PENN CENTER FOR INNOVATION
Empowering Ideas

Site-specific bioconjugation of native immunoglobulins

Method for covalent cross-linking of antibodies to surfaces for immunoassays and targeted drug delivery

Inventor

Andrew Tsourkas, Professor, Department of Bioengineering

STAGE OF DEVELOPMENT

Proof of principle and *in vitro* testing

INTELLECTUAL PROPERTY

PCT pending (PCT/US2014/030457)

REFERENCE MEDIA

Hui JZ et al. *Bioconjugate Chemistry*, 2014, 25(9), 1709-1719.

DESIRED PARTNERSHIPS

- License
- Co-development

APPLICATIONS

- Site-specific conjugation to nanoparticles, biomolecules, polymers, drugs, imaging agents, etc. with no genetic modification of antibody
- Targeted drug delivery with increased therapeutic index
- Coating of ELISA plates with increased sensitivity and reduced amount of antibody needed

LEARN MORE

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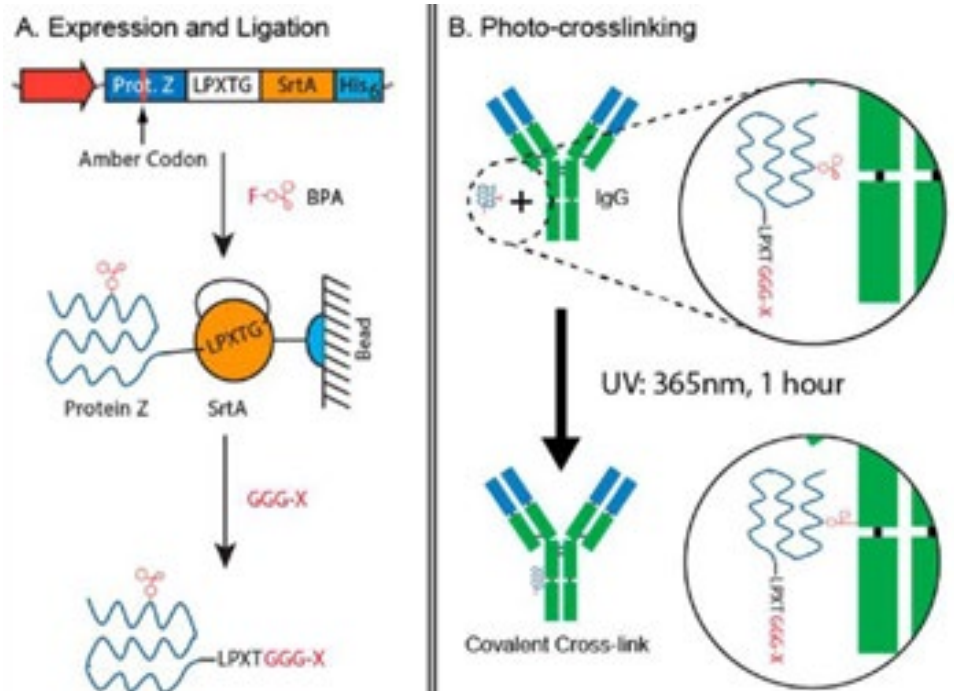
Overview

The Tsourkas lab has designed a facile method for the site-specific bioconjugation of native immunoglobulins (IgGs). The researchers have developed novel photoreactive Protein Z variants that allow for the introduction of a diverse range of modifications, including azides, haptens, and fluorophores, onto IgG. The Protein Z variants can be expressed recombinantly at a high yield in E. coli, with incorporation of the non-natural amino acid benzoylphenylalanine and C-terminal modifications. The variants can be rapidly cross-linked to many types of IgG, including human, mouse, and rabbit, with efficiency up to 95% after 1 hour of UV exposure. This efficient, site-specific conjugation system allows for a cost-effective method to functionalize antibodies.

Advantages

- Robust, high-yield, cost-effective system
- Fast kinetics, site-specific labeling
- Diverse range of C-terminal modifications
- Long wavelength UV light does not damage protein
- Compatible with most native IgGs



Schematic of Protein Z production and IgG cross-linking