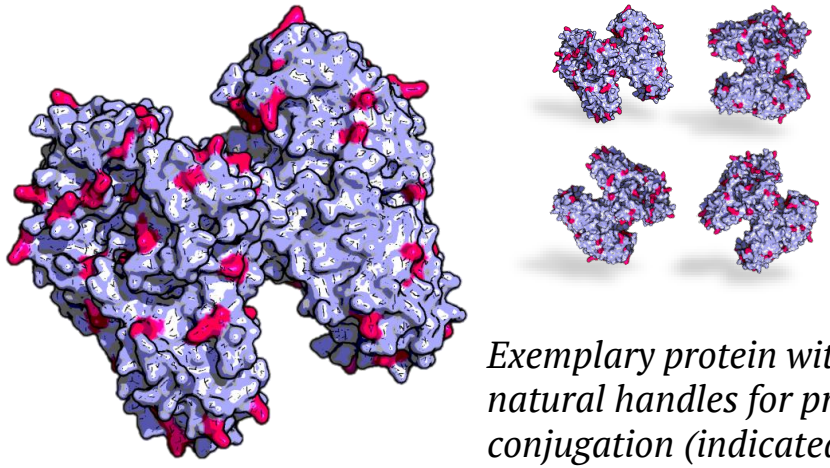
Non-confidential Presentation

PAIN POINT: No site-specific conjugation possible

Situation

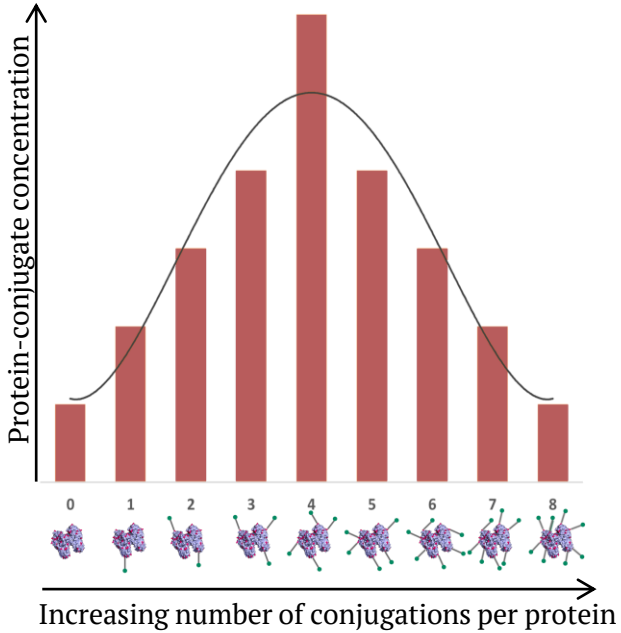
- **Protein therapeutics** often need to be **connected (conjugated) to other proteins, polymers or small molecules** to improve or even **enable their therapeutic value**
- **Natural proteins potentially contain** a lot of **handles** where these **connections can be made** (indicated with red spots on the protein surface)



Exemplary protein with natural handles for protein conjugation (indicated with red spots)

Complication

- Conjugating proteins to small molecules or polymers lead to **mixtures of different protein species** with different numbers of connections
- This poses a **problem in the regulatory approval of these conjugate biotherapeutics** and is a major pain-point in the development of protein conjugates



Exemplary result of a protein conjugation reaction resulting in a stochiometric mixture of protein-conjugates with varying number of conjugates attached to the protein

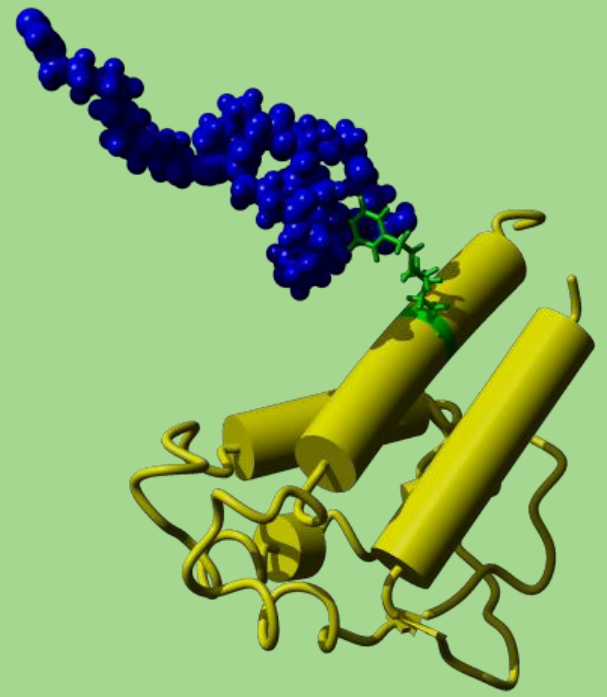
THE VALANX SOLUTION: Site-specific protein conjugates

How does it work?

