

# 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
- ▶ **Medical**
- ▶ Delivery Systems
- ▶ Therapeutics

### RELATED CASES

2019-210-0

European Patent Office  
Patent Cooperation Treaty

Published Application  
Published Application

[WO 2021/050527](#)

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2019-210

Additional Patent Pending

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