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Protease-aided modular construction of bispecific and multi-specific antibodies

Tech ID: 32251 / UC Case 2019-210-0

TECHNOLOGY DESCRIPTION

Researchers at UCSF have developed a method for generating bi- and multi-specific antibodies. Antibodies with bi- or multi-specificity hold great promise to lead the way in the next wave of biologic therapeutics. They are capable of recognizing multiple ligands simultaneously, thus can create synthetic specificity, and interact with multiple signaling pathways to maximize therapeutic benefits, offering advantages over traditional monoclonal antibodies. In the past however, their generation faces significant challenges such as heavy- and light-chain pairing. Incorrect dimerization produces impure biologics that increase complexity in production and purification. This invention solves the challenging light-chain pairing problem. Previous methods to solve this problem involve the addition of an undesired flexible linker, *in vitro* assembly or coupling mutations. These approaches suffer from poor production yields, low *in vivo* stability, and immunogenicity. They also face great difficulty in constructing multi-specific (beyond bispecific) antibodies with an Ig-like architecture. **The researchers’ modular approach overcomes these issues to generate highly pure, bi- and multi-specific IgG’s with no additional mutations or excess amino acids. The method utilizes protease cleavable linkers to enforce correct light chain pairing and to allow for easy purifications; efficient removal of these linkers is performed post purification.** The technology has been fully validated in a laboratory setting.

ADVANTAGES

- ▶ A method for generating pure bi- and multi-specific IgG’s with no additional mutations or excess amino acids
- ▶ The method solves the light chain pairing problem without modifying the natural IgG construct
- ▶ Bi- and multi-specific antibody products have comparable yields, *in vivo* stability, and immunogenicity to their parent monoclonal IgGs
- ▶ Antibody products are easily purified and are highly pure without the presence of homo-dimer impurities
- ▶ The modular nature allows for the facile production of multi-specific antibodies

RELATED MATERIALS

- ▶ [LegoBody: facile generation of bispecific and multi-specific antibodies](#) - 12/27/2019

PATENT STATUS

Country	Type	Number	Dated	Case
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OTHER INFORMATION

KEYWORDS

Bispecific Antibodies,

Multispecific Antibodies,

Platform Antibody

Technology, Protease

Cleavable Linkers, Light

Chain Pairing, Antibody

Generation

CATEGORIZED AS

- ▶ [Biotechnology](#)
- ▶ [Health](#)
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RELATED CASES

2019-210-0

European Patent Office	Published Application			2019-210
Patent Cooperation Treaty	Published Application	WO 2021/050527	03/18/2021	2019-210

Additional Patent Pending

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