**Project 10\_06**

**Oligomer Sequences:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sample ID** | **Sequence 5’ → 3’** | **Bases** | **5’ Mod** | **3’ Mod** |
| 10\_06\_S,a | GAAGCGAGTGATATGATGATGAATGTGATAGAATGGTAAGGTGC | 44 | - | - |
| 10\_06\_S,b | GAAGCTGAGAGTATGATGATGAATGTGATAGAATGGTAAGGTGC | 44 | - | - |
| 10\_06\_S(C,2) | GAAGCCAGTGATATGATGATGAATGTGATAGAATGGTAAGGTGC | 44 | - | - |
| 10\_06\_S(C,3) | GAAGCTCAGAGTATGATGATGAATGTGATAGAATGGTAAGGTGC | 44 | - | - |
| 10\_06\_S(C,4) | GAAGCGACTGATATGATGATGAATGTGATAGAATGGTAAGGTGC | 44 | - | - |
| 10\_06\_S(C,5) | GAAGCTGACAGTATGATGATGAATGTGATAGAATGGTAAGGTGC | 44 | - | - |
| 10\_06\_S(C,6) | GAAGCGAGTCATATGATGATGAATGTGATAGAATGGTAAGGTGC | 44 | - | - |
| 10\_06\_I,a | CGAGTGATATGATGATGAATGTGATAGAATGGTAAGGTGC | 40 | - | BHQ2 |
| 10\_06\_I,b | CTGAGAGTATGATGATGAATGTGATAGAATGGTAAGGTGC | 40 | - | BHQ2 |
| 10\_06\_I(C,2) | CCAGTGATATGATGATGAATGTGATAGAATGGTAAGGTGC | 40 | - | BHQ2 |
| 10\_06\_I(C,3) | CTCAGAGTATGATGATGAATGTGATAGAATGGTAAGGTGC | 40 | - | BHQ2 |
| 10\_06\_I(C,4) | CGACTGATATGATGATGAATGTGATAGAATGGTAAGGTGC | 40 | - | BHQ2 |
| 10\_06\_I(C,5) | CTGACAGTATGATGATGAATGTGATAGAATGGTAAGGTGC | 40 | - | BHQ2 |
| 10\_06\_I(C,6) | CGAGTCATATGATGATGAATGTGATAGAATGGTAAGGTGC | 40 | - | BHQ2 |
| 10\_06\_G,a | GCACCTTACCATTCTATCACATTCATCATCATATCACTCGCTTC | 44 | Cy3 | - |
| 10\_06\_G,b | GCACCTTACCATTCTATCACATTCATCATCATACTCTCAGCTTC | 44 | Cy3 | - |

**Oligomer Quantifications:**

|  |  |
| --- | --- |
| **Oligo** | **Conc. (µM)** |
| 10\_06\_S,a | 91 |
| 10\_06\_S,b | 91 |
| 10\_06\_S(C,2) | 90 |
| 10\_06\_S(C,3) | 94 |
| 10\_06\_S(C,4) | 101 |
| 10\_06\_S(C,5) | 91 |
| 10\_06\_S(C,6) | 94 |
| 10\_06\_I,a | 99 |
| 10\_06\_I,b | 104 |
| 10\_06\_I(C,2) | 98 |
| 10\_06\_I(C,3) | 101 |
| 10\_06\_I(C,4) | 98 |
| 10\_06\_I(C,5) | 101 |
| 10\_06\_I(C,6) | 95 |
| 10\_06\_G,a | 100 |
| 10\_06\_G,b | 96 |

**Experiment 10\_06\_01**

**Annealed Probes:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Gate No.** | **Gate** | **Vol (µL)** | **Incumbent** | **Vol (µL)** | **Buffer** |
| 1 | 10\_06\_G,a | 10 | 10\_06\_I,a | 15.2 | 974.8 |
| 2 | 10\_06\_G,a | 10 | 10\_06\_I(C,2) | 16.7 | 973.3 |
| 3 | 10\_06\_G,a | 10 | 10\_06\_I(C,4) | 15.3 | 974.7 |
| 4 | 10\_06\_G,a | 10 | 10\_06\_I(C,6) | 16.0 | 974.0 |
| 5 | 10\_06\_G,b | 10.4 | 10\_06\_I,b | 14.4 | 975.2 |
| 6 | 10\_06\_G,b | 10.4 | 10\_06\_I(C,3) | 14.9 | 974.7 |
| 7 | 10\_06\_G,b | 10.4 | 10\_06\_I(C,5) | 14.9 | 974.7 |

**Universal Gate Dilution (10 nM):**

* Gate (1 µM) – 100 µL
* Carrier Strand (100 µM) - 100 µL
* Buffer – 9800 µL

**Invader Solutions (1 µM):**

|  |  |  |  |
| --- | --- | --- | --- |
| **Invader** | **Substrate** | **Vol (µL)** | **Buffer** |
| S,a | 10\_06\_S,a | 11.0 | 989.0 |
| S,b | 10\_06\_S,b | 11.0 | 989.0 |

**Invader S,a and S,b Dilution (20 nM):**

* S,a/S,b (1 µM) – 200 µL
* Carrier Strand (100 µM) - 100 µL
* Buffer – 9700 µL

**Invaders 2-6 (100 nM) directly made in 10 mL:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Invader** | **Substrate** | **Vol (µL)** | **Carrier Strand** | **Buffer** |
| S(C,2) | 10\_06\_S(C,2) | 11.1 | 100 | 9888.9 |
| S(C,3) | 10\_06\_S(C,3) | 10.6 | 100 | 9889.4 |
| S(C,4) | 10\_06\_S(C,4) | 9.9 | 100 | 9890.1 |
| S(C,5) | 10\_06\_S(C,5) | 11.0 | 100 | 9889.0 |
| S(C,6) | 10\_06\_S(C,6) | 10.6 | 100 | 9889.4 |

