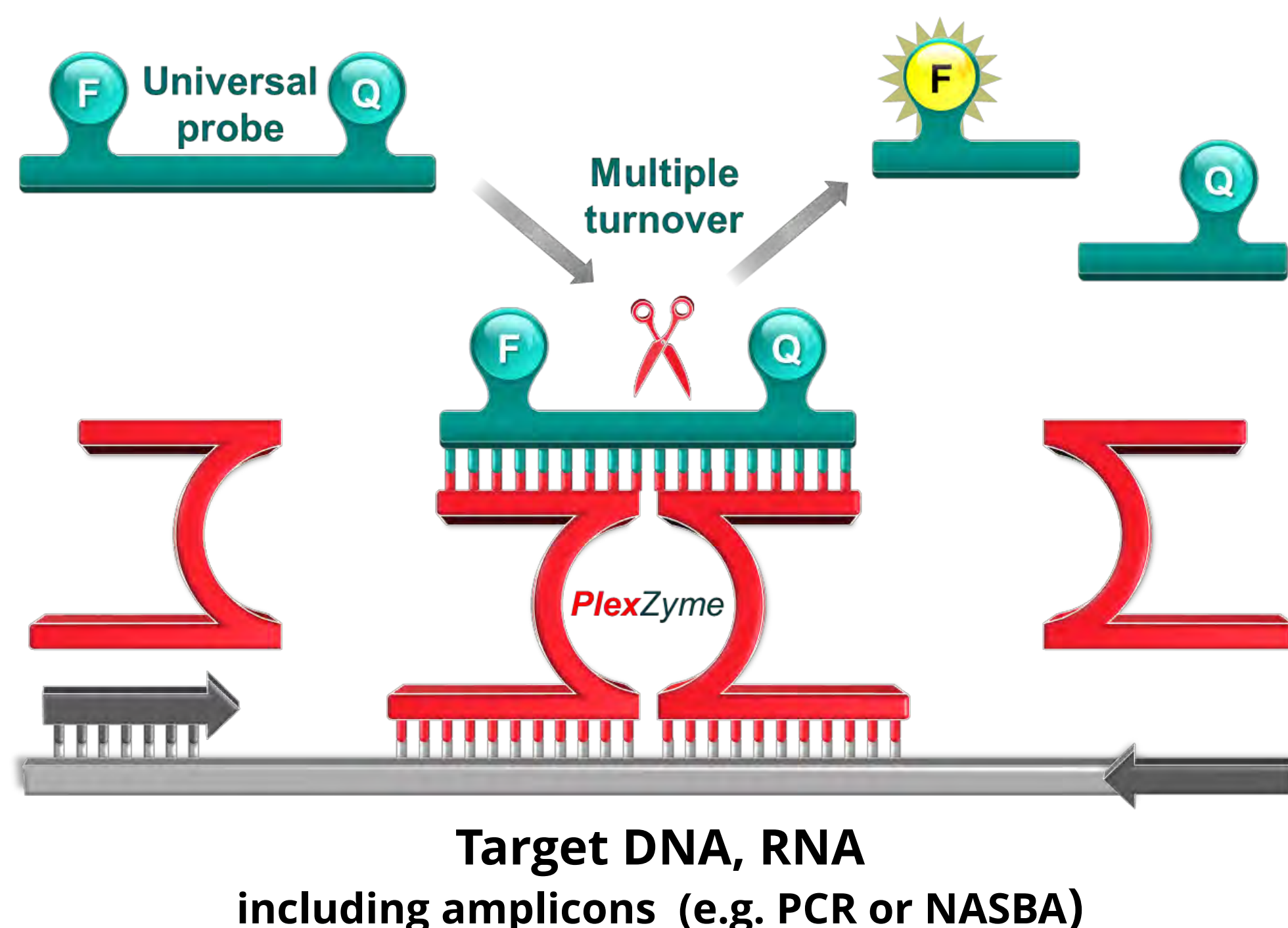


PlexZymes™: Versatile Biosensors for Target Detection

Nicole J Hasick^{a,b}; Alison V. Todd^{a,b}; Nicole E. Lima^a; Simon Bone^{a,b}
^a SpeedX Pty Ltd, ^b University of New South Wales

