# Immobilizing Proteins on the Surface of Resin Using Triazolecarbaldehyde Reagents

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Immobilization of proteins on the surface of solid materials has significantly broadened the applications of proteins in biotechnology and materials science. N-terminal modification of proteins is generally considered a modification method which ensures the stability of modification while retaining the protein's activity to the greatest extent. Nowadays, most of the covalent immobilization of proteins through N-terminal modification requires pretreatment of functional groups on the surface of materials. For example, Francis group developed the 2-pyridinecarboxyaldehyde (2PCAs) which was modified on the materials surface via amide coupling for protein immobilization at the N-terminus.[1] We have established a convenient method to directly functionalize the surface to immobilize proteins at the N-terminus. We used 1*H*-1,2,3-triazole-4-carbaldehyde (TA4C) to attach the N-terminus of native proteins.[2] The surface of polymer resin containing (2-aminoprop-1-yl)polyethylene glycol (PEGA-$NH_2$) was functionalized with TA4C, enabling specific conjugation towards the N-terminus of natural proteins. The conversion from the amino groups to TA4C was confirmed by Kaiser test. The N -terminus of green fluorescent protein (GFP) was linked with the TA4C groups on the surface of the resin through a one-step. The fluorescence imaging confirms the covalent immobilization of GFP on the resin.

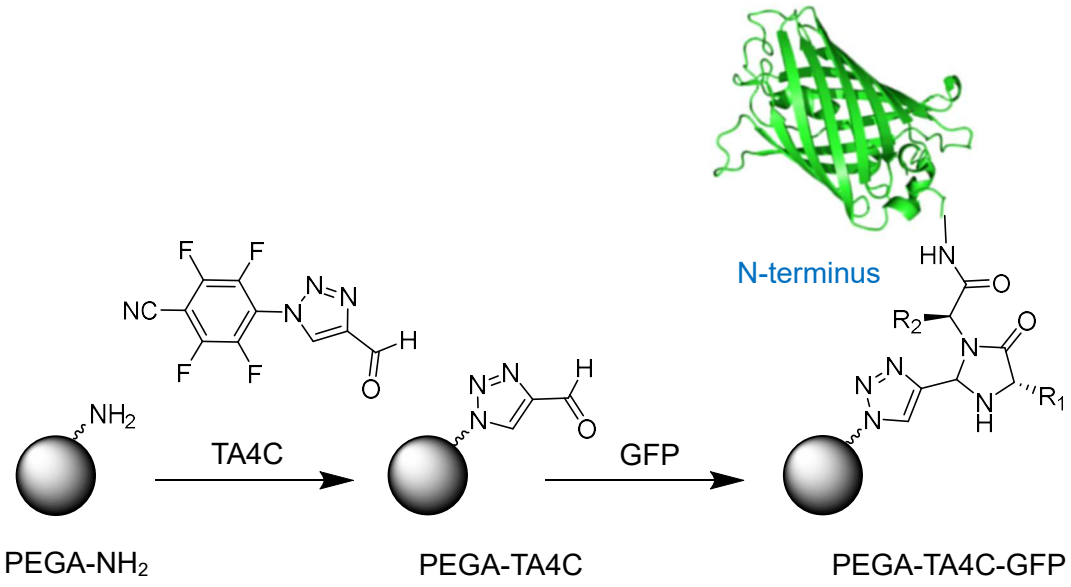


**Fig.1** Resin functionalization strategy. PEGA-$NH_2$ is converted by TA4C to generate PEGA-TA4C through Dimroth rearrangement, on which GFP is immobilized with the N-terminus.

**References** 1) B. Koo, N. S. Dolan, K. Wucherer, H.K. Munch and M. B. Francis, *Biomacromolecules*, **2019**, 20, 3933−3939.
2) A. Onoda, N. Inoue, E. Sumiyoshi, T. Hayashi, *ChemBioChem*, **2020**, 21, 1274.