

TECHNOLOGY OFFERS

Easy, Economical and Reliable Post-Synthetic Modification of Nucleic Acids (P-870)

A high yielding and highly specific click chemistry method to link molecules together under mild conditions.

EXECUTIVE SUMMARY

Solid-phase chemistry approaches for sitedirected modifications are laborious and suffer from inherited drawbacks including limits on the length of synthesized oligonucleotides and on the variety of their incorporated chemical functionality. The “Click chemistry” of this invention is a high yielding and highly specific method to link molecules together under mild conditions.

DKFZ is currently seeking a commercial partner to develop this technology under an exclusive licence and/or collaboration agreement.



Category

Research
Tools

Indication

Imaging

Development stage

Prototype

Seeking

Licensing, Commercial &
Development Partner

BENEFITS

- Variety of application: labelling, drug discovery, material studies, biomolecule research
- Attractive for conjugation of expensive and sensitive compounds
- Suitable for simple and complex molecules
- High yielding, easy to monitor, non-toxic reactions

TECHNOLOGY BACKGROUND

The “Click reaction” used is the well-known Diels-Alder reaction with inverse electron demand (DARinv). In contrast to NHS-ester chemistry and copper-catalyzed azide-alkyne cycloaddition DARinv works efficiently at very low reactant concentrations, without the requirement of transition metals and much lower excesses of labeling reagent.

This is particularly relevant for potential applications of this coupling chemistry in cells, where high concentrations of copper are not tolerated. In comparison with other recent bioconjugation methods, the functional groups required for DARinv are easy to synthesize and incorporate into oligonucleotides.

DEVELOPMENT STAGE

Convincing data are available for the ligation of oligonucleotides of up to 100 nucleotides long.

APPLICATIONS

- Imaging of targets inside of cells
- *in vivo* imaging
- Delivery of diagnostics or therapeutics into cells

INTELLECTUAL PROPERTY

Patent application submitted.

- PCT and EPO patent applications were filed (see WO2011095336A2) and nationalized as EP2531514A2 and US9169283B2 (granted).

PUBLICATIONS & REFERENCES

“Post-synthetic modification of DNA by inverse-electron-demand Diels-Alder reaction” by Schoch J, Wiessler M, Jäschke A in J Am Chem Soc. 2010 Jul 7.

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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.