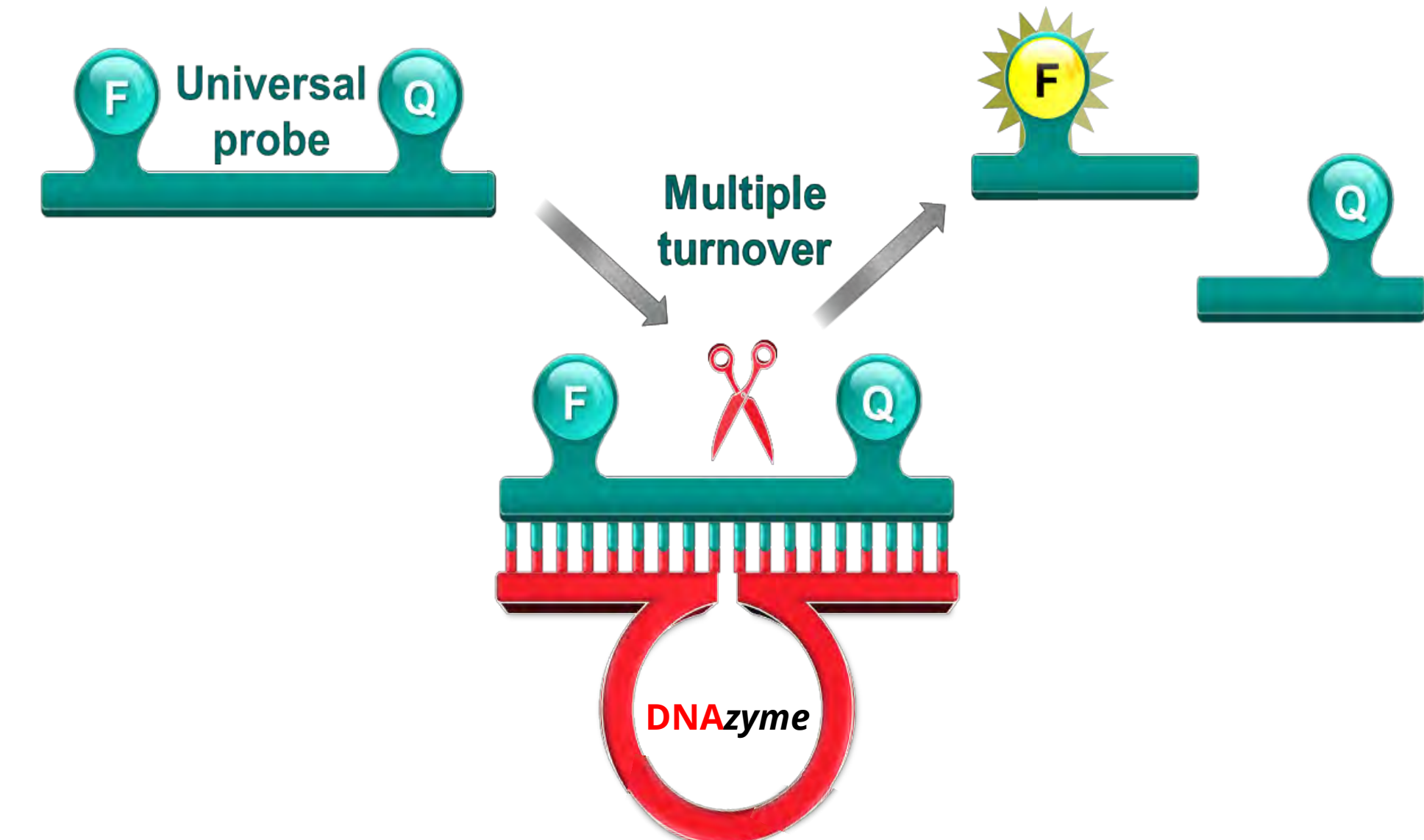
PlexZymes™ are target specific multiple turnover enzymes



PlexZymes™ are target-dependant catalytic oligonucleotide complexes comprised of two partial enzymes (PartZymes). When PartZymes bind adjacently on a target, they form active PlexZymes™ that can cleave substrates that function as universal reporter probes.

