Recent advances in design of copper chelating ligands such as THPTA or BTTAA improved kinetics of copper-catalyzed azide-alkyne cycloaddition reaction, or CuAAC and greatly increased sensitivity of alkyne detection. Despite the recent improvements CuAAC is not without limitations. The reaction kinetics is still slow for detection of low abundance targets. In addition, to achieve sufficient labeling efficiency many protocols call for the use of relatively high concentrations of azide reagent (up to 50 μM), and copper (up to 2 mM), which might result in high background signal due to nonspecific covalent labeling.

The next step in improving kinetics of CuAAC was introduction of copper chelating moiety into azide reporter to raise the effective Cu(I) concentration at reaction site (Figure 1).

The rate of CuAAC reaction depends on concentrations of all reagents, including copper, thus the raise of the effective copper concentration at the reaction site dramatically increase the rate of CuAAC reaction without the need to increase concentration of azide reagent and copper.

The only practically useful azide bearing an internal copper-chelating motif that has been reported to date are electron-donating picolyl azides. The effect of internal copper-chelating motif on the kinetics of CuAAC, and consequently on sensitivity, is so great that it leads to several fold increase in signal intensity compared to conventional, non-chelating azides. This will be of special value for the detection of low abundance targets.

In addition to the gain in sensitivity, the use of picolyl-containing reporters allows for at least a tenfold reduction in the concentration of the copper catalyst without sacrificing sensitivity of alkyne detection.

Selected References:
Click Chemistry Tools offers the largest selection of picolyl azide conjugated to fluorescent dyes. Our section of fluorescent probes includes AFDyes, Cy Dyes and classic dyes conjugated to azide groups. The photophysical properties of our AFDyes are exact match to Alexa Fluor® Dyes. The combination of exceptional reactivity of picolyl azide moiety with brightness AFDyes makes these probes of special value not only for detection of low abundance target but also for all other applications where increased S/N ratio is great value.

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**Fluorescent Picolyl Azides**

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AF Dyes are GENERIC versions of Alexa Fluor® Dyes and ARE NOT manufactured, distributed, or affiliated in any way with Thermo Fisher Scientific.
### Fluorescent Picolyl Azides

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### Biotin Picolyl Azide

**CAS:** n/a

**MW:** 622.74

**Solubility:** DMSO, DMF

**Description:** Biotinylation reagent with superior in copper-catalyzed click reactions.

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### Dde Biotin Picolyl Azide

**CAS:** n/a

**MW:** 815.98

**Solubility:** DMSO, DMF, THF, DCM

**Description:** Biotinylation reagent with superior in copper-catalyzed click reactions.

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