

### Pirellula Genome Array-Ready Oligo Set™ Version 1.0

We are pleased to announce the release of Operon Pirellula AROS™ Version 1.0. The set contains 7353 longmer oligonucleotide probes representing 7353 open reading frames (ORFs) from Pirellula sp. strain 1. Each probe contains an amino linker at its 5' end.

#### Sequence source and ORF selection

All ORF sequences were obtained from the GenBank accession BX119912 (<http://www.ncbi.nlm.nih.gov/entrez/viewer.fcgi?db=nucleotide&val=32456059>).

#### Probe design and selection rules

The longmer probes are selected with an optimal set of parameters as described below.

1. The melting temperatures ( $T_m$ ) of the probes are restricted within the range of  $78 \pm 5$  °C.  $T_m$  is calculated using the following formula:

$$T_m = 81.5 + 16.6 \times \log[\text{Na}^+] + 41 \times (\#G + \#C)/\text{length} - 500/\text{length} \text{ where } [\text{Na}^+] = 0.1 \text{ M and length} = \#A + \#C + \#G + \#T$$

2. The contiguous single nucleotide repeat or poly (N) tract within a probe is limited to 8 bases or shorter.

3. The hairpin stem length of a probe is controlled at 8 bases or shorter.

4. The cross hybridization score for a probe against other non-representing (non-self) ORFs in the genome is set 70% or less of BLAST percent identity score.

5. The contiguous base match to other non-self ORFs is constrained at 20 bases or less.

The probes with the highest specificity (or the least cross-hybridization scores) are selected from a pool of candidates satisfying all the rules as described above.

The exceptions (relaxation of one or more selection rules) are made for the probe candidates of 635 ORFs (8.6%), which don't meet the rules mentioned above.

#### SUMMARY

Selection rules	Threshold	Probe number
Probe length (bases)	70	6718
Melting temperature (°C)	$78 \pm 5$	
Poly (N) tract length (bases)	< 9	
Hairpin stem length (bases)	< 9	
Cross-hybridization score (identity %)	$\leq 70$	
Contiguous base match to non-self ORFs (bases)	$\leq 20$	
Exceptions		635
<b>Total</b>		<b>7353</b>

The following illustrations show the distribution of all 7353 probes for oligo length, melting temperature, GC content, distance from 3' end, hairpin stem length, and cross-hybridization identity.

