Suppl. Table 1. Summary of APT runs performed on multiple tips and run conditions.

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| Run Number | Description | Laser Energy (pJ) | Sample Stage Temperature (K) | Target Detection Rate (%) | Pule Rate(kHz) | Ions Collected(x106) |
| R47\_02740 | Preston (Au EGH-PR3) | 50 | 59.6 | 0.5 | 125 | 6.5 |
| R47\_02741 | Preston (Au EGH-PR3) | 70 | 59.6 | 0.5 | 125 | 1.7 |
| R47\_02743 | Preston (Au EGH-PR3) | 110 | 59.6 | 0.2 | 125 | 0.3 |
| R47\_02784 | Preston (Au EGH-PR3) | 60 | 59.6 | 0.2 | 100 | 3.7 |
| R47\_02786 | Preston (Au EGH-PR3) | 60 | 59.6 | 0.3 | 125 | 0.5 |
| R47\_02744 | McLaughlin (Spot 3) | 35 | 59.6 | 0.3 | 125 | 0.9 |
| R47\_02745 | McLaughlin (Spot 3) | 20 | 59.6 | 0.2 | 100 | 0.07 |
| R47\_02747 | McLaughlin (Spot 3) | 50 | 59.6 | 0.2 | 125 | 0.7 |
| R47\_02791 | McLaughlin (Spot 3) | 60 | 59.6 | 0.2 | 125 | 2.5 |
| R47\_02788 | McLaughlin (Spot 3) | 60 | 59.6 | 0.2 | 125 | 5.5 |