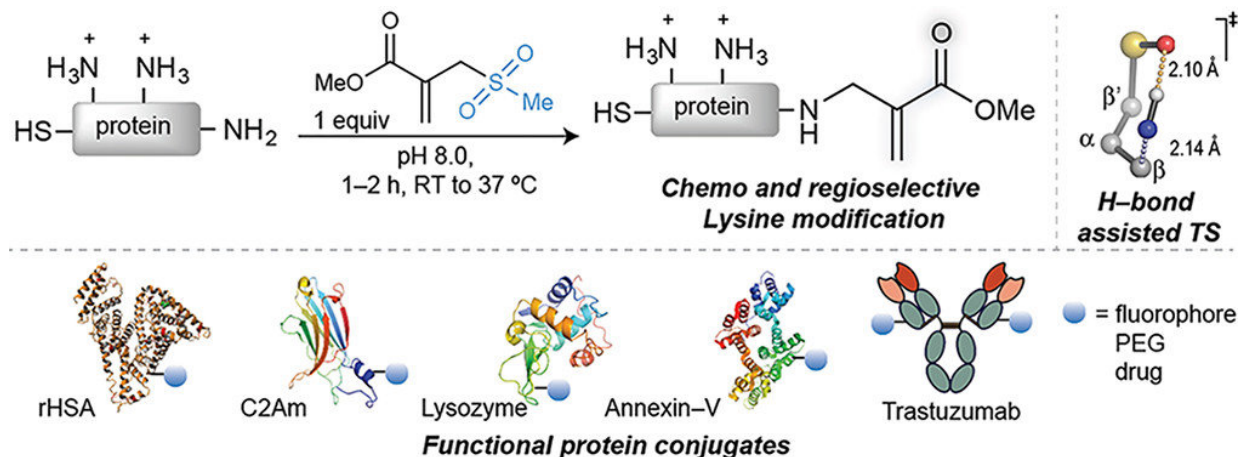


How to spark a chemical chain reaction

March 9 2018



Tailor-made protein drugs in the fight against cancer and other diseases are a step close, with the Centre for NanoScale Science and Technology at Flinders playing a part in one of the latest chemistry discoveries in effectively modifying therapeutic proteins.

Just published in the *Journal of the American Chemical Society*, a new paper titled "Chemo- and Regio-selective Lysine Modification on Native Proteins," describes a process which allows molecules, such as drugs, to be attached to antibodies and other proteins at precise locations.

"Most current methods for attaching drugs to proteins result in unwanted mixtures that can compromise [protein](#) function," says Flinders

University Senior Lecturer in Synthetic Chemistry Dr. Justin Chalker, who is a collaborator on the research.

"In contrast, our [chemistry](#) is easy to do and highly precise," he says.

The international team of researchers, led by Gonalo J. L. Bernardes from the University of Cambridge and the Institute of Molecular Medicine Lisbon and Gonzalo Jim9nez-Os9s of the University of Rioja in Spain, has discovered a sulfonyl acrylate reagent that should give researchers more options for modifying proteins.

The reagent selectively targets only the most reactive lysine in a protein, and not other lysines or buried cysteines.

Lysines are nucleophilic and much more abundant than cysteines, representing about 5.9% of the amino acids in human proteins, the paper says.

"Most excitingly, the chemistry can be applied directly to proteins in their native form," Dr. Chalker says.

"This means that off-the-shelf therapeutic antibodies can be modified directly, attaching drugs that the antibody directs to diseased tissue."

More information: Maria J. Matos et al. Chemo- and Regioselective Lysine Modification on Native Proteins, *Journal of the American Chemical Society* (2018). [DOI: 10.1021/jacs.7b12874](https://doi.org/10.1021/jacs.7b12874)

Provided by Flinders University

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