PlexZymes™ are highly specific for their targets

PlexZymes™ can be integrated with existing diagnostic technologies involving target amplification or they can act as novel switches which trigger isothermal amplification cascades allowing specific detection of genetic targets.

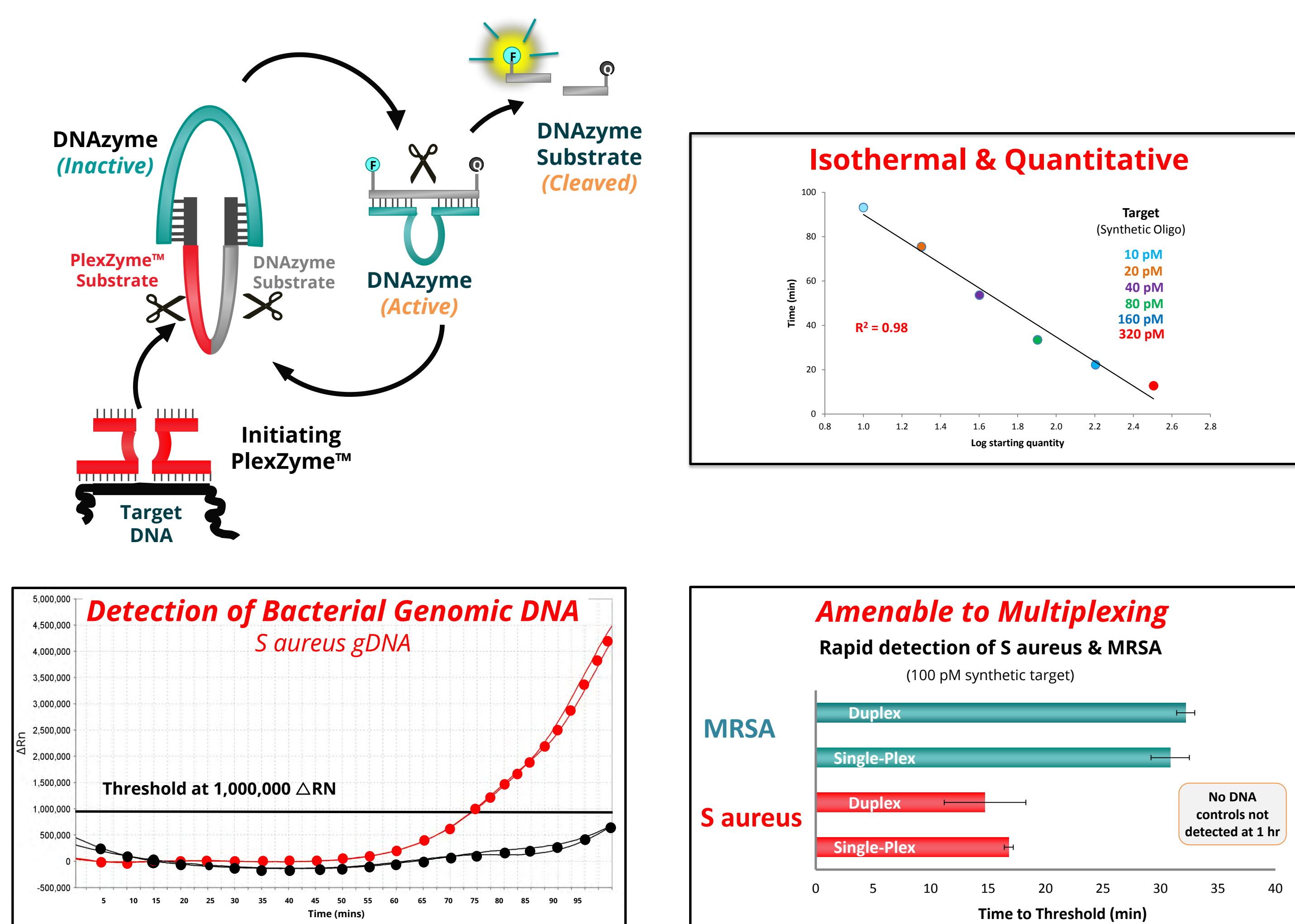


DNAzymes also cleave specific nucleic acid substrates/probes. PlexZymes™ were originally engineered from DNAzymes & can be tailored to cleave the same or different probes.

