

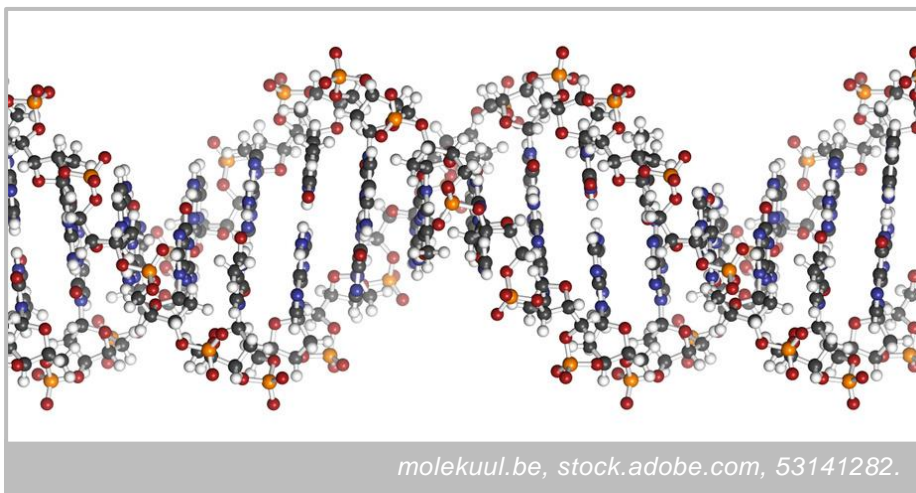
TECHNOLOGY OFFERS

Multiple Orthogonal Labeling of Oligonucleotides (P-1007)

A fast method for post-synthetic multiple orthogonal labeling of oligonucleotides with no chemical byproducts or side reactions.

EXECUTIVE SUMMARY

Labeled oligonucleotides are used in research and for diagnostic, therapeutic and industrial applications. Current labeling methods require excess of fluorescent dye and multiple reaction and purification steps. In order to overcome these disadvantages, a fast method for post-synthetic multiple orthogonal labeling of oligonucleotides was developed by combining the inverse Diels-Alder reaction (DARinv) with the well-known copper catalyzed azide-alkyne cycloaddition (CuAAC).



molekuul.be, stock.adobe.com, 53141282.

Category

Research
Tools

Indication

Development stage

Feasibility

Seeking

Licensing

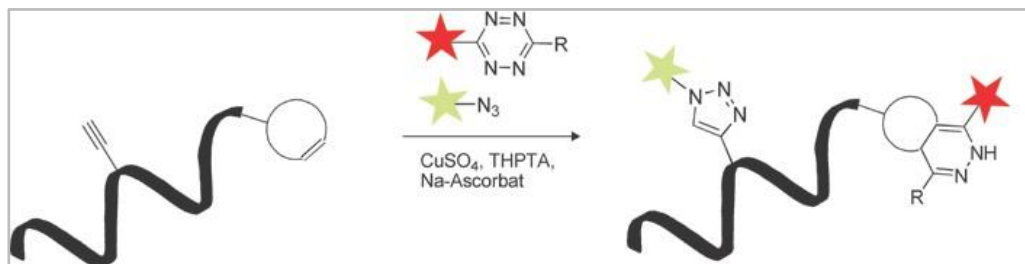
BENEFITS

In comparison with known technologies for postsynthetic multiple orthogonal labeling, the combination of the inverse Diels-Alder reaction with the CuAAC offers the following advantages:

- one step reaction
- no intermediate purification steps necessary
- no side reactions
- fast and cost-effective

TECHNOLOGY BACKGROUND

A preferred embodiment involves the reaction of an N3-reactive group as well as dienophilemodified oligonucleotide (RNA or DNA) with an N3-modified label via a CuAAC reaction as well as a tetrazine-label via an inverse Diels-Alder reaction.



DEVELOPMENT STAGE

The method was tested and validated for a variety of oligonucleotides of different lengths.

APPLICATIONS

The method can be used for research, biotechnology, diagnostic, and therapeutic applications. The technology allows the modification of oligonucleotides with a multitude of labels such as: fluorescent dyes, small molecules, peptides, antibodies, affinity tags, and other biomolecules.

INTELLECTUAL PROPERTY

Patented.

- [International PCT application "Multiple orthogonal labeling of oligonucleotides" WO2013029801A1](#)
[The subsequent national patent has been granted in Europe as EP2751125B1 and in the USA as US9315537B2.](#)

PUBLICATIONS & REFERENCES

- -----

DKFZ Contact:

Dr. Christian Kliem
Deutsches Krebsforschungszentrum
Innovation Management T010
Email: C.Kliem@dkfz.de
Tel.: +49-(0)6221-42-2948
Fax: +49-(0)6221-42-2956

ABOUT THE DKFZ INNOVATION MANAGEMENT

Working at the interface of research and industry, the Innovation Management of the German Cancer Research Center (DKFZ) helps to get new cancer medications, diagnostic tests, and research instruments onto the market as quickly as possible.

The DKFZ with its more than 3,000 employees is the largest biomedical research institution in Germany. At the Center more than 1,300 scientists investigate how cancer develops, identify cancer risk factors and endeavor to find new strategies to prevent people from getting cancer. They develop novel approaches to make tumor diagnosis more precise and treatment of cancer patients more successful. DKFZ is a member of the Helmholtz Association of National Research Centers, with ninety percent of its funding coming from the German Federal Ministry of Education and Research and the remaining ten percent from the State of Baden-Württemberg