

# Minor groove binder (MGB) probes

## Combine proven technology with leading excellence in oligonucleotide synthesis

**MGB** is the latest addition to LGC Biosearch Technologies™ diverse selection of probe chemistries. With over 40 years of leading excellence in oligonucleotide synthesis, we now offer:

- License free MGB probes for any application
- High-quality cost-competitive oligos manufactured under ISO 9001 and ISO 13485
- Multi-site manufacturing operations that provide redundancy, risk mitigation and surge capacity.

### MGB probe specifications

Probe length	8-30 bases
Dyes available	FAM, TET, CIV™, HEX, Quasar® 570, CAL Fluor® Red 610, Quasar® 670
Quenchers available	Eclipse Dark Quencher (EDQ)
Yield	(5)10, (15)20, (45)60 nmols delivered (Quasar 670)*
Purification	RP-HPLC
Delivery format	Dry or in solution (TrisHCl, T10E0.1, T10E1)
Quality control	MS and UHPLC
Quality standard	ISO 9001 or ISO 13485*
Shelf life	12 months from date of manufacture
Shipping conditions	Ambient temperature (dry ice for in solution)

\* Yield for ISO 13485 MGB probes are based on customer specifications.

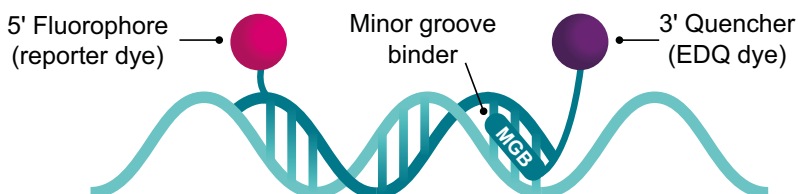


Figure 1. MGB probes are dual-labeled 5' hydrolysis probes consisting of a 5' fluorescent reporter dye and a 3' EDQ, conjugated to a MGB moiety.

- **High specificity and sensitivity**  
Increased stability from the MGB moiety allow for a shorter, more precise probe design with higher sensitivity and specificity.
- **Improved SNP detection**  
Single base mismatches have a greater destabilising effect, enhancing  $\Delta T_m$  for improved SNP detection.
- **Broad applications**  
MGB probes are routinely used in human molecular diagnostics (including pathogen detection) and agricultural biotechnology (including crop breeding, livestock and aquaculture).

Biosearch Technologies' MGB probes demonstrate equivalent performance to industry-standard MGB probes.

