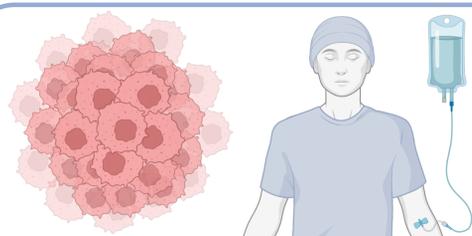


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## 1 - Cancer



### Cancer, the most feared disease

- There are about **14 million** new cancer cases globally each year
- **950 people** a day diagnosed with cancer in England



### What are the problems?

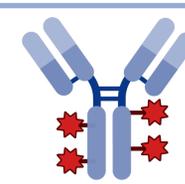
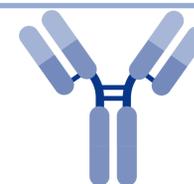
- Cancer is group of diseases
- Heterogeneity
- Resistance and relapses

## 2 - Antibody-based therapeutics



### Deep understanding of cancer permitted the development of antibody-based therapeutics

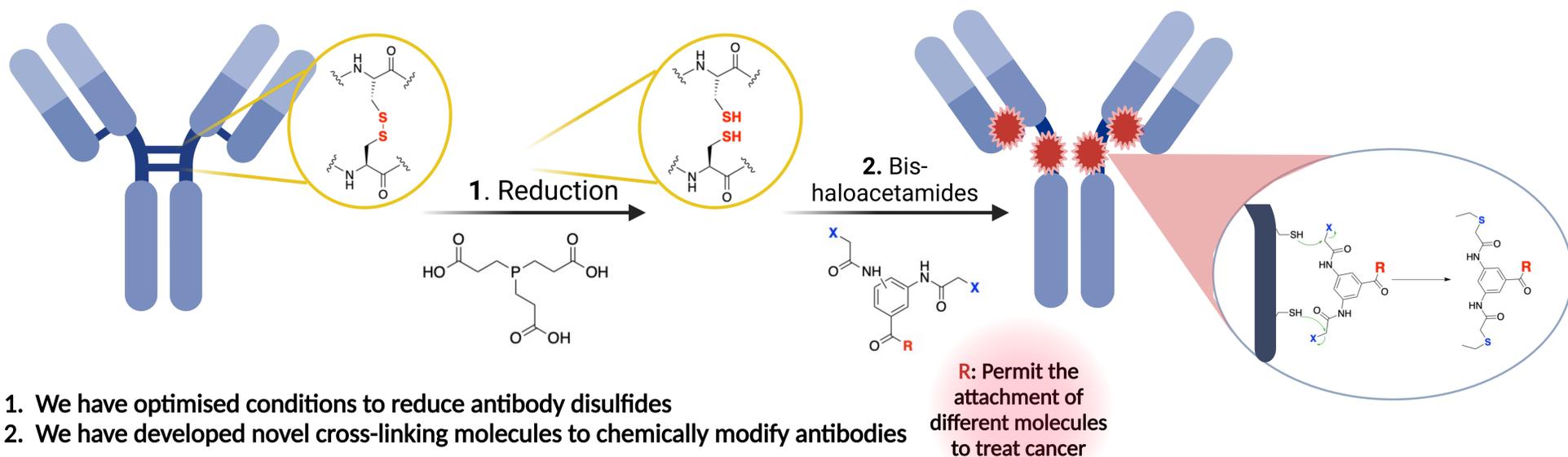
- From the top 10 selling blockbuster products in 2023: Seven were biologics (5 antibodies)
- The antibody therapeutic market is expected to reach \$900 Bn in 2032



### Antibody success inspired the development of :

- Antibody-drug conjugates
- Antibody-siRNA conjugates
- Bispecific Antibodies
- Antibody fragments

## 3 - Our approach: Bis-haloacetamide linkers to develop antibody therapeutics

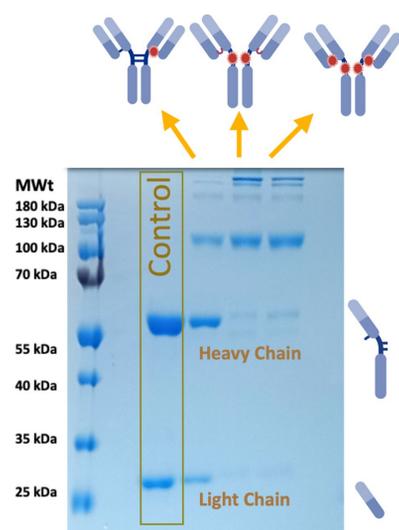


1. We have optimised conditions to reduce antibody disulfides
2. We have developed novel cross-linking molecules to chemically modify antibodies

## 4 - Our Findings

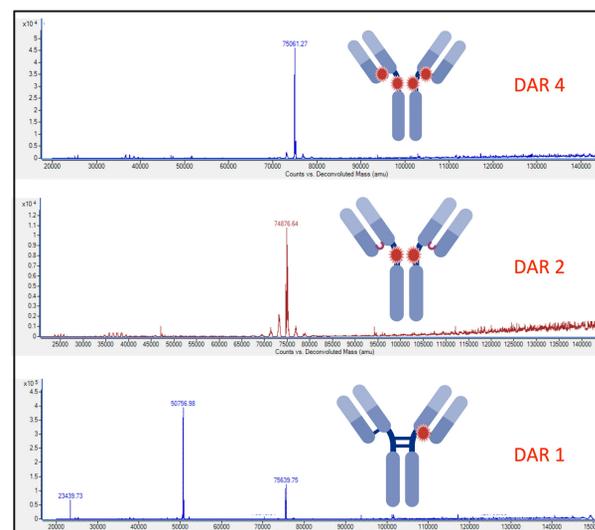
### The advantages of this approach

#### Versatility in labeling



SDS gel of antibody conjugates with 1, 2 or 4 linkers attached

#### High yields and pure products



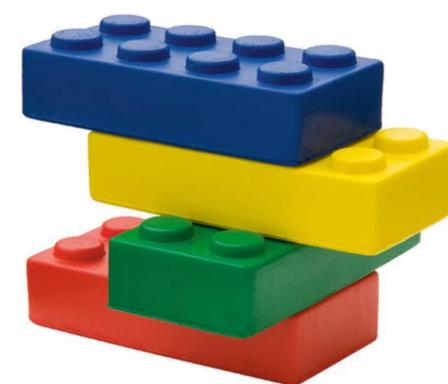
MS data of mAb conjugates (products)  
DAR: Drug Antibody Ratio

#### Stable products



SDS gel of fluorescent conjugate

## 5 - Applications



### A LEGO-based approach

This approach allows discovery of new drug classes by linking antibody fragments together

## 6 - References

- Watts, A.; Alkhawaja, B. Bis(2-Haloacetamido)-Compounds for Use as Linking Agents and Resultant Products Which Comprise Antibodies, Half-Antibodies and Antibody Fragments, June 25, 2020 (Patent No. WO2020260514).
  - Alkhawaja et al. Facile Rebridging Conjugation Approach to Attain Monoclonal Antibody-Targeted Nanoparticles with Enhanced Antigen Binding and Payload Delivery. *Bioconjug. Chem.* 2024.
  - Alkhawaja et al. Dissecting the Stability of Atezolizumab with Renewable Amino Acid-Based Ionic Liquids: Colloidal Stability and Anticancer Activity under Thermal Stress. *Int. J. Biol. Macromol.* 2024
- Funding  
• Engineering and Physical Sciences Research Council (EPSRC, PhD studentship)

- An adaptable conjugation approach which enables the discovery of new drug classes while also providing a more efficient drug manufacturing process