A Novel Mechanism of Ubiquitination

A new pathway for protein degradation is identified using the protein's N-terminal residue as the essential conjugation site instead of internal lysines.

Ubiquitin is a protein that is found in almost all cellular tissues in humans and eukaryotic organisms that helps to regulate the processes of other proteins in the body. Signaling by ubiquitination, the process of adding ubiquitin to a substrate protein, helps to regulate virtually all cellular processes in eukaryotes. For example, ubiquitination can signal the cell to degrade proteins, alter a protein's cellular location, or to promote or prevent protein interactions. Due to its importance, ubiquitination is a primary target of various infectious agents.

Researchers at Purdue University have demonstrated that L. pneumophila can override ubiquitination signaling in host cells with its own enzymes, including members of the SidE effector family. While ubiquitination is generally catalyzed by a cascade requiring the E1, E2, and E3 enzymes, members of the SidE family of bacterial enzymes are capable of performing ubiquitination independent of this cascade. Following this discovery of ubiquitination catalyzed by a single enzyme, this enzyme, SidE, and various SidE constructs hold promise as new tools for research and development in biotechnology.

Advantages:

-Performs ubiquitination with a single enzyme

Potential Applications:

-Protein research

-Bacterial and viral research

-Biotechnology

TRL: 3

Intellectual Property:

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