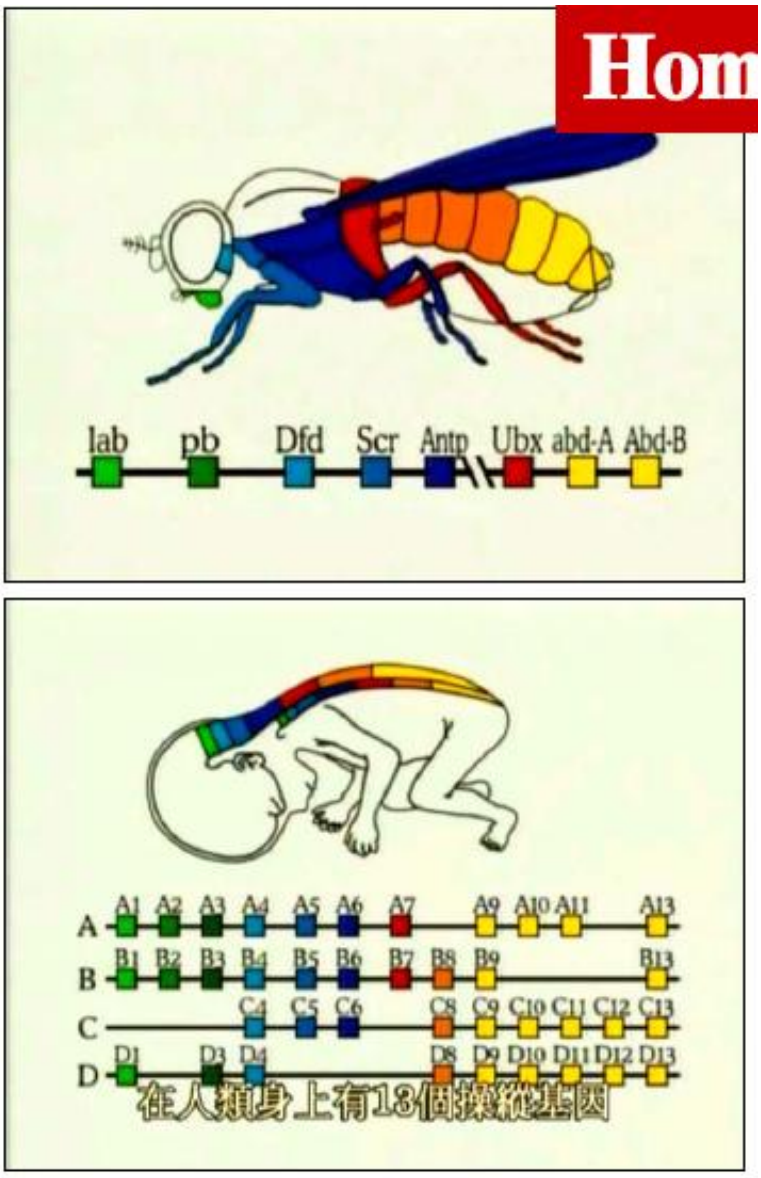
Figure 1. Architecture of the *INK4a* Gene

Transcription of α and β mRNAs encoding $p16^{INK4a}$ and $p19^{ARF}$, respectively, is initiated at two promoters (Stone et al., 1995; Mao et al., 1995). Exon 1α and 1β products are spliced to the same exon 2 acceptor to generate α and β mRNAs of similar lengths but using alternative reading frames for translation. Mouse $p19^{ARF}$ and $p16^{INK4a}$ are each longer than their human cognates, and, like human $p16^{INK4a}$, the mouse $p16^{INK4a}$ distal C-terminal amino acids are encoded by a third exon (Quelle et al., 1995). Protein coding sequences are depicted by closed ($p16^{INK4a}$) or hatched ($p19^{ARF}$) bars, and noncoding sequences by open bars.

Quelle et al. (1995) Alternative Reading Frames of the *INK4α* Tumor Suppressor Gene Encode Two Unrelated Proteins Capable of Inducing Cell Cycle Arrest. Cell (1995) 83: 993-1000

3. 控制器官發育的主鑰匙基因之最新研究？

其中 HOXD13 的突變會造成多指症（synpolydactyly）；而 HOXA13 的突變則會導致手腳生殖器症（hand-foot-genital syndrome，HGFS）。另外 HOXB 群集中的 8 個成員會影響紅血球的發育，其中 HOXB4 與 HOXB7 又會影響 T 細胞與 B 細胞。http://zh.wikipedia.org/zh/Hox%E5%9F%BA%E5%9B%A0



4. 六根手指頭的基因遺傳？

Polydactyly is the most common congenital digital anomaly of the hand and foot. It may appear in isolation or in association with other birth defects. Isolated polydactyly is often autosomal dominant or occasionally random, while syndromic polydactyly is commonly autosomal recessive. According to Muragaki et al, mutations in the HOXD13 gene are associated with synpolydactyly.

http://en.wikipedia.org/wiki/Polydactyly

http://emedicine.medscape.com/article/1113584-overview

Muragaki et al. Altered growth and branching patterns in synpolydactyly caused by mutations in HOXD13. *Science*. 1996; 272(5261):548-51.