Disulfide Bioconjugation

Tech ID: 29961 / UC Case 2017-774-0

SUMMARY

UCLA researchers in the Department of Chemistry and Biochemistry have proposed a one-step radical mechanism for disulfide bioconjugation that overcomes many concerns associated with the free cysteine residues that result from current bioconjugation techniques.

BACKGROUND

The post-translational modification of proteins has a number of important biological applications, including the development of novel drugs. Although its reactive thiol group makes cysteine an ideal site for modification, cysteine is typically bonded in a disulfide bridge. The modification of cysteine disulfide bonds is difficult since these bonds play a crucial role in protein structures. Additionally, current modification techniques require a reduction step prior to bioconjugation that leads to the production of free cysteine residues. Cysteine residues cause protein unfolding and aggregation and can compromise protein structure and function.

INNOVATION

UCLA researchers in the Department of Chemistry and Biochemistry have proposed a radical mechanism for disulfide bioconjugation. The proposed mechanism allows for peptide modification through selective one-step conjugation of disulfide bonds. Importantly, this mechanism does not require the reduction step of current techniques and allows for rapid disulfide bioconjugation without the production of free cysteine residues. The applications of the proposed mechanism range from antibody drug conjugation to more general protein conjugation.

APPLICATIONS

- Antibody drug conjugation
- Small molecule drug conjugation
- General protein conjugation

ADVANTAGES

- Selective disulfide modification
- Does not require additional reduction step leading to free cysteine residues
- Achieves post-translational modification and bioconjugation without compromising protein structure

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20200181192	06/11/2020	2017-774

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Tunable Linear Fluoropolymers
- Improved Shortwave Infrared Polymethine Dyes

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OTHER INFORMATION

KEYWORDS

antibody drug conjugation; bioconjugation; disulfide bioconjugation; post-translational modification; cysteine radical

CATEGORIZED AS

- **Medical**
  - Delivery Systems
  - Disease: Infectious Diseases
- **Research Tools**
  - Antibodies

RELATED CASES

2017-774-0

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