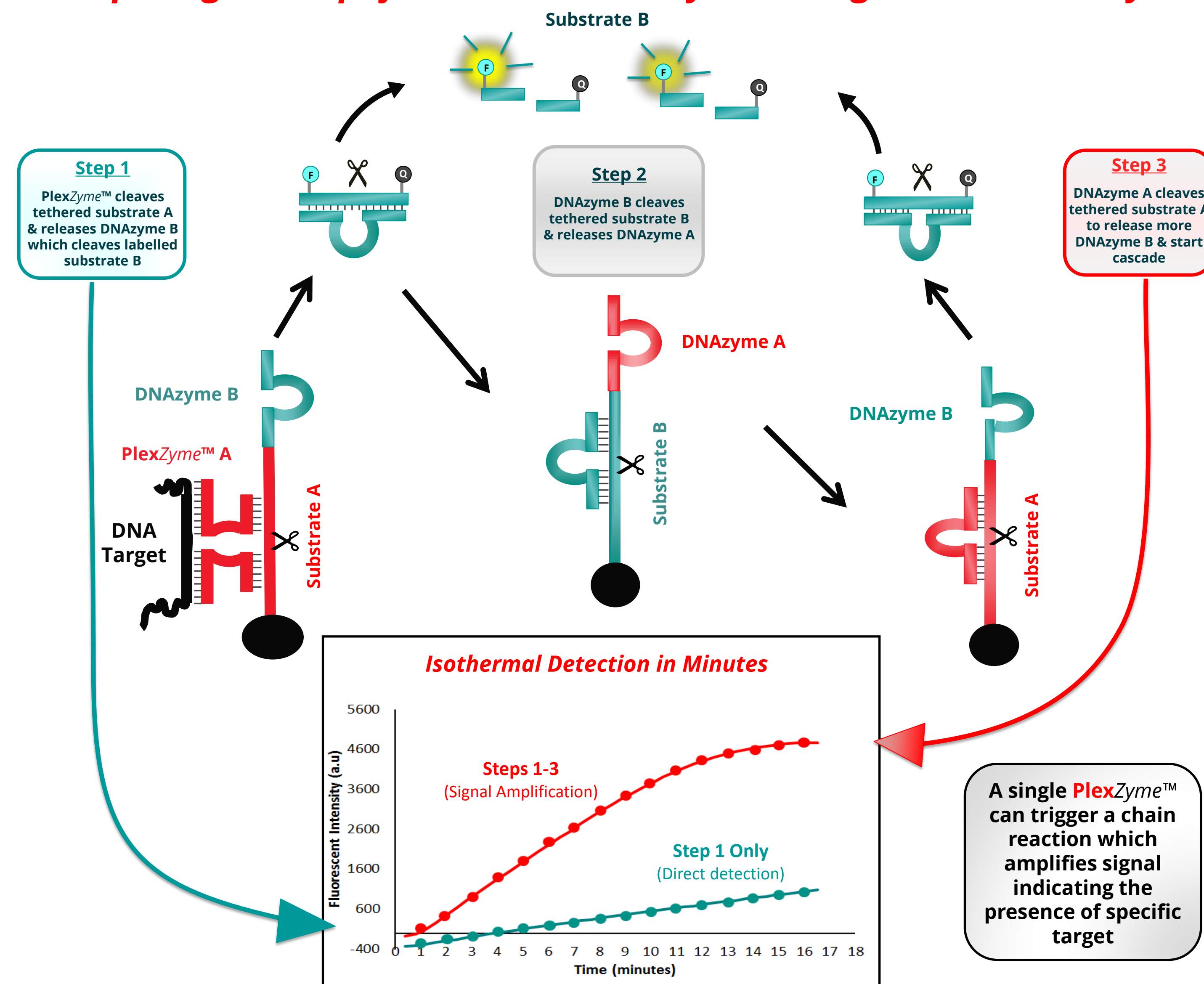
PlexZymes™ can Trigger Signal Amplification Cascades

