Site-Specific Protein Modification via Copper(I)-Catalyzed 1,2,3-Triazole Formation and Its Implementation in Protein Microarray Fabrication

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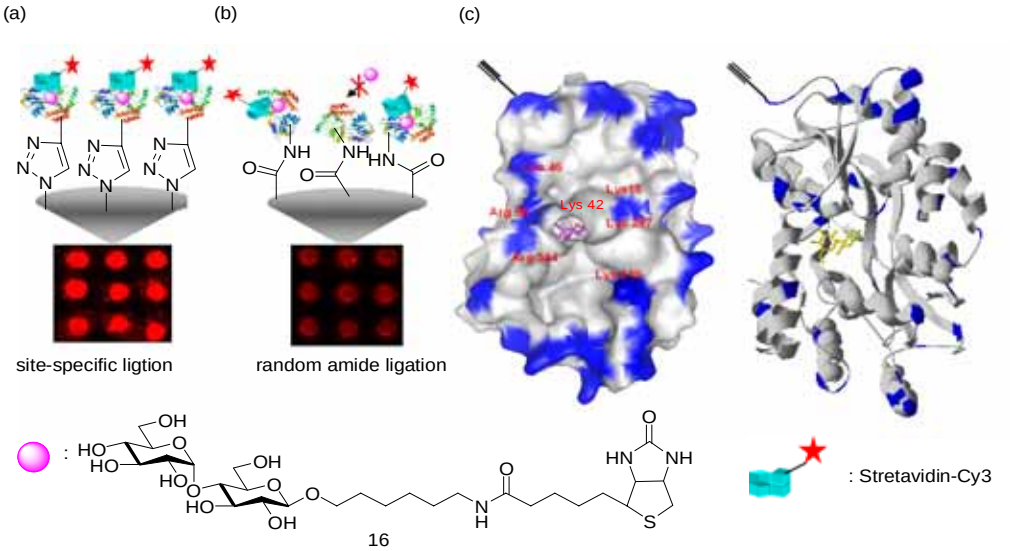
Effective and site-specific modification of proteins by target molecules is an essential yet challenging step to research in biochemistry and biophysics. In this report, we combined the intein fusion protein expression system with Cu(I)-catalyzed 1,2,3-triazole formation to demonstrate specific modification of protein C termini. This protein modification method was validated using various types of molecules including fluorescent FITC, biotin, carbohydrate, peptide and even a covalently linked homodimeric protein by a diazido linker. The method, when applied to the fabrication of protein microarrays, showed that site-specific covalent bond formation retains higher protein activity on a solid surface compared with techniques that rely on random amide bond formation.



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