Docket #: S19-007

Ultra-short protein crosslinkers are easy to cleave and detect by mass spectrometry

Researchers at Stanford have developed a new family of crosslinking agents useful for determining protein structure and interaction. The ultra-short, light-activatable agents can directly crosslink proteins inside living cells and, uniquely, are designed to reveal atomic-resolution protein structures as they exist in their native environment. Unlike existing crosslinkers (e.g, DSSO; photomethionine), the new crosslinkers can be cleaved and readily detected by mass spectrometry, and are small enough to be incorporated translationally into proteins. These advantages have never before been achieved simultaneously.

Related Technologies:
Stanford docket S19-003 – describing hydroxamate-based affinity tags with size and cost advantages for purifying biological macromolecules.

Stanford docket S19-004 – describing an ultra-sensitive, in vivo protein footprinting technique using thiol alkylating agents.

Stanford docket S19-005 – describing improved tags for separating crosslinked peptides for mass spectrometry.

Stage of Development
The researchers have synthesized several members of the new crosslinking family, and shown that custom control software for the mass spectrometer can achieve speed, accuracy and sensitivity.

Applications

- Analysis of protein structure and interaction

- Pharma could use the new crosslinkers to detect and define contacts between proteins and small molecules of interest.

Advantages

- Ultra-short and light-activatable
- MS-cleavable and easy to detect
- Potential to elucidate atomic-resolution protein structures in living cells
- Suitable for both chemical and translational incorporation

Innovators

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