Oligonucleotide-driven Isothermal signal amplification

PlexZymes™ trigger protein-free signal amplification cascades



Rapid signal amplification cascade by releasing tethered DNAzymes



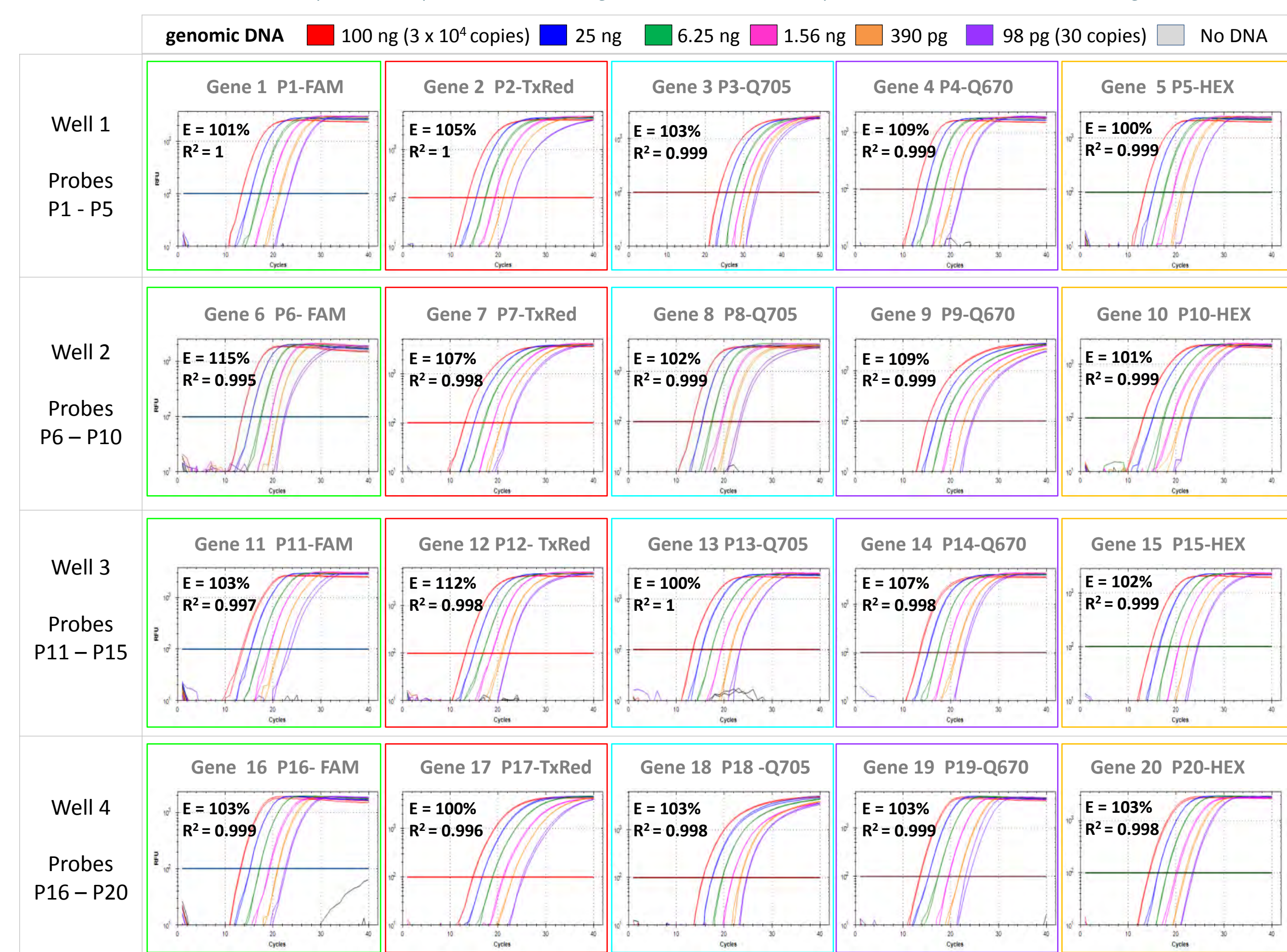
PlexZyme™ Monitor Target Amplification in Real-time

