A decision mechanism for the destruction of non-functional proteins

Proteins intended for destruction and removal from the cell are subject to specific targeting. The biological half-life of cytosolic proteins is very different, from a few minutes to more than twenty hours. The length of existence of these proteins is determined by their N-terminal amino acid. Met, Gly, Ala, Ser, Thr and Val is amino acid No. 1 of more stable proteins (half-life longer than 20 hours). N-terminal Ile or Glu signal peptide *survival* for about half an hour. Pro, Leu, Phe, Asp, Lys, and Arg provide a half-life of only a few minutes. Such a short half-life is important for regulatory peptides, for example, hormones, so that changes in regulation are sufficiently rapid. This signaling arose early in the development of life, as it is known in bacteria, yeast and mammals. The described targeting mechanism is not fully elucidated. An important role is played by the protein ubiquitin (Mr=8500), which is in all eukaryotic cells. The C-terminal Gly of ubiquitin is covalently linked to the ε-NH 2 lysine of the protein destined for degradation. It is interesting that ubiquitin is first activated by ATP and three enzymes and is attached to their -SH groups. Thus, this activation resembles the activation of fatty acids or the synthesis of aa-tRNA (activation of amino acids), which is one of the examples of a general principle that we will encounter more often in biochemistry.

Links

Sources

- ŠTÍPEK, Stanislav. *Stručná biochemie : uchování a exprese genetické informace.* 1. edition. Praha : Medprint, 1998. ISBN 80-902036-2-0.

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