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(1996 characters, including spaces)

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Biological Hollywood: How do Cells Produce Their Movies?

Imagine a long spool of film containing a great number of randomly assembled scenes. Such a film is meaningless, but a talented editor may be capable of deleting certain scenes and joining others, thereby creating a powerful movie. Israeli scientists have recently made progress in understanding an analogous process in cells that has long been a mystery.



In order for cells to produce proteins, which are vital for all forms of life, they must precisely join together short patches from within incomparably greater masses of material available to them, a process termed “splicing”. But how are cells able to pick out the meaningful from the meaningless? This mystery was tackled by Schraga Schwartz and co-workers at Tel Aviv University, in a study that shed much light on the nuts and bolts of this remarkable process. Their findings, they hope, will bring us closer to understanding such diseases as cystic fibrosis and certain forms of cancer that result from cells’ failure to recognize the right patches.

The idea was simple: meaningful patches, termed exons, were compared to highly similar but meaningless patches, termed pseudo-exons. If two patches are highly similar but cells consider only one of them meaningful, comparison of the two can point out the characteristics by which they differ and which allow cells to discriminate between them. Employing such an approach, the study was able to uncover fifteen features that characterize exons – but not pseudo-exons. These features include the content, length, and environment of the patches as well as the three-dimensional structure they acquire within cells. In a complex interplay whose nature remains to be fully understood, these features enable cells to correctly identify exons.

According to Alfred Hitchcock, “Drama is life with the dull bits cut out”. However, life needs no lessons in cutting out its own dull parts – and we are gradually learning how this is achieved.

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