Table 1. Commonly Used Exoglycosidases for Oligosaccharide Sequencing

Short name	Full name	Source	Specificity
ABS	α(2-3,6,8,9)-Sialidase	Recombinant *Arthrobacter ureafaciens* gene, expressed in E. coli	α(2-3,6,8,9)-specific, cleaves all non-reducing terminal branched and unbranched sialic acids.
NAN1	α(2-3)-Sialidase	Recombinant Streptococcus pneumoniae gene, expressed in E. coli	Releases α(2-3)-linked sialic acid.
BKF	α(1-2,3,4,6)-Fucosidase	Bovine Kidney	Releases non-reducing terminal α(1-6) core-linked fucose more efficiently than other α-fucose linkages. Frequently used for release of core fucose residues.
XMF	α(1-2)-Fucosidase	*Xanthomonas manihotis*	Releases non-reducing terminal α(1-2)-linked fucose.
AMF	α(1-3,4)-Fucosidase	Almond Meal	Releases non-reducing terminal α(1-3,4)-linked fucose. Does not release core linked fucose in α(1-3,6) configuration.
BTG	β(1-3,4)-Galactosidase	Bovine testis	Releases non-reducing terminal β(1-3,4)-linked galactose residues.
SPG	β(1-4)-Galactosidase	*Streptococcus pneumoniae*	β(1-4) specific galactosidase removes galactose residues from non-reducing terminal.
CBG	α(1-3,4,6)-Galactosidase	Coffee Bean	Hydrolyses α(1-3,4,6)-linked terminal galactose residues.
JBM	α(1-2,3,6)-Mannosidase	Jack Bean	Releases non-reducing terminal α(1-2,6)-linked mannose residues more efficiently than α(1-3).
GUH	β-N-Acetylhexosaminidase	Recombinant *Streptococcus pneumoniae* gene, expressed in *E. coli*	Releases all non-reducing terminal β-linked N-acetylglucosamine but not bisecting GlcNAc β(1-4)Man residues.
JBH	β-N-Acetylhexosaminidase	Jack Bean	Specific to all non-reducing terminal β(1-2,3,4,6)-linked N-acetylglucosamine and N-acetylgalactosamine residues.