Multiplex PlexZyme™ qPCR Detection

Specific, sensitive & quantitative multiplex detection

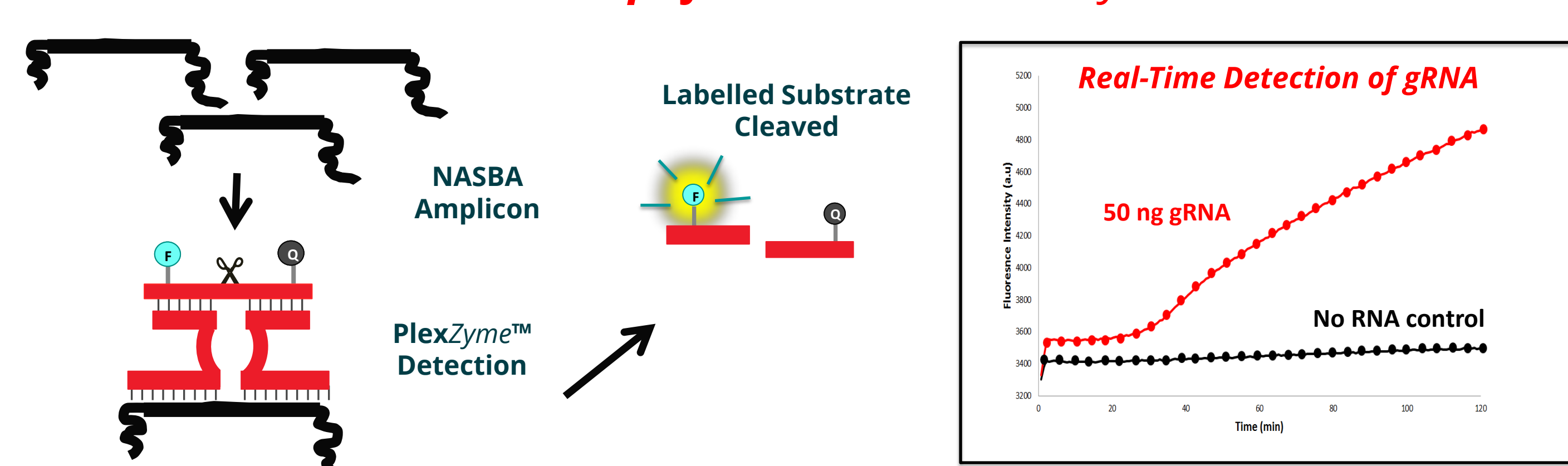
Amplification of 20 human genes simultaneously

Protocol: Master mix = 20 primer sets (for 20 genes) + 20 gene-specific PlexZymes split into 4 wells containing 20 unique PlexZyme probes (5 per well)
 Multiplex PCR amplification of human genomic DNA resulted in specific and sensitive detection of 20 genes



Nucleic Acid Sequence-Based Amplification (NASBA)

Isothermal RNA amplification with PlexZyme™ Readout



PlexZyme™ Advantages

Signal Amplification Cascades

Inexpensive reagents (oligos only)
 (~ US 3 cents/reaction)
 Highly stable reagents
 Protein free
 No replication of target required
 Amenable to multiplexing

Real-Time Target Amplification

Compatible with PCR, NASBA & other methods
 Superior multiplexing
 (More information per reaction)
 Highly specific
 Sensitive
 Rapid detection