- **Introduction of a synthetic amino acid** with a **chemical reaction handle** site-specifically into a protein
- Generation of a **defined protein conjugate** using the introduced chemical handle

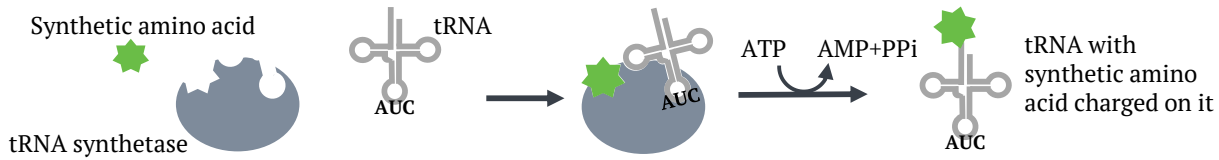
What is your benefit?

- **Freely selectable** conjugation sites enables **conjugation site optimization**
- **Defined** and **easily characterized** protein
- **Removed regulatory hurdles**
- Easier production of a **uniform product** with consistent **batch-to-batch quality**



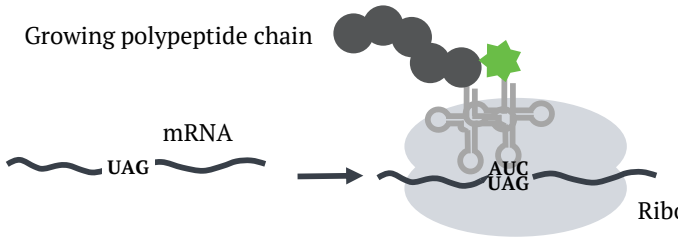
Our technology: Site-specific protein conjugation platform

I



Orthogonal tRNA-synthetase and tRNA in E. coli production strain charge synthetic amino acid onto tRNA recognizing **repurposed TAG stop codon**

II



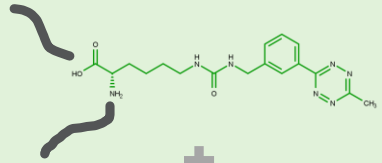
Synthetic amino acid is incorporated into growing protein in response to an **in-frame TAG stop codon**

III

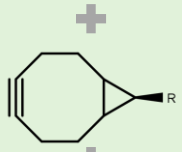
Protein with incorporated synthetic amino acid

Protein contains synthetic amino acid and can be **purified and conjugated**

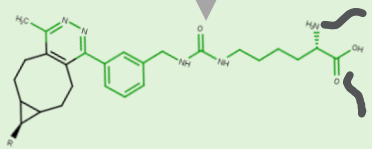
IV



Synthetic amino acid within the protein with tetrazine ring



Conjugation partner containing bicyclononyne (BCN)



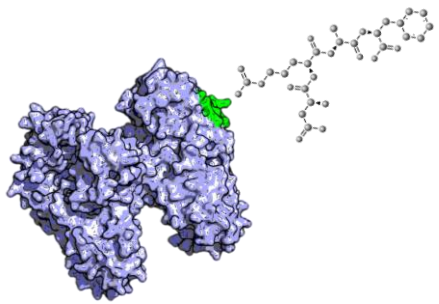
Protein conjugated to the partner via click reaction

- **Tetrazine-based** conjugation chemistry
- **>99% conversion** at **room temperature** in **physiological conditions**
- **Stereochemically defined** conjugate structure
- **90% incorporation efficiency** in industrial medium compared to control protein not containing a synthetic amino acid
- **Synthetic amino acid** (Urea-Tet-Lys, patent pending) **highly soluble in aqueous solution**

Start your journey towards site-specific protein conjugates!

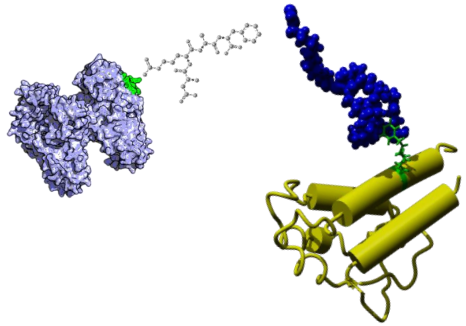
Licensing

…of our protein conjugation platform for in-house development



Partnering

…for joint development of novel protein conjugates



+ Co-development option for a novel protein therapeutic in autoimmunity – contact us for more information!

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