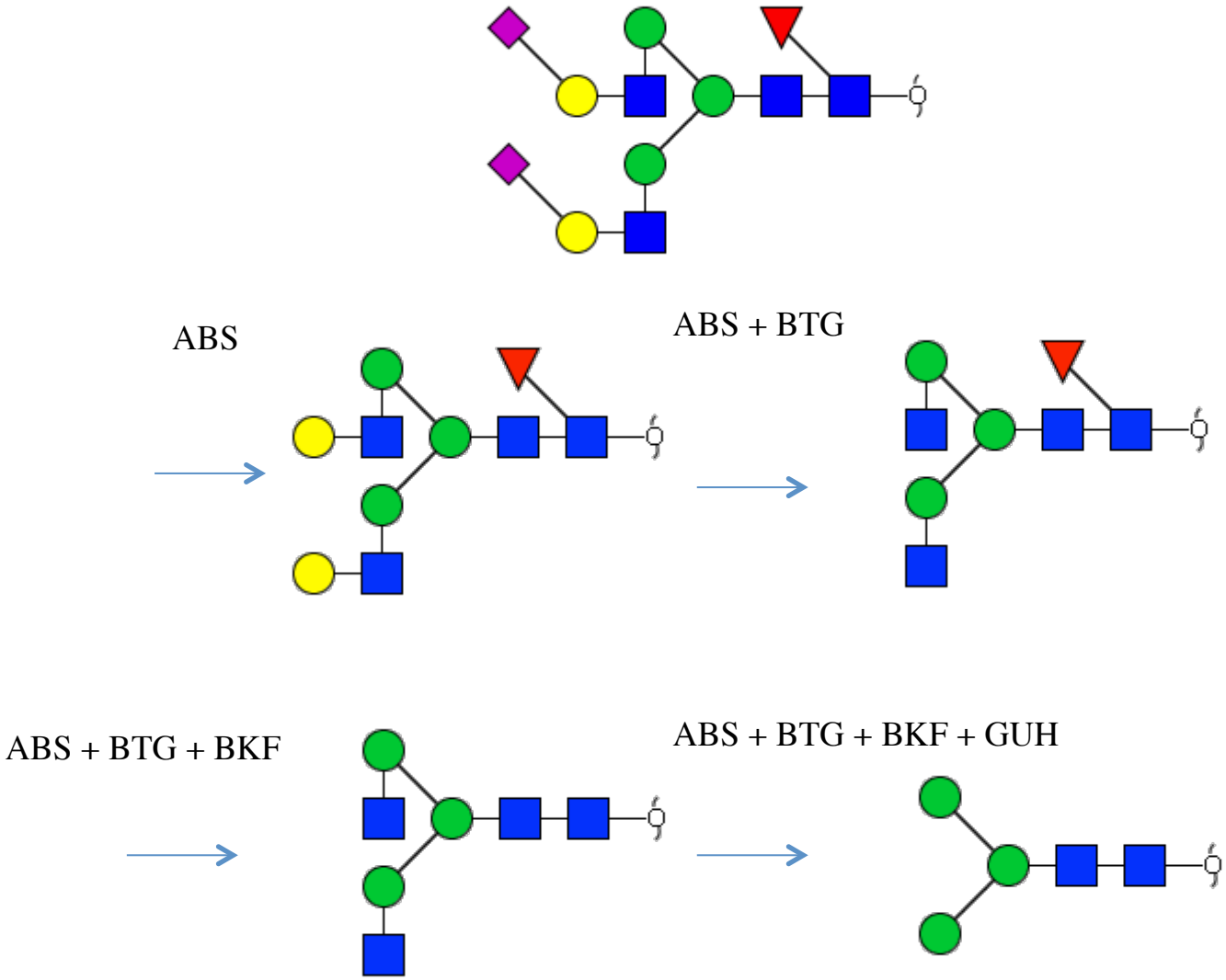

Fig. 2. An exoglycosidase array for the complete sequencing of a bi-antennary doubly sialylated and core fucosylated N-link glycan. The enzyme panel sequentially digests the glycan from the non-reducing end to the chitobiose core.

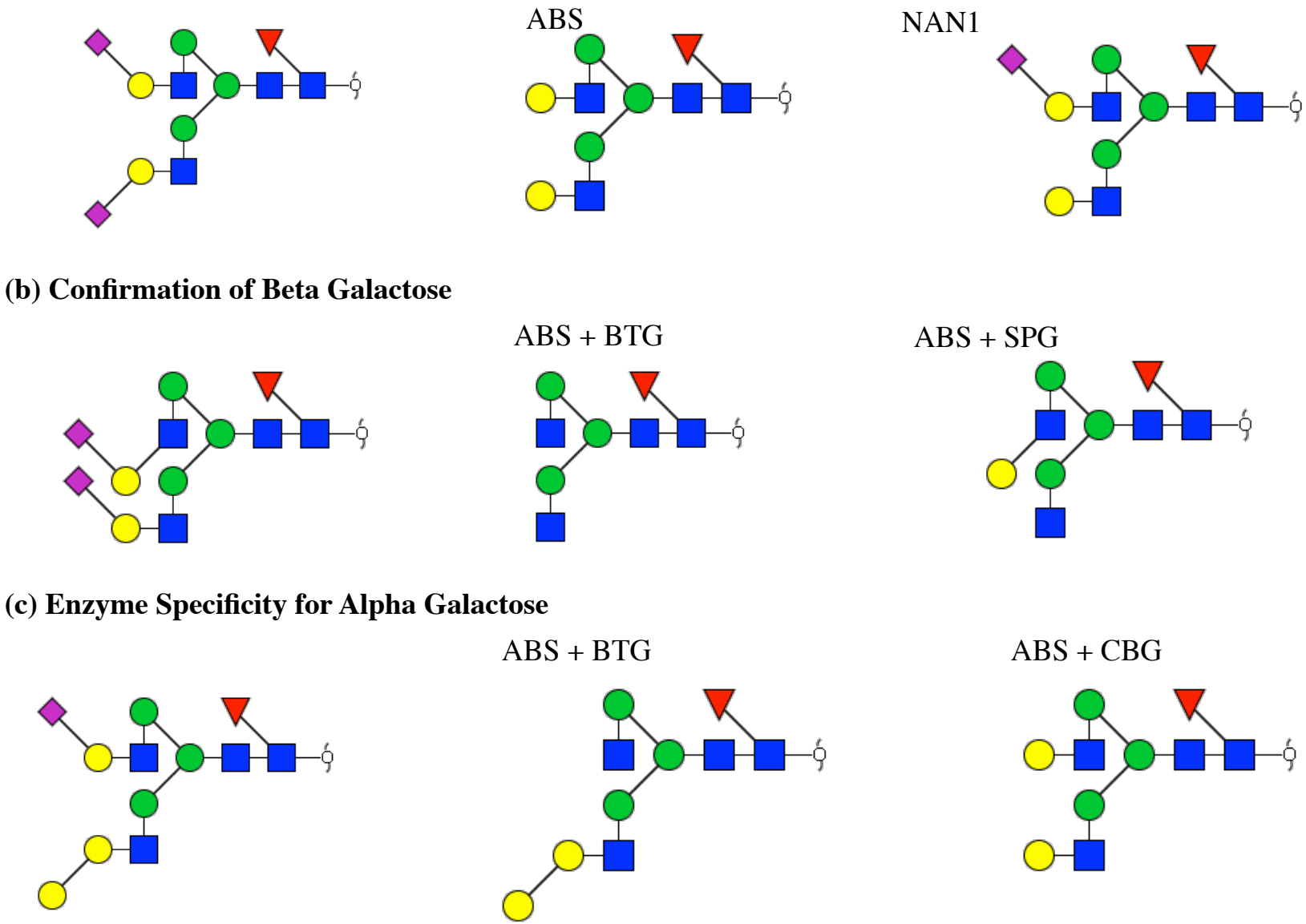

Fig. 1. Example enzyme combinations that can be used for oligosaccharide sequencing: (a) Typically, to confirm the presence of α(1-3) or α(1-6) terminal sialic acids the released glycans are treated with ABS or NAN1; (b) the β(1-4) specific galactosidase SPG can be used to distinguish between β(1-3,4) galactose residues, which can be cleaved by BTG; (c) the anomeric configuration of galactose residue can be determined by the introduction of SPG that cleaves α-galactose residues only.