**Each Well:**

Gate 40 µL = Diluted to 5 nM

S,a and S,b 40 µL = **Diluted to 10 nM**

S(C,2)-(C,6) 40 µL = **Diluted to 50 nM**

Total Volume = 80 µL

Z-Height = 9.0 mm

Gain = 2500

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column** | **1-3** | **4-6** | **7-9** | **10-12** | **13-15** | **16-18** | **19-21** | **22-24** |
| **Row** |  | **Buffer** | **S,a** | **S,b** | **S(C,2)** | **S(C,3)** | **S(C,4)** | **S(C,5)** | **S(C,6)** |
| **B** | **Gate 1** | Control | Complement | X | Formation | X | Formation | X | Formation |
| **C** | **Gate 5** | Control | X | Complement | X | Formation | X | Formation | X |
| **D** | **Gate 2** | Control | Correction | X | Exchange | X | Correct → Form | X | Correct → Form |
| **E** | **Gate 6** | Control | X | Correction | X | Exchange | X | Correct → Form | X |
| **F** | **Gate 3** | Control | Correction | X | Form → Correct | X | Exchange | X | Correct → Form |
| **G** | **Gate 7** | Control | X | Correction | X | Form → Correct | X | Exchange | X |
| **H** | **Gate 4** | Control | Correction | X | Form → Correct | X | Form → Correct | X | Exchange |

**Experiment 10\_06\_02**

**Annealed Probes:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Gate No.** | **Gate** | **Vol (µL)** | **Incumbent** | **Vol (µL)** | **Buffer** |
| 1 | 10\_06\_G,a | 10 | 10\_06\_I,a | 15.2 | 974.8 |
| 2 | 10\_06\_G,a | 10 | 10\_06\_I(C,2) | 16.7 | 973.3 |
| 3 | 10\_06\_G,a | 10 | 10\_06\_I(C,4) | 15.3 | 974.7 |
| 4 | 10\_06\_G,a | 10 | 10\_06\_I(C,6) | 16.0 | 974.0 |
| 5 | 10\_06\_G,b | 10.4 | 10\_06\_I,b | 14.4 | 975.2 |
| 6 | 10\_06\_G,b | 10.4 | 10\_06\_I(C,3) | 14.9 | 974.7 |
| 7 | 10\_06\_G,b | 10.4 | 10\_06\_I(C,5) | 14.9 | 974.7 |

**Universal Gate Dilution (10 nM):**

* Gate (1 µM) – 100 µL
* Carrier Strand (100 µM) - 100 µL
* Buffer – 9800 µL

**Invader Solutions (1 µM):**

|  |  |  |  |
| --- | --- | --- | --- |
| **Invader** | **Substrate** | **Vol (µL)** | **Buffer** |
| S,a | 10\_06\_S,a | 11.0 | 989.0 |
| S,b | 10\_06\_S,b | 11.0 | 989.0 |

**Invader S,a and S,b Dilution (20 nM):**

* S,a/S,b (1 µM) – 200 µL
* Carrier Strand (100 µM) - 100 µL
* Buffer – 9700 µL

**Invaders 2-6 (1000 nM) directly made in 10 mL:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Invader** | **Substrate** | **Vol (µL)** | **Carrier Strand** | **Buffer** |
| S(C,2) | 10\_06\_S(C,2) | 111.1 | 100 | 9788.9 |
| S(C,3) | 10\_06\_S(C,3) | 106.4 | 100 | 9793.6 |
| S(C,4) | 10\_06\_S(C,4) | 99.0 | 100 | 9801.0 |
| S(C,5) | 10\_06\_S(C,5) | 109.9 | 100 | 9790.1 |
| S(C,6) | 10\_06\_S(C,6) | 106.4 | 100 | 9793.6 |

**Each Well:**

Gate 40 µL = Diluted to 5 nM

S,a and S,b 40 µL = **Diluted to 10 nM**

S(C,2)-(C,6) 40 µL = **Diluted to 500 nM**

Total Volume = 80 µL

Z-Height = 9.0 mm

Gain = 2500

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Column** | **1-3** | **4-6** | **7-9** | **10-12** | **13-15** | **16-18** | **19-21** | **22-24** |
| **Row** |  | **Buffer** | **S,a** | **S,b** | **S(C,2)** | **S(C,3)** | **S(C,4)** | **S(C,5)** | **S(C,6)** |
| **B** | **Gate 1** | Control | Complement | X | Formation | X | Formation | X | Formation |
| **C** | **Gate 5** | Control | X | Complement | X | Formation | X | Formation | X |
| **D** | **Gate 2** | Control | Correction | X | Exchange | X | Correct → Form | X | Correct → Form |
| **E** | **Gate 6** | Control | X | Correction | X | Exchange | X | Correct → Form | X |
| **F** | **Gate 3** | Control | Correction | X | Form → Correct | X | Exchange | X | Correct → Form |
| **G** | **Gate 7** | Control | X | Correction | X | Form → Correct | X | Exchange | X |
| **H** | **Gate 4** | Control | Correction | X | Form → Correct | X | Form → Correct | X | Exchange |