Figure 1. Oligo length

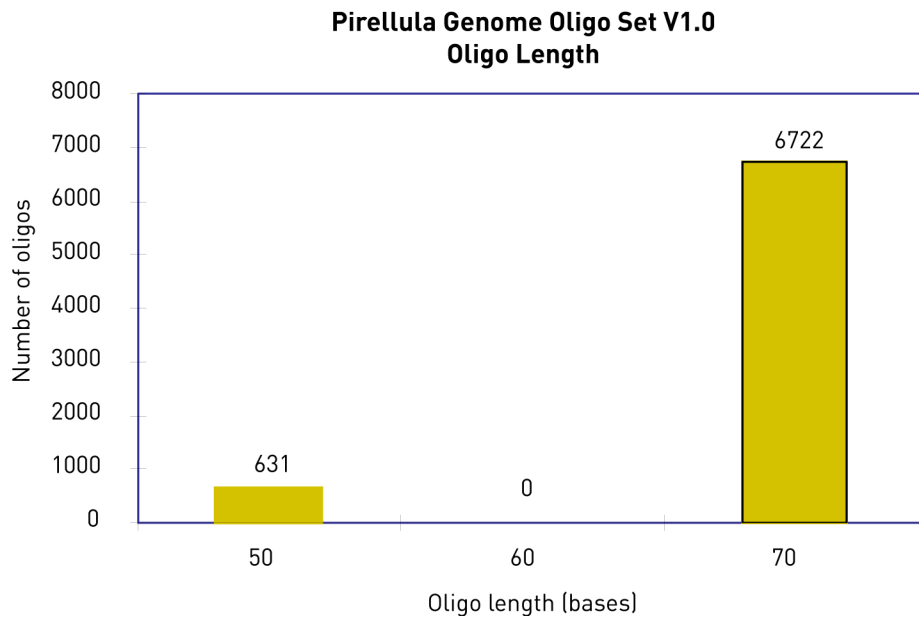


Figure 2. Melting temperature

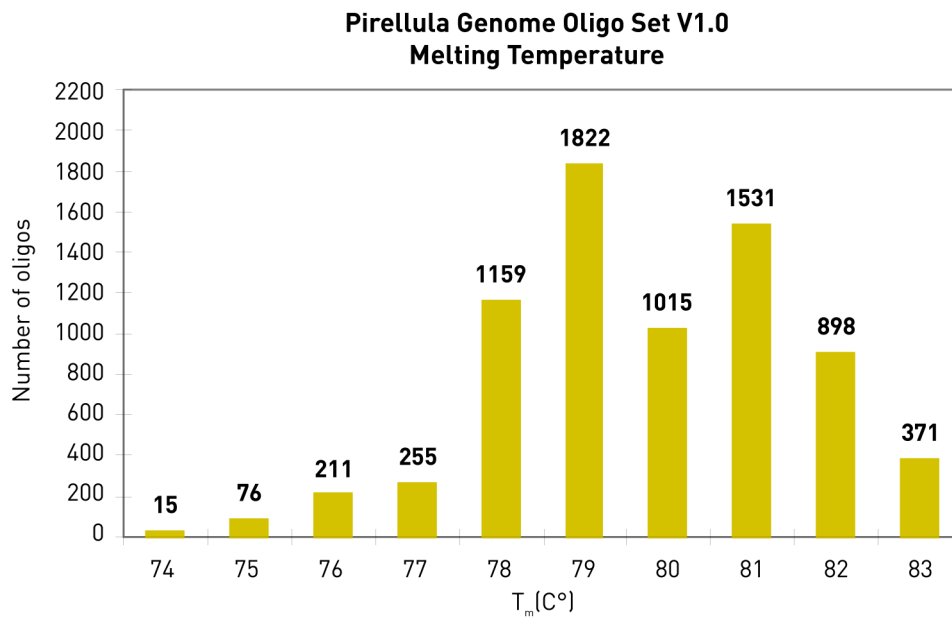


Figure 3. GC Content

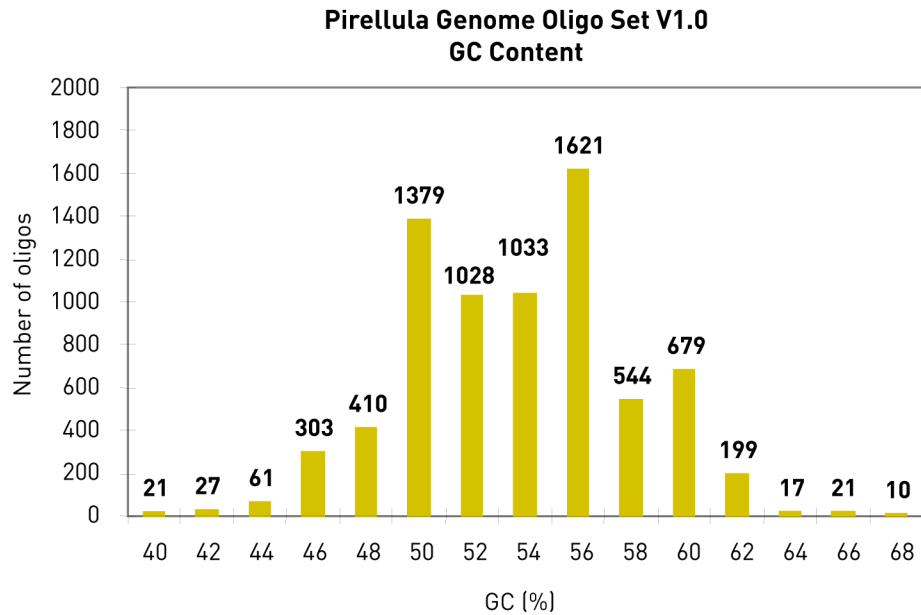


