

# Element Biosciences Library Sequences

## Library structures compatible with the Element AVITI™ System

### Introduction

The Element AVITI System is compatible with the Element Adept™ Library Compatibility Workflow and Element Elevate™ Library Prep Workflow. Library design can pose certain challenges, such as compatibility, custom primers, custom libraries, and low-diversity amplicon sequencing. This technical note provides sequences associated with both workflows to help optimize sequencing experiments.

### Adept library design

The Adept Workflow circularizes or amplifies a library prepared with third-party kits. Circularization anneals a long and short splint oligo, resulting in a library that includes third-party indexes and adapters and an Element short splint oligo (Figure 1). An amplified library also includes third-party indexes and adapters, and is appended with Element sequences added via PCR.

Cloudbreak Freestyle™ sequencing kits are designed to enable sequencing of a third-party library without the Adept Workflow. For these libraries, consult the third-party documentation to determine the library structure and sequences.

### Elevate library design

#### Primer sequences

The Elevate Workflow prepares libraries that include Read 1 and Read 2 sequencing primers and SP5 and SP27 outer primers (Table 1). Figure 2 presents the library structure, which adds three random and diverse bases to the 9 bp Index 1 sequence.

#### Long Splint

5'–TCGCCGTATCATTACCCTGAAAGTACGTGCATTACATGGATCAGGTGAGGCTGCGACGACTCAAGCAGAAGACGGCATAACG–3'

#### Short Splint

5' –Phosphate– AGTCGTCGCAGCCTCACCTGATCCATGTAATGCACGTACTTTCAGGGT–3'

Figure 1. A circular Adept library includes both a long and short splint oligo.

#### Sequencing Primers

Read 1 5' CGTGCTGGATTGGCTCACCCAGACACCTTCCGACAT

Read 2 5' AGTTGACAAGCGGTAGCCTGCACACCTTCCGACAT

#### Outer Primers

SP5 5' Phosphate–CATGTAATGCACGTACTTTCAGGGT

SP27 5' GATCAGGTGAGGCTGCGACGACT

Table 1. Elevate primer sequences

### Index and adapter plate layouts

Depending on the kit and protocol, the Elevate Workflow can use either short stubby adapters and a 96-well plate of indexes or long, full-length adapters packaged in a 96-well plate. Short adapters are packaged in a separate tube alongside an indexing primer plate. Each well contains a pair of index primers to be added indexes via PCR. The long unique dual indexes (UDI) adapter plate contains a ligation-based long adapter with UDIs in each well.<sup>1</sup>

Although the plate contents are different, the plates share a layout. Well A1 contains O01 through O96 in well H12:

- The Elevate Index and Adapter Kit provides primers EIP-UA\_001 through EIP-UA\_096.
- The Elevate Long UDI Adapter Kit Set A provides adapters ELP-UA\_001 through ELP-UA\_096.
- The Elevate RNA Index and Adapter Kit provides primers UDI 001 through UDI 096.

