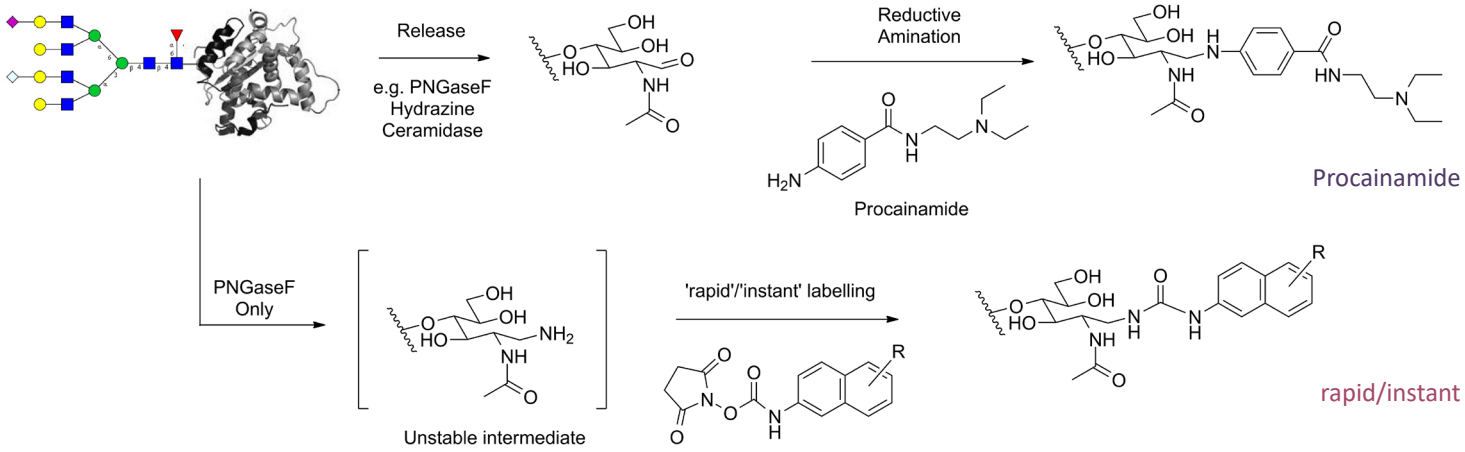
Advantages of Ludger procainamide labelling vs rapid/instant tags

Urbanowicz PA, Hendel JL, Kozak RP -- Ludger Ltd, Culham Science Centre, Oxfordshire, UK

Procainamide and rapid/instant tags are labels of choice when high fluorescence detection (FLD) and mass spectrometry (MS) sensitivity is required. Choosing between labelling strategies for glycan analysis using liquid chromatography (LC) and MS is a difficult task. According to recent scientific reports, both procainamide and rapid/instant tags show comparable FLR and MS sensitivity. Both labelling procedures have short processing times and good repeatability. However, procainamide offers several advantages over rapid/instant tags (Keser T, *et al.* Front Chem. 2018;6:324).

The advantages of procainamide result from differences in labelling chemistry



Procainamide labels through reductive amination	rapid/instant tags label the glycosylamine
Labelling Chemistry	
This is the same chemistry as the industry gold standard labelling systems such as 2AB, 2AA, APTS, PA. This technology is well established, widely used and accepted by the regulators (FDA, EMA, ICH).	This is a technology recently introduced for *N*-glycan analysis. It requires PNGase F release and labelling in quick succession in the same reaction pot.
PNGaseF Conditions and Labelling Efficiency	
Released glycans spontaneously convert from the glycosylamine to the free aldehyde in solution allowing for procainamide labelling after even extended incubation with PNGaseF (many complex glycoproteins (EPO, FSH) require longer incubation time with PNGaseF to achieve complete deglycosylation).	As labelling with rapid/instant tags relies on the presence of glycosylamine group, a longer release time might compromise the labelling efficiency.
Analytical Workflow	
If you are developing new analytical workflows for glycan analysis you can adapt the industry gold standard method. If you currently use reductive amination technology, this means that switching to procainamide labelling requires altering only one step in your current workflow.	If you currently use reductive amination technology and want to switch to rapid/ instant technology you will need to optimise the entire workflow.
Sample Types	
This chemistry works with all glycans containing aldehyde group such as released *N*-, *O*-glycans, glycosphingolipids (GSL), glycosaminoglycans (GAG) e.g. heparins.	The rapid/instant labelling chemistry only works with released *N*-glycans in glycosylamine form which is an unstable intermediate.
Availability of Standards	
Commercial glycans are available in the aldehyde form and therefore can be used as a system suitability standards or reference standard. Panels of well characterised, purified unlabelled and labelled glycan standards are available.	Very limited labelled glycan standards are available commercially. Commercial unlabelled glycosylamine glycan standards are not available.

Procainamide labelling workflow offers flexibility, and is easy to adapt. The wide range of glycan standards that are available at Ludger and can be used in the procainamide workflow which enables you to monitor and control the entire analytical process and gives you confidence in the quality of generated data.

For more information on the procainamide labelling system and related products, including glycan standards visit:
www.ludger.com/procainamide