Figure 4. Distance from 3'-end

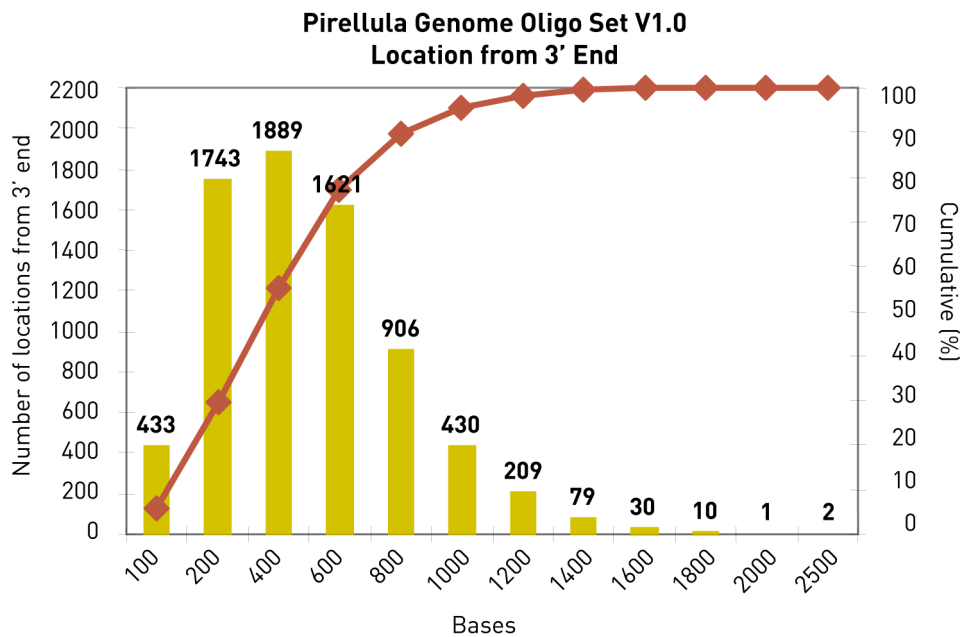


Figure 5. Hairpin stem length

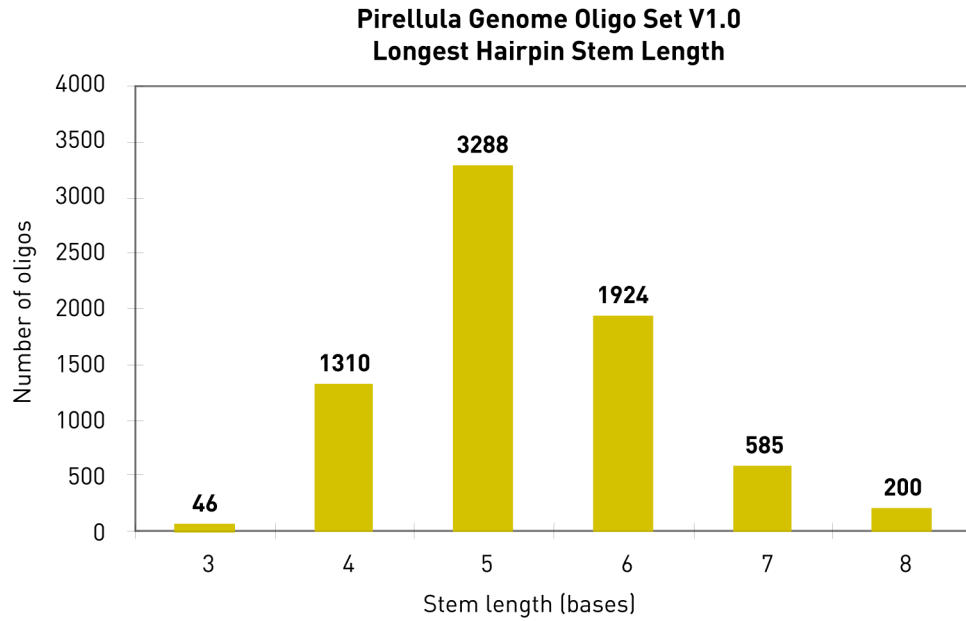


Figure 6. Cross-hybridization score

