Enhancing Protein Stability Through Strategic PEGylation

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Executive Statement:

A novel method for selecting PEGylation sites on proteins to improve their stability and pharmacokinetic properties.

Technology Overview:

This technology presents a method developed by Brigham Young University for enhancing the thermodynamic and proteolytic stability of proteins through strategic PEGylation. By attaching polyethylene glycol (PEG) chains to specific sites on proteins, the method improves protein drugs' pharmacokinetic properties without compromising their biological activity. The research utilizes both experimental and computational approaches to identify optimal PEGylation sites, focusing on the WW domain of the human protein Pin I as a model system.

Key Advantages:

- Increases protein resistance to proteolysis, enhancing durability
- Improves conformational stability through entropic effects
- Maintains the biological activity of proteins post-PEGylation
- Provides a structure-based method for predicting optimal PEGylation sites on various proteins

Problems Addressed:

- Instability of protein-based therapeutics in biological environments
- High degradation rates of protein drugs, leading to reduced efficacy
- Challenges in maintaining the biological activity of proteins while enhancing their stability

Market Applications:

- Design and development of more stable protein-based therapeutics
- Pharmaceutical industries focused on improving pharmacokinetic profiles of drugs
- Biotechnology research in protein engineering and drug design