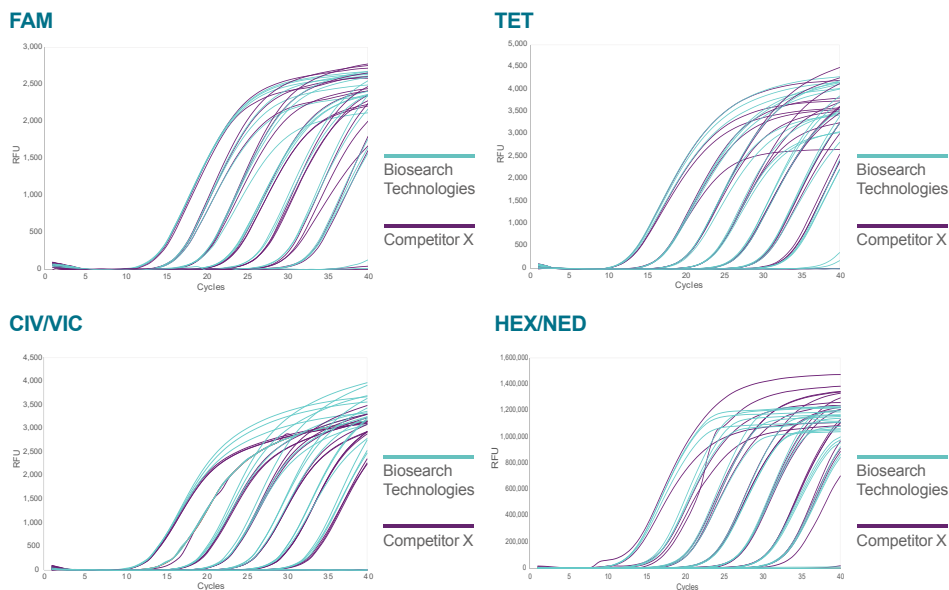


Figure 2. MGB assays were designed for the *E. coli* gene *lacZ*. The probes for each assay were synthesised 5' FAM, TET, CIV, VIC, HEX or NED and 3' MGB – Eclipse Dark Quencher (EDQ), by both Biosearch Technologies (blue) and Competitor X (purple). All non-labelled oligonucleotides were synthesised by Biosearch Technologies. The performance of each assay was monitored by running a dilution series ( $1 \times 10^2$  to  $1 \times 10^8$  copies per reaction) of *E. coli* genomic DNA in TaqMan™ Fast Advanced Master Mix, following manufacturers recommendations for assay concentrations and cycling conditions. Assays were run on a BIORAD CFX96 (FAM, TET and CIV/VIC) or an ABI QuantStudio5 (HEX/NED). The Cq values for the Biosearch Technologies and Competitor X manufactured assays were compared for each dilution point and shown to have equivalent performance, with PCR efficiency and R<sup>2</sup> values passing PCR criteria (efficiency 90-110% and R<sup>2</sup> ≥ 0.98) for all dyes.

Biosearch Technologies' MGB probes demonstrate excellent SNP genotyping differentiation on crude-extracted and highly purified complex plant species in low volume, high-throughput automated platforms.

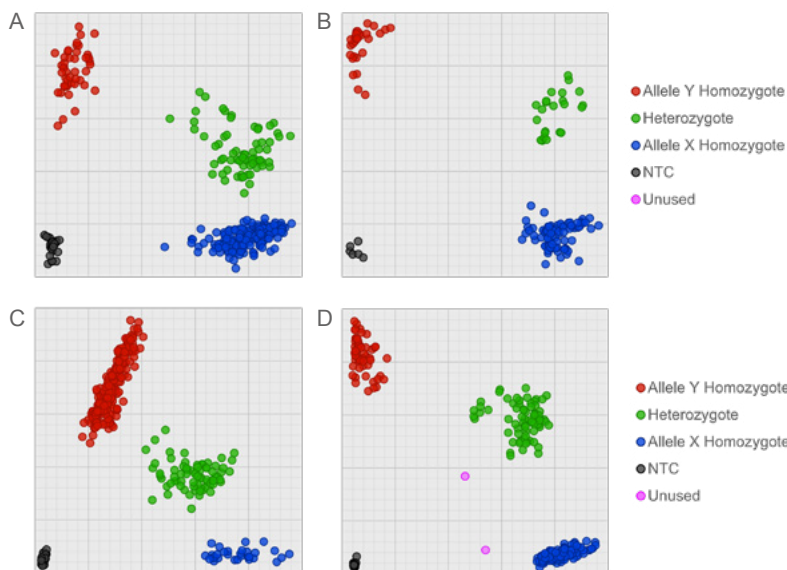


Figure 3. MGB assays synthesised with 5' FAM or CIV and 3' MGB – Eclipse Dark Quencher (EDQ) were designed for maize SNP identification. The cluster plots were generated using maize assays: (A) and (B): PZA03069\_4; (C): PZA01688\_3; (D): PZA02890\_4. Full details of all published assays tested are available on the [maize genotyping panel](#) Biosearch Technologies webpage.

Assays were run on two different Biosearch Technologies low-volume, high-throughput automation platforms, allowing for liquid handling, thermal cycling and fluorescence detection/analysis. Assays were run on the [IntelliQube™](#) in 1.6 µL reaction volumes in [Array Tape™](#) (A and B) and the [SNPlane™](#) workflow in 1 µL reaction volumes in 1536-well plates (C and D). Both crude-extracted (A, C and D) and [sbeadex™](#)-purified (B) DNA gave clear clusters, allowing for clear and easy genotype identification. All assays were run with Biosearch Technologies' [BHQ™ Probe Master Mix](#).